

FACULDADE DE ENGENHARIA DA UNIVERSIDADE DO PORTO



**Information Literacy in Higher Education:  
The case of PhD Students in the UP**

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## Abstract

The present study attempts to identify the PhD students' information literacy needs, regarding three faculties, within University of Porto, contrast this with the way in which their needs are perceived by their supervisors and information literacy providers and also understand how the information literacy programs are planned and if there is a joint effort between supervisors and information literacy providers. Furthermore, the main objective is to provide data which allows a comparison between the findings from the RIN study in UK and findings within the three faculties in UP.

Where used individual interviews with each target group to get the data: PhD students, supervisors and service directors of all academic libraries. Then a qualitative and quantitative analysis was carried out.

The results allow an identification of the main information literacy needs that PhD students have. Regarding the set of competencies students assumed not be competent on *wikis and blogs in their research*, in *licensing and copyright issues* and in *open access to research reports*. Despite the sample of the RIN study, these competencies weren't rated as those they felt as weaker, they also assumed not be so capable in these competences. Further, it also could be perceived through results how the PhD trainings are planned and delivered to these students: professionals aim for contents being as specific as possible in student's research area and just happen by an appointment and there is poor evidence on the outcomes assessment. Regarding RIN study it is still underdeveloped. Finally, another important finding of this study is the confirmation that supervisors are still not completely aware of the Information Literacy issues and don't collaborate with professional on the trainings planning. As such, the RIN study had the following finding: supervisors didn't work jointly with professionals in the trainings planning.

The final conclusion identified that the results of the present study and the RIN results didn't vary in a significant way.

**Keywords:** Information Literacy; Researchers: Information Literacy needs; Library training; Training impact; Training assessment

## Resumo

A presente dissertação consiste na adaptação e comparação do estudo realizado pela Research Information Network (RIN) no Reino Unido: *Mind the skills gap: Information-handling training for researchers* em 2008. Assim, os principais objectivos desta dissertação consistiram na identificação e percepção das necessidades de formação em competências de pesquisa e gestão da informação dos alunos de doutoramento de três faculdades da Universidade do Porto (UP) de forma a realizar-se um contraponto destas necessidades com as que são apreendidas pelos seus orientadores e pelos os formadores na área da Literacia da Informação. Além destes objectivos, pretendeu-se também perceber como é feito o planeamento das formações e se existe um trabalho colaborativo entre orientadores e formadores.

Foram criadas entrevistas individuais para cada grupo alvo: alunos de doutoramento, orientadores e directores dos serviços de Literacia da Informação de cada biblioteca. Em seguida procedeu-se a uma análise qualitativa e quantitativa dos resultados.

As principais conclusões retiradas permitiram responder aos objectivos inicialmente propostos: os alunos de doutoramento assumiram não ser completamente hábeis no uso de *wikis e blogs nas suas investigações*, nas *questões de licenciamento e copyright* e ainda no *acesso livre a documentos*. Apesar de não corresponderem às principais dificuldades da amostra de alunos da RIN, estes alunos também reconheceram ter alguma dificuldade no uso destas competências. O planeamento das formações nas três faculdades não difere significativamente dos resultados obtidos pela RIN: pretende-se que os conteúdos estejam relacionados com a área de investigação dos alunos; os pedidos de formação apenas acontecem quando solicitados aos profissionais da biblioteca e assume-se ser essencial existir uma colaboração efectiva no planeamento das formações. Em jeito de conclusão, aferiu-se que não existe uma diferença significativa entre os resultados do estudo realizado pela RIN e os resultados obtidos no presente estudo.

**Palavras-chave:** Literacia da Informação; Alunos de doutoramento; Necessidades de Literacia da Informação; Formações da Biblioteca; Avaliação das formações; Impacto das formações.

*To my dear father*







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## LIST OF ABBREVIATIONS

AACC	<i>American Association of Community Colleges</i>
AAHE	<i>American Association of Higher Education</i>
ACRL	<i>Association of College &amp; Research Libraries</i>
ALA	<i>American Library Association</i>
ANZIIL	<i>Australian and New Zealand Information Literacy Framework</i>
ARL	<i>Association of Research Libraries</i>
ASCD	<i>Association for Supervision and Curriculum Development</i>
CAUL	<i>Council of Australian University Librarians</i>
CILIP	<i>Chartered Institute of Library and Information Professionals</i>
CHE	<i>Commission on Higher Education</i>
CITL	<i>National Research Council's Committee on Information Technology Literacy</i>
FEUP	<i>Faculdade de Engenharia da Universidade do Porto</i>
FEP	<i>Faculdade de Economia da Universidade do Porto</i>
FLUP	<i>Faculdade de Letras da Universidade do Porto</i>
HE	<i>Higher Education</i>
HEI	<i>Higher Education Institutions</i>
ICT	<i>Information and communications technology</i>
IFLA	<i>International Federation of Library Associations</i>
IIA	<i>Information Industry Association</i>
IL	<i>Information Literacy</i>
ILP	<i>Information Literacy Providers</i>
ILT	<i>Information Literacy Test</i>
IT	<i>Information Technology</i>
JCALT	<i>Joint Committee for Awareness, Liaison and Training</i>
JISC	<i>Joint Information Services Committee</i>
NCLIS	<i>National Commission on Libraries and Information Science</i>
NEA	<i>National Education Association</i>
NFIL	<i>National Forum on Information Literacy</i>
PDP	<i>Personal Development Planning</i>
RIN	<i>Research Information Network</i>
SCONUL	<i>Society of College, National and University Libraries</i>
UNESCO	<i>United Nations Educational, Scientific and Cultural Organization</i>
UK	<i>United Kingdom</i>
UP	<i>Universidade do Porto</i>







# INTRODUCTION

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## **Context of the problem and motivation**

The advent of new technologies to share and manage scholarly information has been taken advantage of by academics and has fundamentally changed their information behaviors and practices (Virkus 2003). The development of the required competencies of researchers and postgraduate students for the identification, management and use of these new resources, has, however, not kept pace with the rapidity these changes (RIN 2008). For this information to be accessed and used properly, students are required to be information literate (Johnston and Webber 2003). They should be able to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (ALA 1989, 1). One role of a modern library is to equip students with the necessary information skills to function effectively and to meet challenges of information age.

While it has been argued that information literacy activities are well represented at an undergraduate level, however, at a postdoctoral level it is less evident (Corrall 2007). Indeed, the Research Information Network in the UK points to the lack of evidence in the assessment of researchers' training needs, recommending that the library should adopt "more systematic and innovative approaches to identifying and assessing the needs of researchers to enhance their information-related skills and competencies" (2008, 9).

The importance of this dissertation is clearly justified. On the one hand, by literature's lack of evidence regarding developments on Information Literacy Programs for PhD students. On the other hand, by the possibility of giving information literacy providers some support and recommendations, in order to provide information literacy programs for PhD students in an effective, efficiently and innovative way.

The present dissertation was carried out on the context of FEUP Library and covered three colleges of the University of Porto (UP): Faculdade de Economia da Universidade do Porto (FEP), Faculdade de Letras da Universidade do Porto) and Faculdade de Engenharia da

Universidade do Porto (FEUP). These three case studies were considered the most representative colleges of Porto's Academia.

The University of Porto was founded in the eighteenth century and nowadays has about 31.000 students, 2.300 academics and researchers. The University has 14 faculties with a great variety of courses regarding all the academic degrees in every knowledge areas. Currently, with 69 research unities, UP has a participation in the database ISI Web of Science with about 20% of scientific Portuguese articles making it the largest producer of Science in Portugal (UP 2010).

### **Objectives**

In this context, the purpose of the research will be to provide data which allows comparison between the findings from the RIN research in UK and findings within three faculties in UP.

To make this possible, this study attempts to identify the PhD students' information literacy needs, regarding three faculties, within University of Porto. Furthermore, it is important to contrast this with the way in which their needs are perceived by their supervisors and information literacy providers. Moreover, this research's aim is also to understand how the IL programs are planned and if there is a joint effort between supervisors and information literacy providers.

### **Research question**

This study will attempt to answer the following question: Is there a gap between PhD students, regarding information literacy needs, and the way in which their needs are perceived by supervisors and IL providers in the University of Porto?

### **Methodological aspects of the dissertation**

After the objectives and the research question were established, it is necessary to design the methodology that will enable the achievement of the objectives and the research question answer. In this context, in an initial stadium, there was a literature review of the theme,

which is the theoretical base for any research because it allows a perception of what was done until recently. At the same time, it is essential to identify what was not done or/and what needs improvement. In the second stadium the data gathering methodology was planned in order to get data which allows the achievement of the proposed objectives.

This project, as was said, was initially undertaken by reviewing broader literature, concerning with information literacy training for postdoctoral students. During the literature review the following questions were surveyed: How is information-handling training planned? Should a set of key skills exist for each graduate level? Are Information Literacy skills requirements reached before the training? How has this consideration been prepared by the information literacy providers? And also questions related to the quality of training programs: Are information professionals well trained with the skills? Are training programs connected with real students' needs? How are outcomes evaluated? And are outcomes the expected ones? The answers to these questions are linked to the purpose of this work. In this context, they provide a broad knowledge of what has been done in this area.

In order to do this, the following research terms, closely connected with Information Literacy concept, were used in the search process: “postdoctoral training”, “PhD students”, “research training”, “information seeking”, “needs assessment”, “information needs”, “training needs”. As mentioned above, these terms were always related to the key word “information literacy” which gives relevant hits to the documents title search.

Databases used for searching activities were scientific databases, such as *ISI Web of Knowledge*, *ERIC*, *SCOPUS*, *Academic Search Complete* and *Library, Information Science & Technology*. Online Journals, such as *Journal of Information Literacy* and *Communications in information literacy* and *The International Information & Library Review*, accessed through the *Science Direct*, which has a recent issue dedicated to the Information Literacy.

Also the popular Google Scholar and Google searches were used to find, for example, works of recognized authors in the area, such as Sheila Webber Blog of Information

Literacy, and to find places on the internet such as the RIN place, Vitae, and the database in open access *Research Information*.

Furthermore, the data gathering methodology is also mentioned briefly, since this same topic is very detailed in Chapter IV, regarding the objectives of the dissertation, the selection of the appropriated data gathered methods, which allows an archive of these objectives. In this context, a qualitative methodology was used and selected individual interviews were put together for each target group: PhD supervisors, information literacy providers and PhD students of each college.

### **Dissertation structure**

The present dissertation is to be divided in seven chapters.

- Firstly, there is the Dissertation Introduction chapter, which consists of a description of how the dissertation draft will be developed (which objectives and research questions), and also which are the main difficulties and limitations to the study.
- Secondly, the Theoretical Framework chapter, where the main concepts related with Information Literacy and its definition are described. The importance of skills on this area is so relevant, not just for students but mostly for them. This chapter ends with Information Literacy scope, which is Information Science. This chapter is important for the development of the present study because it allows a better understanding of the core concepts and also a clarification of which concepts will be used along the text.
- The third Chapter is Literature Review, where the main topics informing the present research are enclosed. It starts with a brief historical overview of Information Literacy evolution concentrated into higher education context, which is divided in three parts: Information Literacy – pre-ALA, Information Literacy –ALA and Information Literacy – post-ALA, whereas ALA (American Library Association) was the first one to alert people for Information Literacy. The following topic is concerned with an overview of the generic Information Literacy skills provided by the institutions that recognize most works produced in this area. Subsequently, there is an analysis of the Information Literacy Instruction in academic context: how they



are planned; which activities are provided; and the suggestions for the outcomes assessment. These topics are helpful for the data gathered through the semi-structured interviews to information literacy providers in each UP library faculty. There are some important topics on these interviews, like how IL trainings are planned, how trainings are put together and how outcomes are assessed. The next topic is related with the assessment of the Information Literacy Training: why it should be done and how. More specifically, assess how the Information Literacy programs have been provided to help librarians develop teaching staff and improve the quality of the programs. Through this information it was possible to understand what the main aspects that contribute for IL trainings success are. The following topic traces some methods that were used by Information Literacy providers to assess the students' training needs in this area. Although, this methods were mostly concerned with undergraduate students rather PhD students, which confirms even more the poor developments on this area for PhD students. Also, in this topic, the previous issue was analyzed through one of the key finding of the RIN Study: "Focusing on researchers' real needs is vital". The next topic is related with the information training needs of PhD students. It "tries" to analyze which are which are their difficulties to access and manage their information until now. Another topic that was entitled Auditing Skills for Postdoctoral Students is related to the postdoctoral researcher skills training they should acquire, develop and demonstrate, in order to make a significant and innovative work in their area. The UK GRAD Programme and the UK Research Councils have identified a range of skill areas for postgraduate and postdoctoral researchers - *Joint Skills Statement* (2001), which is a good tool for the audit researchers' skills. So, this information was helpful to perceive, at the end of the study if the PhD students in UP have the skills required or not. The following topic addresses the role of a supervisor, not only as a PhD supervisor but as a collaborator in the planning of IL programs. As PhD supervisors, they should be able to recognize subject expertise, as well as the skills and experience necessary to monitor, support and direct the student's work. Furthermore, they also have an important role on helping IL providers in planning the IL programs, because they know about the research topic. Moreover, what

sources have relevant information, as well as the difficulties of their postdoctoral students in information research? However, a question should be raised: are the supervisors aware of this issue? This topic helps to better understand what has been noticed in the literature about this issue. The goal of this chapter's last topic is to provide some examples for higher education library training practices and researcher's support. As this study's aim is to compare its results with the RIN results from UK, these examples come from the UK and Portugal.

- The fourth chapter discusses how the dissertation research structure was built. It starts with the description of the methodology goals and then how it was carried out. Thus, the target groups were characterized - PhD students, supervisors and information literacy providers – mentioning their features to better understand how to study them. An exploratory qualitative research approach is used because qualitative research provides a deeper understanding of the issues that are aimed to be studied (George 2006). The data gathering methods were semi-structured, in-depth interviews to supervisors, IL providers, and to PhD Students in three Faculties of Porto's University (UP). These methods were developed based on those used by RIN. The questions and also the methods' structure are similar. Although, the present study is directed towards institutions, different from the ones used by RIN study, some questions were added and others weren't used.
- The next chapter focuses on the data analysis and discussion process. How data has been analyzed? Which are the findings? These topics will allow a comparison between RIN findings in UK.
- Finally, in the last chapter some conclusions were made and some recommendations arranged.

# Chapter 1

## THEORETICAL FRAMEWORK

---

### **Introduction**

The theoretical framework of the present work is set within the later decades of the 21st century. The information explosion, fueled in part by a revolution in information technology, has deeply affected academic libraries and higher education. These changes originate a transformation from the traditional mission for teaching “library skills” into a broader instruction for teaching “information literacy.” In this context, Information Literacy in higher education will be the most important set of investigation of this work.

### **1.1- Concept of Information Literacy**

Since 1974, Information Literacy has been an area of increasing interest to librarians and information professionals, in education, social, political, and economical areas.

Many definitions regarding Information Literacy have been outlined by many authors and institutions and other terms also can be used.

The emergence of Information Literacy can be divided in three parts. In addition, American Library Association (ALA) represents a landmark, because it is the world's oldest and largest national library association (established in 1876) and also was the first one to alert people for Information Literacy, especially academic libraries and information professionals, to its importance in the Information Age (see Annex A). The most common definition of Information Literacy used was provided by this Association. It stated that for “to be information literate an individual must recognise when information is needed and have the ability to locate, evaluate and use effectively the information needed. Ultimately the 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.” (1989, 1)

The Association of College & Research Libraries (ACRL) defines Information Literacy as: “the set of skills needed to find, retrieve, analyze, and use information.” It created a set of competencies standards that outline in detail the skill set needed to be information literate.

The Prague Declaration defines Information Literacy as “encompasses knowledge of one’s information concerns and needs, and the ability to identify, locate, evaluate, organize and effectively create, use and communicate information to address issues or problems at hand; it is a prerequisite for participating effectively in the Information Society, and is part of the basic human right of lifelong learning.”(2003, 3)

Also in 2003, CILIP has defined Information Literacy as “knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner.” They have also created more in depth guidance on the skills required to be information literate.

The Alexandria Proclamation of 2005 on Information Literacy and Lifelong Learning proclaims that Information Literacy is a prerequisite for lifelong learning. It enables people for all life, to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. “It is a basic human right in a digital world and promotes social inclusion of all nations.”(IFLA 2005)

The Joint Information Services Committee (JISC) uses the term i-skills to describe Information Literacy and IT skills. I-skills are defined as: “the ability to identify, assess, retrieve, evaluate, adapt, organise and communicate information within an iterative context of review and reflection” (2010, 4).

The Research Information Network (RIN) support the both CILIP and JISC’s definitions of information literacy, but argue “it is important to adopt a broader interpretation of

information literacy, which (i) recognises that ‘information’ must be taken to include research data; and (ii) clearly also encompasses the ability to manage, and where appropriate preserve and curate one’s own information and data” (RIN 2010).

Sheila Webber and Bill Johnston two experts in this area, in 2003 defined Information Literacy as an "adoption of appropriate information behaviour to identify, through whatever channel or medium, information well fitted to information needs, leading to wise and ethical use of information in society."

Although, all of these definitions often vary from author to author, it’s interesting to notice that there is a general agreement that they should include skills such as Information Technologies (IT), evaluation, critical thinking and problem solving skills. These skills feature an information literate person.

## **1.2- Core concepts of the key terms**

A distinction between the competencies of Information Literacy and the competencies in Information Technology is essential, because they have different meanings and sometimes people use them as synonyms: it is a prerequisite for being an information literate person because it allows individuals to access the information resources. They include basic skills (use of keyboard, mouse, printer, file/disk management), Standard software (word processing, spreadsheets, databases, etc.) and Network applications (electronic mail, Internet, web browsers). As Mokhtar and Majid said, “IL entails the ability to search, locate, evaluate and use this information or facts to create useful knowledge, whereas the IT encompasses competencies in utilizing technology based tools effectively. It is therefore reasonable to consider IT literacy as one facet of IL” (2008, 6)

As regards to literature, terms like “information literacy skills” or “information competencies standards” are predominant in the American and Australian context, whereas in the UK the most commonly used term is “information skills”. So, which one is the key term? Some authors argue that “information literacy” is not enough as students should have “information competencies”. However, there are authors that use both terms

interchangeably because they argue that none of these terms is substantively different from the other (Manchester Metropolitan University Library Services 2001). In this work, the term information literacy skills have been used related to literature.

The terms “assessment” and “evaluation” are also used interchangeably, mainly in the US literature. But Bruce made in the Australia and New Zealand framework (2004) a distinction between both: the term “assessment” is related to measuring and describing student learning, whilst “evaluation” is the feedback for the IL instructor/ teacher regarding the effectiveness of the curriculum and the teaching. For the present work, was intended that it is just a question of language, because both means the same, and do a distinction between both, can lead to a confusion of the subject.

### **1.3- The importance of Information Literacy**

Information Literacy (IL) skills are very important for all citizens whether they are in an office, in a work-at-home environment, in school, or in other social settings, due to the growing boost not only in information resources, but also in the different access methods.

For students, IL competencies should smooth the progress of independent and authentic learning, rather than create a dependence on the teacher to provide answers to questions or problems that they are faced with. In addition, these competencies should help them become self-motivated learners and thinkers, who are creative, analytical and effective (Mokhtar and Majid 2008).

Increasingly, information comes unfiltered. So, questions about authenticity, validity, and reliability, which represent large challenges for researchers, begin to be raised. “Sheer abundance of information and technology will not in itself create more informed citizens without a complementary understanding and capacity to use information effectively” (Bundy 2004, 3).

Therefore, information literacy aims to provide people with an important concept of learning - Lifelong Learning. If people recognize that everything is becoming increasingly

dependent on information, as well as the learning skills necessary to get it (Business, Economic Development, Governance and so forth), then getting information, evaluating it and using it becomes essential to knowledge. Eventually, information literate people are those who have learned how to become skilled at something. They can always find the information needed for any task or decision at hand (ALA 1989). When individuals are able to do that over the course of their lifetime, they become Lifelong Learners (UNESCO 2007).

#### **1.4- Information Literacy and Information Science**

Since one of the themes of this paper is that of defining information literacy, it is useful to consider the scope of a discipline with which it is intertwined: information science.

Both the terms ‘information’ and ‘information science’ have been discussed and defined many times throughout literature. Webber and Johnston (2000) cited some: Saracevic 1056; Summers *et al.* 2010; Ingwersen 1992; Machlup 1962; Zuboff 1995. Through their approaches, information science aims were highlighted “not only organizing and retrieving information for clients, but also evaluating that information”, at the same time enabling all citizens with “skills in information selection, organisation and handling”.

All these approaches were compiled in one. Silva, stressed that Information Science covered three connected areas: Information Management, Organisation and Representation of Information and Information Behaviour, which is related to the origin, collection, organization, storage, recovery, interpretation, transmission and use of information (Silva 2006).

Although it would be difficult to argue that every citizen needs to follow a course in information science, the fact is that every citizen should acquire information literacy skills. Therefore, information professionals skilled for training all citizens with these competences and the existence of information institutions that provide information literacy, as well information skills, are very important.

The previous theoretical framework provides a better understanding of how the Information Literacy has been defined by experts, the main concepts linked to the area, its importance in higher education and their relation with Information Science. Through it was created a basis for the next chapter: literature review.



# Chapter 2

## INFORMATION LITERACY RESEARCH

---

### **Introduction**

This chapter begins with an overview of the key Information Literacy skills provided by the institutions that recognized most works produced in this area. The following topic is related with the Information Literacy Instruction in academic context: how they are planned; which activities are provided; and the recommendations for the outcomes assessment. The last topic concerns the evaluation of the Information Literacy Instruction: why it should be done and how.

### **2.1- Information Literacy skills**

There are various information skills/competencies standards concerning information access and use that have been implemented in different Universities in the world. Some of them are from ACRL (2000), Doyle (1992), Dupuis (1997), Rader (1996), CAUL (2000), Bundy (2004) and SCONUL (1999). These documents not only list the competencies that students ought to possess and exhibit, but also make recommendations as to how these competencies can be achieved and their product.

Some countries – United Kingdom, Australia and United States – have made their contribution with recognized works in this area. Therefore, the standards of this study will derive from those work and will be focus on those that represent the mirror for development and implementation of information literacy in different universities in the world. In this context, the SCONUL model, ACRL standards and ANZIIL standard.

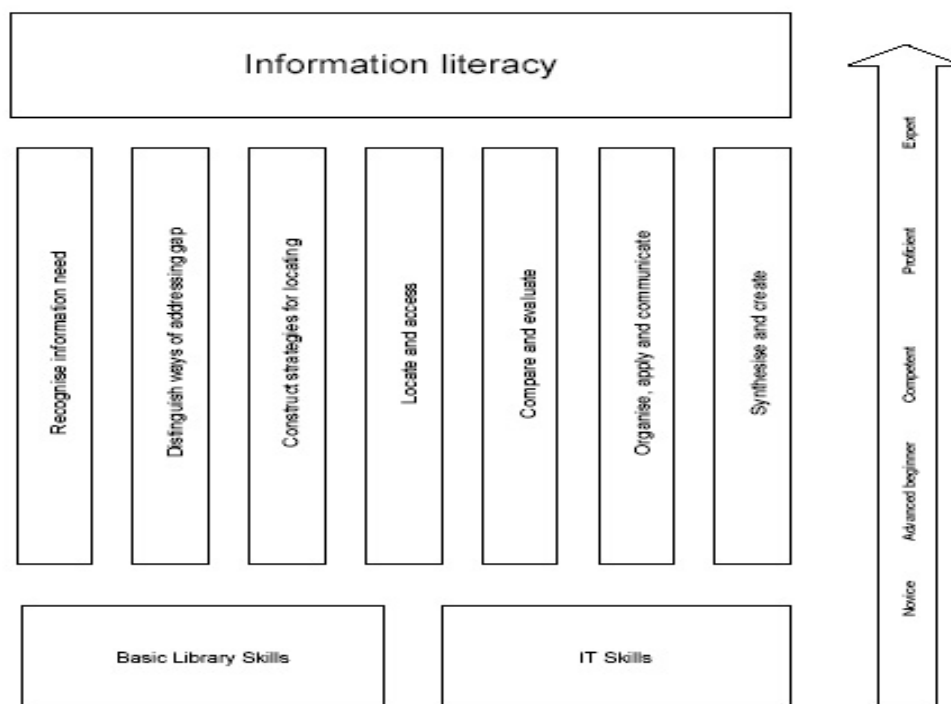
Developments in the UK have tended to lag behind those in Australia and the USA (Johnston and Webber 2003). While the US and Australian has drawn up information

literacy standards, the Standing Conference of National and University Libraries (SCONUL) started by developing a model for information literacy. In December 1998, SCONUL was convened and proposed the *Seven Pillars of Information Skills* framework (Mokhtar and Majid 2008).

In this paper the relationship between *Information Skills* and *Information Technology Skills* is pointed out: the last one is a prerequisite for the first one. And the need for information skills was sought, mainly in the UK's higher education.

Furthermore, higher education information skills can be applied in two strands: (I) Basic Library Skills, related with the students' abilities to use an institutional library and its resources and to be able to perform "literature searches" to whatever complexity is required for a particular discipline area; as well as being able to demonstrate their skills to their tutors, for example through citations and references. (II) IT Skills, including those already listed, are elements of critical thinking and solve problems.

These strands can be realized in the following diagram (Diagram 1), which represents the SCONULs Information skills model. They are the base for that model. Between the base and the higher level concept of 'information literacy' seven headline skills and attributes stand out, the iterative practice which leads from being a competent user to the expert level of reflection and critical thinking of information as an intellectual resource. The arrow indicates the progression from novice to expert. Probably, the first undergraduates will be at the bottom of the arrow and perhaps only practicing the first four skills becomes an aspiring to the seventh.



**Diagram 1 - SCONUL Seven Pillars Model for IL**

In the United States, the Association of College and Research Libraries (ACRL) in 2000 published the *Information Literacy Competency Standards for Higher Education*. It was, and still is, one of the most recognized documents in this area. It provides a range of five core standards with performance indicators and outcomes for each one (see Appendix I). The outcome allows the students' assessment, which reveals their progress. It serves as a guideline for staff measuring student learning in the context of an institution's unique mission (ACRL 2000). The use of the standards provided outline the process by which faculty, librarians and administrators determine specific indicators that identify a student as information literate.

In Australia, Alain Bundy (2004) revised the first edition of CAUL Standards (2001), and, with the recommendation of academics and librarians, produced a framework entitled *Australian and New Zealand Information Literacy Framework (ANZIIL)*. This second edition "is derived, with permission, from the Association of College and Research Libraries' (ACRL) *Information literacy competency standards for higher education*" (Bundy 2004, 3). The main objectives were: to provide guidance and more comprehensive

details for each of the six core standards, so that it can be implemented in Australia Universities.

Through this paper, Information Literacy is a prerequisite for participative citizenship, social inclusion, creation of new knowledge, organisational empowerment and learning for life (Bundy 2004).

It has evolved year after year, and despite the fact that it was in different places in the world, the importance that Information Literacy acquires in 21st century, is completely perceived. Through the analyses of each frameworks previous described, some things can be pointed out, for most of them go in the same direction.

- (I) The information skills/ competencies standards (see table 1) are focused on defining personal characteristics, in other words, they pretend to empower individuals with intellectual abilities for reasoning and critical thinking, and help them to construct a framework for learning how to learn;
- (II) Some of these skills require IT Skills, so that students can use and access information resources;
- (III) The objective of each model is basically the same: to provide a framework for assessing the information literate individual (ACRL 2000), who acknowledge their need for information, and identify, locate, access, evaluate and apply the needed information (Bundy 2004) in order to solve problems;
- (IV) All models seem to go into the same direction: these skills must be embedded into the students' curriculum and a collaborative work between lectures, librarians and administrators is important. Lectures and leading discussions lead to an establishment of the faculties' context for learning. Faculty also inspires students to explore the unknown, offer guidance on how to fulfill information needs, and monitors students' progress. Academic librarians coordinate the evaluation and selection of intellectual resources for programs and services; organize, and maintain collections and many points of access to information; and provide instruction to students and faculty who seek information.

Administrators create opportunities for collaboration and staff development among faculty, librarians, and other professionals who initiate information literacy programs, lead in planning and budgeting for those programs, and provide ongoing resources to sustain them (ACRL 2000).

- (V) The SCONUL model stated that the IL skills learning as an “iterative process”, which means that learning IL skills is a process that must be repeated so that an individual becomes an expert. But the ACRL Standards also stated that “as students’ progress through their undergraduate years and graduate programs, they need to have repeated opportunities for seeking, evaluating, and managing information gathered from multiple sources and discipline-specific research methods”(2000, 7). So, IL skills are typically easy in the first cycle, more developed in the second, and in the third cycle it is possible that students can consider themselves experts.
- (VI) In contrast to American approaches, Australians provided a broader base for implementing Information Literacy into subject curriculum (Johnston and Webber 2003).
- (VII) An evolution from ACRL to Australian and New Zealand standards stand out, when talking about “information literate *person*” rather than student, which recognizes IL as a citizen (Johnston and Webber 2003)

		United Kingdom	United States	Australia
		SCONUL (1999)	ACRL (2000)	Bundy (2004)
<b>Information Literacy Skills</b>	<b>Skill 1</b>	Recognises a need for information	Determines the nature and extent of the information needed	Recognises a need for information and determine the extent of the information needed
	<b>Skill 2</b>	Distinguish ways in which the information 'gap' may be addressed	Access needed information effectively and efficiently	Finds the needed information efficiently and efficiently
	<b>Skill 3</b>	Construct strategies for locating information	Evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system	Evaluates the information and the information seeking process
	<b>Skill 4</b>	Locate and access information	Individually or as member of a group, uses information effectively to accomplish a specific purpose	Manages information collected or generated
	<b>Skill 5</b>	Compare and evaluate information obtained from different sources	Understands many of the economic, legal and issues surrounding social information use and accesses and uses info ethically and legally	Applies prior and new information to construct new concepts or create new understandings
	<b>Skill 6</b>	Organise, apply and communicate information to others in ways appropriate		Uses information with understanding and acknowledges cultural, ethical, economic, legal, and social issues surrounding the use of information
	<b>Skill 7</b>	Synthesise and build upon existing information, to the contributing creation of new knowledge		

**Table 1 - Information Literacy Skills/ Competencies Standards**

## **2.2- Information-handling training**

In past decades, traditional library instruction was planned to teach students the “library skills” necessary to use the library effectively. This instruction focuses in enabling students with the correct knowledge on how to use library resources: the library catalog is the gateway to the book collection, the periodical indexes represent the access to the periodical collection, and the reference collection.

These skills had none or little emphasis on academic staff, which reveals “that could be useful for students to know but that was not really central to the student’s intellectual growth, academic success, or future careers” (Thompson 2002, 2). Then, even if the teachers do not recognize the importance of the library skills, the undergraduates realized that learning these skills would not get them many benefits in the classroom.

Due to the overload of information, that originated the development of new technologies in more recent decades, reforms in higher education, with greater focus on active learning, have been growing: lifelong learning, critical thinking, problem-solving, career preparation, undergraduate research, and assessment of learning outcomes (Thompson 2002). An effective use of library resources enabled the students with more capacities to find relevant resources for their assignments and research papers.

In this context, libraries have now an active educational mission: Library and information resources and services contribute to developing the ability of students, faculty, and staff to use the resources independently and effectively (Thompson 2002). The Know-how to find information, where to find it, manage and evaluate it in order to produce new knowledge represent a set of skills – Information Literacy Skills - that students, and everyone in general, must learn.

So, the programs of Information Literacy training intend to provide students with Information Literacy Skills. Regarding literature, some ways of planning appeared, as well as some activities, and methods of outcomes’/training assessment, which have been adopted in some universities in the world. Therefore, the following topics will be enlisted.

### **2.2.1- Planning**

In order for the library's mission to be achieved, the Information Literacy training programs should plan a strategy to meet specific needs rather than a range of conventional standards (Breivik 1998). Some associations, through its experience, recommend some practical examples, but because a diversity of them exist in different contexts it is difficult to say which is the best one.

The earliest is from the ALA's Final Report, which presented some recommendations for all educators (teachers, librarians, learning advisers, trainers):

- Library associations must work more closely with other professional associations to promote Information Literacy;
- State departments of education and commissions on higher education must mandate the inclusion of Information Literacy in all curricula; and
- Teacher education programs should introduce future teachers to the concepts of Information Literacy. (ALA 1989)

The Quality Assurance Agency for Higher Education recognized the importance of embedding Information Literacy Skills into students' subjects. (Quality Assurance Agency for Higher Education 1999)

In the SCONUL model, were stated some principles which might support the Information Literacy training programmes implementation. One that stands out is "programmes should make valid use of new technology and other innovations". On one hand, this means that students must know information technology and, on the other hand, librarians must also be up-to-date with software programs, mainly those that are concerned with web browsing, printing, bibliographic management, and data management in order to deliver information effectively to students and faculty.

The ACRL produced the report *Best Practices Initiative* in 2001, where ten categories are offered with the elements which represent the best practices in information literacy



programming. It was perceived that the most emphasized elements had an institutional context (audience, purpose, budget, staffing and time), curriculum alignment and the use of different methods of assessment, because they appeared in most elements or, in other situations, appeared unintended.

In Bundy's framework (2004) the practices of curriculum alignment was also emphasized. It was mentioned that "there is a correlation between goals, objectives, content, learning outcomes, teaching methods, teaching and learning activities, assessment and evaluation" what makes students more centered in their works. In this Australian framework, it was also stated that all institution staff should collaborate in the development of assessment tools and strategies in some subjects (see 2.2.3 point).

Many others authors (Manchester Metropolitan University Library Services 2001; Johnston and Webber 2003; Mokhtar and Majid 2008; Thompson 2002) assumed that the Information Literacy training integration into students curriculum was important, because students begin to really develop the skills required and understand the importance of them for enhancing employability.

Although, there are some challenges to integrate Information Literacy training into curriculum. According to the specific context and goals of disciplines, each IL program must deliver their own standards, as ACRL says on its standards "information literacy manifests itself in the specific understanding of knowledge creation, scholarly activity and publication processes found in those disciplines" (2000, 8). Consequently, library and academic staff should collaborate both to integrate specific learning and assessment instruments in order to "reach all students, pinpoint areas for further development, and consolidate learning goals already achieved" (ACRL 2000, 9). As the big Blue project showed, working together is the key to develop skills with appropriate timing and context to their core disciplines.

Another challenge is the time that librarians have for training students. Gutierrez and Wang (2001) emphasize that a single library research session is not enough to significantly improve these skills, it is necessary a continuous learning to achieve the objectives.

Johnston and Webber (2003) present two others challenges to implement IL programs into curriculum, both related to the developments of the information society. If the Information Literacy is useful for lifelong learning, it must be adjustable to changes trough life (Johnston and Webber 2003). This means that these changes will have an effect on, both in the nature of curriculum (for example, students should to be aware of the changes in legislation of the open access and the copyright) and on the other hand in the way academic staff see these skills. They should know about the benefits and the importance that Information Literacy Skills represent for students in all contexts and throughout life. Teachers should also be “information literate people”, so that they can teach students

To sum up, the integration of an IL program into students’ curriculum is one of the key practices of planning an IL program and the best way to do that is through the collaborative work between Information Literacy providers, academics/ supervisors.

### **2.2.2- Activities**

In order to provide students with the education that enables them to use the information resources, and having in mind all the practices mentioned before, some activities have been created to offer Information Literacy Instruction within universities.

According to Peacock, and Eisenberg, Lowe, and Spitzer, current Information Literacy Instruction in higher education has four main types of approaches - intra-curricular, inter-curricular, extra-curricular and the stand-alone curricular courses (Wang 2006).

Concerning an intra-curricular approach, the Information Literacy Instruction is integrated into learning outcomes, learning activities and assessments of an academic curriculum. It is generally delivered via collaborative work between academic and library staff. There is strong literature evidence to suggest that Information Literacy training is best developed if

integrated in researcher's subject context (Wang 2006). Some practice examples of how this is outlined come from the Institutes of the University of Leeds. One of the various examples is the IL training in The Faculty Team Librarian for Dentistry. A collaborative work with the librarians and a tutor in the school created a new approach to teaching advanced Medline searching to 3<sup>rd</sup> year undergraduates. Students receive training about how to construct comprehensive searches with a demonstration of a worked example. This is followed by a practical exercise, where students do a guided example search and then carry out an independent search so they can put to practice the taught methodology. After that, students email their independent search strategy. The results reveal that this approach is effective and the students themselves have suggested that the session should be incorporated permanently into the 3<sup>rd</sup> year curriculum. So, having this in mind, the Faculty Team Librarian for Dentistry is working together with the School's Undergraduate Dental Education Group to integrating Information Literacy training throughout the 5-year undergraduate curriculum (University of Leeds 2003).

The inter-curricular approach, the training of Information Literacy is provided as an add-in session(s) for an academic course or program by the library in consultation with or at the request of individual academic staff. Generally, attendance is a requirement for training.

Extra-curricular programs of Information Literacy are taught outside the students' curriculum and attendance is voluntary. Topics such as web searching, literature searching in electronic journals and databases, library catalog, information management (eg. Endnote) are taught accordingly with the interest/purpose across faculty (Wang 2006). For example, the library of Faculty of Engineering, University of Porto provides training about engineering databases and online journals to students.

A stand-alone approach consists in teaching IL as an independent discipline only dedicated to Information Literacy as part of the students' curricula (Wang 2006). The stand-alone Information Literacy course is either taught as a selective course for credit or non-credit or taught as a compulsory course as part of the general education program offered in a faculty or university. FEUP Library also has an example of a stand-alone approach that is available

for faculty community in an e-learning environment (through the platform Moodle) and aims to develop IL skills. It is constituted by six modulus and equals tree ECTS. The contents of each module are:

Module 1 – investigation, innovation and literature review

Module 2 – registration of the investigation outcomes and innovation

Module 3 – formal aspects of publications

Module 4 – systems of documents research

Module 5 – Information of the World Wide Web

Module 6 – Information management (FEUP Library)

According with the study on the IL training, provided by academic libraries in UK, elaborated by Streatfield, Allen and Wilson in 2009, much of the library Information Literacy programs are taught based on construtive learning approach and a few exceptions on behavioral learning approach. A constructive learning means that learners understand, recognize and build upon their previous knowledge, skills, expertise and experimental learning. In turn, behavioral learning consists in transmitting information and basic skills through teachers' presentations and demonstrations. Most sessions are characterized by student listening, watching and repeating the steps demonstrated by the teachers. To support this approach, usually worksheets and computer-based tasks were used.

In today's information-exploded world, Information Literacy training in higher education "needs to shift from recommending resources to critically selecting and evaluating resources; from how to use a particular database or a product to how to understand database process; from specific skills to general, transferable critical thinking and lifelong learning skills" (Wang 2006, 2).

To sum up, academic staff should collaborate with librarians in order to rethink pedagogies in information literacy instruction to meet new challenges and develop student's critical thinking and lifelong learners.

### **2.2.3- Outcomes assessment**

The learning outcomes, provided by the program of information literacy training, should be assessed. As Bundy said in his framework it “is a powerful way for students and educators to come to a common understanding” (2004, 29) about what has been learnt or how much has been learnt in order to facilitate learning, diagnose the gaps of learning and provide a structure for learning.

To develop an assessment process it is necessary to make two decisions. The first one is related to the level of assess that will take place: institutional, course, specific discipline or training activities provided by the library. For each level a set of objectives should be stipulated through the collaboration between academic staff and librarians, and also should be part of the information literacy training program. The other decision that is put into consideration is the selection of the appropriated assessment tools (MSCHE 2003). There are a vast range of assessment tools but, as stated, there is a need for recognizing “that different levels of thinking skills are associated with various learning outcomes” (ACRL 2000, 8) so, choosing those that is essential in order to achieve a real assessment.

The trainers can develop an assessment strategy according with qualitative and/or quantitative methods and use assessment tools such as essays, pre- and posttest, seminars, portfolios, projects, reports, group presentations, quizzes, professional experiences, observations, questionnaires (Bundy 2004). Although, as already said, its choice should be closely related with what is wanted to assess in each IL activity.

Evaluating the programs of IL training is also possible in order to alert academic staff to the contributions of IL skills into students’ curriculum and for their success throughout life. What still happens nowadays is that academics are not yet aware of the IL value and consequently they do not incentive their students to be information literate people. With the results’ assessment of the IL programs, a demonstration of the students’ progress in their academic works can be shown to academics and, consequently, they can become more aware of working together with librarians in the development of IL programs.

So, assess the students' outcomes allow librarians to improve their trainings to better answer the students' needs.

### **2.3- Assessment of the training programs**

“Library instructors desire to meet the needs of their students and want to know how effectively they do so” (Davidson 2002, 4). Assess how the Information Literacy programs have been provided to help librarians (I) develop teaching staff and (II) improve the quality of the program.

(I) Information Literacy skills and knowledge of trainers have a direct influence on the development of student's skills and knowledge. Due to this, implementation of programs for “training the trainers” at academic libraries is a good practice for achieving the success of Information Literacy training programs (Thompson 2002). These programs aim is to develop instructors with abilities for transferable IL skills, including IT skills, such as selecting software programs, dealing with web browsing, bibliographic management and data management in order to deliver information effectively to students (Streatfield, Allen, and Wilson 2010; Thompson 2002). Librarians nowadays are seen as teachers, because now they are concerned with refining their instruction through the application of teaching techniques, learning theory, leadership and assessing Information Literacy. In Australia, The University of New South Wales delivers a course to enhance academic librarians with teaching skills (Thompson 2002). In this context, through the assessment of training it is possible to recognize its strengths and weaknesses and restructure the instruction programs.

(I) A training program of Information Literacy with trainers and students working in the same direction: trainers want to know the Information Literacy students' necessities and work with them in order to respond to them. Interconnected aspects, such as the number of sessions offered and the content of the training programs, are essential. The sessions should be provided systematically and shouldn't constantly be cancelled, so that students can constantly be up-to-date with the contents taught. The training contents are related to the Information Literacy skills that students should acquire, and should be those that students really need to learn, that most of the time, are related with the student's graduate level

(undergraduate, postgraduate and postdoctoral). This is an important alignment, because otherwise a gap between existing practice and desired position can exist. Generic Information Literacy skills, based on information seeking, citing sources and introducing students to the library services are taught at all faculty levels rather than developed what needs to be acquired. For example, adapt specific Information Literacy skills to the postgraduate and postdoctoral levels of faculty such as “how to write research reports and journal articles”, “how to prepare and submit conference papers”, and questions related with copyright and open access (Streatfield, Allen, and Wilson 2010).

Summing up, both criteria should be correct so that the Information Literacy objectives can be achieved.

#### **2.4- Meeting the training needs of researchers**

In the universities of US and Australia, some methods were developed by the librarians and academics to assess the students’ training needs in the area of Information Literacy, many of which were triggered by the ACRL IL competency standards. The James Madison University, in US, developed a proposal for the first-year students to take a test on IL, known as Information Literacy Test (ILT); Another IL test gaining importance is the SAILS project, initially conceived by a working team of the Kent State University and later approved by Association of Research Libraries (ARL). Based on ACRL rules, this online test measures general IL skill of diverse groups of students and assesses the knowledge on IL of those surveyed and not so much their skill. It is composed of 45 questions randomly selected from a base of more than 250 items; The ISS test, developed by the Council of Australian University Librarians following IL rules and demanding those surveyed to self-report on what they do with information, has been also analysed; Other IL tests is the one developed by the Educational Testing Service (Princeton, NJ, USA), in conjunction with the CSU and other colleges and universities, and has been field tested for several years across many campuses. It was called the Information and Communications Technologies Literacy Assessment (iSkills, previously known as ICT). This online scenario-based test of student skills in IL and technological literacy, also based on the ACRL standards, measures seven areas of performance (Lopes 2010).

Although all these methods, one of the key findings of the report developed by the Research Information Network - *Mind the skills gap: Information-handling training for researchers*, revealed that there is “little evidence of libraries or other trainers making systematic attempts to assess researchers’ training needs” (2008, 24) This puts in danger the quality/effectiveness of the training programs, because they are not centered on researchers’ needs. So, agreeing with the RIN key findings “focusing on researchers’ training needs is vital”.

The scarcely information related to assessment is partly due to the difficulties of communicating with researchers and is also due to the poor knowledge that researchers have about these competencies implying that they don’t know how to recognize their needs. Other difficulty is related to what providers hope will be useful for the researchers to learn (RIN 2008). Another reason for little or none assessment is the general perception that some supervisors do not recognize the need for content training, that their PhD students should learn (RIN 2008). Most of them come from the oldest generation, and they are not fully aware of the advances in research information.

Despite these difficulties, identifying the researchers, who need Information Literacy, training them and realizing what kind of competencies and knowledge they need to learn is an important effort that must be developed.

The technique that RIN report used to achieve the training needs was structured focused groups, conducted in different Universities in UK. The report also suggests a development of an e-portfolio, where students can check their self-assessment progress according to objective criteria.

So, meeting the information literacy needs of students is not an easy task but it is, however important that professionals assess these needs so they can be answered.



## **2.5- Information training needs of PhD students**

As any other university student, PhD students have a greater need to be information literate (Pilerot 2004) since they should present a significant and innovative doctoral work.

Until now what have been shown by the literature is that “the ability to handle a large amounts of research information is of particular importance for this group of students” (Pilerot 2004, 94). Their studies are often taking place during a long period of time and there is a tendency to collect large amounts of information in order to respond to the problem more thoroughly (Pilerot 2004).

Genoni and Partridge (1996) have described the so called “Project PRIM” (Personal Research Information Management) in which students from the field of humanities participated. The conclusion reveals that “many students who undertake postgraduate research are poorly prepared for the personal research information management tasks which await them”. Furthermore, these authors also stated that these students have different information literacy needs from those of undergraduate students (Jan Partridge & Paul Genoni 1996). This difference, as they expose, is mostly linked on their information management process.

The RIN report *Mind the skills gap: Information-handling training for researchers*, revealed that the weaker competencies are “how to write research reports and journal articles” and “how to prepare and submit conference papers”. But, researchers reported themselves relatively weak in use of digital repositories, in licensing and copyright issues, in developments in metadata, and in use of wikis and blogs in their research.

Although of these studies, many students have the tendency to assume that they have the skills. They already know all they need to access and manage the information (University of Leeds 2003). So, a systematic assessment of the students’ needs is very important to improve the results of the IL trainings (RIN 2008), but as the students assume having the competencies, do they need training? And if so, do they perceive it? These questions

reveals that sometimes the previous training needs assessment appears to be little because of the difficulty of contacting the students. (RIN 2008)

Other difficulty in assessing the students' training needs is linked to the "widespread perception that some research supervisors do not recognise the need for the types of training on offer to 'their' postgraduate students" (RIN 2008, 22). It has been noticed that supervisors are poorly linked to these questions of information research and management, so they "are not well placed to guide the next generation of researchers towards appropriate help" (RIN 2008, 22).

In order to overcome these difficulties have been developed by the UK GRAD Programme (now renamed Vitae) some key skills training, which formed the basis for a training initiative aimed at postgraduate and postdoctoral students (RIN 2008). The following topics address these initiatives.

#### **2.6- Auditing skills for postdoctoral students**

Currently, a progress has been made related to the training of postgraduate and postdoctoral researchers. In the UK, this interest was stimulated by government initiatives such as the Roberts review *SET for Success*, which examined the general picture of postgraduate and postdoctoral researcher skills training and made recommendations for a more systematic approach. Subsequently, the Quality Assurance Agency produced the *Code of Practice* in 2004, which set out standards for postgraduate training programs (Streatfield, Allen, and Wilson 2010).

As Vitae postulated, a doctoral work should start by the identification of the researchers' strengths and weaknesses: thinking about the skills they already have, which will be useful in their doctorate, life and career, and those ones that they will need to achieve or refine.

As a response to that, the UK GRAD Programme and the UK Research Councils have identified a range of skills areas for postdoctoral researchers - *Joint Skills Statement* (2001). It is a good tool for the audit researchers' skills.

This document provides a certain guideline for researching: self-direction, supervisor support and mentoring, departmental support, workshops, conferences, elective training courses, formally assessed courses and informal opportunities (UK GRAD Programme and the Research Councils 2001).

Postdoctoral students should make a significant and innovative work in their area, which means that the training provided must be connected to the needs that they have to develop their work efficiently and effectively.

Therefore, the skills that the UK GRAD Program “expects” postdoctoral students to achieve are:

Research Skills and Techniques - to be able to demonstrate:

- The ability to recognize and validate problems;
- Original, independent and critical thinking, and the ability to develop theoretical concepts;
- Knowledge of recent progress within one's field and in related areas;
- An understanding on relevant research methodologies and techniques and their suitable purpose within one's research field;
- The ability to critically analyze and evaluate one's findings and those of others;
- An ability to summarize, document, report and reflect on progress.

Research Environment - to be able to:

- Show a broad understanding of the context, at a national and international level, in which research takes place;
- Demonstrate awareness of issues related to the rights of other researchers, of research subjects, and others who may be affected by the research, e.g. confidentiality, ethical issues, attribution, copyright, malpractice, ownership of data and the requirements of the Data Protection Act;
- Demonstrate the positive reception of the standards of good research practice in their institution and/or discipline;
- Understand relevant health and safety issues and demonstrate responsible working practices;

- Understand the processes for funding and evaluation research;
- Justify the principles and experimental techniques used in one's own research;
- Understand the process of academic or commercial exploitation of research results.

Research Management - to be able to:

- Apply effective project management through the setting of research goals, intermediate milestones and prioritization of activities;
- Design and execute systems for the acquisition of information through the effective use of appropriate resources and equipment;
- Identify and access appropriate bibliographical resources, archives, and other sources of relevant information;
- Use information technology appropriately for database management.

Personal Effectiveness - to be able to:

- Demonstrate a willingness and ability to learn and acquire knowledge;
- Be creative, innovative and original in one's approach to research;
- Demonstrate flexibility and open-mindedness;
- Demonstrate self-awareness and the ability to identify own training needs;
- Demonstrate self-discipline, motivation, and thoroughness;
- Recognize boundaries and use support sources as appropriate;
- Show initiative, work independently and be self-reliant.

Communication Skills - to be able to:

- Write clearly and in a style appropriate to the purpose, e.g. progress reports, published documents, thesis;
- Build up coherent arguments and articulate ideas clearly for a range of audiences, formally and informally, through a variety of techniques;
- Constructively defend research outcomes at seminars and viva examination;
- Contribute to promoting public understanding of one's research field
- Support efficiently the learning of others when involved in teaching, mentoring or demonstrating activities.

Networking and Team working - to be able to:

- Develop and maintain co-operative networks and working relationships with supervisors, colleagues and peers, within the institution and the wider research community;
- Understand one's behavior and impact on others when working in and contributing to the success of formal and informal teams;
- Listen, give and receive feedback and respond perceptively to others.

Career Management - to be able to:

- Appreciate the need to show commitment to a continuing professional development;
- Take ownership and manage one's career progression, set realist and achievable career goals, and identify and develop ways to improve employability;
- Demonstrate an insight into the manageable nature of research skills to other work environments and the range of career opportunities within and outside the academia;
- Present one's skills, personal attributes and experiences through effective CVs, applications and interviews. (Joint Skills Statement 2001)

The Office of Research of the Central Queensland University in Australia is responsible for carrying out research training for higher education. The program of research training provided by this Australian University includes similar competencies to those developed by the UK GRAD Programme: use of information technology, project management, literature searching, database management, statistical and qualitative data analysis, personal effectiveness, communication skills (written, oral, listening), networking and team working, and career development should be available (Sahoo and Mazid 2009). These competencies should be determined by a training needs analysis and reviewed to ensure that it is meeting the necessities of the student. Although, as already said, this practice of pointing out what researchers need is poorly developed.

The UK GRAD Programme also built an online database, which records a national review of emerging practice on the use of the Personal Development Planning (PDP) for postgraduate researchers. The UK Higher Education Institutions were invited to submit

their current practice to help postgraduate students in their doctoral work. It was shown that certain practices were put together in a different level: cross-institutional, faculty, school or department (focusing specific disciplines).

To assess personal developments mechanisms such as - paper-based resources with electronic support, editable electronic portal, work in groups and personal presentations - were used.

The UK GRAD database found that the practices that Higher Education Institutions (HEI) have done focused mainly in training needs analysis, personal reflection and review, skills assessment, planning training, collecting CV information, research planning, input into HEI transcripts and institutional records, departmental records.

It was also perceived that there is little evidence (almost a third of respondents) in assessing training needs. But, from the responses, the focus is on research specific skills development. The majority of the practices revealed that the work described is still at an early stage, and that there is much scope for ongoing learning, and further developing the practice.

## **2.7- The supervisor's role**

As in undergraduate level the role of the academic staff is very important, in the Postdoctoral level the role of the supervisor has no less importance, it is also very important.

The supervisors should possess not only recognized subject expertise, but also the skills and experience necessary to monitor, support and direct the student's work. The way they do this depends on the university's regulations. Although, there are some features that are traditional across institutions and there is one which is really necessary: A good relation between both students and supervisors. Without this, they can't collaborate each other in the development of a good doctoral work (UK GRAD Programme and the Research Councils 2001).

The UK organization Vitae, stated that typically, supervisors should:

- guarantee that the student understand what is expected;
- meet regularly with students for exploring ideas, thinking the project through, agreeing the pre-requisites the student should bring;
- support students with the co-ordination of the supervisory team responsible for the project;
- provide guidance about literature, training, research techniques and academic conventions;
- give a feedback on the student written work and his/her overall progress;
- alert for courses, both specialist and concerning transferable skills;
- help students to submit the work on time;
- inform students on where they should present their work;
- read and make some comments about the whole work develop until the final thesis.

Summarizing, part of being an effective supervisor is to identify and be responsive to the individual needs of postdoctoral researchers and to tailor supervision accordingly. So, specifically, it will be not considered important integrate a collaborative work between supervisors and IL providers in planning specific Information Literacy training? Supervisors can discuss with information literacy providers about the research topic, suggest what sources have relevant information, as well as find out the difficulties of their postdoctoral students in information research. Through this information, cannot librarians be better able to provide tailored training for students and further, help them efficiently and effectively in their work?

Although, what has been noticed is that supervisors are not yet aware of these issues of information Literacy, its contributions and importance for students' development and lifelong learning. All this represents, indeed, a challenge for all professionals in the Information literacy area(RIN 2008).

## **2.8- Examples of HE library practices: researchers training and support**

There are a considerable number of examples of practices regarding research in formation training and support, as well as, overall training provision for PhD researcher (RIN 2008). The present dissertation will just be focused on UK and Portugal examples, as the main goal of the work is to make a comparison between the data gathered by it and the data gathered through RIN research about the HE institutions in UK.

In general, at the beginning of each academic year, the HE Libraries deliver introductory presentations about the Library (RIN 2008). The aim of these presentations is to provide students with knowledge about all resources and services that the Library is able to deliver, in order to create autonomous students in searching and retrieving information. In Portugal, there are some examples of these practices in the HE Libraries, such as Universidade de Aveiro, Universidade de Trás-os- Montes e Alto Douro, Universidade do Minho e Universidade do Porto.

In the UK, the Oxford University History Faculty offers introductions at two levels: one through an “Information Fair” which is seen as a “gateway to information resources” for postgraduate students. The first event offered 17 stalls and was attended by 70 students (of a total of 180, 50 of whom were new that year). Stalls were staffed by library and IT staff, tutors and graduate students (whose stall was judged the most successful) and 15 minute inputs on various research information topics; the other level consists in coffee mornings for supervisors and postdoctoral researchers, run on similar lines. Both events are supported by workshops in information skills and electronic resources. (RIN 2008)

Therefore, these interactive presentations of information resources and services, provided by the academic library, are an important way to introduce students in library and make them aware of the importance of its access and how to use them.

More specifically, concerning research competencies, the academic libraries develop some practices of training and support for researchers. Some examples of good practices are presented in the RIN Report (2009). For example, Kingston University invites researchers



to create research mind maps, in order to ensure that information seeking sessions start from what the researchers bring to the training, which provides training sessions more centered in researchers' needs and also increases the interest to participate in these training sessions. Other example is the University of Northampton, which offers research degree supervisor training centrally through its Knowledge Exchange, is described as a development focus providing a one-stop shop for research and knowledge transfer services. The Imperial College, London consists in other example of practice in this area with the *PILOT* (Post doc information literacy online tutorial) funded by a grant from the Staff Development Unit and developed from the undergraduate OLIVIA programme, but with a focus on individual rather than group learning. Moreover, a shift of emphasis on research topics. A ground-breaking way to attract researchers to the Information Literacy trainings was produced by the Leeds University Library and that is a "bloody brilliant" introductory booklet and "names its courses to attract people – "Intelligent Searching Agents" instead of "Internet Searching"".

In Portugal, regarding PhD Students, what has happened (and in some cases for masters students and undergraduates students) is that the training sessions are asked either by the supervisors or by the students individually and should be appointed previously. Some examples of this practices comes from the Universidade de Aveiro, Universidade do Minho and Universidade de Trás-os-Montes e Alto Douro (UA; UM; UTAD 2011). The training sessions go on during two or three hours, and the contents are "always adapted to the scientific area or researcher's subject context" (UA 2011) so that students can get the best benefit of the training. Although, through the web pages of those Universities it is not possible to perceive how the trainings are planned and also how they are delivered to students. A possibility is maybe training programs, which are planned through a previous contact with PhD students, who tell IL providers what they would like to learn (what are their information training needs). Also, the planning can also be through a previous contact with supervisors, who can tell IL providers what PhD students should learn, regarding IL skills, to better develop their doctoral works.

## **Summing up**

This literature review provides a rationalization of all the work. It will address some key issues related with Information Literacy in Higher Education, and, more particularly, related with the case of postdoctoral researchers. Some of these are intimately linking to the present investigation.

First of all, Information Literacy and Information Technology are intimately related. Broadly, IT competencies are a prerequisite for being an information literate person because it allows individuals to access information resources. They include basic skills (use of keyboard, mouse, printer, file/disk management), Standard software (word processing, spreadsheets, databases, etc.) and Network applications (electronic mail, Internet, web browsers), which are undoubtedly essential to get information.

The three key models of Information Literacy have numbers of competencies different, all of them wants to mean the same: to provide a framework for assessing the information literate individual (ACRL 2000), who acknowledge their need for information, and identify, locate, access, evaluate and apply the needed information (Bundy 2004) in order to solve problems.

Another issue is “curriculum alignment”, concerning undergraduate level. Planning an information-handling training should be integrate into students curriculum, to ensure that students are more centered in their problem-solving and critical thinking (ALA 1989; ACRL 2001; Bundy 2004; Johnston and Webber 2003; Manchester Metropolitan University Library Services 2001; Mokhtar and Majid 2008; Quality Assurance Agency for Higher Education 1999; Thompson 2002). The same issue can be broadly applied to postdoctoral students. Integrate the IL programs into PhD students’ subject context, in order to better help them in the development of an innovative and significant PhD work. Although, as the literature reveals, this is still poorly developed. Furthermore, the activities provided by the academic libraries are closely connected with training key skills for undergraduate students, as was perceived by the literature review. As regards to postgraduate and postdoctoral students, there is a need to learn more specific skills so they

can develop their work, which means it is necessary to develop Information Literacy training programs more directly to these researchers and linked to their doctoral works.

As the RIN study reveals, there is little evidence of information literacy providers making systematic attempts to assess researchers' training needs. Well, as a key finding to this research, it is vital to focus on researchers' real needs and, at the same time, a gap between what students expect to learn and what information literacy providers are training. However, students, even in a high academic level, may not even know the key information skills (recognize an information need, select the specific resources and construct a research strategy). When it happens, and librarians don't know, a gap between the actual student's needs, the perception of their needs by research staff and the training provided can exist. Nowadays, it has been noticed. So, it is necessary to assess students' needs of information literacy skills, in order to provide information-handling training with high quality.

An important issue to guarantee the trainings quality is very linked with the capacity of trainers have to provide IL sessions for PhD students. In the postdoctoral level students want to know more and more and information literacy providers should be well capable with all competencies to provide appropriated trainings to PhD students.

According to the UK GRAD Program, there are several competencies in the area of IL that PhD students should learn and develop in order to present an innovative and significant work. Nevertheless, are these competencies well known by them? And are those ones trained by librarians? This is one of the mains goals of this investigation.

What concerns with the main difficulties of the PhD students, they are closely linked to the way these students manage the large amounts of information retrieved (Jan Partridge & Paul Genoni 1996 and (Pilerot 2004). Also RIN study finds that postgraduate students have more difficult on writing research reports and journal articles and on preparing and submit conference papers. So, as they becoming in doctors in a specific subject and the doctorate degree takes so long (at least three years) in which students access lots of information and don't know how organize and preserve this information. Regarding the difficulties found by

RIN study, they were assessed in a sample of masters and PhD students, although which concerns with PhD students these competencies are very important for them. These kind of documents are constantly asked to experts with this academic level. So, having this in mind the present study attempts to understand what are the information training needs of PhD students and further if they overlap with these ones identified in the literature review and RIN study.

Regarding PhD supervisors' role, a question was raised, which was: Are librarians able to provide tailored training for students and further help them efficiently and effectively in their work if supervisors work together with them? As Vitae stated, supervisors should, among other aspects, guarantee that the student understands what is expected and provide guidance about literature, training and research techniques. The role of a supervisor is, therefore, to know what students difficulties are, what literature they should research, what are the specific information resources, and so forth. Although, striking the literature, there is little evidence of this collaborative work of supervisor and IL providers because supervisors are not aware of Literacy Information issues, its contributions and importance for students' development and lifelong learning. In this investigation it is aimed to perceive if PhD supervisors in the UP are or are not aware with the IL issues.

Concerning with HE Library Practices in UK and Portugal, could be perceived that they differed significantly. The UK practices are more interactive, centered in students' needs and also students' area. In these trainings are asked to students to expose their problems incentivizing them participate in the trainings sessions. What happens in Portugal is still much linked to undergraduates and masters students: the contents are the same although they are adapted to the students' area (for example, specific databases).

Consequently, according to this literature review, the focus of this investigation is to identify the PhD students' needs regarding Information Literacy competencies. It is also aimed to understand if these needs are perceived by their supervisors and the providers of information literacy. And how the Information Literacy trainings are planned, more specifically what are IL providers base to deliver the trainings. For example, they are based

on assessment needs, curriculum alignment, and collaborative work with supervisors and expected outcomes.

As the investigation will mirror the RIN study, to make this investigation happen the same data gathering methods used in the RIN study will be used in the study too.



# Chapter 3

## METHODOLOGY: DATA GATHERING

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### Introduction

In this chapter will be designed the methodology that will be followed to collect data.

#### 3.1- Methodology goals

The main pragmatic goal of this research is to discover whether information literacy needs for PhD students are adequately met by their supervisors and information professionals in UP. More specifically:

- To learn about the information training needs, in the area of Information Literacy, of PhD students in order that their information needs can be supported;
- understand how the IL programs are planned;
- and, understand if there is a joint effort between supervisors and information literacy providers.

As a comparative study with the RIN research, it was also pretended to contribute to theoretical knowledge about the information literacy needs of PhD students and also how the trainings are provided. So the research has, drawn heavily upon study conducted for the Research Information Network which investigated information-related training for researchers provided by universities and other higher education institutions in the UK. The intention of the research will be to provide data which allows comparison between the findings from the UK Universities and findings from University of Porto.

## **3.2- Methodology research**

### **3.2.1- Characteristics of the target groups**

The project goals listed above define the type of participants – PhD Students, Supervisors and Information Literacy providers - of each faculty within UP. So the results of the research can be compared with those obtained by the RIN study, three faculties within UP will be studied: Arts, Economy and Engineering. In the RIN research the IT service of each college also was studied. In UK, during last decades, an integration of information management has been implemented by all kind of organizations. Thus, in academic institutions, information technology, services and contents management, are provided by the same organization unit. In Portugal, goes on the tradition of separating the unit that manages information contents and services, from the management of technology. That is the reason for not having interviewed the IT directors in the context of this research.

An important question was raised that is: What criteria should be used to choose participants? By “the literature it was clear that homogeneity and variety were both necessary aspects to improve a better effectiveness” (Perry 2002, 257).

In the case of the students, regarding to the variety, they will be selected based on different areas of study, so that a comparison can be made between areas. To address the need of homogeneity, there is a selection of those who are in a PhD degree.

Will be interviewed three supervisors in each faculty, at least 1 Senior Academic involved in a research group and 1 lone academic, so the necessity of variety can be addressed. In terms of homogeneity, will be selected PhD supervisors. This distinction between a senior academic involved in a research group and a lone academic it's because if a student is in a larger team they may be provided with support by members of the team, whereas the student studying with the lone scholar won't have the same support network. The students' information needs and requirements for information skills will be similar, however, the way in which they are met can be very different.



Regarding to the IL providers, in terms of variety will selected one in each faculty, more specifically the Service Director because is the one who is entirely linked to trainings in Information Literacy. Attended to the homogeneity, will be selected information professional linked to the area of Information Literacy.

So, a total of 58 individual interviews were carried out with 45 PhD students, 10 supervisors and 3 information literacy providers in colleges studied.

### **3.2.2- Qualitative research**

An exploratory qualitative research approach with semi-structured individual interviews will be used instead of a quantitative research. Through a qualitative research it is possible to explore not only the participants' actions but also to get a deeper understanding of their meaning, the context in which they act and the influences on their behavior (George 2006). So, the use of that approach seems to be appropriated since the objective of the research is to understand the needs of PhD students regarding to the information literacy competencies.

The individual interviews will be conducted with PhD students and supervisors of different areas and also Information Literacy providers in each faculty.

### **3.2.3- Data gathering method: individual interviews design**

The qualitative interviews are one of the most recognized methods to data gathering in an investigation. It involves a direct questioning between two participants: the interviewer and the interviewee, which enables a detailed and observable feedback. (Fernandes 2010)

This data gathering method, allows a better understand what each sample of participants thinks and does regarding the questions. It allows the possibility to correct some incomprehension of the interviewees, do follow-up questions for a better understanding and get data with high quality (Fernandes 2010). These vantages result from the interaction between interview and interviewee. The interviewer should start by identifying himself, saying his/ her name, the theme and objective of his work. He/ she also should say how long the interview will last (approximately). Another important aspect that the interviewer

should make clear is what is expected from the interviewee, so they could speak with ease. (Ghiglione 2001)

The biggest disadvantage is also concerned with the interaction between interview and the interviewee. Through this interaction can result an influence, which provides wrong answers and causes a negative effect on the research results. (Ghiglione 2001)

Regarding each type of interview - not structured, semi-structured and structured interviews – those used in this research were the semi-structured and structured interviews. An interview guide was used with the themes which were pretend to focus and investigate. When was pretended to get more information of the interviewee a follow-up question was raised.

#### **3.2.4- Planning for conducting the interviews**

Some guidelines should be planned to conduct an individual interview (McClelland 1994).

In a present research some aspects were kept in mind to carry out the interviews: define for each target group interview specific objectives, what questions should be addressed in each interview (according to each interview objective), how to record the data gathered through the interview, how to select and contact the participants in each faculty.

##### Specific objectives

For each interview, to each target group, were stated specific objectives according to the main objective of the present research:

The main goal of the PhD students' interviews was to perceive the information training needs of them and how well they feel supported by the academic library in this area.

The PhD supervisors' interviews aim to perceive if they are aware about the information literacy programs at Library, if they work jointly with information literacy providers in the planning of training and what information literacy skills they consider to be the most important ones for PhD students learn in these trainings.

Regarding with information literacy providers, the interviews' goal was to perceive how the training in research skills and information skills concerning PhD students is being delivered and what skills they consider important for PhD students to learn.

#### Composition of questions

It was necessary to design an interview guide in order to help to address the pretended topics and to provide a cohesive structure to the interview.

The questions and also the methods' structure will be similar from those used by the RIN study. Although, the present study is directed towards institutions, different from the ones used by RIN study, some questions were added and others weren't used.

So, the questions are developed according to the specific objectives of each interview (referred before).

Regarding PhD students, were used structured interviews and was asked to them to rate the level of importance, competence and library's support for each competency using a 5 point scale (see Annex A)

During the interviews, when students are rating the level of importance of each competency, was asked to them to make some comments in order to perceive why they are rating competency "x" as very important or not important.

Regarding PhD students, structured interviews were used and it was asked to rate the level of importance, competence and library's support for each competency using a 5 point scale. During the interviews, when students are rating the level of importance of each competency, they were asked to make some comments in order to perceive why competency "x" is been rated as very important or not important (See Annex B).

Concerning information literacy providers semi-structured interviews also took place and they were asked to rate each competency for PhD students by its level of importance, using the same scale. Still, it was asked how they planned the Information Literacy trainings for

PhD students, if there was a supervisor's collaboration on this planning, its contents, and the main difficulties that PhD students have in these same competencies (see Annex C).

The interviews with PhD supervisors were semi-structured, and each competency was rated for PhD students according to the level of importance, using the same scale. Additionally, they were asked to describe the importance of a collaboration between supervisors and IL providers for planning the training sessions, as well as what are the main difficulties that PhD students have in these competencies (see Annex D).

#### Recording the information

Recording as much information as possible, as well as, taking some notes is both helpful and necessary for the interviewer. So, was used a voice recorder to register all the information.

Recording an interview provides a great deal more in terms of accuracy and recall, however, confidentiality becomes a principal issue. For this reason, an advance notice of the intent to record the interview was mentioned to the respondent so that he/she agrees or rejects the proposition honoured. No one, reject and all the interviews were recorded using the voice recorder. Although an ethical statement was stated in all the interviews mentioning that the interviewees' identity will be preserved and the data collected just will be used for the purposes of research.

#### Select and contact the target groups

The selection of the people who are available for responding the interviews was made with the help of the Library director of academic library of each faculty. In a first stage, the library director of each academic library will be contacted to ask if he/she can contact three PhD supervisors and at least twelve PhD Students. Other way to contact the PhD students is through director of each postdoctoral course asking them to contact some students who were available to respond a brief interview regarding the competencies in research and management the information.

### **3.3- Instrument application**

In an initial part, were done some interviews tests in order to make sure that questions were well structured and are well perceived by the respondents. Furthermore, it was helpful to get some experience to carry out the interviews. So, one PhD supervisor, one PhD Student and one information provider were contacted to test the interviews. At the end, the 4.a question should be restructured in the information providers' interview, because doesn't make sense: the initial question was "Please could you tell me why you have selected X Subset of skills as "very important"?" and as was asked before to respondent to evaluate de importance of each IL skills, this question need to be changed to "Please could you tell me what subset of skills do you consider "very important" PhD students learn?". Also, for a better development of the interview, was perceived that this question 4. should be asked at the end of the interview, because it was for respondent answer in the paper so to not make a brake in the interview it was moved to end.

After this part of tests, it began to apply the interviews with the supervisors, students and information providers. The place, where the interviews were carried out were mostly in the offices of PhD supervisors and information providers. Regarding PhD students, the interview place was mostly in their classes' room. The duration of the interviews depended from group to group: with PhD Supervisors run between 13 – 18 minutes, with PhD Students lasted between 15 – 20 minutes and with Information literacy providers took 20 – 30 minutes.

After finishing all the topics mentioned during this chapter, was possible to pass to the following step: data collection, data analysis and then data discussion so a comparison with the RIN study could be made.



# Chapter 4

## DATA ANALYSIS AND DISCUSSION

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### Introduction

In this chapter the data analysis process will be described to display the results of the research. Further, a comparison, as well as a discussion about the results obtained, will take place. And, at the same time, an analysis of the RIN results and of the previous literature review.

#### 4.1- Data analysis and discussion process

The data analysis process is going to be structured by a set of competencies, used in each interview with individual target groups: PhD students, PhD supervisors and information literacy providers for each case study.

The analysis will be based on each competency according to the following criterion: importance, competence and library's support. In the same section, a quantitative and qualitative analysis will be used to present an interpretation of less subjective results.

Therefore, each information literacy competency will be analyzed according to the qualitative data recorded in individual interviews, for example, students' thoughts, visions and opinions about competency; in order to allow a perception of what are the most quoted levels for each competency.

Individual competency will be incorporated in single bar charts, with a level of importance, competence and library's support in percentage. Is important to notice that the 100% of the PhD students interviewed corresponds to 45, the 100% of the supervisors interviewed corresponds to 10 and finally, the 100% of the service directors interviewed corresponds to 3(see Annex D).

Also an analysis of the way IL trainings are planned will take place, having in mind the following topics: who participates in this planning, contents addressed, number of attendance and training assessment.

And finally, the supervisors' role on planning the IL trainings for PhD students.

One of the main objectives of the present study was to arrange data that allows a comparison with RIN study, which is a main goal in this topic. At the same time, it is important to compare the data with the literature review. More specifically, in this topic, there will be also a description of the main similarities and differences between data from the RIN study and data from the present study in UP, as well as the data from literature review.

This comparison will be made at three levels: importance, library's support and competence levels that PhD students' considered about information literacy skills; Planning the IL trainings; and supervisor's role on this planning.

#### **4.2- Key findings and discussion**

As it was already mentioned, each competence is going to be discussed individually, regarding importance, competency and library's support topics, and data collected from the interviews with PhD students, supervisors and information literacy providers. The detailed analysis for each competence could be accessed by the Annex E. In following topic, the most significant responses will be analyzed.

##### **4.2-1. Analysis of the most significant competencies**

The competencies described above were selected from a set of nineteen competencies. They were considered the most significant ones due to being the most and least quoted ones by the target groups, regarding the importance, support and competence criteria.

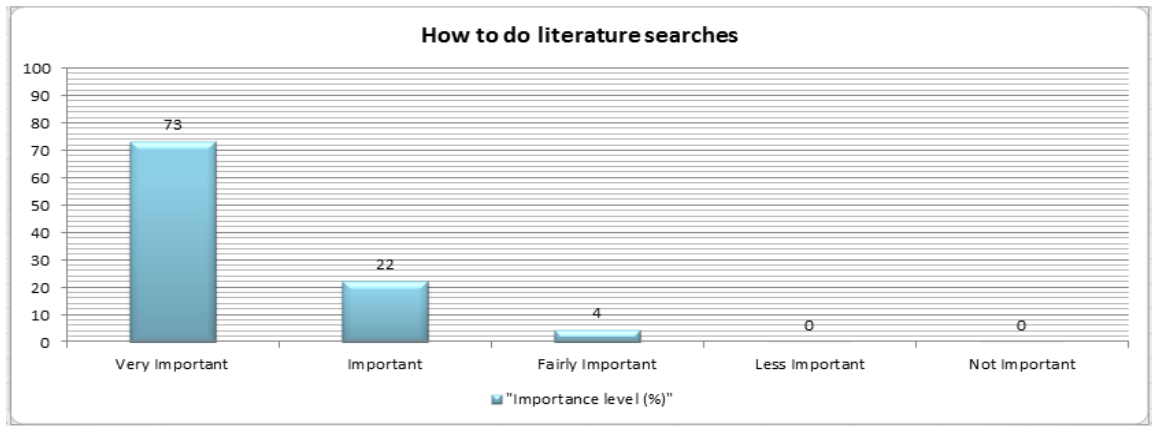


a) *How to do literature searches*

**Data analysis:**

**Importance level**

PhD Students:



**Bar chart 1: Competence a - rating of the importance level of the PhD students**

When asked about assessing the importance level of this competence, regarding how to carry out their scientific researches: 73% of the PhD students said it is “very important”, whereas 22% PhD students said it is “important”.

PhD students’ comments are closely linked to the importance of how to get the information needed:

*“Important because, sometimes I know what I want to search but I don’t know to search it”  
(Respondent 2, 04.09.2011)*

*“This is very important, undoubtedly. Because it’s the first step for our research, if we have no information to support it we can’t do it well” (Respondent 5, 05.09.2011)*

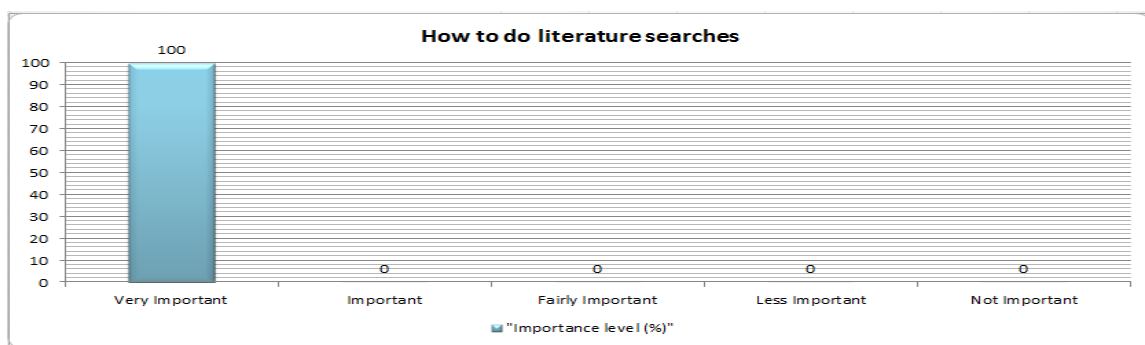
Furthermore, 4% PhD students assessed this competence as “fairly important”. On the first case, this assessment is linked with the PhD students’ academic year, as they said “gaining some practice during my degree”, while on the second case, this assessment is linked to the fact that students are working in a team, what in some occasions is helpful, for example

when working towards the same objective. However, this is not conventional, because students in 3<sup>rd</sup> academic year evaluate this skill as “very important” and justify it by saying that:

*“Knowing how to do literature searches in catalogues, databases, journal and so forth, is always important because information is nowadays available through these platforms, and more and more will be. So, knowing how to find it, what to use to find it, what terms use, what combinations, and so forth is always important.” (Respondent 8, 09.09.2011)*

The importance of this IL competency can be perceived by the fact that no students rate it as “less important” and “not important”.

Information Literacy providers:



**Bar chart 2: Competence a - Rating of importance level of the ILP**

Regarding information literacy providers, all of them assessed this competence as “very important”, for PhD students learn and apply effectively. Although their justifications vary:

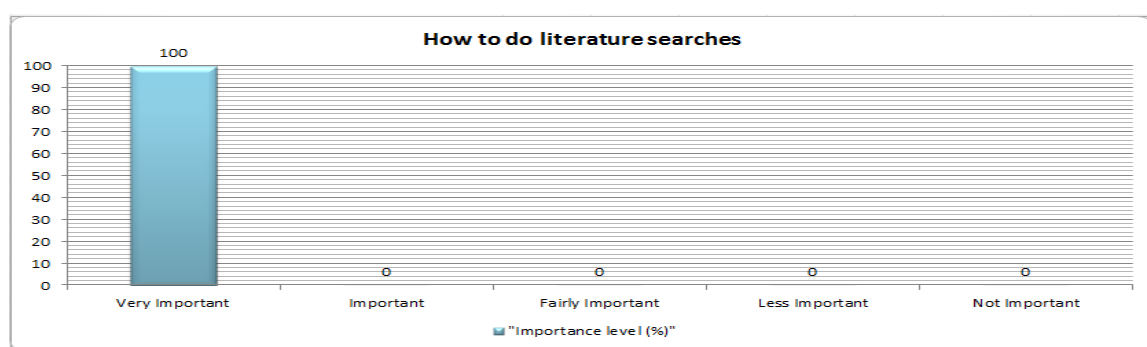
*“Knowing how to access reliable information is very important for students who are doing scientific researches, so they can have a theoretical part well-reasoned” (ILP 1, 02.09.2011)*

*“Locate the information on literature is very important for PhD students of our faculty. The databases that we have retrieve lots of information, so they need to know how to search,*

*which terms should use, in depth what search strategies they should develop” (ILP 2, 09.09.2011)*

*“The academic level where they are now – doctorate level – they already should know how to do it well. But this is not what has been perceived by library, so is very important PhD students learn and practice this competence” (ILP 3, 19.05.2011)*

### Supervisors:



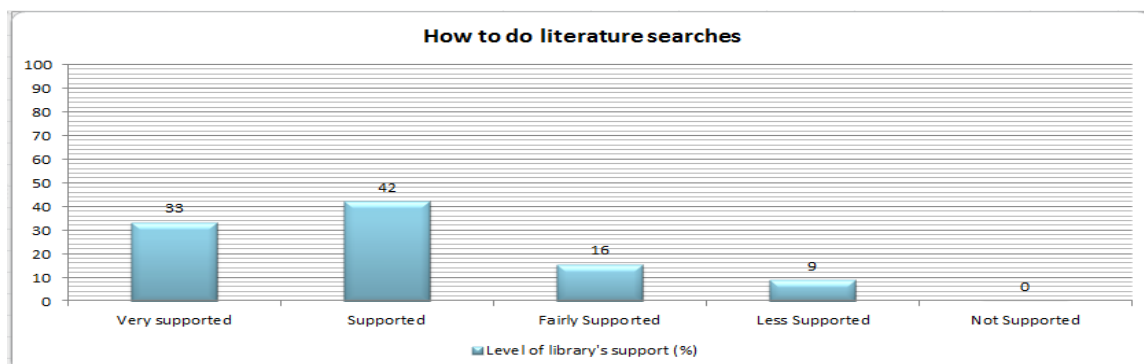
**Bar chart 3: Rating of the importance level of the supervisors**

The level of importance assigned by a supervisor to this competence was the maximum. All 10 supervisors interviewed recognized that to know how to do literature searches is “very important” for PhD students.

*“This is very important for sure. Even for me it is very important! For everyone who is carry out investigations is very important know how to do literature searches” (Supervisor 5, 16.09.2011)*

## Level of library's support

### PhD Students:

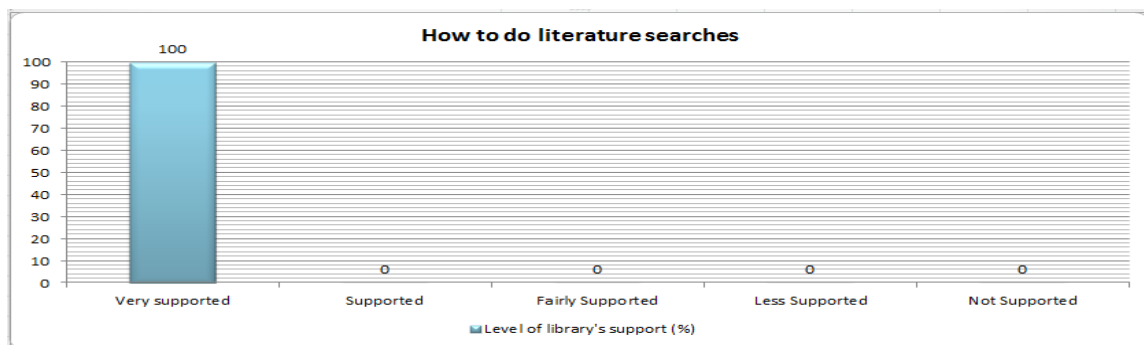


**Bar chart 4: Competence a - Rating of the level of library's support of the PhD students**

To this competence, 42% of the PhD students fell “supported” by the library and 33% of the PhD students “very supported”. In general, students said that when they have some doubt on searching librarians help or, in a specific case, like “*don't know what are the main information resources to search*” (Respondent 40, 25.09.2011) they ask for help to their supervisors.

Then, 16% of the PhD students considered that this competence is “fairly supported” by library and 9% of the PhD students considered that is “less supported” by library. The percentage of students that considered this competence is less supported by library is closely linked to some occasions that students don't see their need satisfied and also don't know the existence of IL trainings in library.

### Information Literacy providers:



**Bar chart 5: Competence a - Rating of the level of the library's support of the ILP**

All IL service directors of each faculty interviewed said that they provide the highest level of support to this competence – “very supported”.

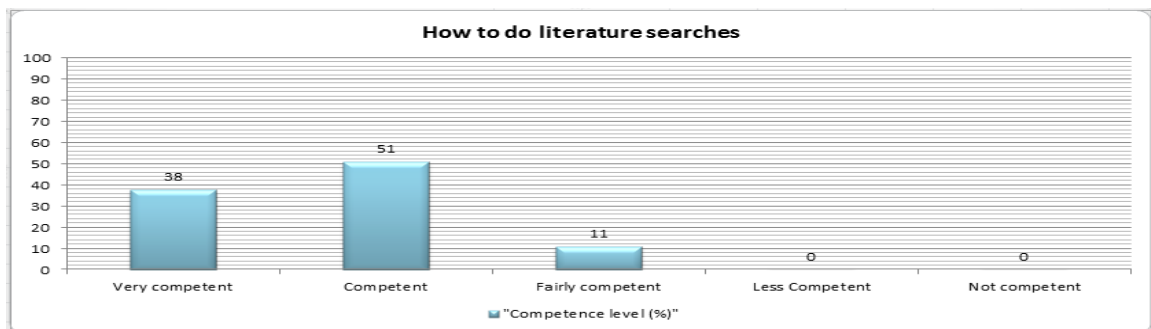
*“We have a specific room with professionals specialized in this area to receive students and help them on doing literature searches or other difficulties that they possibly have regarding the search information. And if they can’t go to the room they can send an email to our service asking for help. We are always available to do that. ” (ILP 3, 19.05.2011)*

*“When students have some doubt on searching information they know that they can always come to library and ask for help, to me or other professional, and we can always provide this help” (ILP 2, 09.09.2011)*

*“We are always available to give help to students in all problems that they can possible have regarding the library” (ILP 3, 19.05.2011)*

## Competence level

### PhD students:



**Bar chart 6: Rating of the competence level of the PhD students**

Regarding the competence level, 51% of the PhD students assumed they were “competent” and 38% of the PhD students assumed they were “very competent”. Just 11% of the PhD students consider themselves as being “fairly competent”, doing literature searches.

*“I know how to do this because I already have some practice so this is not a difficult form me” (Respondent 26, 19.09.2011)*

*“I attended once one of the trainings provided by library. It was helpful to have a general vision about what I should do to search information” (Respondent 28, 19.09.2011)*

No students recognized themselves as being “less competent” or “not competent” on doing literature searches for their PhD researches. Some of them reported that:

*“Sometimes the research subject still has poor evidence on literature and when it happens is difficult to find the information needed” (Respondent 31, 20.09.2011)*

### **Data discussion:**

Importance level - Concerning the level of importance given by the groups to this competence it can be perceived there is an agreement. A large part of the students consider this competence very important for their researches, as well as all information literacy providers and supervisors. There is no evidence of students ranking the importance of this competence and the same happens in literature. Maybe, because in some occasions, students argued they already had the skills, so as this competence is a basic one, they considered it not important for students in their academic level.

Level of library’s support - The majority of PhD students consider that library provides a good support to this competence, as well as consider all the information literacy providers. Regarding RIN findings “libraries tend to focus in their training on information seeking” (RIN 2008, p. 13), also in the literature this is very clear, as the professionals tend to adapt the undergraduates trainings to PhD trainings. Therefore, in spite of in the three case studies of this research this tendency not being obvious (only one faculty - 5.2-2 topic), all of them consider important for PhD students to be able, because it is the basis for learning other competencies.

Competence level - In general, regarding this competency, students didn’t report difficulties doing it, because they have been gaining practice and already know the information resources that they commonly used on their PhD research. On the subject of the RIN study there is no evidence of students having difficult on applying this competence in their researches. Although, in the literature review it was mentioned that, in some occasions,

PhD students don't know the basic Information Literacy competencies, so they don't know how to do literature searches.

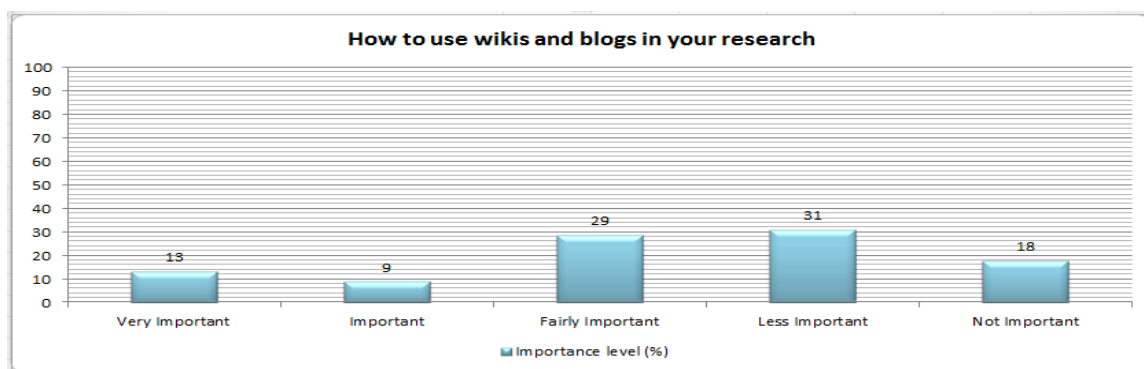
Summing up these results, this competence was the one which had the highest levels of quotations: it was the most important for all groups; the most supported for professionals and students and the majority of students considered themselves as being "very competent" on doing this competence in their researches.

*b) How to use wikis and blogs in your research*

**Data analysis:**

**Importance level**

PhD students:

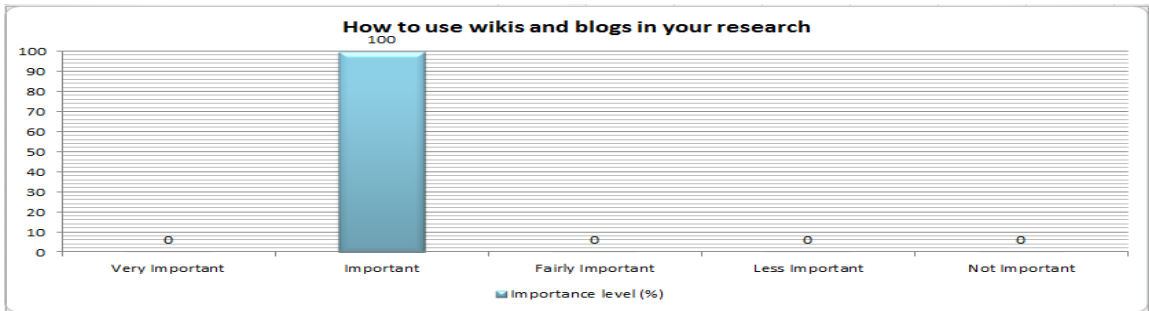


**Bar chart 7: Competence b - rating of the importance level of the PhD students**

As was well demonstrated, this competency is most quoted as "less important" by 31% of the PhD students and really close is "fairly important" with 29% of the PhD students. Then 18% of the PhD students considered this competence "not important" to their researches. Finally, 13% of the PhD students considered this competence "very important" and 9% "important".

This competency is most quoted as being "less important" because students defended that "*a scientific research cannot be supported with information from blogs and wikis*" (Respondent 41, 25.09.2011)

Information Literacy Providers:



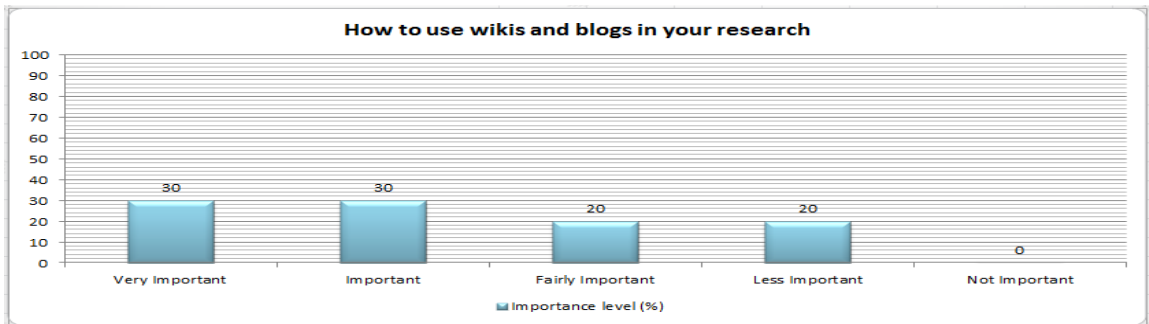
**Bar chart 8: Rating of the importance level of the ILP**

All of the 3 professional interviewed considered this competence “important” for PhD students. Their justifications go around the following:

*“This is not an essential competence, but it is important to know about at least.” (ILP 1, 02.09.2011)*

*“Nowadays exist lots of blogs produced by experts and I this is an important resource to find important information. But it is necessary students know who are an expert and who are not of course” (ILP 2, 09.09.2011 and ILP 3, 19.05.2011)*

Supervisors:



**Bar chart 9: Competence b - Rating the importance level by supervisors**

The importance level given by supervisors to this competency is divided: 30% of the supervisors considered this competence “very important” and “important”, and 20% of the supervisors considered this competence “fairly important” and “less important”. The comments vary as can be perceived:

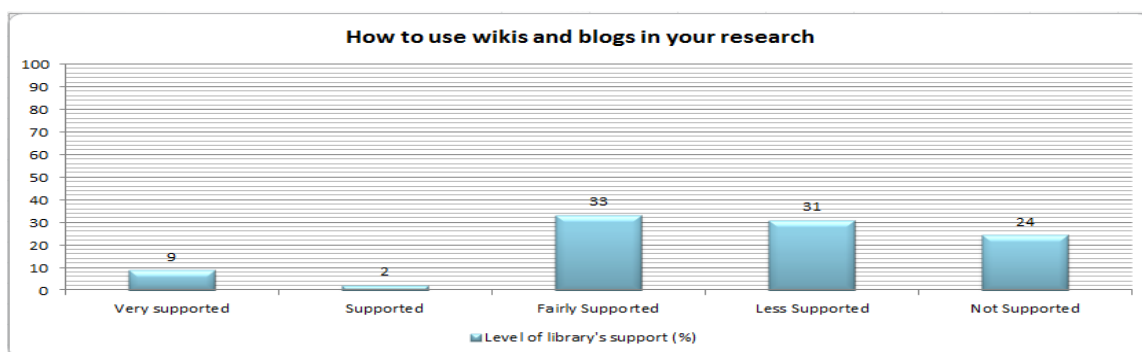


*“Yes, is very important to know how to use it. I think blogs are much more important than wikis, because in wikis everybody can participate in same topic and we don’t know who they are. In case of blogs this doesn’t happens and the blog creator could be someone who works in an area and wants to share their knowledge. Students can take it” (Supervisor 4, 13.09.2011)*

*“In my area we don’t do investigations based on blogs and wikis!” (Supervisor 8, 23.09.2011)*

### **Level of library’s support**

#### PhD students:



**Bar chart 10: Competence b - Rating of the level of library's support by PhD students**

PhD students assessed the library support to this competence as mainly “fairly supported” (33% of the PhD students) and “less competent” (31% of the PhD students). Then, 24% of the PhD students said that they are “not supported” by librarians about this competence. Just 9% of the students considered to be “very supported” on it and 2% considered to be “supported”. The PhD students’ comments to this support are a bit inconsistent, let’s see:

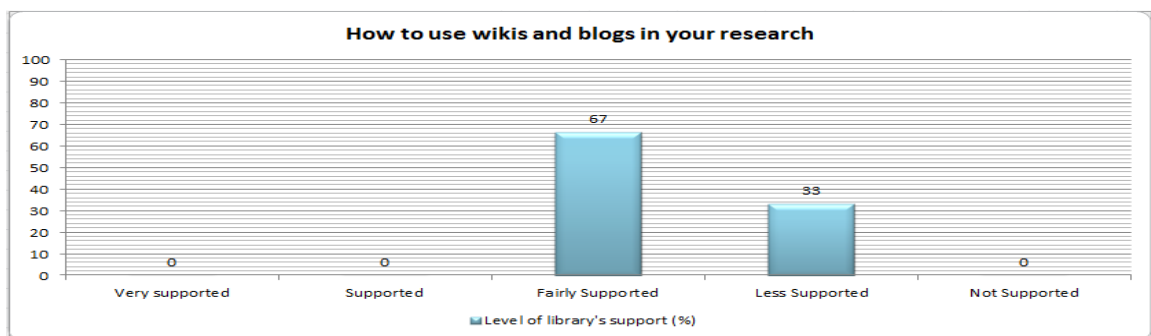
*“I do not usually use these platforms to get information for my research. So I never ask help to librarians to use it, and I think they wouldn’t like it!” (Respondent 10, 11.09.2011)*

*“I think they can help us but I think that everybody knows how to do that, so they shouldn’t be concerned with this” (Respondent 14, 16.09.2011)*

*“Yes, maybe they can provide some help to us, but I’m not sure if they are requests for help for this” (Respondent 24, 18.09.2011)*

Students don’t feel supported, as they think that library shouldn’t be concerned with that, because everybody knows how to do it, and also due to the fact that they think librarians do not consider platforms reliable.

Information Literacy Providers:



**Bar chart 11: Competence b - Rating of the level of library's support by ILP**

The services’ directors assessed their support to this competence as being “fairly supported” (67% of the ILP) and “less supported” (33% of the ILP).

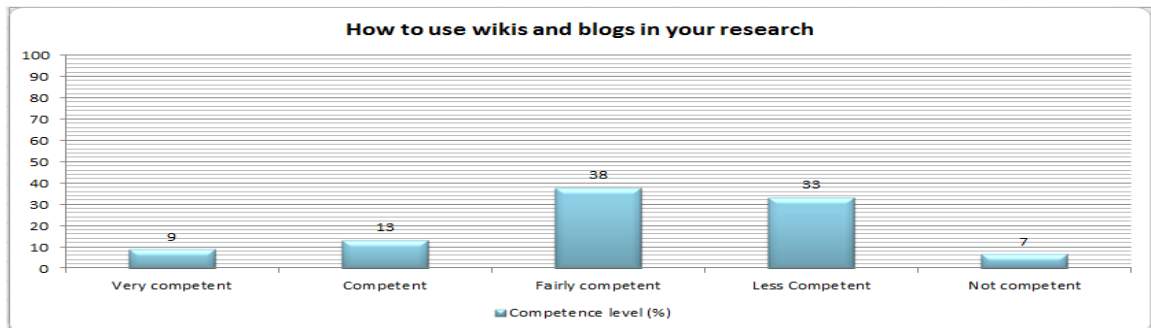
*“Actually we don’t provide this support so well. But I’m sure this is not a difficult for students, they already are in a PhD degree” (ILP 1, 02.09.2011)*

*“Until now we didn’t felt the necessity of provide help in this competence. No students asked us anything about that” (ILP 2, 09.09.2011)*

*“We consider that is not as important as the other competencies that we spoke about here” (ILP 3, 19.05.2011)*

## Competence Level

### PhD students:



**Bar chart 12: Competence b - Rating the competence level by PhD students**

PhD students assumed themselves as being “fairly competent” (38% of the PhD students) and as being “less competent” (33% of the PhD students). Then, 13% PhD students assumed themselves as “competent” and 9% as being “very competent”. Still, 7% of the PhD students are not competent when using information from these platforms on their researches.

Despite these results, great part of PhD students assumed a lowest level of competence, not because they don’t know how to use these platforms but because they argued that that information could not be used in a scientific research. So they assumed not to be competent or less competent.

### **Data discussion:**

Importance level - The importance level of this competence, PhD students assessed mostly as being “less important”, information literacy providers as being “important” and supervisors as being “very important” and “important”. So, in this competence, what PhD students consider is far from what professionals and supervisors consider. This gap, could be mostly due to the fact that students deliberate these resources (blogs and wikis) could not be used to access information in spite of professionals and supervisors (some of them) see these resources as possible tools to get some useful information (mostly blogs) if they meet the blog owner. The same happened with the RIN results: not all students considered

such resources as important for their work. In the literature review there is no evidence of the importance rated by PhD students about this competence.

Level of library's support - The support the library gave, concerning this skill, was assessed by the students as weak. Plus, the competent entities agree, as their own backup towards this skill is not the best one. As such, there is no gap in this skill, because both groups agree in their evaluation. On the topic of RIN study, in UK academic libraries there is also no evidence of this competence being covered in the information literacy trainings. In the literature review this competence was also not considered important libraries support.

Competence level - Great part of PhD students assumed a lowest level of competence, not because they don't know how to use these platforms but because they argued that that information could not be used in a scientific research. So they assumed not to be competent or less competent. In relation to RIN results, students also recognized they were weak, when concerning the use of wikis and blogs in their research, also because most of them don't recognize this resources effectiveness in the area of research.

A brief conclusion about this competence: it was the least important for all groups; the least supported for professionals and students, as the majority of students think of themselves as not being able to do this competence in their researches.

Besides the competence which students assumed not to be so competent they also assumed not to be so competent in two others (although with less quotation). In this context PhD students also recognized having difficulty in *licensing and copyright issues* (49% of the PhD students assumed to be "fairly competent") and in *open access to research reports* (60% of the PhD students).

In relation to RIN results, the information literacy skills, recognized by postgraduate students as not being so competent, were *how to write research reports and journal articles* and *how to prepare and submit conference papers*. In addition, they also recognized themselves relatively weakly in use of digital repositories, in licensing and copyright issues, in developments on metadata and in use of wikis and blogs in their research (not all of them considered such things so important for their work). So, it doesn't vary substantially from the results in UP.

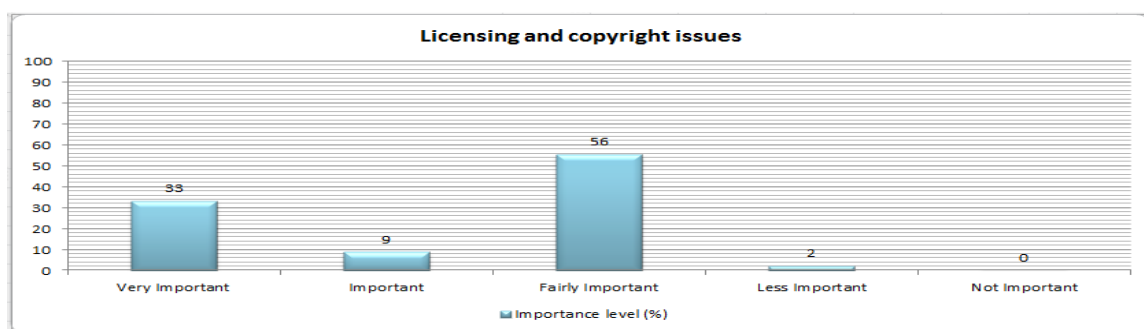
In the literature review, what has been shown is that PhD students have strong difficulties on handling large amounts of research information. Consequently, the information management was the principal difficult of the PhD students (Jan Partridge & Paul Genoni 1996). This complexity was not identified in the previous studies, what is weird, since PhD students interviewed also retrieved lots of information and did not recognise the information management of the weakest competences. Maybe because, when asked, they would refer to tools, such as EndNote and Zotero to organise their information.

*c) Licensing and copyright issues*

**Data analysis:**

**Importance level**

PhD students:



**Bar chart 13: Competence c - Rating the importance level by PhD students**

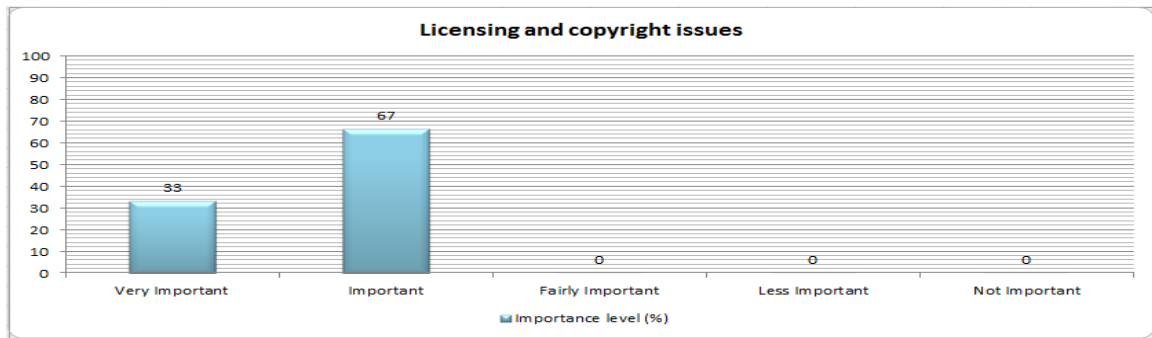
This competence was most rated as “fairly important” (56% of the PhD students) and as “very important” (33% of the PhD students). Then, 9% of the PhD students considered this competence “important” and just 2% of the PhD student “less important”.

Great part of the students argued that:

*“To carry out a research I don’t need to know these issues of licensing and copyright, I could always check them” (Respondent 32, 20.09.2011)*

These ratings are justified by students with the fact that they don’t need to know exactly the licensing and copyright issues. Some students also said that to carry out a research this issues are not so important.

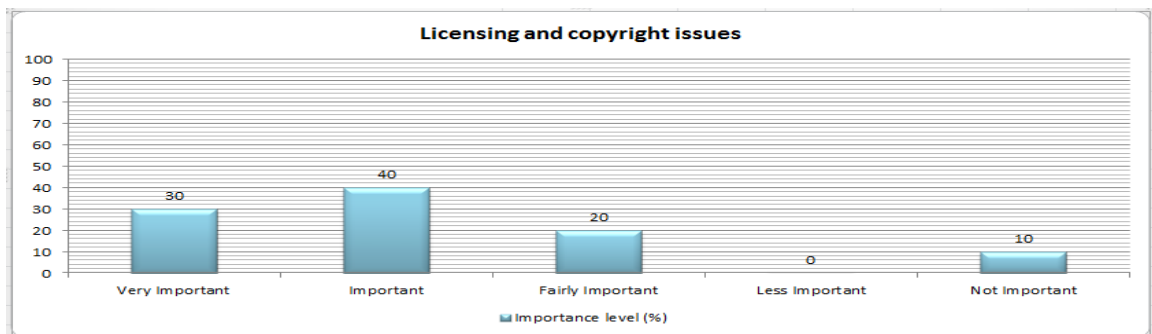
Information Literacy Providers:



**Bar chart 14: Competence c - Rating the importance level by ILP**

As the chart bar shows, 67% of the professionals considered this competence “important” and 33% considered it “very important”. Although all professionals in general considered this competence important, everyone said that it is not essential for PhD students.

Supervisors:

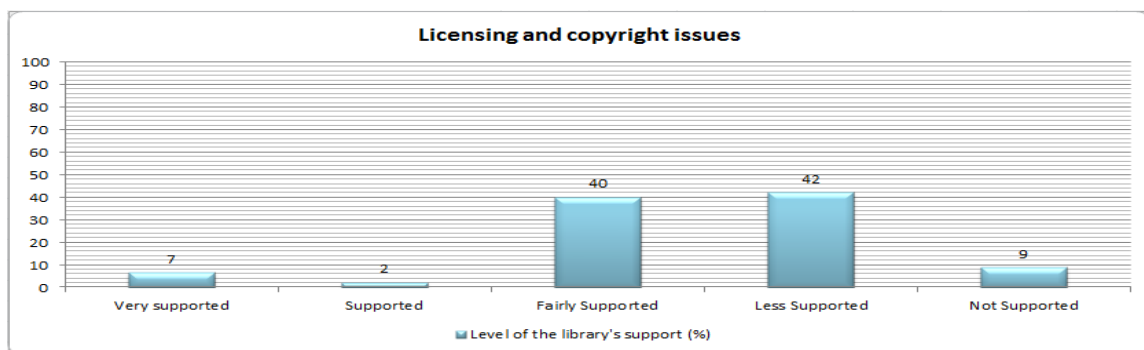


**Bar chart 15: Competence c - Rating the importance level by supervisors**

This competence was divided by supervisors: 40% considered it “important”, 30% “very important”, 20% “fairly important” and 10% supervisor “not important”. They also argued that PhD students don’t need to know this.

## Level of library's support

### PhD students:

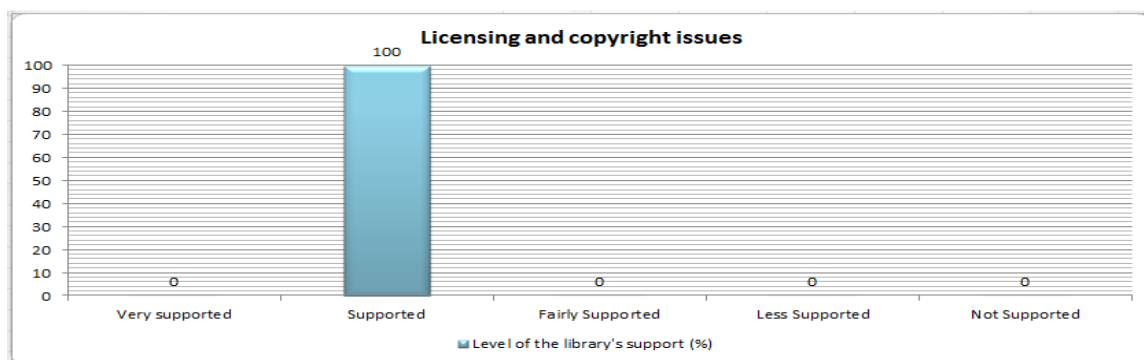


**Bar chart 16: Competence c - Rating of the level of the library's support by the PhD students**

PhD students think that library provides less support (42% of the PhD students) or fairly support (40% of the PhD students). Then, 9% of the PhD students were not supported by librarians, 7% of the PhD students said they were very supported and 2% of the PhD students considered to be supported by library.

PhD students, when answering this question, just referred that they didn't feel this support.

### Information Literacy Providers:



**Bar chart 17: Competence c - Rating the level of the library's support by ILP**

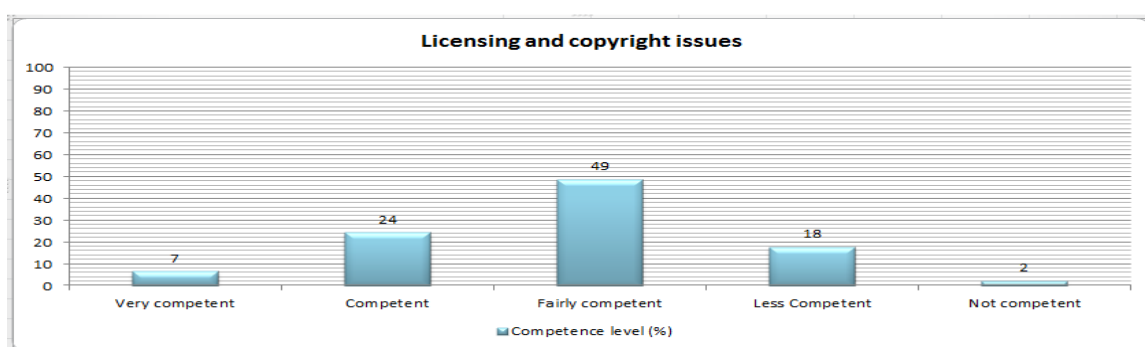
All information literacy providers said they give students the support on this competence. Their comments were as follows:

*“When PhD students need help regarding these issues we are always available to help them” (ILP 1, 02.09.2011 and ILP 3, 19.05.2011)*

*“We could help them consulting the appropriated laws for these issues” (ILP 2, 09.09.2011)*

## Competence level

### PhD students:



**Bar chart 18: Competence c - Rating the competence level of PhD students**

Concerning the level of students' competence, 49% of the PhD students said that they were “fairly competent”, 24% “competent”, 18% “less competent”, 7% “very competent” and just 2% of the PhD students not competent on these issues.

The students' comments were mostly linked to the fact that students didn't feel completely integrated in these issues:

*“I need to consult this” (Respondent 34, 23.09.2011)*

*“I don't know this without having the law with me” (Respondent 42, 26.09.2011)*

### **Data discussion:**

Importance level - Regarding the importance level of this competence, it could be perceive that there is a gap between results: PhD students considered it “fairly important” and the information literacy providers and the supervisors considered it “important”. All groups



found it non essential for PhD students to know about all the issues related with licensing and copyright, but supervisors and professionals found it important to have some idea about it. Although this was the least important competence, supervisors have quoted; students recognized it as important for them. Regarding literature review specifically, no evidence on this competence was found.

Level of library's support - As such, this level of library's support, could be perceived as a considerable gap between ratings. PhD students thought that librarians provide fairly support in this competence and librarians in your turn gave support to students. This gap could be due to the fact that librarians don't have anything explicit that shows students they could have support. Concerning the RIN study it was found that academic libraries in the UK usually covered this topic in their trainings extensively. Again in the literature review with this competence there was no evidence of academic libraries importance on giving support to this topic.

Competence level – Basically PhD students assumed not to feel completely integrated in licensing and copyright issues. About RIN findings, there is no gap between students from the three case studies in UP and the students in the UK universities, because this study reveals that students also feel poorly competent about licensing and copyright issues. In the literature review, specifically on this competence there was no evidence found of students having difficulties.

Summing up the results of this competence, as regards the percentages of supervisors, it could be perceived that it was the least important competence considered by them, and, further it was also one of the competences considered by students, where they feel not competent.

It is important to notice that information literacy providers didn't rated any competence as "fairly important", "less important" or "not important" because all of them stated that PhD students must to know using all these competencies and many others.

#### 4.2-2. Planning of the Information Literacy trainings for PhD students

##### Data analysis:

Another topic, which aim was to focus in the present study, was the way the information literacy providers of each faculty plan the researches' trainings, in the area of Information Literacy. It allows recognition of the practices used, by these professionals, to educate PhD students with IL competencies. The whole picture has few or none variation amongst the studied case faculties:

- The staff of one of the faculties revealed not to have this training integrated in its institution, but said they were working on it. Therefore, what they have been doing to promote and encourage Information Literacy in this faculty consists of:
  - in the beginning of each academic year, librarians provide a library tour, allowing all students to have access to the information resources library, that is available for them, as well as to the library's website;
  - Specifically for PhD students, they have their sessions planned, according to academics/supervisors requests. So, its aim is that the trainings' contents are related to the PhD students' area.
  - Some previous information is gathered by supervisors or academics, who have made the training request;
  - The delivery of the trainings to a small group, so that students can receive a greater support by the trainer;
  - None assess to the trainings. They just want to show students where they can search for information, demonstrate how to do it in each resource, and where they can ask for help when they need it.

This institutions' IL service director also added in the interview that:

*“The best way to educate students in these competencies is through the integration of these trainings in their curriculums, being assessed as part of a discipline to incentive students in participates effectively in these trainings” (ILP 1, 02.09.2011)*

- Now, concerning one other faculty, which was also studied, the service director, who was interviewed, explained that the planning for these trainings was divided in three levels and carried out in the following way:
  - The first level consists in providing a library tour, allowing information resources in the library available to all students and also the library's website of the;
  - The second level is divided in two sublevels: 1<sup>st</sup> EndNote training and 2<sup>nd</sup> information resources and online catalogue training. These trainings consists in seminars of mandatory attendance for PhD students;
  - The same trainings take place if students and/or academics make a request to the library. Therefore, the contents are concerned with each student's area.
  - An effort is made to have some information, given by supervisors, as they are *"the ones who better knows the PhD students information needs"* (ILP 2, 09.09.2011)
  - Group or individual trainings occur (if students ask for it).
  - This service provides an assessment at the end of each training session: through individual questionnaires to students, in order to do an analysis and understand if the work is or isn't good, in order to constantly improve.

The professional, who was interviewed, didn't add anything, but it could be perceived that the mechanism used in undergraduate students is the same for PhD students: trainings happen when librarians have a request and are specific to the students' area, but for PhD students it is mandatory.

- The other case study service director also explained how they provided IL training for their PhD students:
  - The trainings are planned having in mind the area of the PhD students, as they take place when an academic or a supervisor makes a request to a library;
  - An attempt is made, in order to try and present to students contents more concerned with their research area: information resources, how to use or to evaluate them, the information retrieved, or whatever they need to learn;

- The specific trainings for PhD students happens in the collaboration with supervisors or academics (who request it);
- The aim is to integrate these trainings in all PhD curriculums, but at this level this is not developed enough. At undergraduates and masters this integration is more developed. At a doctorate level it still isn't: "*we need to be well capacitated to give these trainings to this academic level*" (ILP3, 19.05.2011)
- The contents are presented to students and then there is the practical part, in which there are some exercises about the contents presented;
- These trainings are assessed through a web questionnaire at the end of each session. Its goal is to know the real impact of these trainings through supervisors, although it would be necessary to determine what are the indicators for its assess.

Moreover, regarding the IL practices of each case study, it could be perceived that the developments for PhD Students are still poorly advanced.

As can be perceived in two of the previous case studies the practice is the same for undergraduates, masters and doctorates: the trainings take place when there is a request by academics, supervisors or students. As for the other case study (the third one), these trainings are already more integrated in the students' curriculum and less happen through a request by these academic levels.

Concerning the training contents, there is an agreement, as all the people interviewed, assumed to address specific contents to the PhD students' research area.

According to the way the contents are given to PhD students, only the third interviewee thought of dividing the training in a theoretical part (where the contents are presented to students) and a practical part (where students are asked to do some practical exercises). The first interviewee talked about presenting the information resources to students and teaching them by using these resources in their researches.

Finally, regarding the trainings assessment, only the first case study doesn't have a mechanism of assessing trainings. The other two, thought of a questionnaire at the end of

each training, so they can tell if the training was helpful or not for students. But what concerns with outcomes assessment, still now no one case study provides this.

#### Data discussion:

Providing some discussion of the data gathered from the three case studies of UP and the RIN study and further literature review regarding the way information literacy providers plan the trainings of Information Literacy for PhD students, could be perceived that it doesn't vary significantly between studies.

The way IL trainings are planned in the three case studies of UP was already described. As a result the practices don't vary significantly: trainings just happen by appointment, the contents are as specific as possible in the area of PhD researchers, and to present these specifics contents professionals argued that the contribution of the supervisors is essential (which doesn't happen in reality).

In one of the case studies the contents were specific: information resources, how to use these resources, how to evaluate the information retrieved, or whatever they need to learn and ask to the information literacy provider. The contents are given to students through a theoretical part followed by a practical part (in one case study faculty) or just through a theoretical part (two others case study faculties). Lastly, one case study doesn't provide any training assessment; the other two access the trainings through individual questionnaire. Furthermore, in just one case study, the faculty has integrated some doctoral curriculums IL trainings, but still they are not enough.

In what concerns RIN results, in many universities trainings delivered by librarians, it just takes place by appointment or an ad hoc basis. The contents are also according to the area of PhD researches and tend to focus on information seeking, citation of sources, and the portfolio of services that the library itself provides. There is much less issues coverage, such as, evaluating, organizing, managing, transforming or communicating information, or of key underpinning issues such as copyright and open access.

Their practices were mostly based on demonstrating specific information sources and tools, which could adopt an approach considered by conveying information instead of constructing learning experiences. In this study there was also little or no evidence of

information literacy training provision systematic evaluation. Due to many things, for example: the range of sessions sorted out by different members of the library team; events are open, but not confined, to researchers, and so forth. There are similar gaps in approaches on how to assess the impact on researchers' information skills and competencies for those who attend training sessions. Just three libraries described ran pre- and post-event questionnaires in an effort to identify changes carried out through their training, while one library has undertaken systematic observation of researchers as part of their evaluation process.

Subsequently, both studies about the PhD IL trainings, providing in scheduled time, and the contents, that are as specific as possible in relation to the research area of the students. The contents do not vary considerable, although in the UK they tend to focus more on information seeking, citation of sources, and less in evaluating, organizing, managing and communicating the information, so in the three case studies of UP this doesn't happen. What was perceived in the three case studies of UP is: the third one faculty library - provides trainings about evaluating and communicating the information and about information seeking and information management; the second - provides training in information management (through teaching EndNote) and information seeking and doesn't provide trainings about evaluating and communicating the information; the first one - provides training about information seeking.

The way contents are delivered to students are also similar, because both studies revealed that librarians tend to demonstrate the contents to students (for example information resources): how they work, what they are about, their specificities, and not much else. In UP, just one case study revealed there was also a practical part present, where students can put in practice what they have learnt in the theoretical part and clarify their doubts. The other two also tend to demonstrate the sources and tools.

As regards training assessment in UP, professionals, at the end of each session, want to know if it was helpful or not. If the contents expected by students, in order to improve in

the next training session. Although in the UK, it doesn't seem well evidenced, due to all the factors mentioned above.

Moreover, in UP, these factors don't occur, as the librarians' teams are too short and, in all case studies, the faculty for each kind of training is always the same.

Concerning the assessment of the impact on researchers' information skills and competencies for those who do attend training sessions, the outcomes assessment is still not very clear in any study. In the UK, some libraries have been developed and some efforts were made, although not systematic ones (in UP there is no evidence of it in any case studied).

Through the literature review, all good practices show:

- IL trainings for PhD students are not integrated into their curriculums, they occur by means of an appointment ;
- Supervisors lack collaboration;
- Contents are as specific as possible to the students research area;
- Information literacy providers should be capable of giving these trainings to PhD students and what happens is that they are still few and are carrying the first steps in this Information Literacy area
- Finally, regarding the good practices of assessment outcomes enlightened by literature, it is necessary to make two decisions: what level of assessment is aimed (institutional, course, specific discipline or training activities provided by the library) and what assessment tools will be select (essays, pre- and posttest, seminars, portfolios, projects, reports, group presentations, quizzes, professional experiences, observations, questionnaires). There is still little evidence by librarians. What they are doing, in a very superficially way is the training assessment, through individual questionnaires, after each training, in order to understand what they should change or intensify in the next training.

On the subject of literature review, the planning of the IL trainings to PhD students is still too far of what is expected.

### 4.2-3. Supervisors' role

#### Data analysis:

To understand how supervisors see the IL trainings for PhD students and if they work together with information literacy providers was also an objective for the present study.

Regarding the way supervisors see the IL trainings for PhD students, all of the ten supervisors interviewed answer that this is very helpful for students who are carrying out a scientific research. For various reasons: "*great part of them don't know where to search information*" (Supervisor 3, 06.09.2011), others "*don't know what to do to find the information they need*" (Supervisor 5, 17.09.2011), still others don't know "*how to separate the information essential for their research of the additional information*" (Supervisor 9, 23.09.2011) and finally other students have difficulty in "*writing documents to communicate their findings, for example journal articles*" (Supervisor 6, 17.09.2011). So, these are the main difficulties that supervisors recognized in PhD students on the subject of the IL competencies and it is because of this they say it is so important for students to have these trainings. One supervisor also added about the importance these trainings have for the supervisors themselves, so they can receive some training in these competencies.

Although all supervisors interviewed considered these trainings important for PhD students, no one gave the idea of collaborating with the information literacy providers on planning the trainings. Some of them answered that:

*"This could be important but for sure the information literacy providers know what to address in the trainings"* (Supervisor 1, 03.09.2011)

*"No, I don't collaborate with professionals because I already know the contents and are very appropriated for what I want students learn. But when necessary I will be available"* (Supervisor 9, 23.09.2011)

*"I don't think this collaboration essential because it's the same provide training in the area of history or sociology since students learn how to use the resources"* (Supervisor 8, 23.09.2011)



*“Yes and no. There were some conversations about what would be more important to address in the training but nothing in concrete” (Supervisor 10, 25.09.2011)*

What could be observed by these comments is that supervisors don't collaborate with professionals, because they are not aware about Information Literacy issues. They know it is important, but don't help information literacy providers to improve the trainings for PhD students.

#### Data discussion:

As it has been already said, the supervisors of the three case studies say it is important for PhD students to receive further training in this area of Information Literacy competences. They have a substantial resistance in collaborating effectively with information literacy providers, when planning the IL trainings for PhD students. Their justification for that, as was already mentioned, is concerned to the fact that they are not so aware of these Information Literacy issues for students and/or also because they think this association it is not necessary.

On the subject of the RIN results, these ones differ a bit from the results expressed before. In this case, some supervisors have a widespread perception not to recognize the importance of IL trainings for postgraduate students. Most of them were overtaken by developments in research information and they aren't completely aware of the consequences of these changes. So, most of the supervisors don't collaborate with information literacy providers in the planning of IL trainings. Their help would be very helpful in explaining professionals about the main information needs that students can have, but aren't aware of these issues.

Through the literature review the important role that supervisors play in the planning IL trainings for PhD students was perceived. They are the ones who better know how difficult PhD students feel on carrying about their research. Supervisors can discuss the research topic with information providers; suggest what sources have relevant information, as well as, finding out the difficulties of their postdoctoral students in information research. Although this is important in the literature, there is no evidence of a collaborative work between supervisors and information literacy providers.

After this description a similarity could be identified: in any case evidence of a participative role of the supervisors exists in the planning of the IL trainings. The difference concerns the justification for not participating effectively in the planning of the IL trainings for PhD students. What happens with supervisors from UP is that they are not outdated about the developments in research information, because they know the implications that this new era of new technologies and the overload of information can cause in students. They don't associate these issues to Information Literacy, and some of them don't know well what is been talked about if just was said "Information Literacy". As such, some supervisors lack collaboration with professionals, because of not knowing. Still, other supervisors, who think they known Information Literacy issues and associate this with the developments in research information, don't collaborate with professionals because they mostly said "*they know what they should do to provide a well training to students*" (Supervisor 1, 03.09.2011). Therefore, they don't know how the trainings are processed and how they can collaborate with professionals in the IL trainings planning.

# FINAL CONCLUSIONS AND RECOMMENDATIONS

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## Conclusions and futures recommendations and work

Some final conclusions could be taken, having in mind the initial objectives of this study, stipulated to answer the research question: *Is there a gap between PhD students, regarding information literacy needs, and the way in which their needs are perceived by supervisors and IL providers in the University of Porto?*

To answer this question, individual interviews were developed (semi-structured and structured interviews) in each one of the groups. The conclusion achieved was that all groups agree that knowing *how to do literature searches* was the most important competence for these students. Although, the two others competencies (*How to write research reports and journal articles* and *How to prepare and submit conference papers*) also considered by students are also seen as being the most important overlap with others also considered important by information literacy providers.

On the topic of the library's support, there also is an agreement: the information literacy providers presented support on the competences *how to do literature searches* and *how to use specific subject databases* and PhD students recognized they receive this support. PhD students also agree with information literacy providers not receiving support about the competence *how to use wikis and blogs in your research*.

Then, another comparison takes place, regarding the level of competence of PhD students and the library's support: about the competences that students considered, all of them are well supported by library (according to library assessment). However, not all of them were considered by PhD students well supported by library. Two of them (*How to do literature searches* and *How to use specific subject databases*) were and could contribute to this level of students' competence.

Therefore, when answering the research question, in these three case studies, was not found a significant gap between the Information Literacy needs of PhD students and the way these needs are perceived by supervisors and information literacy providers.

To accomplish generic objective of this study “*provide data which allows comparison between the findings from the RIN research in UK and findings within three case studies faculty in UP*” some specific objectives were stipulated:

- (I) identify the PhD students’ information literacy needs, regarding three different faculties, within University of Porto;
- (II) contrast PhD students’ needs with the way in which their needs are perceived by their supervisors and information literacy providers;
- (III) understand how the IL programs are planned;
- (IV) understand if there is a joint effort between supervisors and information literacy providers.

In an initial part a literature review was carried out, in order to better know the core concepts of the research area, what has been done, by whom, and what is necessary to improve in order to provide effectiveness of the Information Literacy linked to the PhD students. The biggest limitation carried out in this first chapter was the poor evidence on literature of developments about Information Literacy for PhD students. There is much more evidence of developments for undergraduates and masters students. Although, all the main topics were addressed on the research ground.

Although RIN study focus on all postgraduate students (masters and doctorates students), the present study has its focus on PhD students by an agreement between tutors and students. Furthermore, the RIN study also focused on eight case studies and again by an agreement between tutors and student, and having in mind the objective mentioned, in the present study three case studies were focused in UP.

The first objective (I): through the PhD students' interviews it could be perceived that they have more difficulty on using *wikis and blogs in their research* (because most of them don't recognize this resources as important to be covered on the research ground), in *licensing and copyright issues* and in *open access to research reports*. In the UK reality, students assumed to have more difficulty on *writing research reports and journal articles* and *how to prepare and submitting conference papers*. In addition, they recognized themselves relatively weakly in use of digital repositories, in licensing and copyright issues, in developments on metadata and in use of wikis and blogs in their research (not all of them considered such things so important for their work). So, students in UK and students in UP differ on the competencies they feel less competent.

The second objective (II): it was also taken into consideration through interviews to supervisors and information literacy providers. These interviews aim to know what competencies they considered essential for PhD students in order to make a contrast with those competencies thought important by PhD students. In this context, it could be perceived that supervisors and PhD students just agree in one competence - *how to do literature searches*; and information literacy providers agree in three competencies: *how to do literature searches*, *how to write research reports and journal articles* and *how to prepare and submit conference papers*. So could be perceived that in general don't exist a complete agreement between assessments but also there is not a substantial gap between them because all of the interviewed people agreed in the most important quoted competence: *how to do literature searches*. So, although meeting the information literacy needs of PhD students might be a difficult task, all professionals try to have this knowledge. In the RIN study many universities provide trainings following the Roberts initiatives instead of attempts to identify students' needs. This seems to be little training needs assessment work being carried out by professionals.

The third objective (III): it was considered through the individual interviews to the service directors of Information Literacy in each case study faculties the way the IL trainings for PhD students are planned. These ones, as could be perceived, don't differ significantly from each other. To sum up, in faculties, the PhD students' trainings just happen by an appointment, the contents are as specific as possible to the research area, and it's always

expected that supervisors collaborate with professionals, in what contents should be addressed, so the information literacy needs of students could be answered. In the UK context, as the RIN study shows the trainings sessions just happen by a previous appointment, the contents are also according to the area of PhD researches and tend to focus on information seeking, citation of sources, and the portfolio of services that the library itself provides. There is much less issues coverage, such as, evaluating, organizing, managing, transforming or communicating information, or of key underpinning issues such as copyright and open access, which also happen in the three case studies in UP. Concerning with supervisors (the fourth objective (IV) of this study also gains through the individual interviews technique) could be perceived that supervisors recognize the importance of the Information Literacy skills for PhD students. Although, they still seem not to be completely aware about the IL importance, about the way trainings are processed and how they can collaborate with information literacy providers to carry out these trainings for PhD students. So, as happens in UK context, in UP context supervisors also assumed don't collaborate with librarians on the trainings planning.

As could be perceived, these objectives are all connected to answer the initial research, which is connected PhD students' information literacy needs assessment. In this context, a joint conclusion could be taken. As was perceived, meeting the information literacy needs of PhD students is a difficult task for IL providers, however it is the only way to offer appropriate trainings for PhD students. As the RIN study recommends after their findings: UK libraries should adopt more systematic and innovative approaches to identifying and assessing the needs of researchers to enhance their competencies (RIN 2008). In Portugal, regarding the three case studies in UP, it seems to be also important because in spite of the professionals' ratings don't diverge a lot from students' ratings, they don't mentioned in their planning trainings strategies for assessing students' needs (see topic 5.2.2). What they mostly said was that supervisors were the best ones to help professionals doing this assessment since they know students' information needs although as was identified they didn't provide this help effectively. In the RIN study this was also explicit, although the supervisors also didn't collaborate with professionals. So, concluding the key objective of

this study, it could be said that between the RIN study and the three cases studied in UP faculties, results don't differ significantly.

Some concerns and limitations were felt during the study. One of them is about the data gathering method selection. Choose the most appropriated methods to get data was a big concern, because there was an intention to compare the results with the RIN Study, so were the data needed that allows it. As such, between web-based questionnaire, individual interviews and a focus group a selection was necessary.

A web based questionnaire, in the three case studies, in order to cover the data gathered with more PhD students was carried out. However, the deadline was coming and it was not possible. Other limitation was concerned to the PhD students. Unfortunately, in some of the faculties studied a lot of their time was not spent in faculty, consequently contact with them was very difficult. Furthermore, PhD students and some supervisors don't speak a lot, or don't speak as much as it would be desired. So, to get information from them was very difficult. Regarding this limitation it was recognized that, very likely, it was due to the poor practice of the interviewer.

Despite all of my concerns and limitations, this study was considered well achieved and provides a significantly contribution to the development of the Information Literacy in HE, regarding PhD students. There is now a perception of the main difficulties for PhD students, what the important competencies are and how they feel, concerning librarians supports in these competencies. Moreover, this study helps understand how information literacy programs are planned and delivered to PhD students. Regarding what literature review considered to be the "good practices" for these trainings the level in these three case studies is trying to be increased. It is also understood that this study contributes to alert for the importance of the collaboration between supervisors and information literacy providers in the trainings planning. Supervisors are the ones who better know the information PhD students' needs, so working together with providers is essential for the effectiveness of the trainings.

These findings have a role on reminding librarians to provide an effective assessment, on what concerns information literacy training needs, so they can provide information literacy programs, according to students' requirements.

Regarding PhD students information literacy needs, this study contributes to a new knowledge, because the needs identified in the present study differ from those identified in the literature review and in the RIN study. This means that there is no standard, and information literacy needs vary according to universities, research areas, and academic year (and so forth) and must be assessed to provide trainings capable to answer these needs. Unfortunately, the way professionals provide the trainings for this study confirms what was already known: In Portugal, they differ from those in the UK, but three case studies in UP faculties identified that training sessions are planned and delivered in the same way. Besides, the contents are as specific as possible for students' research area and only take place by a prior arrangement. Also, on what concerns supervisors role, this study confirms that supervisors are still not completely aware of Information Literacy issues and don't collaborate with professionals on planning the trainings.

After finishing the present study, some recommendations can be given to the services of Information Literacy in each case study in faculties. The first one regards the supervisors: Information Literacy providers should work closely with supervisors. It seems to be a good practice for supervisors become more aware about the way information literacy trainings could be helpful for PhD students. Incentive them to work together with professionals in planning the IL trainings and integrating these trainings into PhD students curriculum adds significant value to the students. Regarding the second recommendation, professionals could give some workshops jointly with supervisors alerting them to the Information Literacy issues for PhD students. Also, through this collaboration, professionals could provide more specific contents to PhD students and consequently provide PHD students more capable to develop their researches. The third recommendation is linked to the level of each student regarding these competencies. In other words, the information literacy providers should be aware about the uniformity of the students in these competencies so the trainings are helpful for all audience. Finally, to carry out these trainings it's not an easy task for professionals, as they must be well prepared to provide training to PhD students.



So, information literacy providers should provide themselves with all the competencies necessary to be able to provide IL training for PhD students.

Finally, for a future work the same study could be developed, but not with three case study faculties only, but in all faculties within UP, in order to understand in what level the area of Information Literacy has been developed in all University. Or even, doing the same study, but in all Universities in Portugal (or the biggest ones) to understand at a national level of development of Information Literacy for PhD students. In these cases individual interviews are not enough to reach the target groups, they are more distant from each other, so maybe using a web based questionnaire seems to be the most proper.



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# ANNEXES

## **Annex A - Emergence of Information Literacy**

Since 1974, Information Literacy has been an area of increasing interest to librarians and information professionals, in education, social, political, and economical areas. Most publications come from the United States, Australia, New Zealand, Southeast and South Asia and Europe (especially United Kingdom) (Virkus 2003).

In this section the emergence of Information Literacy is divided in three parts. In addition, American Library Association (ALA) represents a landmark, because it is the world's oldest and largest national library association (established in 1876) and also was the first one to alert people for Information Literacy, especially academic libraries and information professionals, to its importance in the Information Age.

### *Information Literacy – pre-ALA*

The term “Information Literacy” first appeared in 1974, and the author was Paul Zurkowski, while President of the Information Industry Association (IIA). During a presentation to the National Commission on Libraries and Information Science, he pointed out that concept for a national program of instruction. So, for Zurkowski, “information literacy” is defined as:

“People trained in the application of information resources to their work can be called information literates. They have learned techniques and skills for utilizing the wide range of information tools as well as primary sources in molding information-solutions to their problems.”(1974, 9)

There is an obvious link between IL and the skills needed to locate information, and also its use for problem solving and decision making. In doing so, Zurkowski had an important breakthrough in the linkage between information literacy and developing information technologies and networks - “Information tools” now means “Information Technology”.

As new technologies made their appearances in the 1980s, new perspectives on technology started to come up, as well. Network technologies, especially with the “birth” of internet, made it possible for anyone to create, store, and access information from anywhere in the world. This originated an exponential rise in the amount of information.

A few examples are: the personal computer, CD-ROMs, and cellular phones. Therefore, computers are now synonymous to information handling and increasingly changed their role to become tools for locating, retrieving, and manipulating information. Epitomizing these new developments, *Time* magazine chose the microcomputer as its “Machine of the Year” in 1983. This drew significant public attention to computers and related technologies. Previously, computers were discussed in terms of how they worked and/or on aspects of programming. *Time’s* “award” focused attention on using computers to accomplish tasks and perform specific functions. For these reasons, it is not surprising to find that definitions of “computer literacy” began to include references to information and that the term “information literacy” began to achieve ascendancy.

In this “new age,” *computer literacy* is no longer considered as being the same as *information literacy*, but rather a prerequisite. In the areas of literature and popular press, to satisfy the need for a change, the term “information literacy” started to show.

William Demo (1986) talks about the importance of information literacy outside of the library and of the new emergent communication technologies (e.g. email). He wrote about the new technologies and the need for new skills. He too speaks about the fact that information was no longer solely the domain of libraries and librarians. Information is available for everyone, everywhere, at all times, and could now be accessed with a computer. For Demo, information literacy was essentially a new intellectual skill that enables people to be masters of new communications and information technologies (Demo 1986.). That same year, it was observed that librarians need to accept that there were many sources of information outside the library and that knowledge of these resources and how to use them was essential. As a result, librarians took the role of not only being responsible



but also having the opportunity to take part on showing how information systems and services work.

As a result, along with the new important role given to technology, accessing and manipulating information, gave the opportunity for many libraries to carry on internal reviews. To become part of the reform movement, they begun to look ahead and develop services, collect resources, and create policies and procedures to deal with the challenges and opportunities presented by this new era.

### *Information Literacy –ALA*

In 1987, the American Library Association formed the Presidential Committee on Information Literacy to explore the role of information in education, business, government, and everyday life and to put forth models for how information literacy could contribute to informal and formal learning at all levels. The goals of the final report in 1989 were to:

1. Define information literacy within the higher education and its importance to student performance, lifelong learning, and active citizenship;
2. Devise one or more models for information literacy development, which are appropriate to formal and informal learning environments, throughout people's lifetimes;
3. Determine implications for the continuing education and development of teachers (ALA 1989).

The report was defined information literate people as “those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information, and how to use information in such a way that others can learn from them” (1989, 2). They are people prepared for lifelong learning, because they can always find the information needed for any task or decision at hand (ALA 1989). This report was the first to present recommendations that emphasize the importance of information for learning, careers, business, and citizenship.

This basic ALA definition becomes the foundation for nearly all contemporary definitions and understandings of information literacy. The skills presented by the report were then evolved into a series of standards which were subsequently reviewed and approved by the Association of College and Research Libraries (ACRL) Board of Directors in 2000.

### *Information Literacy – post-ALA*

Since the publication of the ALA definition, on the one hand, there have been several developments which have impact on definitions and interpretations of information literacy; and, on the other hand, the provision of instruction in information literacy. What's left of this section can be summarized by key developments and important publications in relation to the development of the notion of information literacy among the world.

In 1989 the American Library Association (ALA) Presidential Committee on Information Literacy defined four competencies for information literacy: the ability to recognize when information is needed and to locate, evaluate and use effectively the needed information.

Also in 1989, as a direct result of the ALA's *Final Report's* recommendations, the National Forum on Information Literacy (NFIL) begun. Patricia Senn Breivik, a member of the ALA Presidential Committee on Information Literacy, was the NFIL's first Chairperson. This group represented more than seventy-five national organizations and groups, surrounding three important areas – business, government and education. The group's purpose was to identify trends in information literacy and to bring groups together. Since then, NFIL has grown considerably. Today's NFIL is a coalition of over 90 national and international corporations and organizations, as well as, members from business, government, and education. Included in this list are important bodies (National Forum on Information Literacy 2010).

In 1991, the Association for Supervision and Curriculum Development (ASCD), a membership organization that develops programs, products, and services essential to the way educators learn, teach, and lead, approved a resolution of Information Literacy demonstrating its commitment to the importance of information literacy. This action required each of its units to report annually on what was done to support and promote

information literacy. Among its activities to date are featuring information literacy in its journal, *Educational Leadership*, two newsletters, and the establishment of a special interest group.

In the following year, 1992, the ERIC education database established “information literacy” as a research term, which has also sponsored several publications on information literacy including the 1992 *Libraries for the Education Goals* by Christina S. Doyle (National Forum on Information Literacy 2010).

By 1993 the Commission on Higher Education (CHE) of the Middle States Association of Colleges and Schools became the first real agency to promote Information Literacy skills as an essential undergraduate learning outcome (National Forum on Information Literacy 2010).

In 1994, The Australian Government Report, which gave a huge contribution to the information literacy debate in Australia, was the *Developing Lifelong Learners through Undergraduate Education*, or the *Candy Report*: Information literacy allows students to achieve lifelong learning, and the librarians’ role is to develop efforts to help create a university community of lifelong experiences (National Forum on Information Literacy 2010).

In 1997, the National Education Association (NEA) of US incorporated information literacy into its Teacher Education Initiative Program allying higher education and K-12 as partners, in order to support both school and teacher education reform. In 1998, NEA also published a book about information literacy that is targeted at elementary school principals (ACRL 1998).

Also, in 1997, Christine Bruce did her PhD work in the area of Information Literacy. It was entitled *The Seven Faces of Information Literacy*. Bruce's work was a critical analysis of the theoretical foundation of information literacy, although it had a turn. By applying a relational model to information literacy education and research, as opposed to the traditional behaviorist model, Bruce presents a fresh approach to the study of information literacy and its place in education (ACRL 1998).

In 1998, *Progress Report on Information Literacy*, produced by the Association of College and Research Libraries, mentions the efforts of some educational organizations to create National Forum on Information Literacy (NFIL), which the goal is to promote information literacy as a means of allowing individuals and increasing the educational potential and economics goals of communities everywhere (ACRL 1998).

In 1998 The American Association of School Libraries and the Association of Educational Communications and Technology published *Information Literacy Standards for Student Learning* for students in K-12. These Associations' work listed standards detail competencies for students in K-12 (National Forum on Information Literacy 2010).

In 1998, Allen Bundy produce an Information Literacy framework: *Information Literacy: The key competency for the 21<sup>st</sup> century*, presented at the Annual Conference of the International Association of Technological University Libraries in South Africa (Bundy 1998).

In 1999, the National Research Council's Committee on Information Technology Literacy (CITL) produced a report, entitled *Being Fluent with Information Technology*, which introduced the term "Information Fluency". This report argues that people "fluent with information technology" (FIT people), are able to both acquire and adapt more knowledge in all life contexts. So, through this report, the importance of knowing how to use the information technologies or to be an information literate person, was recognized.

In 2000, the American Association of Higher Education (AAHE) endorsed the ACRL's *Information Literacy Competency Standards for Higher Education*, with the following call: "With societal well-being so dependent upon how its citizens find, review, and use information, institutions must help students become information literate, in the fullest sense of the term" (Breivik 2000).

In 2001 the Council of Australian University Librarians (CAUL) revised the ACRL standards and produced the Australian version information literacy standards. Their version takes a broader approach to information literacy than the US original, talking about the information literate *person* (rather than student) and adding two new standards:

...recognises that lifelong learning and participative citizenship requires information literacy;

...expands, reframes or creates new knowledge by integrating prior knowledge and new understandings individually or as a member of a group. (CAUL, 2001)

Also, these Australian Standards are reflected in the Australian Library and Information Association's (2001) *Statement on Information Literacy for all Australians*, which stated the importance of information literacy for personal empowerment, participative citizenship and social inclusion. It also agrees with the National Library of Australia's commitment to *Equity of Access to Information Literacy Skills* (Alston, 2001).

In 2002, the Joint Information Systems Committee through the JISC Committee for Awareness, Liaison and Training (JCALT) funded *The Big Blue* project, which was managed jointly by Manchester Metropolitan University Library and Leeds University Library (Manchester Metropolitan University Library Services 2001). In this report, "Information Skills" and "Information Literacy" were understood as synonyms and surveyed current practice in information skills training for students in higher and post-16 education. The project concluded that there is only a relatively small amount of published literature, which relates to the UK experience of information skills. Besides, most literature describes approaches to the introduction of Information Literacy programs adopted by individual institutions.

However, the "Big Blue project", carried out through a review and case studies, revealed good practice in individual institutions. Nonetheless, it was pointed out that without the national recognition of information skills, as an important attribute to graduates, the concept will not be included in a Curriculum Vita (Manchester Metropolitan University Library Services 2001).

In 2003, NFIL, UNESCO, and NCLIS held the first international information literacy experts meeting in Prague, resulting in the *Prague Declaration*. This meeting of experts was a great success, as it accomplished its goals regarding the definition of the information literacy concept, the recognition of its role in changing communities worldwide and the creation of action plans. In this meeting Information Literacy was intended as a prerequisite

for well participating in the information society, and is part of the basic human right of lifelong learning.

Also in 2003, NFIL established the International Alliance on Information Literacy. The general purpose for the Alliance is to ease the sharing of information and provide information literacy skills across regions and nations of the world. The ultimate goal of the Alliance is to simplify people's participation in the Information Society, as part of the basic human right of lifelong learning. The Alliance consists of several organizations around the world. Member organizations will be regional or national organizations. They will include representation from the economic development, education, health, human services, librarianship, public policy, and information and communications technology sectors (National Forum on Information Literacy 2010).

In 2003, Society of College, National and University Libraries presents: *Information Skills in Higher Education: a SCONUL position paper*. These paper's main goals were to define the information skills for higher education in UK, and stimulate the debate about the place of information skills within the context of current activity, surrounding 'key skills' and lifelong learning. The outline model for information skills in the briefing paper has become known as the *Seven Pillars Model*. An interactive process is present in the pillars, so that progress of the information user is carried out by practicing its skills (SCONUL 2003).

In 2004, The Partnership for 21st Century Skills, an organization that provide tools and resources to help the US education system, identified information literacy as a key student learning outcome. To keep up with the education system this organization aims to relate critical thinking and problem solving, communication, collaboration, and creativity and innovation in the students' works (National Forum on Information Literacy 2010).

In 2004, Alain Bundy produced an adaptation of the ACRL's framework update to the Higher Education in Australia: *Australian and New Zealand Information Literacy Framework: principles, standards and practice*. This framework stated the principles, standards and practices that can sustain information literacy education in all education sectors in Australia (Bundy 2004).

In 2004 the Research Information Network (RIN) was set up by the four UK higher education funding councils, the British Library, the national libraries of Scotland and Wales and the seven UK Research Councils. Its establishment stems from the recommendation of the Research Support Libraries Group Final Report in 2003 where it was found that a cohesive and strategic leadership was missed to join together a national framework to meet the information needs of researchers. So, a new body was formed to improve, highlight and lead a UK-wide strategy for the provision of research information.

In 2005, UNESCO/IFLA/NFIL sponsored a symposium of information literacy experts in Alexandria, Egypt, producing The Alexandria Proclamation on Information Literacy and Lifelong Learning. On this meeting it was declared that Information Literacy lies at the core of lifelong learning, because it allows people in all sets of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion of all nations.

In 2006, First National Information Literacy Summit in the U.S. – Co Sponsored by the National Forum, Committee for Economic Development, Institute for a Competitive Workforce, National Education Association, Educational Testing Service, and the National Forum. This summit presented informative and appropriate discussions between government, education and business leaders on information literacy and its impact on the global society, workforce readiness in the United States (National Forum on Information Literacy 2010).

In 2007, UNESCO published the report entitled *Understanding Information Literacy: A Primer* by Dr. F. Woody Horton, one of the conveners of the 2003 Prague and Alexandria. This publication helped senior and middle level public and private sector executives to find, retrieve, organize, evaluate and use information. It even has a special section (Part II) that is especially for readers with very little time (UNESCO 2007).

In 2008, UNESCO also published *Towards Information Literacy Indicator*, a conceptual framework for measuring information literacy. It was designed to serve as a reference to aid the elaboration of information literacy indicator (UNESCO 2008).

Also, in 2008, the American Association of Community Colleges (AACC) published a Position Statement on Information Literacy. It says that effective curricula of Information Literacy offer both current and classic content of disciplines through: a design that engages students meets their learning needs, supports their success in courses and retention in academic programs. To design a curriculum and its content it's necessary to include practices such as active learning techniques, the establishment of a context, real life importance, the integration of technology, significant assessment, and an integration of critical thinking, that stimulates the questioning and discussion of ideas. The Faculty should work together with library teachers to create instructional groups to encourage information literacy outcomes in education. In this report, the AACC also states that "Information literacy, which encompasses information fluency and information technology mastery, is critical to success in higher education and lifelong learning".

From this literature brief overview on the emergence of Information Literacy it is clear that the amount of information produced each year keeps growing at an incredible rate.



## Annex B: PhD students' interview

Faculty \_\_\_\_\_

### Introduction

Identification: Ana Mesquita, 2nd year student of the Master in Information Science.

Dissertation theme: Information Literacy in Higher Education: The case of research staff and students in the University of Porto.

Interview goal: Perceive the information training needs of the PhD students and how well they feel supported by the academic library in area of research competencies – Information Literacy Skills.

Ethical statement: The interviewees' identity will be preserved and the data collected just will be used for the purposes of research.

1. Could you tell what is your academic year of the doctorate course?

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2. How is the research carried out?

Individually

Work in a team

Associated with a project

3. Could you please mark, in a 5 point scale, how important do you consider the following IL skills for PhD Students?

		<b>Very Important 1</b>	<b>Important 2</b>	<b>Fairly Important 3</b>	<b>Less Important 4</b>	<b>Not Important 5</b>
<b>Construct strategies for locating the information:</b>	1. How to do literature searches					
	2. How to use specific subject databases					
	3. How to use appropriate search engines (moving beyond Google)					
<b>Locate and access the information:</b>	4. How to find research material in the Library					
	5. How to find and obtain research evidence from outside the university					
	6. How to obtain published research papers					

<b>Compare and evaluate the information:</b>	7. How to use subject-based electronic portals and gateways					
	8. How to use wikis and blogs in your research					
	9. How to use electronic repositories in your research					
	10. How to evaluate published research papers					
<b>Organise, apply and communicate the information:</b>	11. How to manage the information generated through your research					
	12. How to retain and preserve the information generated through your research					
	13. How to cite journal articles, books and reports to demonstrate that you have covered the ground					
	14. How to cite information on websites					
	15. How to write research reports and journal articles					
	16. How to prepare and submit conference papers					
	17. How to avoid plagiarism					

<b>Licensing and copyright issues</b>	18. Licensing and copyright issues					
	19. Open access to research reports					

a. Please could you tell me what subset of skills do you consider “very important” PhD students learn?

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4. Could you rate your skill level regarding the following skills:

		<b>Very Competent 1</b>	<b>Competent 2</b>	<b>Fairly Competent 3</b>	<b>Less Competent 4</b>	<b>Not Competent 5</b>
<b>Construct strategies for locating the information:</b>	1. How to do literature searches					
	2. How to use specific subject databases					
	3. How to use appropriate search engines (moving beyond Google)					

<b>Locate and access the information:</b>	4. How to find research material in the Library					
	5. How to find and obtain research evidence from outside the university					
	6. How to obtain published research papers					
<b>Compare and evaluate the information:</b>	7. How to use subject-based electronic portals and gateways					
	8. How to use wikis and blogs in your research					
	9. How to use electronic repositories in your research					
	10. How to evaluate published research papers					

<b>Organise, apply and communicate the information:</b>	11. How to manage the information generated through your research					
	12. How to retain and preserve the information generated through your research					
	13. How to cite journal articles, books and reports to demonstrate that you have covered the ground					
	14. How to cite information on websites					
	15. How to write research reports and journal articles					
	16. How to prepare and submit conference papers					
	17. How to avoid plagiarism					
<b>Licensing and copyright issues</b>	18. Licensing and copyright issues					
	19. Open access to research reports					

5. Would you classify how well are these skills supported by the Academic Library?

		<b>Very Supported 1</b>	<b>Supported 2</b>	<b>Fairly Supported 3</b>	<b>Less Supported 4</b>	<b>Not Supported 5</b>
<b>Construct strategies for locating the information:</b>	1. How to do literature searches					
	2. How to use specific subject databases					
	3. How to use appropriate search engines (moving beyond Google)					
<b>Locate and access the information:</b>	4. How to find research material in the Library					
	5. How to find and obtain research evidence from outside the university					
	6. How to obtain published research papers					

<b>Compare and evaluate the information:</b>	7. How to use subject-based electronic portals and gateways					
	8. How to use wikis and blogs in your research					
	9. How to use electronic repositories in your research					
	10. How to evaluate published research papers					
<b>Organise, apply and communicate the information:</b>	11. How to manage the information generated through your research					
	12. How to retain and preserve the information generated through your research					
	13. How to cite journal articles, books and reports to demonstrate that you have covered the ground					
	14. How to cite information on websites					
	15. How to write research reports and journal articles					
	16. How to prepare and submit conference papers					
	17. How to avoid plagiarism					



Licensing and copyright issues	18. Licensing and copyright issues					
	19. Open access to research reports					

6. Is there any training aspects related to this area that we haven't talked about, but could be important?

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*Thank you for your time and assistance on the project.*

# Annex C: Information Literacy Providers' interview

Faculty \_\_\_\_\_

## Introduction

Identification: Ana Mesquita, 2nd year student of the Master in Information Science.

Dissertation theme: Information Literacy in Higher Education: The case of research staff and students in the University of Porto.

Interview goal: Perceive how the training in research skills and information skills concerning PhD students is being delivered and what skills the providers of information literacy consider important for PhD students to learn.

Ethical statement: The interviewees' identity will be preserved and the data collected just will be used for the purposes of research.

## Planning

*To begin with, can we talk about the way research skills and information skills training is conducted in \_\_\_\_\_ generally?*



1. How is the delivery of Information Literacy trainings for PhD students planned?
  - a. For example, is it based on expected learning outcomes;
  - b. Is there agreement on what areas are to be covered?

\_\_\_\_\_  
\_\_\_\_\_

2. Is there any joint training plan by PhD supervisors and library staff?
  - a. Do you consider this joint planning important? Why?

\_\_\_\_\_

3. Does it *feel* like planned provision? Are there any gaps?

4. Could you please mark, in a 5 point scale, how important do you consider the following IL skills for PhD Students?

		<b>Very Important 1</b>	<b>Important 2</b>	<b>Fairly Important 3</b>	<b>Less Important 4</b>	<b>Not Important 5</b>
<b>Construct strategies for locating the information:</b>	1. How to do literature searches					
	2. How to use specific subject databases					
	3. How to use appropriate search engines (moving beyond Google)					
<b>Locate and access the information:</b>	4. How to find research material in the Library					
	5. How to find and obtain research evidence from outside the university					
	6. How to obtain published research papers					

<b>Compare and evaluate the information:</b>	7. How to use subject-based electronic portals and gateways					
	8. How to use wikis and blogs in your research					
	9. How to use electronic repositories in your research					
	10. How to evaluate published research papers					
<b>Organise, apply and communicate the information:</b>	11. How to manage the information generated through your research					
	12. How to retain and preserve the information generated through your research					
	13. How to cite journal articles, books and reports to demonstrate that you have covered the ground					
	14. How to cite information on websites					
	15. How to write research reports and journal articles					
	16. How to prepare and submit conference papers					
	17. How to avoid plagiarism					

Licensing and copyright issues	18. Licensing and copyright issues					
	19. Open access to research reports					

- a. Please could you tell me what subset of skills do you consider “very important” PhD students learn and what are the ones library provide support?

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**Delivery**

*Now we have some questions on the way the training is delivered.*

5. In FEUP as a whole, what is the mix of generic skills training vs. subject-based training (e.g., using specialised databases) or resource-type-based training (e.g., in archival material)?

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6. What methods of delivery do you or your team favor?

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7. Are there situations in which teaching to groups is appropriate, vs one-to-one or smaller tutorial groups?

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8. Is any virtual learning environment used in the provision of training, by any unit in the faculty?

No \_\_\_ Yes \_\_\_

Can you describe the environment and the teaching materials, briefly?

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9. Is any virtual learning planned for this kind of training?

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10. What is the general feeling on the efficacy of such methods?

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**Evaluation and impact**

11. How is the training evaluated?

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12. What is done with this evaluation?

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a. Which are the most frequent obstacles in information research and management for PhD students?

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**Support**

13. How well, do you believe, are the target audiences being served (through training and other means) in relation to research and information skills training?

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14. Is there any training aspects related to this area that we haven't talked about, but could be important?

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*Thank you for your time and assistance on the project.*

# Annex D: Supervisors' interview

Faculty \_\_\_\_\_

## Introduction

Identification: Ana Mesquita, 2nd year student of the Masters in Information Science.

Dissertation theme: Information Literacy in Higher Education: The case of research staff and students in the Faculty of Engineering of the University of Porto.

Interview goal: to perceive if PhD supervisors are aware about the information literacy programs at FEUP Library, if they work jointly with information literacy providers in the planning of training and what information literacy skills they consider to be the most important ones for PhD students learn in these trainings.

Ethical Statement: The interviewees' identity will be preserved and the data collected just will be used for the purposes of research.

1. Do you know about the Information Literacy service at Library?
  - a. If YES:
    - Do you consider it useful for PhD students? Why?

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-

- Do you recommend it to your students?

If YES - For what? (e.g. Search engines, citations, references etc.) Students were clarified?

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b. If NOT:

- Why? Perhaps poor dissemination of the service?

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-

2. Do you consider important having a joint planning of information literacy training by PhD supervisors and providers of information literacy?

a. Why?

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3. Could you please mark, in a 5 point scale, how important do you consider the following IL skills for PhD Students?

		<b>Very Important 1</b>	<b>Important 2</b>	<b>Fairly Important 3</b>	<b>Less Important 4</b>	<b>Not Important 5</b>
<b>Construct strategies for locating the information:</b>	1. How to do literature searches					
	2. How to use specific subject databases					
	3. How to use appropriate search engines (moving beyond Google)					

<b>Locate and access the information:</b>	4. How to find research material in the Library					
	5. How to find and obtain research evidence from outside the university					
	6. How to obtain published research papers					
<b>Compare and evaluate the information:</b>	7. How to use subject-based electronic portals and gateways					
	8. How to use wikis and blogs in your research					
	9. How to use electronic repositories in your research					
	10. How to evaluate published research papers					

<b>Organise, apply and communicate the information:</b>	11. How to manage the information generated through your research					
	12. How to retain and preserve the information generated through your research					
	13. How to cite journal articles, books and reports to demonstrate that you have covered the ground					
	14. How to cite information on websites					
	15. How to write research reports and journal articles					
	16. How to prepare and submit conference papers					
	17. How to avoid plagiarism					
<b>Licensing and copyright issues</b>	18. Licensing and copyright issues					
	19. Open access to research reports					

a. Please could you tell me what subset of skills do you consider “very important” PhD students learn?

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4. Are there any aspects of training in this area that you would like to see developed?

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*Thank you for your time and assistance on the project.*



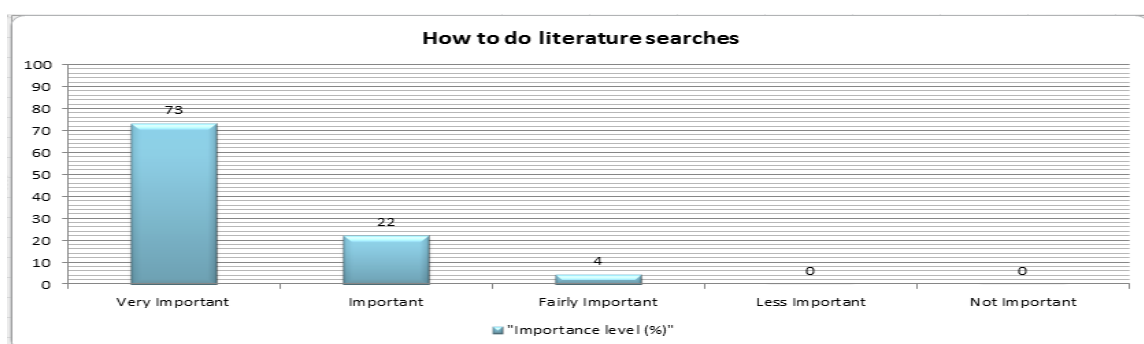
## Annex E - Key findings

### Competencies analysis

#### 1. How to do literature searches

##### Level of importance

##### PhD Students:



When asked about assessing the importance level of this competence, regarding how to carry out their scientific researches: 73% of the PhD students said it is “very important”, whereas 22% PhD students said it is “important”.

PhD students’ comments are closely linked to the importance of how to get the information needed:

*“Important because, sometimes I know what I want to search but I don’t know to search it”  
(Respondent 2, 04.09.2011)*

*“This is very important, undoubtedly. Because it’s the first step for our research, if we have no information to support it we can’t do it well” (Respondent 5, 05.09.2011)*

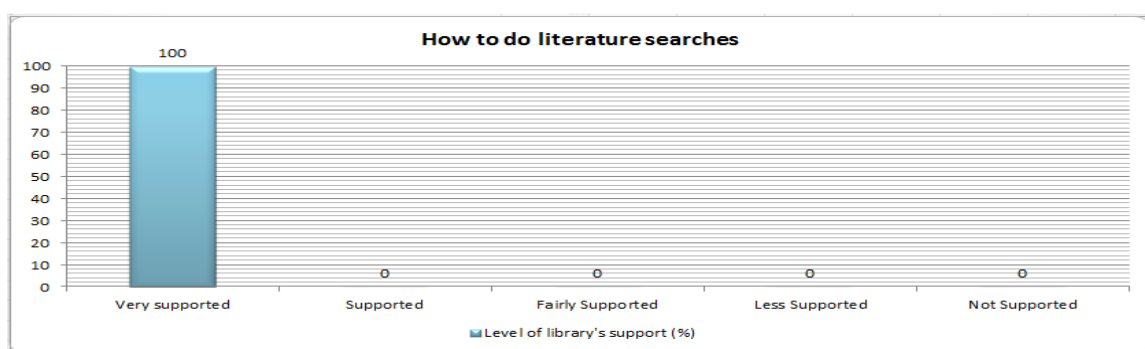
Furthermore, 4% PhD students assessed this competence as “fairly important”. On the first case, this assessment is linked with the PhD students’ academic year, as they said “gaining

some practice during my degree”, while on the second case, this assessment is linked to the fact that students are working in a team, what in some occasions is helpful, for example when working towards the same objective. However, this is not conventional, because students in 3<sup>rd</sup> academic year evaluate this skill as “very important” and justify it by saying that:

*“Knowing how to do literature searches in catalogues, databases, journal and so forth, is always important because information is nowadays available through these platforms, and more and more will be. So, knowing how to find it, what to use to find it, what terms use, what combinations, and so forth is always important.” (Respondent 8, 09.09.2011)*

The importance of this IL competency can be perceived by the fact that no students rate it as “less important” and “not important”.

#### Information Literacy providers:



Regarding information literacy providers, all of them assessed this competence as “very important”, for PhD students learn and apply effectively. Although their justifications vary:

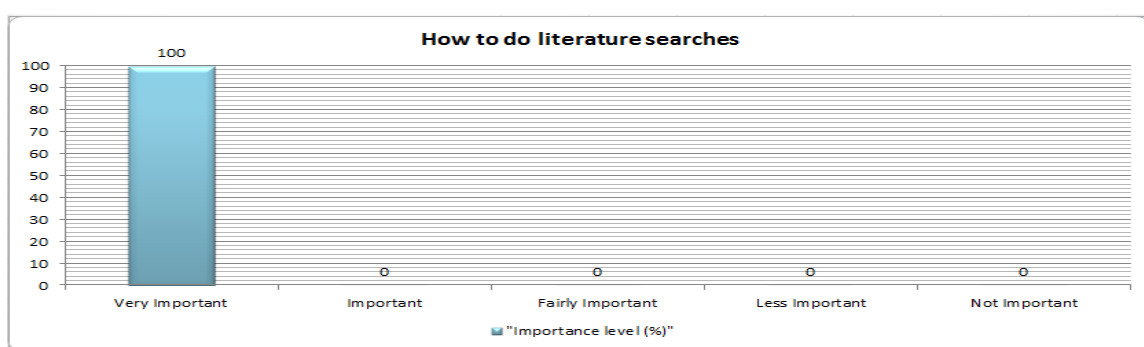
*“The academic level where they are now – doctorate level – they already should know how to do it well. But this is not what has been perceived by library, so is very important PhD students learn and practice this competence” (ILP 3, 19.05.2011)*

*“Locate the information on literature is very important for PhD students of our faculty. The databases that we have retrieve lots of information, so they need to know how to search,*

*which terms should use, in depth what search strategies they should develop” (ILP 2, 09.09.2011)*

*“Knowing how to access reliable information is very important for students who are doing scientific researches, so they can have a theoretical part well-reasoned” (ILP 1, 02.09.2011)*

### Supervisors:



The level of importance assigned by a supervisor to this competence was the maximum. All 10 supervisors interviewed recognized that to know how to do literature searches is “very important” for PhD students.

*“This is very important for sure. Even for me it is very important! For everyone who is carry out investigations is very important know how to do literature searches” (Supervisor 5, 16.09.2011)*

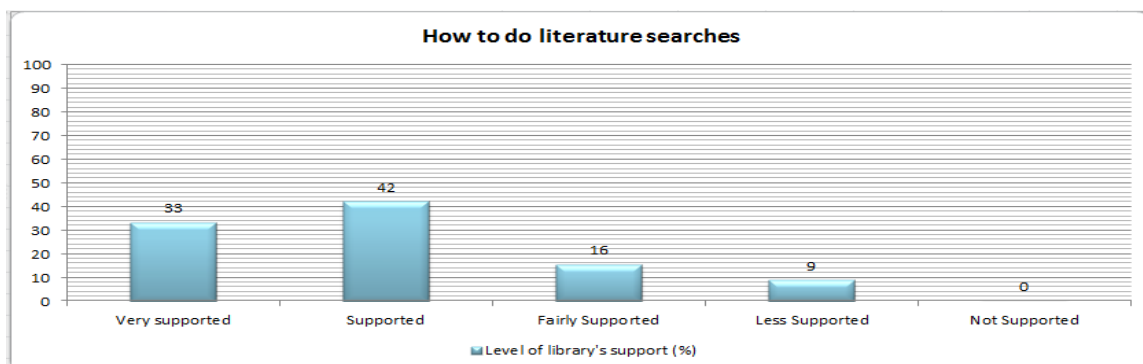
### Comparison:

Concerning the level of importance given by the groups to this competence it can be perceived there is an agreement. A large part of the students consider this competence very important for their researches, as well as all information literacy providers and supervisors.



## Level of library's support

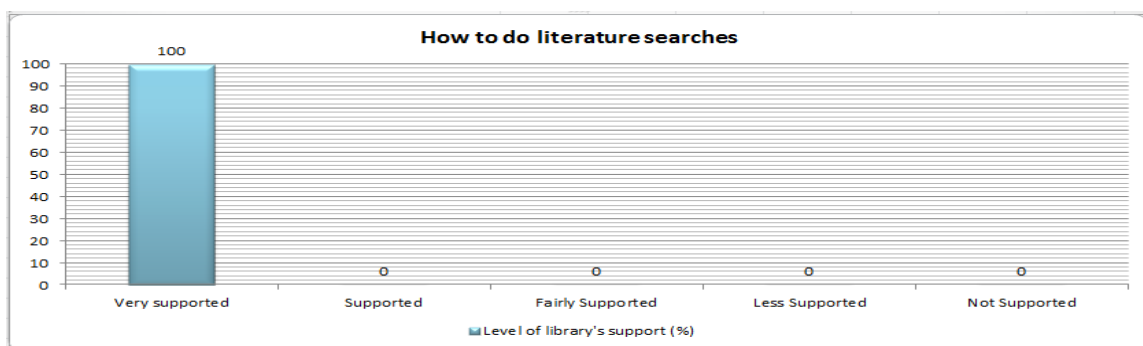
### PhD Students:



To this competence, 42% of the PhD students fell “supported” by the library and 33% of the PhD students “very supported#.. In general, students said that when they have some doubt on searching librarians help or, in a specific case, like “*don’t know what are the main information resources to search*” (Respondent 40, 25.09.2011) they ask for help to their supervisors.

Then, 16% of the PhD students considered that this competence is “fairly supported” by library and 9% of the PhD students considered that is “less supported” by library. The percentage of students that considered this competence is less supported by library is closely linked to some occasions that students don’t see their need satisfied and also don’t know the existence of IL trainings in library.

### Information Literacy providers:



All IL service directors of each faculty interviewed said that they provide the highest level of support to this competence – “very supported”.

*“We have a specific room with professionals specialized in this area to receive students and help them on doing literature searches or other difficulties that they possibly have regarding the search information. And if they can’t go to the room they can send an email to our service asking for help. We are always available to do that. ” (ILP 3, 19.05.2011)*

*“When students have some doubt on searching information they know that they can always come to library and ask for help, to me or other professional, and we can always provide this help” (ILP 2, 09.09.2011)*

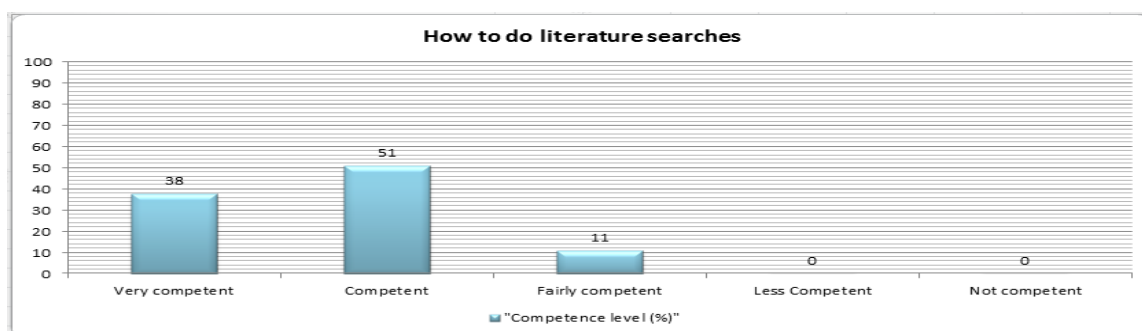
*“We are always available to give help to students in all problems that they can possible have regarding the library” (ILP 3, 19.05.2011)*

Comparison:

A big difference between these two groups: the majority of PhD students consider that library provides a good support to this competence, as well as consider all the information literacy providers.

## Competence level

PhD students:



Regarding the competence level, 51% of the PhD students assumed they were “competent” and 38% of the PhD students assumed they were “very competent”. Just 11% of the PhD students consider themselves as being “fairly competent”, doing literature searches.

*“I know how to do this because I already have some practice so this is not a difficult form me” (Respondent 26, 19.09.2011)*

*“I attended once one of the trainings provided by library. It was helpful to have a general vision about what I should do to search information” (Respondent 28, 19.09.2011)*

No students recognized themselves as being “less competent” or “not competent” on doing literature searches for their PhD researches. Some of them reported that:

*“Sometimes the research subject still has poor evidence on literature and when it happens is difficult to find the information needed” (Respondent 31, 20.09.2011)*

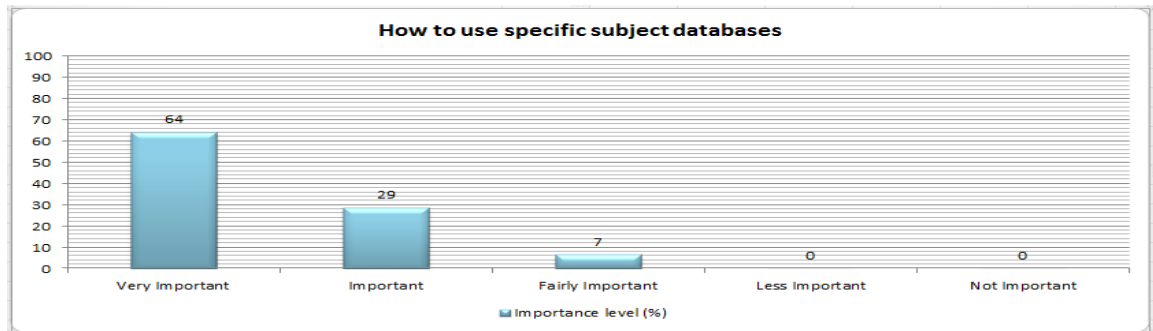
In general, regarding this competency, students didn't report difficulties doing it, because they have been gaining practice and already know the information resources that they commonly used on their PhD research.

Regarding this topic – competence level – all of the trainings provided by the information literacy providers are integrated contents for helping students doing literature searches. As all of the information literacy providers mentioned, the trainings for PhD students are generally specific to their area, and happen when academics, supervisors or doctoral directors ask to library.

## 2. How to use specific subject databases

### Importance level

#### PhD Students:



In relation to the importance level, this competence was considered by 64% of the PhD students as being “very important” and by 29% of the PhD students as being “important” for their researchers. PhD students’ justifications are the following:

*“Knowing the databases that have specific information regarding the area of research is a very helpful tool to get information” (Respondent 15, 16.09.2011)*

Others PhD students (just 7% of them) recognize this skill as important, but comparing with the first skill they said that is “fairly important” because:

*“Even searching inside these kind of databases, or journals, I need to know what I want to find specifically, so I always need to know how to do literature searches”. (Respondent 19, 17.09.2011)*

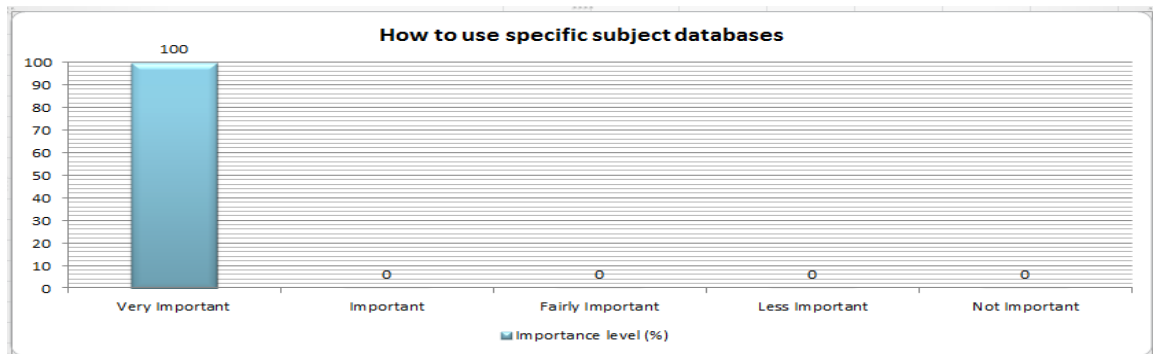
In further cases, students referred that:

*“These databases may be even more difficult to get information, because they have so information concerned with an area that for instance could be difficult to get the information that I real need” (Respondent 11, 12.09.2011)*

Still others say that:

*“If I don’t know the existence of these databases but I know searching on general databases, I can retrieve the information that I need” (Respondent 11, 12.09.2011)*

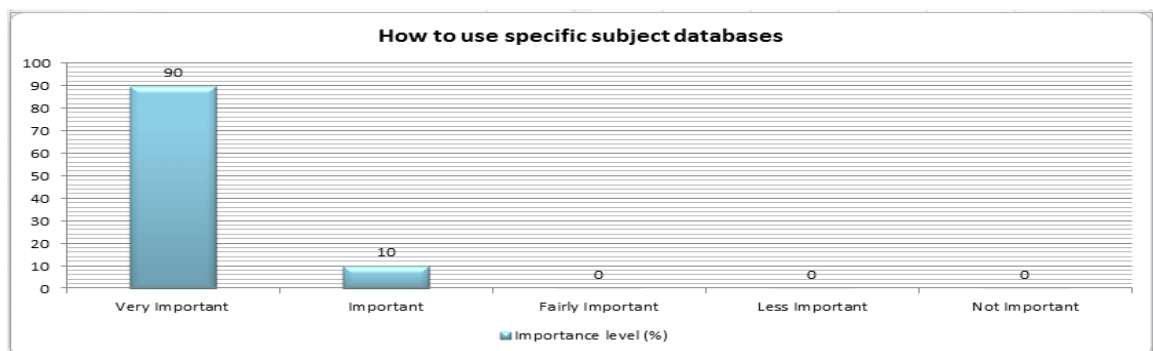
Information Literacy Providers:



All of the information literacy providers interviewed in each faculty categorised this competence as “very important” for PhD Students. Their comments don’t vary significantly from the first competence. Therefore, regarding the academic level, it was expected that they knew where they should go to search for information.

They also said that this knowledge, about what are the specific databases, linked to a specific area, should also be indicated by their supervisors, as they already are doctors of that area.

Supervisors:



The importance level assigned by supervisors to this competency varies, but not significantly: 90% of the supervisors said that this competence is “very important” and 10% said that it is “important”.

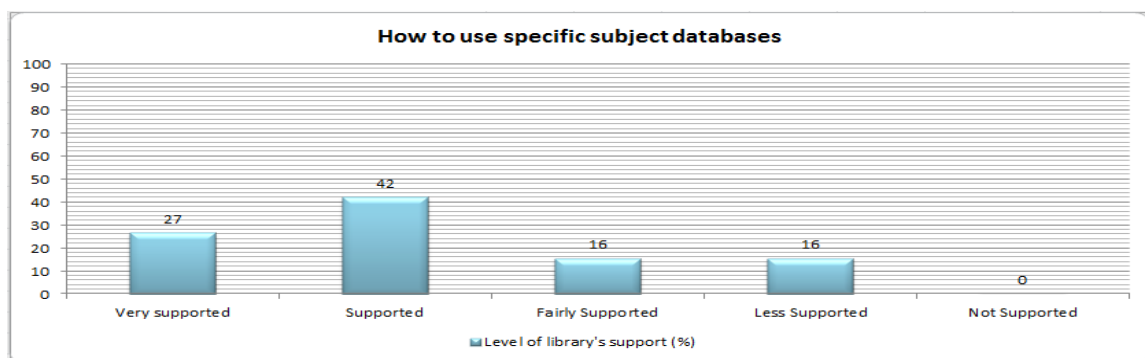
*“Meet these information resources give them a better knowledge about what have been produced in their area not only for their research process but also during their career”  
(Supervisor 3, 13.09.2011)*

Comparison:

Regarding the importance level rated by all groups, it could be perceived that an agreement between them exists, all groups find this competence “very important”.

### **Level of library’s support**

PhD students:



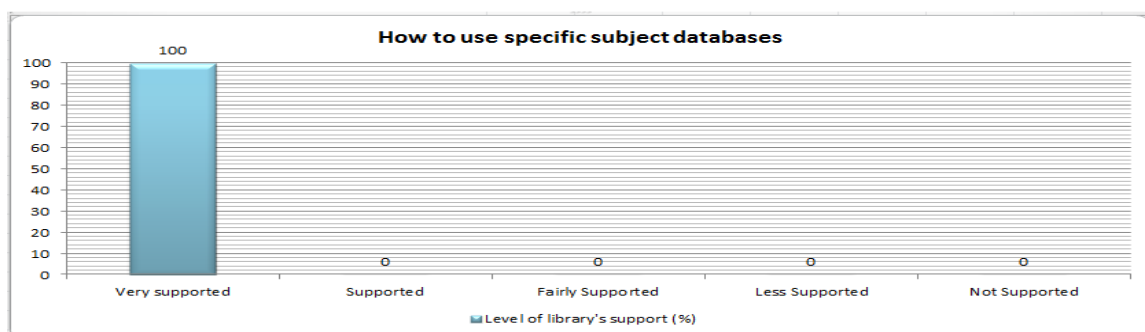
Regarding PhD students interviewed, 42% considered that this competence is “supported” by library, and 27% of the PhD students considered that this competence is “very supported”. While, 16% of the PhD students considered that this competence is “fairly support” and “less support” given by the library.

Much PhD students argued that:

*“Library has available information resources very useful and when I need some help I ask them to help me finding it. I don’t feel difference on support provided on generic resources and specific resources” (Respondent 41, 25.09.2011)*

*“Until now consider that library has fantastic resources and they're very, very helpful in finding resources. I think they're good because they're tough on you and make you learn how to use it” (Respondent 42, 26.09.2011)*

#### Information Literacy Providers:



Again, all of the information literacy providers referred that they give students’ support in this competence in a high level, as can be perceived by the chart.

Their justifications for having said this are closely linked to the fact that the trainings for PhD students are planned specifically, in other words the contents delivered are always concerned to the area of research. Therefore, there is a preoccupation related to present students with this kind of information resources, as implicit in these trainings.

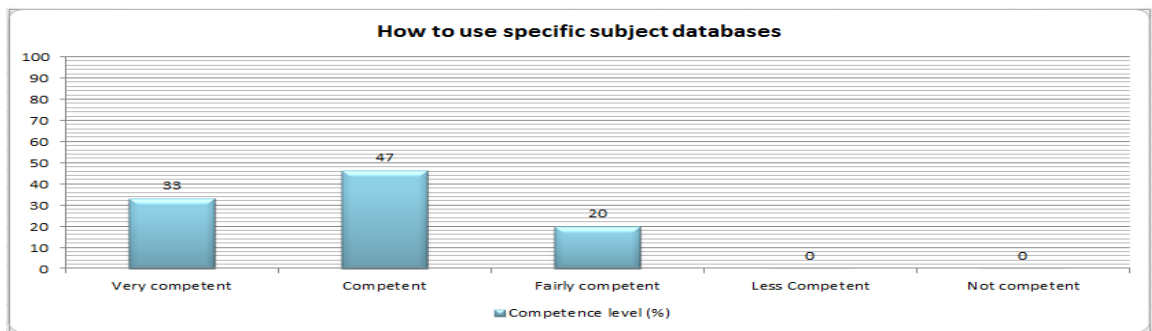
*“In cases like those ones the participations of the supervisors are essential, to better meet the information needs of PhD students” (ILP 3, 19.05.2011)*

Comparison:

Regarding the level of library's support there is not a huge difference: PhD students considered to be "supported" by library and library's professionals rated it as highest level of support.

## Competence level

### PhD Students:



Regarding this competency, 47% of the students evaluated themselves as being "competent", 33% of the students as "very competent". Just 20% of the students assumed to be "fairly competent" and, as was the competency before, no students recognized themselves as "less competent" or "not competent" on using specific subject databases.

Some PhD students said to have difficulties on using specific databases, but in some cases, students pointed out that

*"Till now, I didn't find any specific subject database concerned with my research theme, but I think I can use it well, if I know how to use one I know how to use everyone"* (Respondent 30, 20.09.2011)

*"For me, the specific databases in my research area are very easy to use now, for example the Compendex Database. But I recognize that in the beginning of my degree search on it was very very difficult. With the time's pass I was gaining practice and now I can use it well."* (Respondent 35, 23.09.2011)

XXX



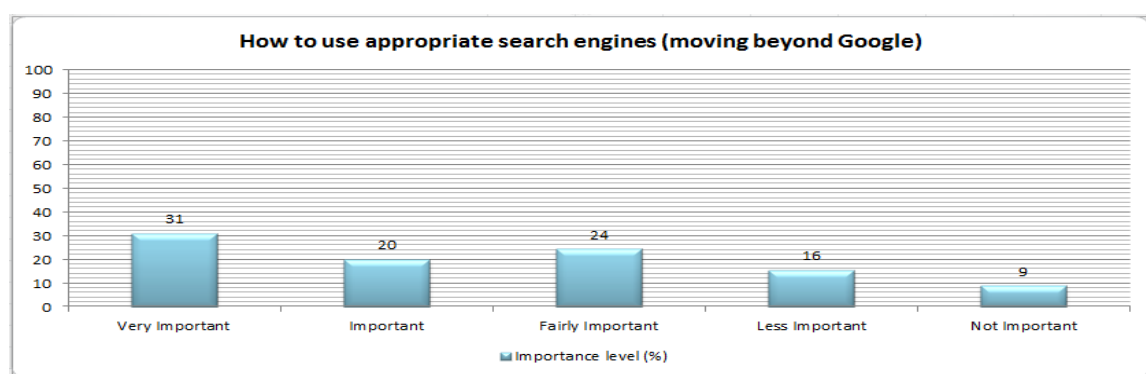
*“Well sometimes is difficult to find information even in these databases, but yes I consider myself competent on using this kind of databases” (Respondent 15, 16.09.2011)*

This reveals that all students think they know how to use specific databases, despite their disciplines.

### 3. How to use appropriate search engines (moving beyond Google)

#### Importance level

##### PhD Students:



This competence, as can be perceived by the bar chart, is divided by levels of importance. Some students (the higher quotation) considered this competency “very important” (31% of the PhD students). Then, 24% of the PhD students said that this competence is “fairly important”, 20% of the PhD students said that it is “important”, while 16% of the PhD students assessed this competence as “less important” and 9% of the PhD students as “not important”.

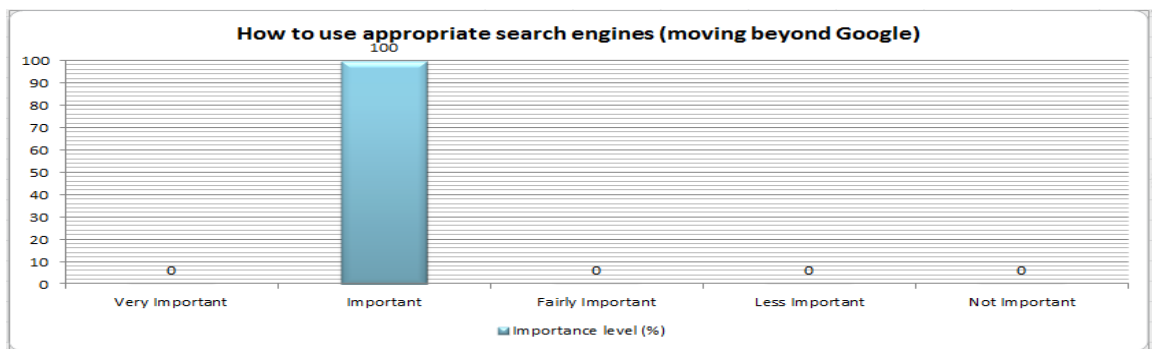
PhD students do not consider this competency to be as important, because they intend that it is the same for the first competency: how to do literature searches. And some of them said that:

*“Yes, knowing how to use appropriate search engines beyond Google searches is important for a PhD research, but this competency means the same of doing literature searches.” (Respondent 1, 03.09.2011)*

Interpreting student’s words means that they know they can’t use the same search engines, used in Google, when they are searching on databases, journal. Students that find this competency very important or just important didn’t make this comparison with the first competency, and most of them said that:

*“Using Google search engines on databases is not useful! I know, I’ve do it before. So it is necessary use the key words and relates them” (Respondent 9, 11.09.2011)*

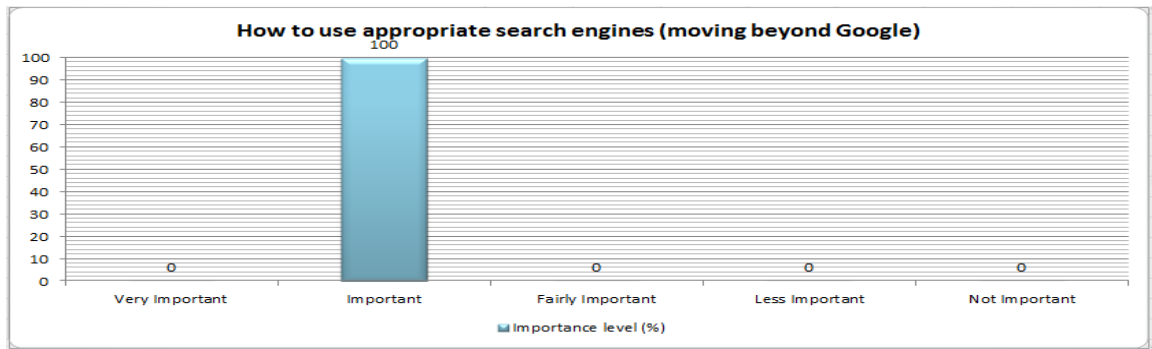
Information Literacy Providers:



Once more, all professionals recognized providing a great support to this competence. Information literacy providers for each faculty assumed that this competence is very supported by their services. In general, all professionals said:

*“Of course! This is one of the first concerns that we have in our trainings: incentive students doing search engines effectives and not those used in Google” (ILP 3, 19.05.2011)*

Supervisors:



As can be perceived by the bar chart, all supervisors assessed this competence as “very important” to PhD students, arguing that:

*“Mainly in a first year, students have a lot this behaviour. Some ones still not are sensitized to this search problem” (Supervisor 8, 23.09.2011)*

Other supervisors pointed out an interesting aspect:

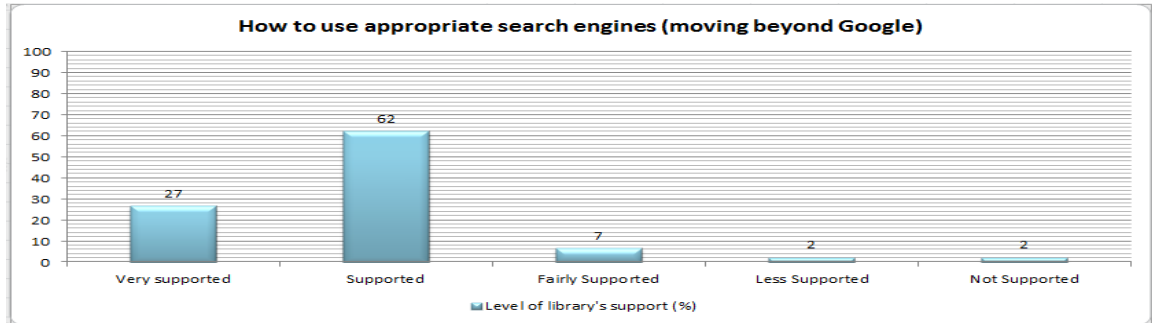
*“It is very possible, because having in mind the power that Google and Google Scholar have been acquired during the years, the “intimacy” is so much that for instance they could not doing search engines moving beyond Google, let’s say “simple and generic searches engines” (Supervisor10, 25.09.2011)*

Comparison:

So, all the groups assessed this competence as very important” which reveals don’t exist any gap in this rating.

## Level of library's support

### PhD students:



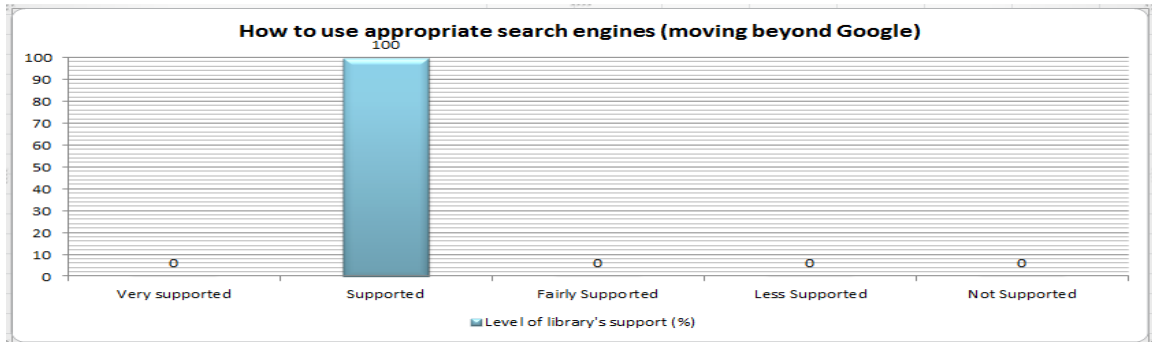
The level of library's support most quoted by PhD students to this competency was "supported" (62% of the PhD students). Then 27% of the PhD students considered having "very support" by the library, regarding this competence. And finally, 7% of the students assessed this competency as "fairly supported" and 2% of the PhD student said having less or no support by librarians.

As much of the PhD students considered this competence similar to the first one, the support they assumed, is also high.

*"At least, when I ask help to librarians they are available to help me doing information searches" (Respondent 12, 13.09.2011)*

*"Yes, I feel supported by library regarding this competence. It is similar to the first one, and I think that librarians do not use Google searches engines!" (Respondent 16, 16.09.2011)*

Information literacy providers:



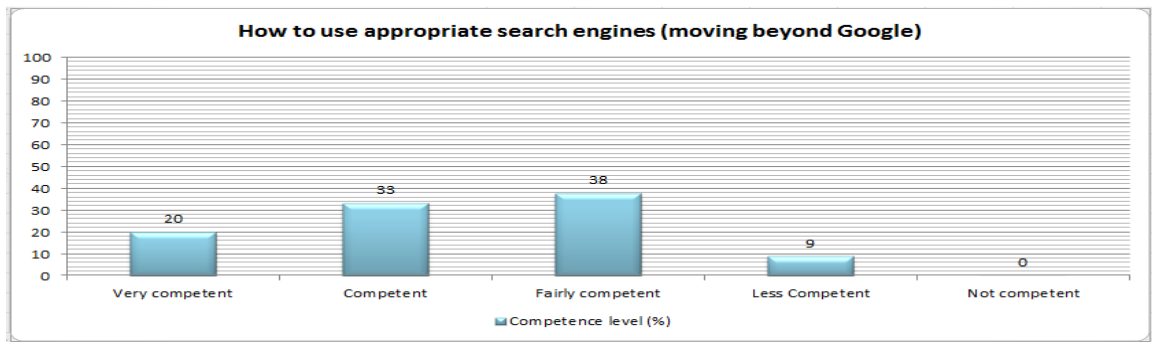
All of the 3 professionals interviewed recognized library provides to be support to this competence. They argued that help students doing this kind of search engines is one of their main objectives.

Comparison:

Regarding the level of library's support there is no difference: PhD students considered to be "supported" by library and library's professionals rated it as giving support to students about this competence.

**Competence level**

PhD students:



Regarding this competency, 38 % of the students evaluated themselves as being "fairly competent", 33% of the students as "competent". Just 20% of the students assumed to be "very competent" and 9% of the PhD students as "less competent".

Although students know that using information from Google could be a risk and it's not appropriated for a scientific research, the first step they take is going to Google when researching their subject, using simple engines. Some students spoke and said that it is "easier and faster". Then, when they use databases, journals or other kinds of information resources the first search engines used are the ones used on Google.

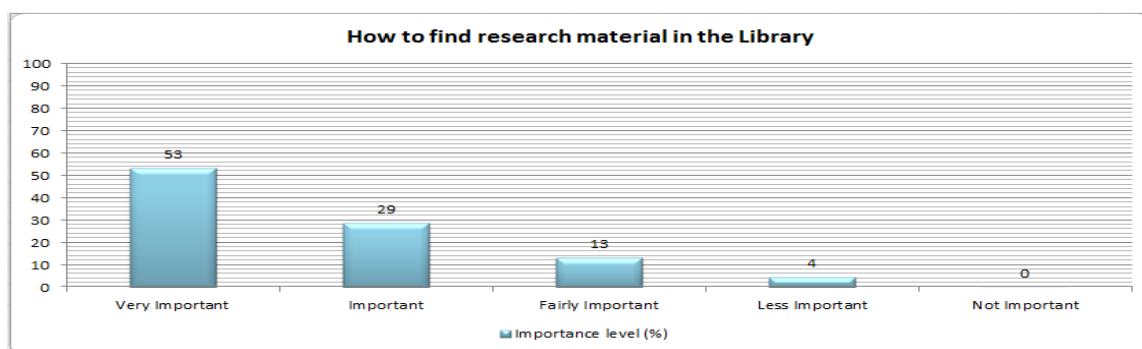
*"I usually start doing generic search engines and the Google engines are by default generic searches, so firstly I use generic engines and then I start doing more specific and elaborated search engines."* (Respondent 14, 16.09.2011)

*"I use firstly Google, just to have an open view of what subject is and what has had done about it. But when I'm going to use specific databases of course I create appropriated search engines"* (Respondent 19, 17.09.2011)

#### 4. How to find research material in the Library

##### Importance level

##### PhD students:

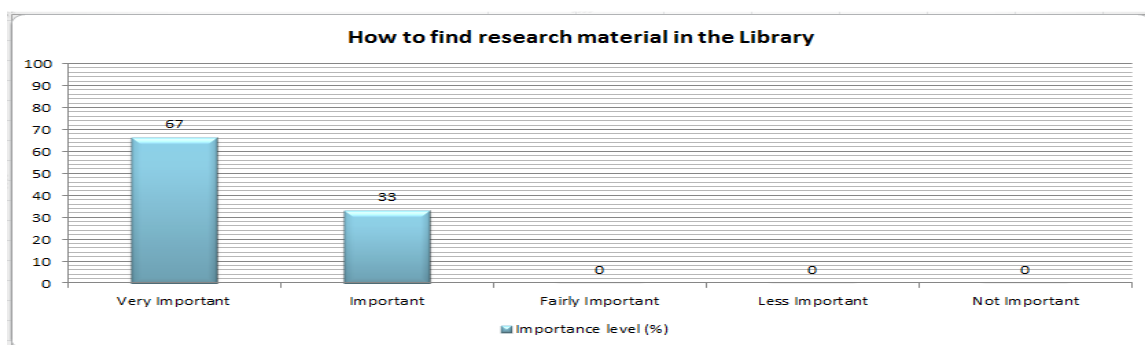


This competency generated some interpretations by students: some of them understood "research materials in the library" as being, for example, books; and others as being books and information resources online. As can be seen, this competency was rated by 53% of the PhD students as "very important" and by 29% of the PhD students "important". Then, 13% of the PhD students rated this competence as "fairly important" and just 4% of the PhD students rated it as "less important".

For some PhD students, it is important to have available some library information sources, like books, literary and old works, for example humanities' students. Commonly, these students fundament their doctoral works in antique developments. However, in cases like engineering and economy students, this may not be so important because the recent developments are always more important (this information was got through an interview with a PhD supervisor of the Engineering College).

No students rate this competency as “not important”, which means that even when having different interpretations, all of them recognized that finding research material in library is important.

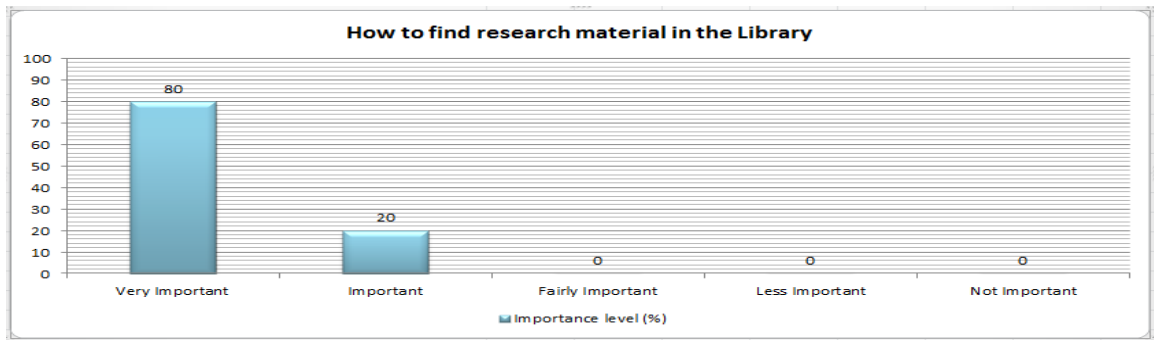
### Information Literacy Providers



Regarding the total of the information literacy providers interviewed, 67% of them considered this competence “very important” and 33% of them “important”. In general they said that:

*“Students should know firstly what their faculty library has available for them” (ILP 1, 02.09.2011)*

Supervisors:



Generically, PhD supervisors considered this competency important for their students: 80% supervisors considered it “very important” and 20% considered it “important”.

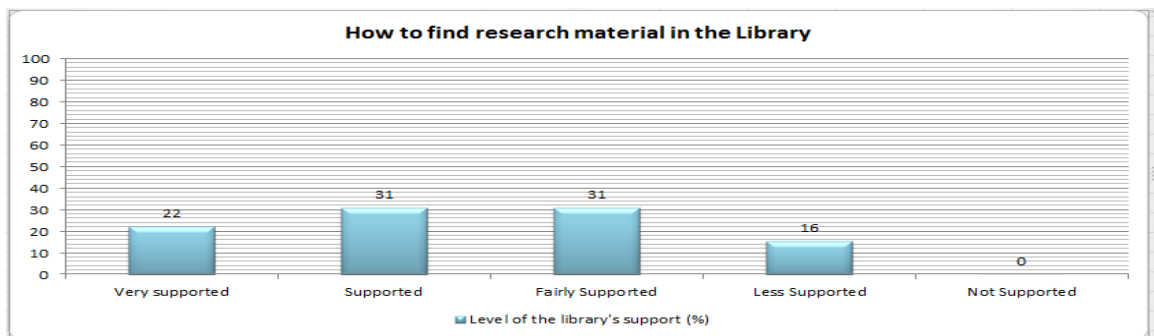
*“PhD students should be able to know what research material their faculty library has. But, when they don’t know they can always ask help to me or to librarians” (Supervisor 3, 13.09.2011)*

Comparison:

Regarding the importance level of this competence, PhD students referred that it is “very important”, information literacy providers rated this competence as “very important” and supervisors rated it as “important” (generically). This is not a considerable gap in this rating, everybody considered this competence “important”.

**Level of library’s support**

PhD students:





The level of library's support most quoted by PhD students to this competence were "supported" and "fairly supported" with 31% of the PhD students each one. Then, 22% of the PhD students assumed to be "very supported" by library and 16% assumed to be less supported on improving this competence.

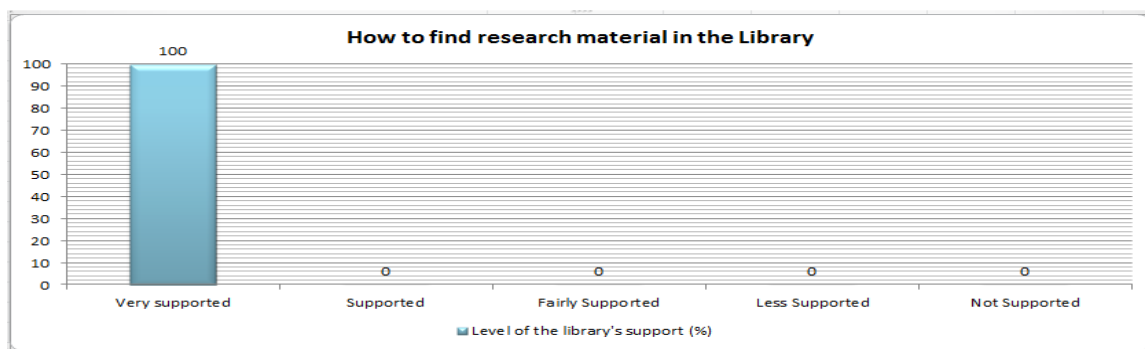
So, there is not a level which is more highlight. Students, who said that this competence is "very supported" and "supported" in general refer to:

*"When I ask help to librarians to find me some documents, even online articles or books, they always help me so I consider to be supported" (Respondent 36, 23.09.2011)*

Students who said that this competence is "fairly supported" and "less supported" in general refer to:

*"Library don't communicate their resources joint their students. I know what it has because I search on catalogue. But if they communicate what are their new acquisitions or online resources subscriptions, it could works better" (Respondent 27, 19.09.2011)*

#### Information literacy providers:



The 3 services' director of each faculty present a high level of support, concerning this competence to students. They argued that

*"We are always available to help students on finding their information needed" (ILP 1, 02.09.2011)*

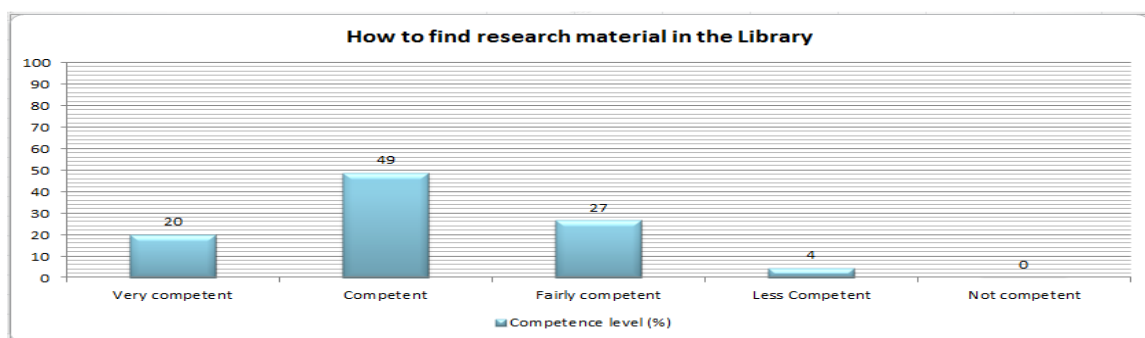
*“We have been felt students’ asks about where there x book or x magazine, or also inside catalogue. In other words, students ask us to help them on finding their material research in library and we can always try to do it well” (ILP 2, 09.09.2011)*

Comparison:

The PhD students’ most quoted level to library support was “fairly supported” and “supported” and the services’ directors was “very supported”. So, the perception that professionals have is a bit above of what PhD students assessed, which for instance do not correspond to the reality.

## Competence level

PhD students:



PhD students, mostly rate themselves as being “competent” on finding research material in the library (49% of the PhD students). Then, 27% of the PhD students considered themselves as being “fairly competent” and 20% of them as being “very competent”. Just 4% of the PhD students revealed to be “less competent” on carry out this competence.

Furhtermore, PhD students assume to be capable of finding research material in Libraries, because they already know the library since their undergraduate, or when gaining practice during their doctorate.

*“I made my undergraduate and my master degree here, so using Library to find information is not difficult. Sometimes is possible not find what I’m searching but I can ask for help” (Respondent 14, 16.09.2011)*

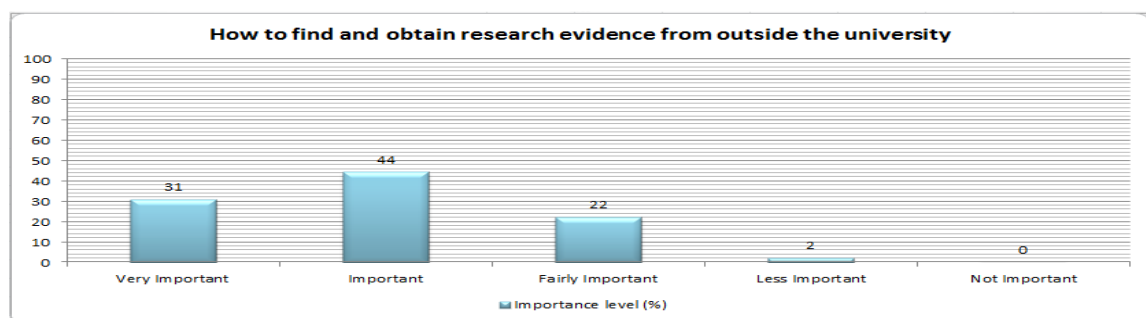
*“Sometimes it is not easy, but I have practice doing it and I already know library because I’m on third year of my doctorate” (Respondent 23, 18.09.2011)*

*For knowing how to do that is necessary be familiar with library resources. I am but the library online catalogue in my opinion should be easier to use because at first sight is a bit confused because it has a lot of information” (Respondent 28, 19.09.2011)*

## 5. How to find and obtain research evidence from outside the library

### Importance level

#### PhD students:



This competence was most quoted by PhD students as being “important” (44% of the PhD students) and then “very important” (31% PhD students). Most of these students argued that:

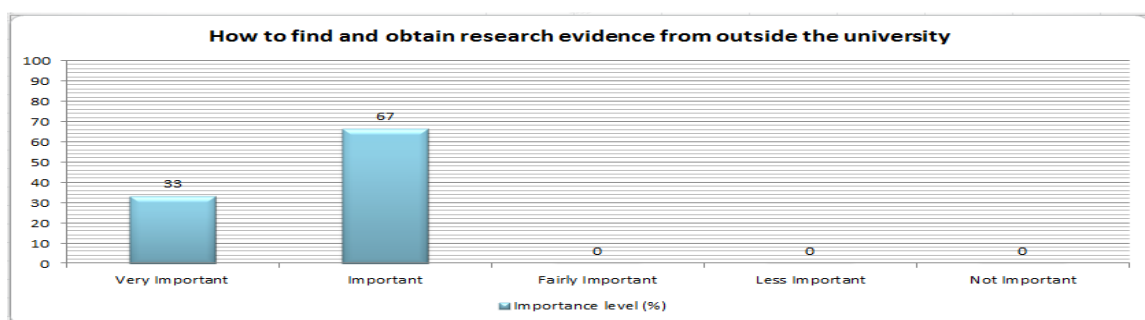
*“When library doesn’t has the document, book, or what else that I need I try to find it in some other place, for example in local public library, in others libraries inside the university, etc” (Respondent 31, 20.09.2011)*

Finally, 22% students referred that this competence was “fairly important” and just 2% of the students categorised it as being “less important”. A number of students can find the information needed through library, when for some reason they find in some other place what they are looking for, they said that:

*“I can find the information but cannot obtain it outside the library, or because the book cannot be consulted or borrowed, or because the document online doesn’t are in open access.” (Respondent 40, 25.09.2011)*

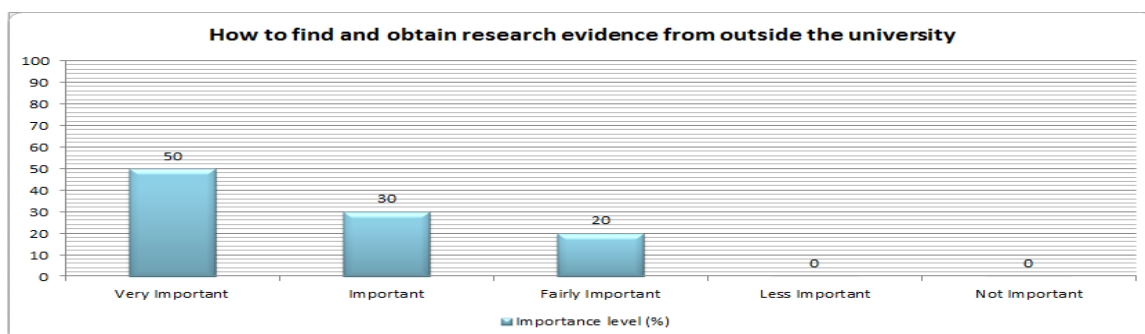
So, students consider this competence important for their researches but it is not essential.

Information literacy providers:



The information literacy providers assessed this competence as being “important” (67 of the ILP) and “very important” (33% of the ILP). Professionals think the first place to search for information to PhD students is in their academic library. If library doesn’t function as the resources that students need, in this case, it is necessary to find it in other places.

Supervisors:



Regarding this competence, 50% of the supervisors said it “very important” and 30% just “important” (Annex D – Bar chart 27).

*“PhD students should search information in all places that possibly have information reliable to well fundament their research” (Supervisor 3, 13.09.2011)*

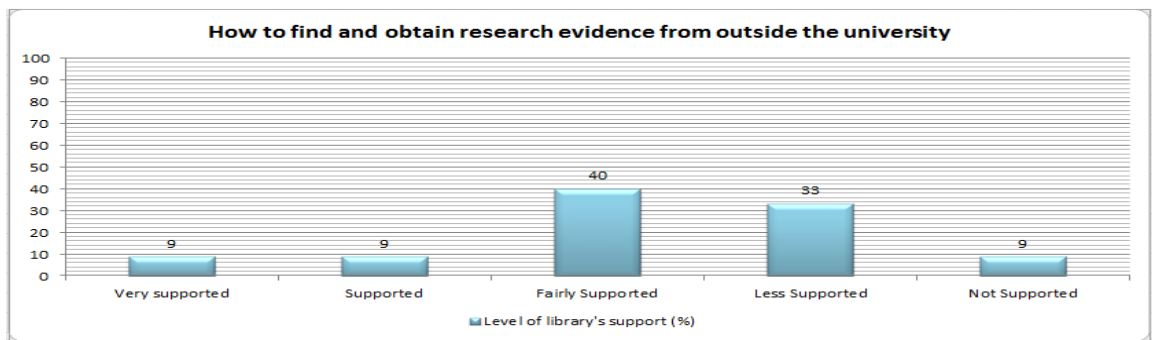
Only 20% of the supervisors categorise this competence as a “fairly important” one for PhD students to acquire, because comparing it with others competencies this one is not so important.

Comparison:

Regarding the importance level of this competence, PhD students referred that it is “important”, information literacy providers rated this competence as “important” and supervisors rated it as “very important”. This is not a considerable gap in this rating, everybody considered this competence “important”.

### **Level of library’s support**

PhD students:

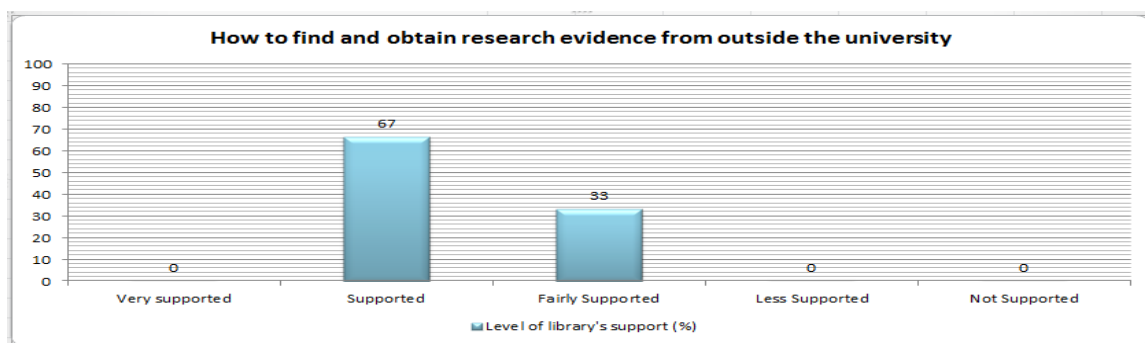


PhD students defend this competence is “fairly supported” by library (40% of the PhD students) and also “less supported” (33% of the PhD students). Still, 9% of the PhD students said that was “not supported”. The PhD students’ justifications go around:

*“I never receive any support by library to find and obtain research evidence from outside the library” (Respondent 4, 04.09.2011)*

*“Until now, I have not felt this support” (Respondent 21, 18.09.2011)*

### Information literacy providers:



Librarians agree to some extent with students. 67% of them provide “support” to this competence and 33% “fairly support”. They said that:

*“Until now this is not the biggest concern” (ILP 2, 02.09.2011)*

*“When they need information about other countries, I always suggest them to search information in the online catalogue of the national library, for example” (ILP 1, 02.09.2011)*

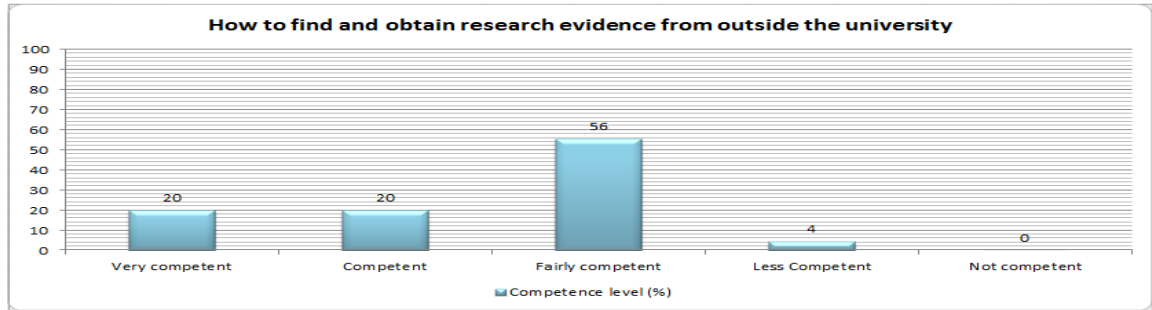
*“Despite we don’t provide any training with this competence, we can suggest them where they can search information” (ILP 3, 19.05.2011)*

Comparison:

The PhD students’ most quoted level to library support was “fairly supported” and the services’ directors was “supported”. So, the perception that professionals have is a bit above of what PhD students assessed, which for instance do not correspond to the reality.

## Competence level

### PhD students:



Regarding this competence, a great number of students find themselves to be “fairly competent” (56% of the PhD students). Then, 20% of the PhD students said to be “competent” and “very competent”. Finally, just 4% PhD students considered themselves as “less competent”.

When needed, resources are not available in the college library, PhD students supplement by using the libraries' interlibrary loan services to borrow from other libraries. Some of them, only a few, reported using local public library:

*“Yes, I know how to do that. Sometimes library doesn't have information resources that I need so I start searching in other libraries. But also happens I'm working in my PhD theses in a local public library and find an important document.” (Respondent 25, 19.09.2011)*

*“Until now I didn't need much of it. Sometimes I suggest or ask library to by a book or obtain a scientific article that is not available in full text.” (Respondent 33, 23.09.2011)*

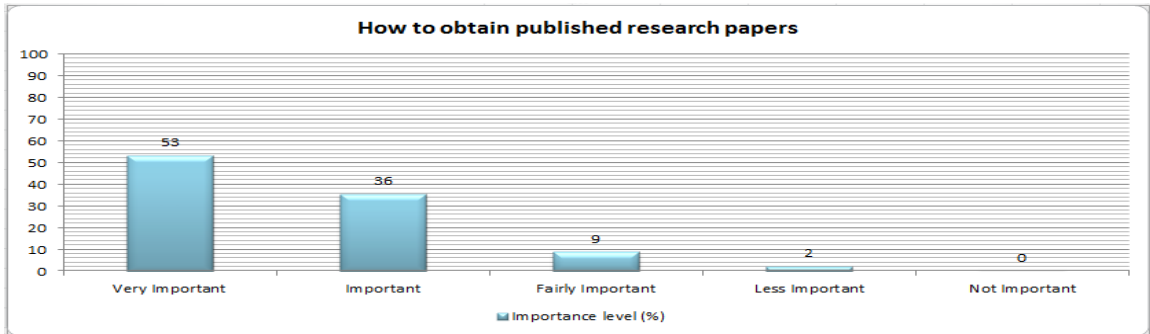
*“Sometimes when I perceive that the document that I needed is in other library I ask library to do an interlibrary loan” (Respondent 44, 30.09.2011)*

*“Some organizations produced important documents regarding my area, so as I am doing a PhD research in Economy it is important to know what they have been produced, national and international way” (Respondent 45, 31.09.2011)*

## 6. How to obtain published research papers

### Importance level

#### PhD students

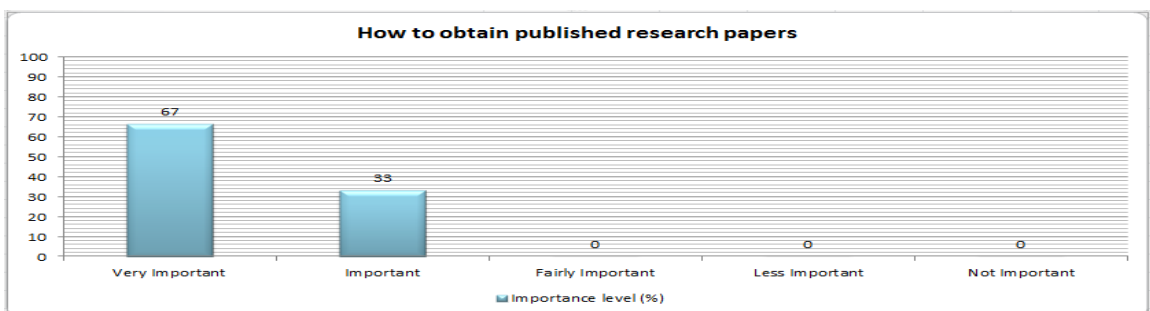


This competence is most quoted as being “very important” by 53% of the PhD students and as being “important” by 36% of the PhD students. Then, it was quoted as “fairly important” by 9% of the PhD students and “less important” just by 2% of the students. Some PhD students commented:

*“I should know what exists regarding my research subject. Try to perceive if it is outdated or not, and try to perceive what was done and what needs to be improved” (Respondent 2, 04.09.2011)*

*“Obtain these papers is important for students who are carry out a scientific research, but sometimes this is difficult because documents are not available in full text or in open access” (Respondent 11, 12.09.2011)*

#### Information Literacy Providers





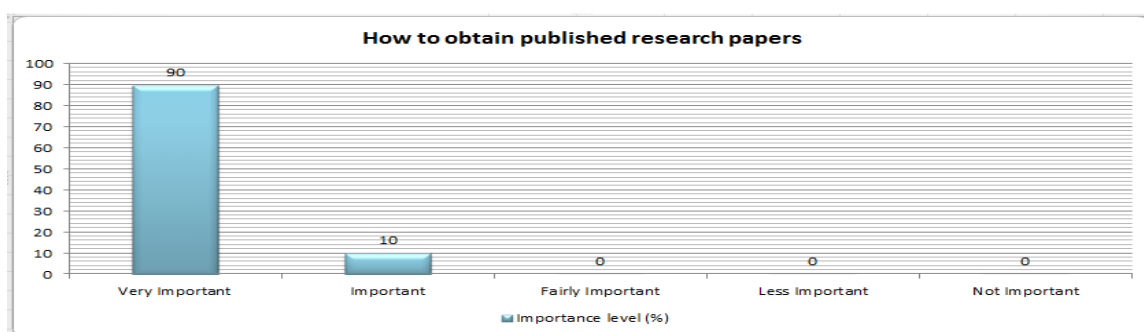
In general, information literacy providers of each faculty find this competence important for PhD students: 67% of them said that this competence is “very important” and 33% of them recognized it as being “important”. The professionals’ comments go around the following topics:

*“This is a very important competence because students should be able to find information that answers their research problems” (ILP 1, 02.09.2011)*

*“This is almost the same of the first one competence. Doing literature searches they are searching for published research papers so this is very important too” (ILP 2, 09.09.2011)*

*“Of course this is important because PhD students should know what has come to develop regarding their research” (ILP 3, 19.05.2011)*

#### Supervisors:



Regarding the total of the supervisors interviewed, 90% of them said that this competence is “very important” and 10% said it is “important” for PhD students. The supervisors comments focus always on the fact of “knowing what been developed” in the students research area.

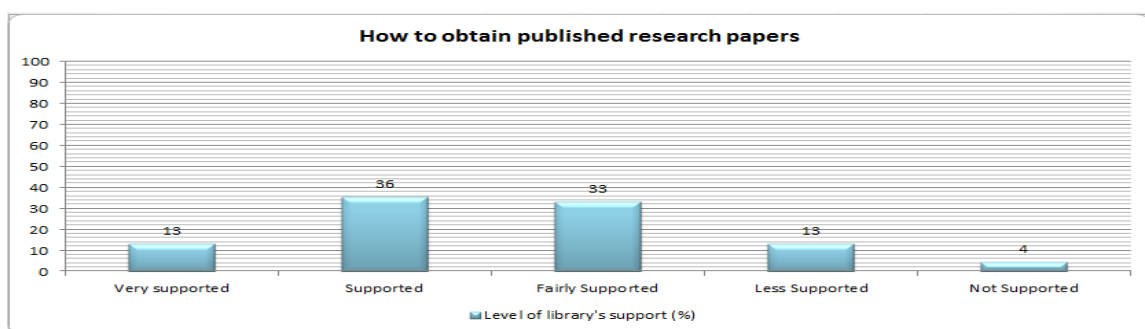
*“I consider this competence very important because PhD students should know what have been published in their research area” (Supervisor 5, 16.09.2011)*

Comparison:

Regarding the importance level of this competence, PhD students referred that it is “very important”, information literacy providers rated this competence as “very important” and supervisors rated it as “very important”. So, there is no gap in this assessment, all groups considered this competence “very important” for PhD students acquired.

### **Level of library’s support**

#### PhD students:



As can be perceived by the bar chart, most part of the students – 36% of the PhD students - consider to be “supported” by library in this competence and 33% “fairly supported”. Through the PhD students’ comments it’s possible to notice that students feel having support by library but in some occasions it doesn’t happened as they expected:

*“Yes I feel supported by librarians when I ask this kind of help to them” (Respondent 8, 09.09.2011)*

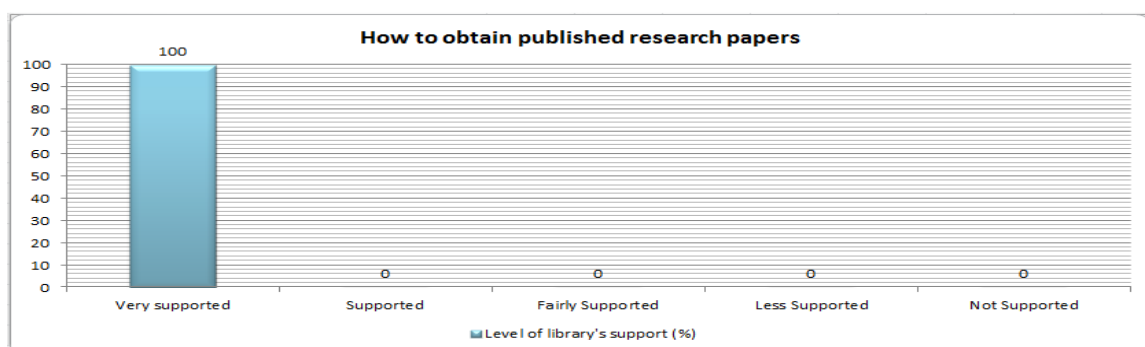
*“Yes I feel supported but I think librarians should help us with this with more depth and explain better how to do it” (Respondent 17, 16.09.2011)*

Other PhD students considered to be “very supported” and “less supported” by library in this competence (13% of the PhD students). Still, 4% of the PhD students considered to be “not supported” by library in this competence. The students’ comments diverge, as follows:

*“I feel librarians are very attentive with students and until now I was always very well attended” (Respondent 21, 18.09.2011)*

*“All I found until now was by my one, librarians could help students on using databases and so forth but with that I didn’t feel any support” (Respondent 22, 18.09.2011)*

**Information Literacy Providers:**



All of the 3 professionals interviewed recognized library provides to be a well support to this competence.

*“This is one of the principal competencies for PhD students and we are available to help them with that” (ILP 1, 02.09.2011)*

*“They should know how important it is and always they need help to do it they can ask help to us” (ILP 2, 09.09.2011)*

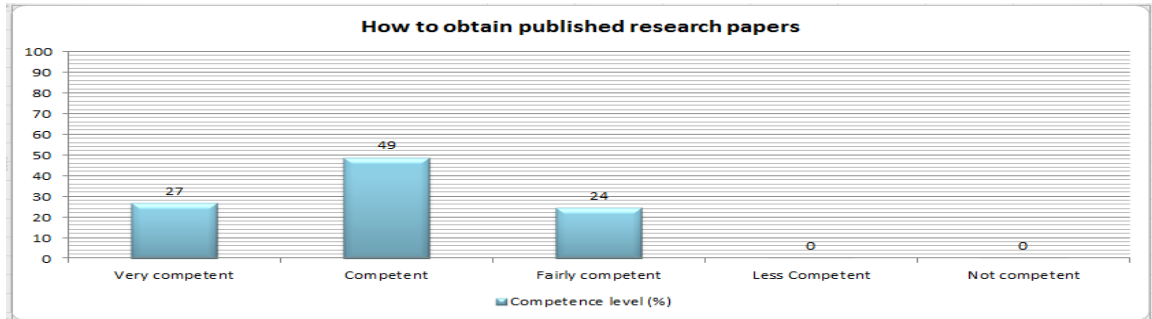
*“Yes we give students support on it, for sure” (ILP 3, 19.05.2011)*

**Comparison:**

The PhD students’ most quoted level to library support was “fairly supported” and “supported” and the services’ directors was “very supported”. So, the perception that professionals have is a bit above of what PhD students assessed, which for instance do not correspond to the reality.

## Competence level

### PhD students:



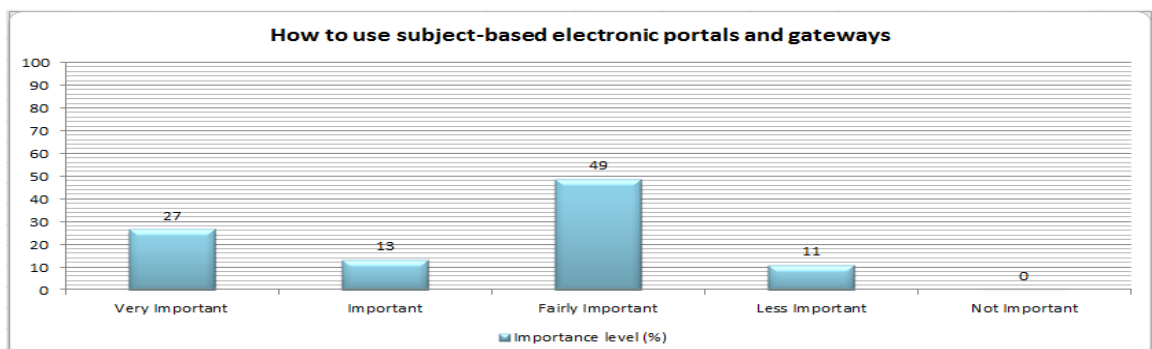
A great percentage of PhD students recognized to be “competent” obtaining published research papers (49% PhD students). Then, with a similar quotation, 27% of the PhD students assumed to “very competent” and 24% of the PhD “fairly competent”. This quotation is very similar.

Most students said that “*it is the principal objective of doing literature searches*” (Respondent 38, 24.09.2011). When a scientific research is initiated, it is necessary to know what has been published and developed about the research’s subject. So students assumed themselves competent doing, whereas no student thought of himself “less competent” or “not competent”.

### 7. How to use subject-based electronic portals and gateways

## Importance level

### PhD students:



In a total of 45 PhD interviewed, 49% of them said that this competence is “fairly important” for their researches, arguing that:

*“I don’t consider this is one of the very important competencies that PhD students should acquire to carry out a research.” (Respondent 25, 19.09.2011)*

When doing judgment of these words, this competency is not essential for these PhD students.

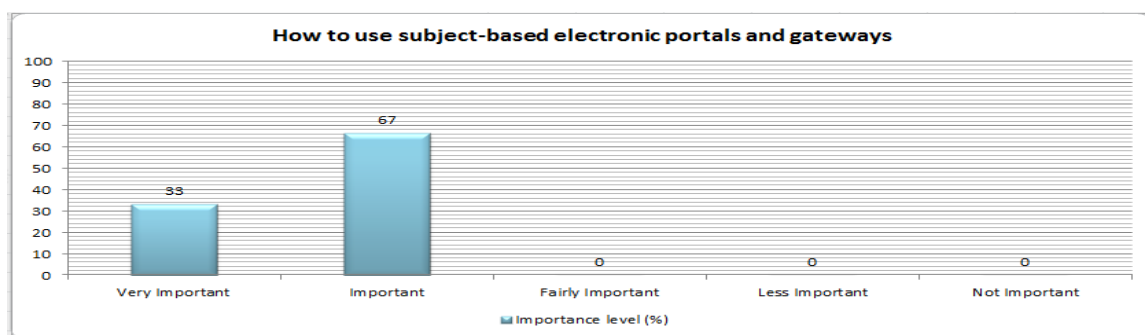
Then, 27% of the PhD students assessed this competence as “very important”, saying that:

*“In my area of research there are some information resources of this kind that my supervisor advice it to me and they are very useful. They have specific information and I’m sure that I find information concerned to my subject area there” (Respondent 13, 13.09.2011)*

Nonetheless, with the lowest quotation are students who considered this competence “important” (13% of the PhD students) and “less important” (11% of the PhD students).

A considerable part of students revealed that this is not an essential competence to carry out their researches.

#### Information literacy providers:



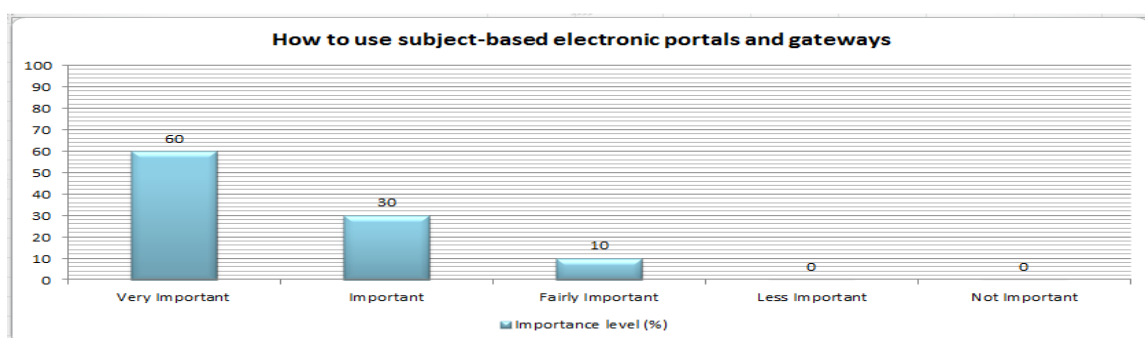
The information literacy providers of each faculty studied find this competence important: 67% of them said it is “important” and 33% said it is “very important”.

*“This is, in my opinion, a good source for help them to get information. But they need to use other resources too” (ILP 1, 02.09.2011)*

*“I think this is very helpful for them to get specific information regarding their research area” (ILP 2, 09.09.2011)*

*“Well even if they didn’t find any information in databases in these portals and gateways they can, as they are specifics to a subject” (ILP 3, 19.05.2011)*

### Supervisors:



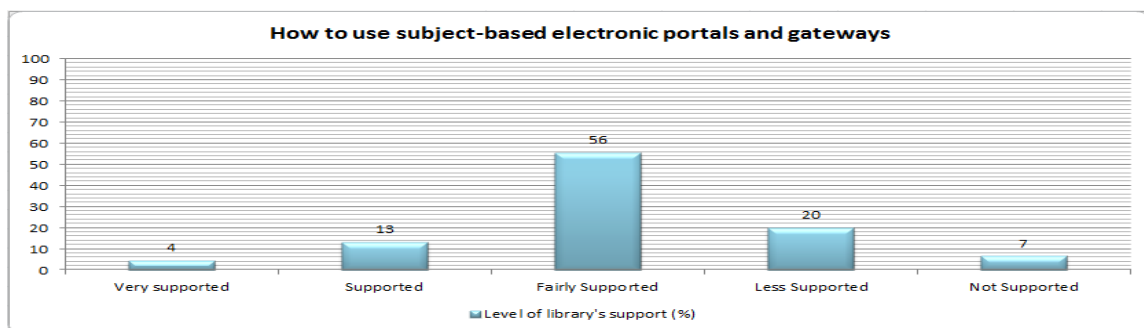
Regarding supervisors, 60% of them considered this competence as “very important”, and 30% of the supervisors considered this competence “important”, because students can specify information from there. Then, just 10% of the supervisors do not consider this competence as important as the others, saying that it is “fairly important” for PhD students.

### Comparison:

To sum up, there is a bit of difference on the importance level assessed by PhD students, information literacy providers and supervisors. Students quoted it as being more “fairly important” and information literacy providers as “important” and supervisors as “very important”. So, there is no huge gap between assessment although

## Level of library's support

### PhD students:



As the bar chart shows, 56% of the PhD students feel “fairly supported” by library, when referring to this competence, 20% feel “less supported” and 7% feel “not supported”. PhD students commented that:

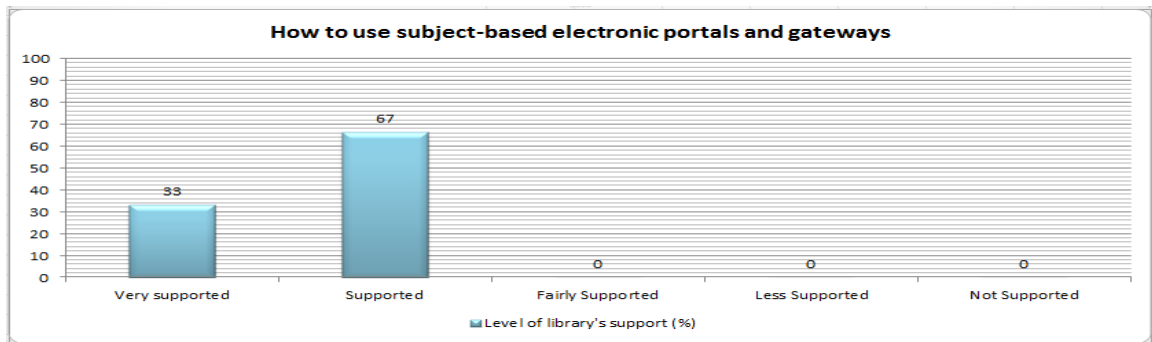
*“I don’t feel well supported about it I even think that library just has available databases and journals, not resources like that” (Respondent 29, 20.09.2011)*

*“I never ask library help to search on resources of this kind, not even to find them. And as I said, this is not so important, so in my opinion library do not has to provide support on it” (Respondent 36, 23.09.2011)*

Other students said to be “supported” by library (13% of the PhD students) and “very supported” (4% of the PhD students). Usually a large part of the students interviewed doesn’t ask this kind of help to librarians, so their comments go around the following:

*“I think library do a good job on support their students in spite of I never asked this kind of help. But if I asked I think they will provide it” (Respondent 40, 25.09.2011)*

### Information Literacy Providers:



Regarding the information literacy providers interviewed, 33% of them assessed his library's support to this competence as "very supported" and 67% of others as "supported". So, generically libraries provided a good support to this competence.

*Two of them said that for every kind of doubt that students may have library is always available to help them, and this case is not an exception" (ILP 1, 02.09.2011 and ILP 3, 19.05.2011)*

*"We don't have this well implicit in our service but I'm sure we can help students with it" (ILP 2, 09.09.2011)*

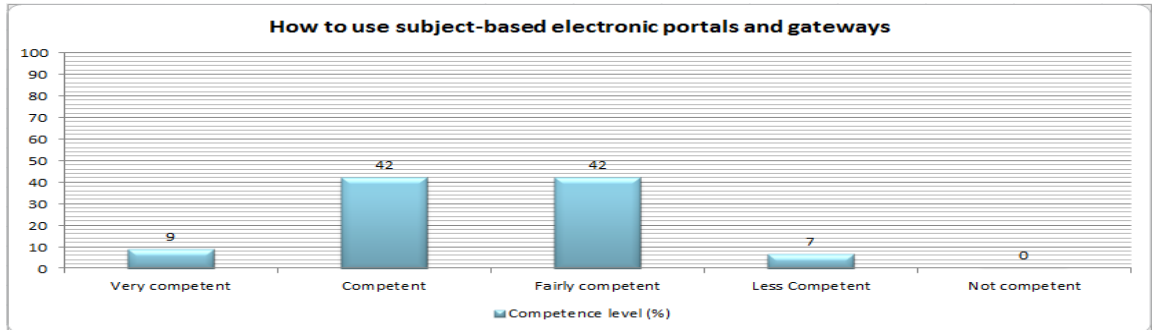
### Comparison:

The PhD students' most quoted level to library support was "fairly supported" and the services' directors was "supported". So, the perception that professionals have is a level above the PhD students, which for instance do not correspond to the reality.



## Competence level

### PhD students:



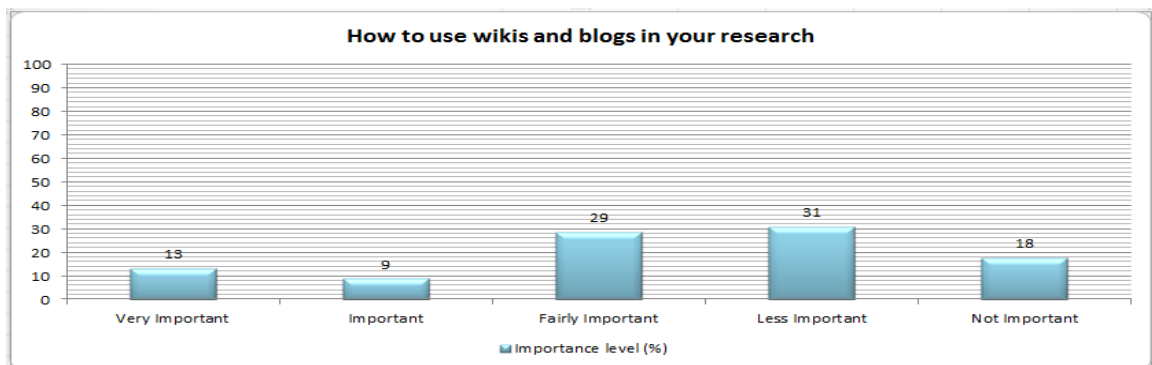
Concerning PhD students' competence level, 42% of the PhD students are “competent” and “fairly competent”. Then, with lowest quotation, 9% of the PhD students assumed to be very competent” and 7% “less competent”. PhD degree students assumed having enough competence to use subject-based electronic portals and gateways in their researches. As some of them argued:

*“Knowing how to use these kinds of information resources is not so important for a PhD research. Sometimes the information could not be updated. But, using it is not difficult so I consider myself competent” (Respondent 36, 23.09.2011)*

## 8. How to use wikis and blogs in your research

## Importance level

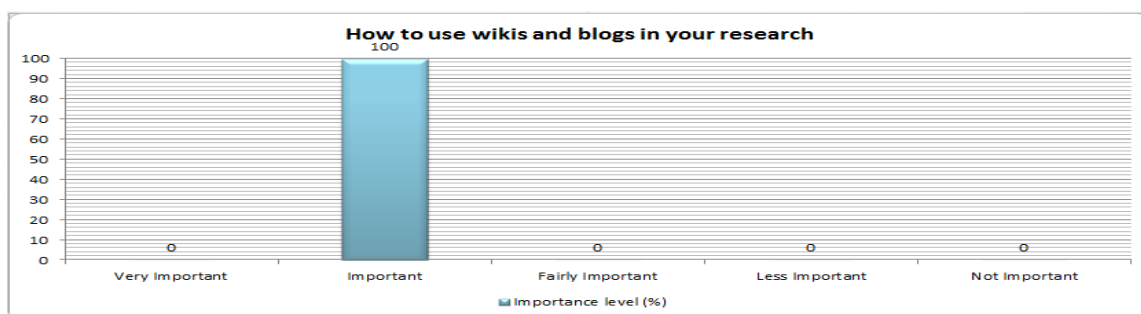
### PhD students:



As was well demonstrated, this competency is most quoted as “less important” by 31% of the PhD students and really close is “fairly important” with 29% of the PhD students. Then 18% of the PhD students considered this competence “not important” to their researches. Finally, 13% of the PhD students considered this competence “very important” and 9% “important”.

This competency is most quoted as being “less important” because students defended that *“a scientific research cannot be supported with information from blogs and wikis”* (Respondent 41, 25.09.2011)

#### Information Literacy Providers:

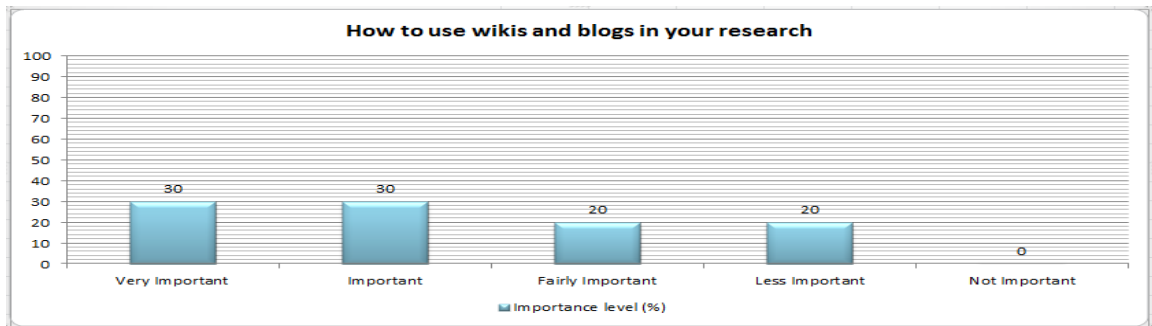


All of the 3 professional interviewed considered this competence “important” for PhD students (Annex D – Bar chart 44). Their justifications go around the following:

*“This is not an essential competence, but it is important to know about at least.”* (ILP 1, 02.09.2011)

*“Nowadays exist lots of blogs produced by experts and I this is an important resource to find important information. But it is necessary students know who are an expert and who are not of course”* (ILP 2, 09.09.2011 and ILP 3, 19.05.2011)

### Supervisors:



The importance level given by supervisors to this competency is divided: 30% of the supervisors considered this competence “very important” and “important” and 20% of the supervisors considered this competence “fairly important” and “less important”. The comments vary as can be perceived:

*“Yes, is very important to know how to use it. I think blogs are much more important than wikis, because in wikis everybody can participate in same topic and we don’t know who they are. In case of blogs this doesn’t happens and the blog creator could be someone who works in an area and wants to share their knowledge. Students can take it” (Supervisor 4, 13.09.2011)*

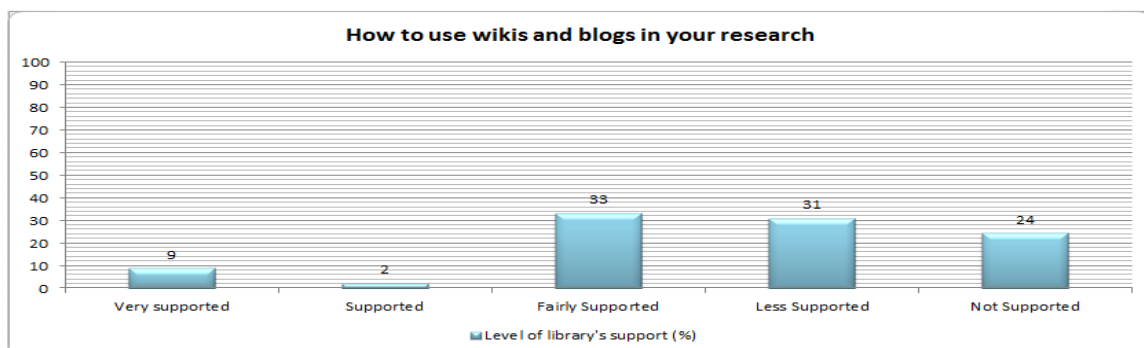
*“In my area we don’t do investigations based on blogs and wikis!” (Supervisor 8, 23.09.2011)*

### Comparison:

The importance level of this competence, PhD students assessed mostly as being “less important”, information literacy providers as being “important” and supervisors as being “very important” and “important”. So, in this competence, what PhD students consider is far from what professionals and supervisors consider. This gap, could be mostly due to the fact that students deliberate these resources (blogs and wikis) could not be used to access information in spite of professionals and supervisors (some of them) see these resources as possible tools to get some useful information (mostly blogs) if they meet the blog owner.

## Level of library's support

### PhD students:



PhD students assessed the library support to this competence as mainly “fairly supported” (33% of the PhD students) and “less competent” (31% of the PhD students). Then, 24% of the PhD students said that they are “not supported” by librarians about this competence. Just 9% of the students considered to be “very supported” on it and 2% considered to be “supported”. The PhD students’ comments to this support are a bit inconsistent, let’s see:

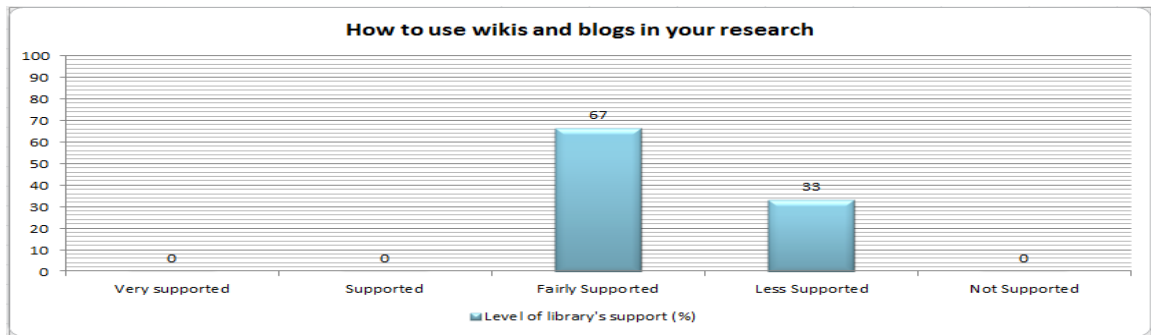
*“I do not usually use these platforms to get information for my research. So I never ask help to librarians to use it, and I think they wouldn’t like it!” (Respondent 10, 11.09.2011)*

*“I think they can help us but I think that everybody knows how to do that, so they shouldn’t be concerned with this” (Respondent 14, 16.09.2011)*

*“Yes, maybe they can provide some help to us, but I’m not sure if they are requests for help for this” (Respondent 24, 18.09.2011)*

Students don’t feel supported, as they think that library shouldn’t be concerned with that, because everybody knows how to do it, and also due to the fact that they think librarians do not consider platforms reliable.

### Information Literacy Providers:



The services' directors assessed their support to this competence as being "fairly supported" (67% of the ILP) and "less supported" (33% of the ILP).

*"Actually we don't provide this support so well. But I'm sure this is not a difficult for students, they already are in a PhD degree" (ILP 1, 02.09.2011)*

*"Until now we didn't felt the necessity of provide help in this competence. No students asked us anything about that" (ILP 2, 09.09.2011)*

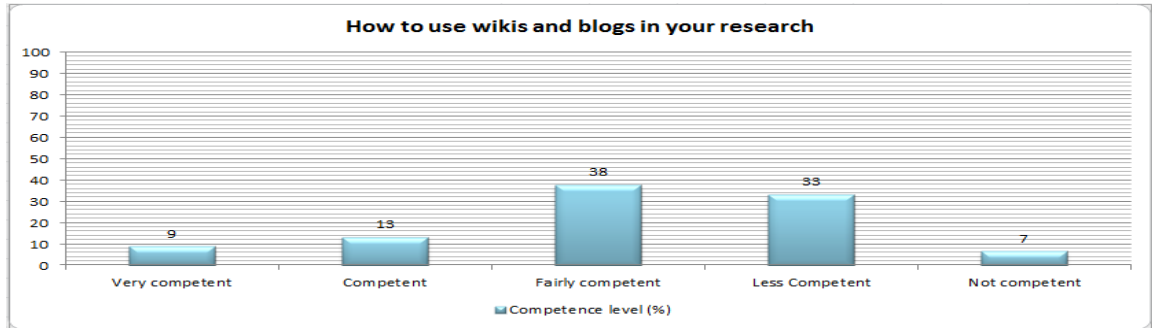
*"We consider that is not as important as the other competencies that we spoke about here" (ILP 3, 19.05.2011)*

### Comparison:

The support the library gave, concerning this skill, was assessed by the students as weak. Plus, the competent entities agree, as their own backup towards this skill is not the best one. As such, there is no gap in this skill, because both groups agree in their evaluation.

## Competence Level

### PhD students:



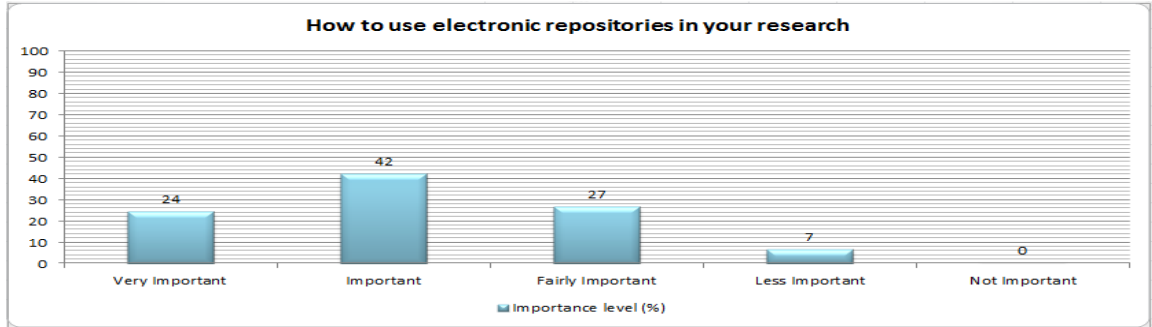
PhD students assumed themselves as being “fairly competent” (38% of the PhD students) and as being “less competent” (33% of the PhD students). Then, 13% PhD students assumed themselves as “competent” and 9% as being “very competent”. Still, 7% of the PhD students are not competent when using information from these platforms on their researches.

Despite these results, great part of PhD students assumed a lowest level of competence, not because they don't know how to use these platforms but because they argued that that information could not be used in a scientific research. So they assumed not to be competent or less competent.

## 9. How to use electronic repositories in your research

### Importance level

#### PhD students:

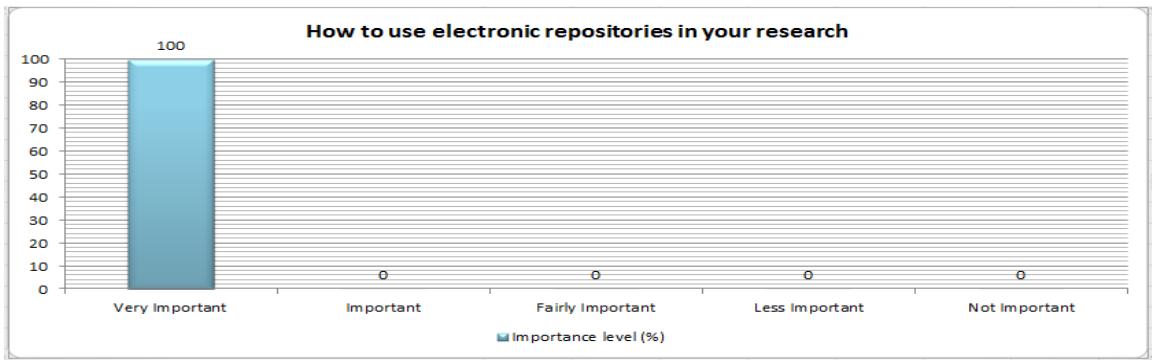


This skill is most quoted as being “important” (42% of the PhD students). Then, 27% of the PhD students assessed this competence as “fairly important” and 24% as “very important”. Finally, just 7% of the PhD students assessed this competence as “less important” for their researches.

In spite of the rating of this competency, many students don’t know what electronic repositories there are. So, it is because of this that they considered this competency as “fairly important”: they don’t know what electronic repositories exist, but after an explanation they perceive that maybe these resources could be important for their research. The others, who knows it, said that

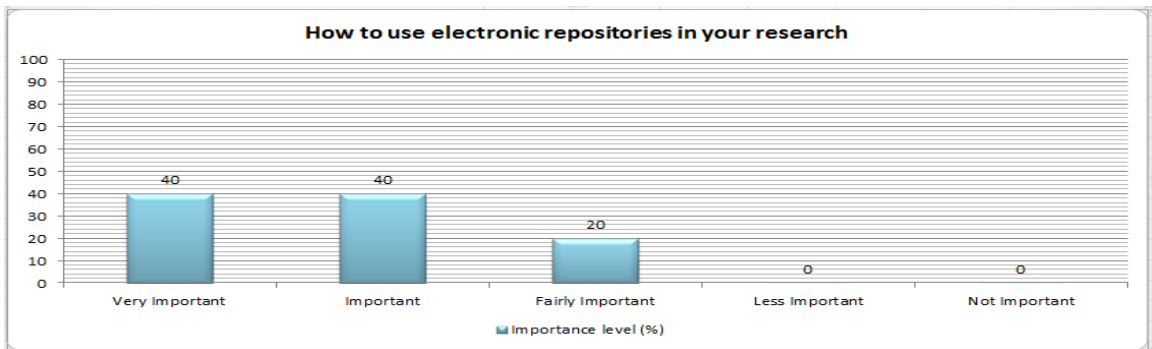
*“yes, it helpful I already find there some information to my research.” (Respondent 34, 23.09.2011)*

Information Literacy Providers:



Concerning this competence the 3 professionals interviewed rated this competence as “very important” for PhD students learn. They argued that for example the UP’ repository allows students to know what have been produced institutionally.

Supervisors:



Some supervisors didn’t know very well what repositories are, and for 40% of them this competence is “very important” or “important” and for 20% of them it is “fairly important”. Their justifications are similar to those of the professionals:

*“Yes... I don’t consider it essential because for instance could not have nothing related to my area, and to the area of my students, but yes in some occasions it could be helpful” (Supervisor 6, 18.09.2011)*

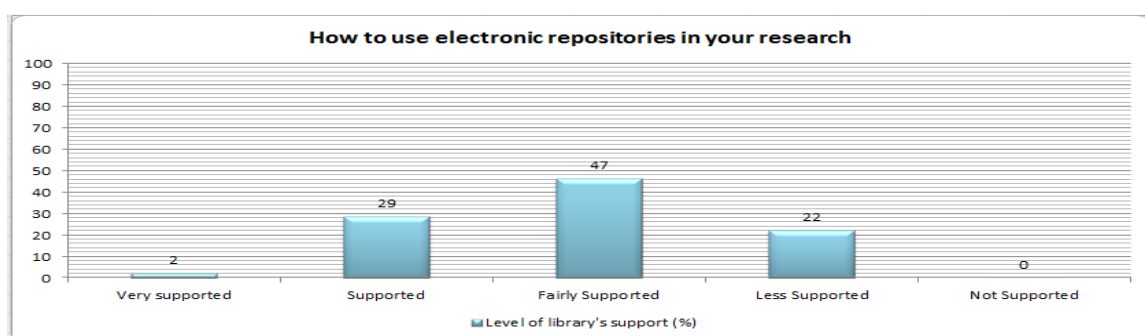


Comparison:

Regarding the importance level of this competence, PhD students referred that it is “important”, information literacy providers rated this competence as “very important” and supervisors rated it as “important” (generically). This is not a considerable gap in this rating, everybody considered this competence “important”.

### **Level of library’s support**

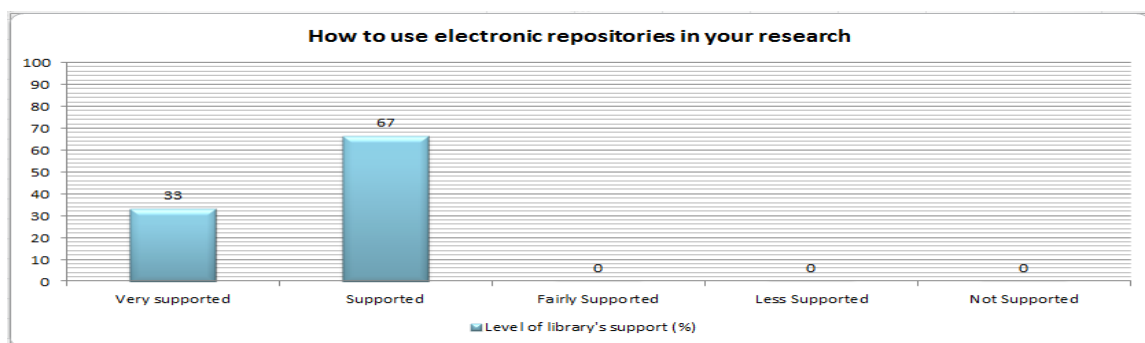
PhD students:



Regarding the level of support provided by library, PhD students feel they are mostly “fairly supported” in this competence (47% of the PhD students). Then, 29% of the students are said to be “supported” by library, and 22% “less supported”. Just 2% of the students classify themselves as “very supported” by library in this competence. The students’ comments do not differ from the following one:

*“Librarians do not give support to students on using electronic repositories, at least I don’t know about nothing.” (Respondent 37, 24.09.2011)*

### Information Literacy Providers:



As can be perceived in the bar chart, 67% information literacy providers give support to students in this competence, and just 33% a large support.

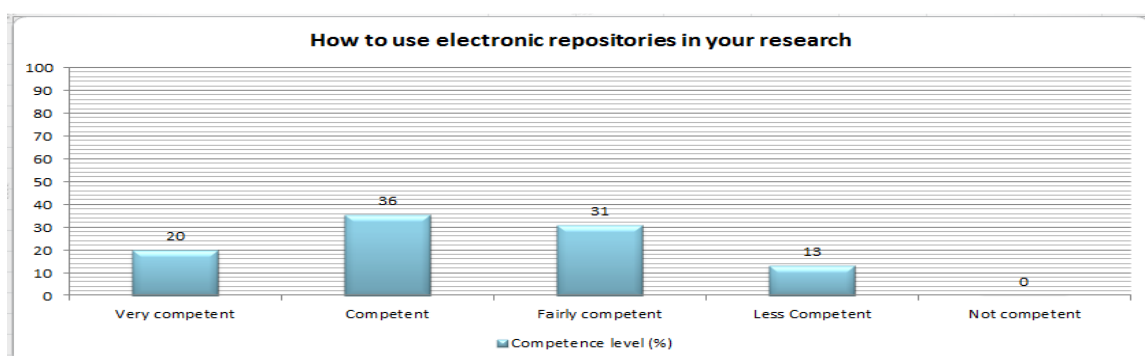
*“Although we didn’t received any doubt about these kind of resources, we are always available to give it to students” (ILP 2, 09.09.2011)*

### Comparison:

In this case there is a considerable gap between assessments: PhD students are considered to have “fairly support” in this competence and professionals assumed to present a very high support to it. This is maybe due to the fact that librarians are always available to give support in any case, but instead PhD students do not know it or don’t use it.

### Competence level

#### PhD students:



Concerning with PhD students competence level, they mostly rated themselves as being “competent” on using electronic repositories (36% of the PhD students). Then, 31% of the PhD students considered themselves “fairly competent”, 20% as being “very competent” and 13% of the PhD students as being “less competent”.

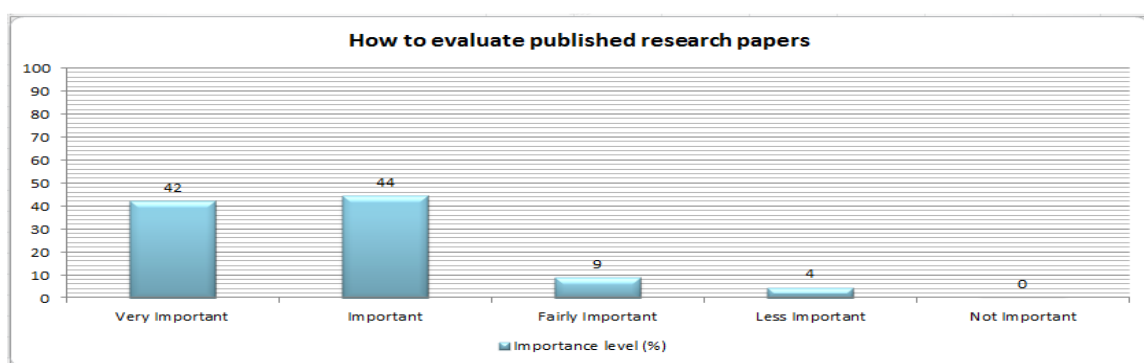
In spite of some of them not knowing what electronic resources are, the others who already used, it said that:

*“It is not difficult to use so I consider myself competent using it” (Respondent 43, 27.09.2011)*

#### 10. How to evaluate published research papers

##### **Importance level**

PhD students:



As could be perceived, through the bar chart, this specific competency was considered “important” for 44% of the PhD students’ researches and “very important” for 42% of the PhD students. Most students said that:

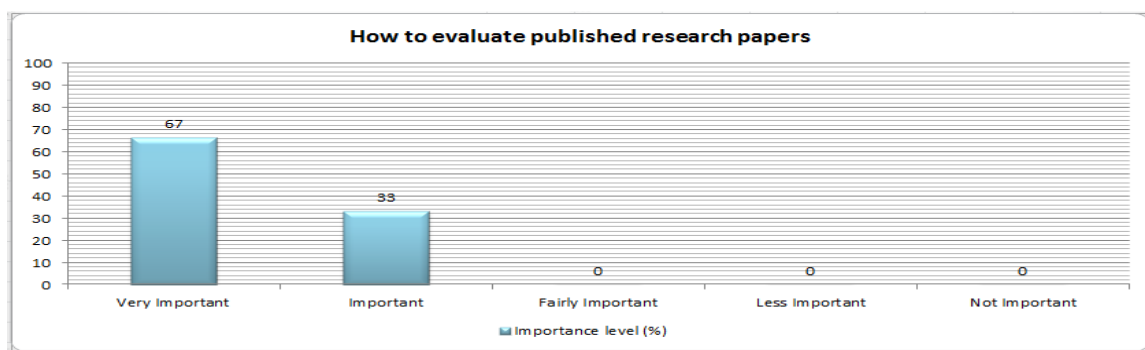
*“This is very important for us and for everyone who are doing a research. Know how to evaluate the information retrieved to know what to do with it is very important” (Respondent 3, 04.09.2011)*

*“This means know how to separate the essential from the additional, is that right? So, yes is very important” (Respondent 14, 16.09.2011)*

*“This is so difficult to do in some cases, but I considered it important” (Respondent 24, 18.09.2011)*

Then, 9% of the PhD students rated this skill as “fairly important” and 4% “less important”. Regarding these students, there was a perception that they weren't sure about what it really means, because they didn't ask or comment its meaning.

#### Information Literacy Providers:



In what concerns the importance level given by service's directors, 67% of them considered this competence “very important” and 33% “important”. Their opinion was that:

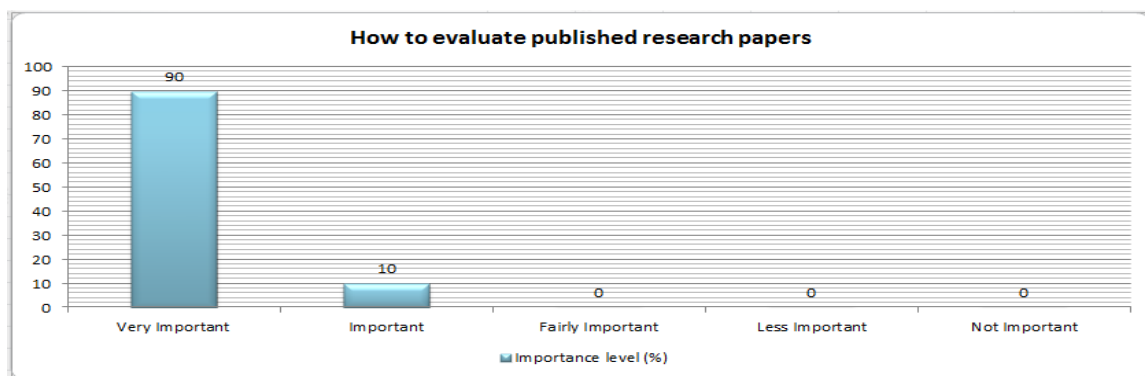
*“It is very important they do. Not all the information retrieved is important for their research, and they need to know how to do it” (ILP 2, 09.09.2011)*

*“Evaluate the information retrieved is essential for PhD students. Using the most appropriated information to fundament their research is very important” (ILP 3, 19.05.2011)*

The other information service director commented, regarding the information literacy plan, that he uses in faculty:

*“This essential for these students, but is a competence that depends much more from themselves and not so much from our help” (ILP 1, 02.09.2011)*

Supervisors:



In general, all the supervisors interviewed considered this competence indispensable for research students. So, 90% of the supervisors said it is “very important” and 10% said it is “important”.

*“Is unthinkable they don’t do this, so this is a very important competence for these students” (Supervisor 5, 16.09.2011)*

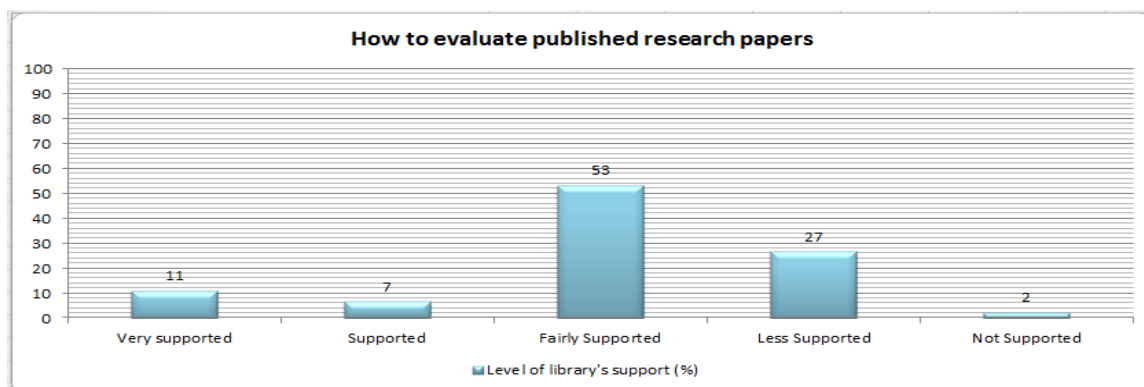
*“This is essential, not all is retrieved is relevant to research so is necessary select this information” (Supervisor 9, 23.09.2011)*

Comparison:

As for the importance level of this competence, PhD students mostly assessed it as “important” and “very important” (only 1 student makes the difference), information literacy providers, as well as supervisors, categorised it as “very important”. Therefore, there is not a considerable difference in this rating. All groups think this competence is essential for PhD students.

## Level of library's support

### PhD students:



The level of library's support that PhD students (53% of the PhD students) most quoted was "fairly supported". Moreover, the following level, quoted by 27% of the PhD students, was "less supported". Only 11% of the PhD students said this competence is "very supported" by the library and 7% "supported". And, finally, 2% of the PhD students said that this competence isn't supported by library at all.

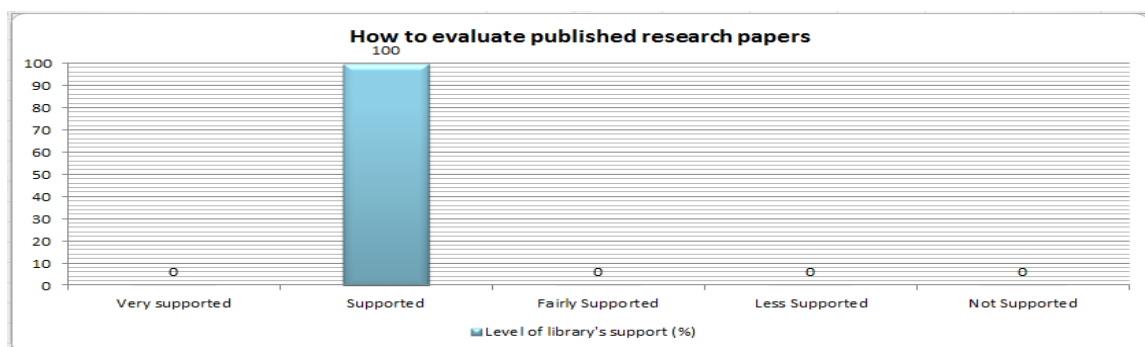
In general, students argued that:

*"I don't feel well supported by library about this competence. But this is because I think should be me knowing how to do it. I'm doing the research and I know what the research scope is so this evaluation could be difficult for librarians to help me to do. It's my opinion!" (Respondent 26, 19.09.2011)*

*"They could teach us some techniques to do it, but until now I don't have perceived nothing about this support so I this is less supported" (Respondent 32, 20.09.2011)*

*"I never ask this kind of help to librarians but if I ask them I they could help me" (Respondent 35, 23.09.2011)*

### Information Literacy Providers:



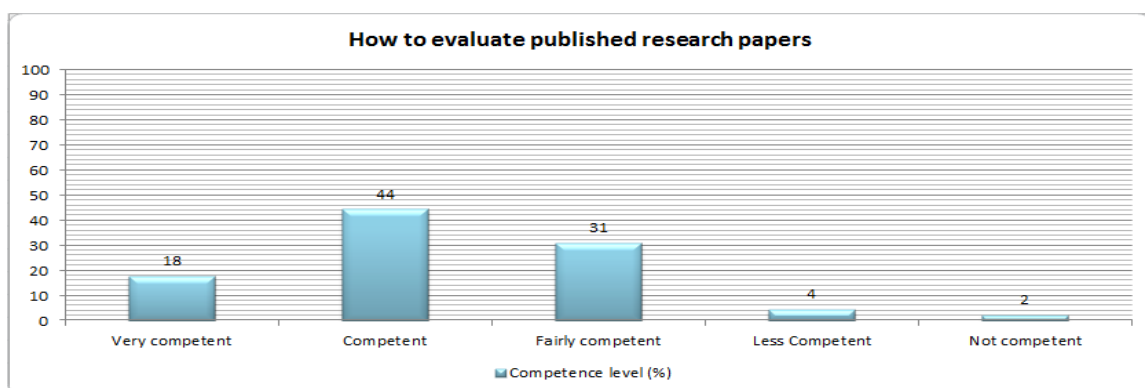
All 3 of the information literacy providers said they give support to PhD students. Despite not having anything effective about this competence, as has been said during this competencies' support, they are always available to help students in all cases related to the information.

### Comparison:

Regarding this level of library's support, a considerable gap between ratings could be perceived. PhD students said it was "fairly supported" and library understood to give support to PhD students in this competence. This gaps' origin is related to the fact that students never ask any help to professionals and don't know if it's possible or not to present support to this competence.

### Competence level

#### PhD students:



The competence level, regarding this competence, by PhD students are as follows: 44% of the PhD students categorise themselves as “competent”, 31% of the PhD students as “fairly competent”, 18% of the PhD students as “very competent”, 4% of the PhD students as “less competent” and 2% of the PhD students as competent, when evaluating the information.

A great majority of students, as could be perceived by the bar chart, are considered to be competent on evaluating published research papers, arguing that:

*“This is very difficult do to in some specific cases, mostly in a beginning of the research, because we don’t know well what are we looking for and identify the information pertinent is not an easy task. But now, I think I could do it well, I was gaining practice with the years” (PhD students on the 3<sup>rd</sup> academic year) (Respondent 45, 31.09.2011)*

*“Yes I could do it, don’t have doubts or difficulties doing it” (Respondent 30, 20.09.2011)*

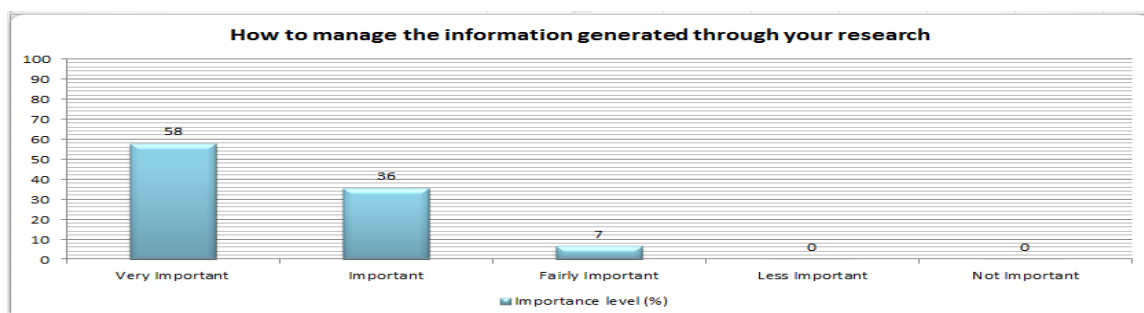
*“This is something subjective, select what is important and what is not, because what could be important for me could not be important to my supervisor and vice versa. I considered myself able on doing this evaluation” (Respondent 38, 24.09.2011)*

To sum up, students are capable, in what concerns the competence level.

## 11. How to manage the information generated through research

### Importance level

#### PhD Students:





Regarding the way PhD students manage the amount of information, they reveal that it is “important” for 58% of the PhD students and “very important” for 36% of the PhD students. Only 7% of the PhD students evaluate this competency as “fairly important” for their researches.

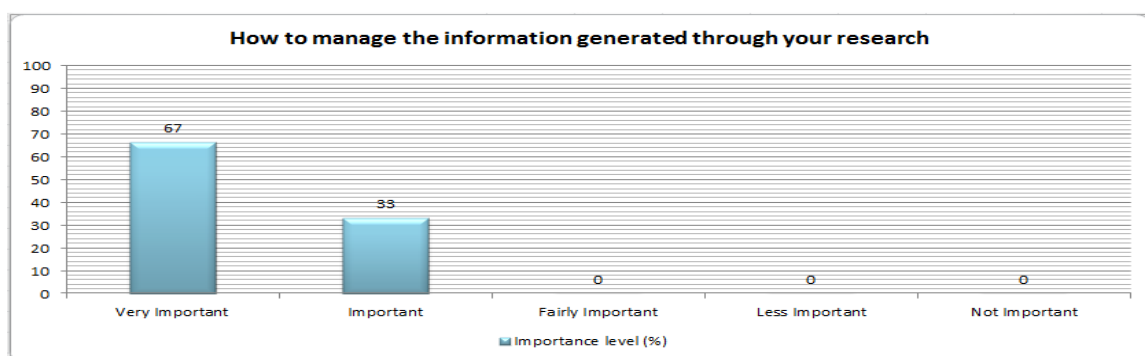
Some students mentioned that knowing how to manage information is “very important”, as during their doctoral degree they have to do lots of work and they must know how organize the information according to each work. Most of them said that:

*“Knowing how to use specific software to manage the information retrieved is very important for us, to access information in our computers rapidly. I use Zotero for example.” (Respondent 27, 19.09.2011)*

Although, others students considered this competency “fairly important”, justifying that:

*“Yes, is important knowing that, but it is not so important because manage the information could be put the information inside specific folders on the computer and give them names. So, this everyone knows.” (Respondent 33, 23.09.2011)*

Information Literacy Providers:



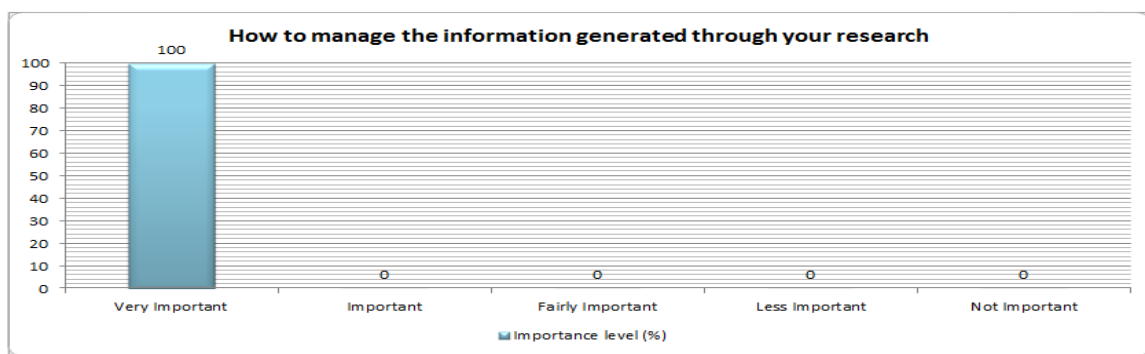
When asked to rate the level of importance for this competence, 67% of them rated it as “very important” and 33% as “important”. The reason for this could be perceived from the excerpts below:

*“This is a competence that also depend much more themselves then the professionals, we could help them with that presenting them some techniques but they should know the better way to do it” (ILP 1, 02.09.2011)*

*“This is very important for students so they could found the information easily and quickly” (ILP 2, 09.09.2011)*

*“Yes, is very important because they should know how to organize the information retrieved in order to found it” (ILP 3, 19.05.2011)*

### Supervisors:



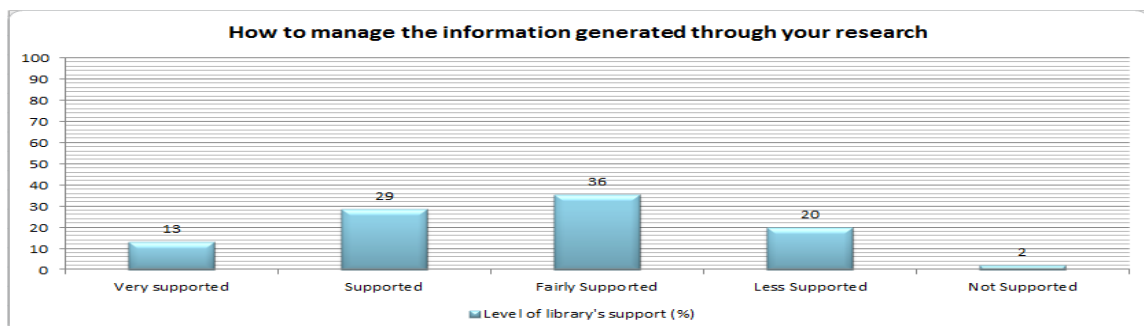
All of the 10 supervisors interviewed rated this competence as “very important” for PhD students to acquire. Their comments on this didn’t vary significantly from the professionals’ comments. They also spoke about the importance in how to manage their information, in order to access it easily and quickly.

### Comparison:

Regarding this competence importance level, PhD students, as well as information literacy providers and supervisors mostly assessed it as “very important”. So, there is not a considerable difference in this rating. All groups think this competence is essential for PhD students to carry out their scientific research.

## Level of library's support

### PhD students:



In this competence, 36% of the PhD students said to be “fairly supported” and 29% “supported”. Other PhD students receive less support by librarians (20% of the PhD students), while some admitted that this competence is “very supported” (13% of the PhD students). Just 2% of the students said that library didn’t provide any kind of support for this competence.

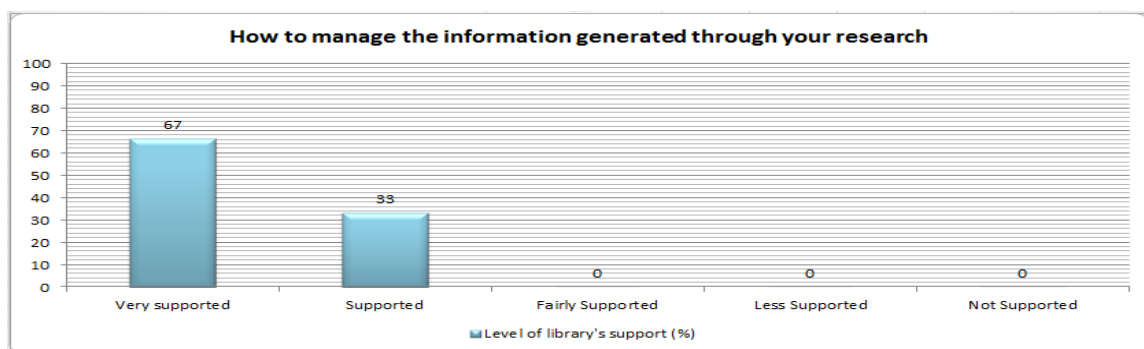
A considerable part of the students’ comments goes around the fact they didn’t feel this support by librarians, so they mostly rated this competence as “fairly supported”. Others said that:

*“I’m not sure if library provide help to this competence” (Respondent 41, 25.09.2011)*

And others mentioned that:

*“Yes I feel well supported by library in this competence. Library has available EndNote and when I have some doubt I could go there ask help” (Respondent 26, 19.09.2011)*

### Information Literacy Providers:



The level of support presented by library to students, concerning this competence: 67% of the information literacy providers rated it as “very supported” and 33% as “less supported”. Their comments are as follows:

*“We don’t have anything really effectively to this competence, but when students need our help to it we are available” (ILP 1, 02.09.2011)*

*“We provide trainings about EndNote and we try to give them orientations to use this tool on managing their information” (ILP 2, 09.09.2011)*

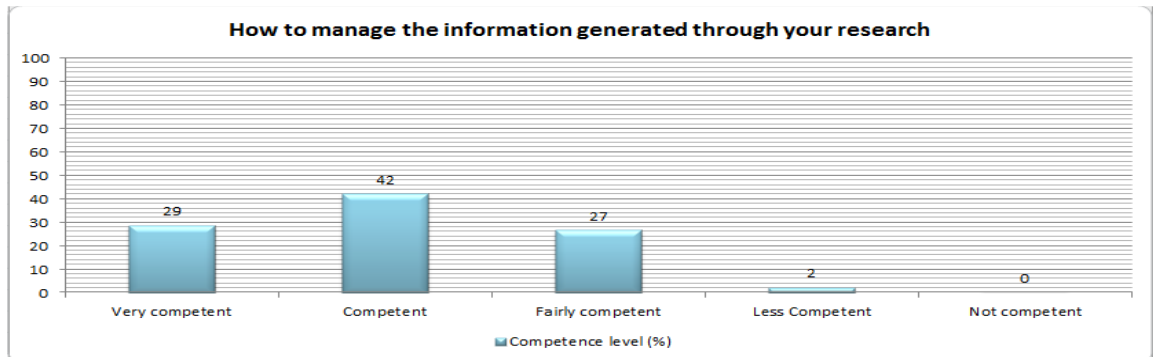
*“We provide trainings about EndNote (basic and advanced) for students. They just need to register in their trainings. In these trainings we give them orientations to use this tool” (ILP 3, 19.05.2011)*

### Comparison:

When considering the level of library’s support, a considerable gap could be perceived between ratings. PhD students said it is “fairly supported”. This gap could be related to the fact that students considered library doesn't provide support to this competence.

## Competence level

### PhD students:



Regarding the competence level, 42% of the PhD students said to be “competent” and 29% “very competent”. Then, 27% of the PhD students “fairly competent” and 2% “less competent”.

*“I use EndNote to organize all the information retrieved through my searches and I know how to do it well until now” (Respondent 7, 09.09.2011)*

*“Yes I know how to do it well, I have all organized by folders well entitled and I could organize myself in this way” (Respondent 12, 13.09.2011)*

*“Sometimes is difficult and became a bit confuses, because is so much information that I don’t know what to do with it. But this is normal and I should be able to found a way to organize my work well” (Respondent 15, 16.09.2011)*

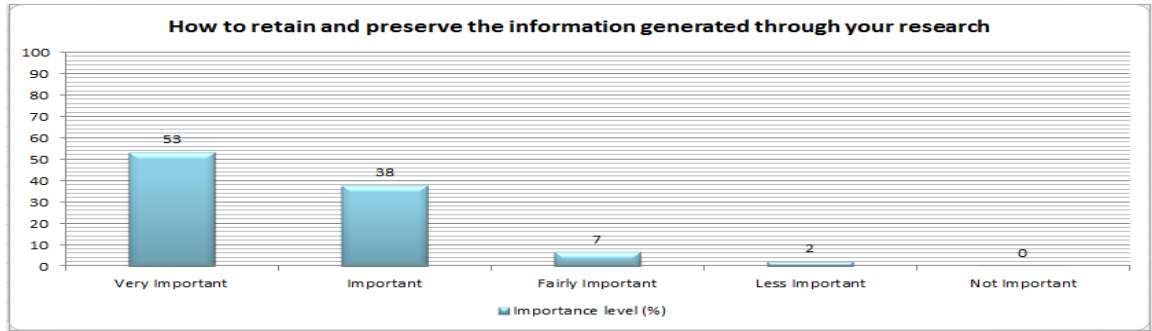
*“Zotero is optimum. I use it and considered myself competent to manage my information with this tool” (Respondent 18, 17.09.2011)*

Therefore, students, using or not using some tools to help them manage their information are considered competent and, despite having lots of information, could always found a way to organize their work.

## 12. How to retain and preserve the information generated through your research

### Importance level

#### PhD students:

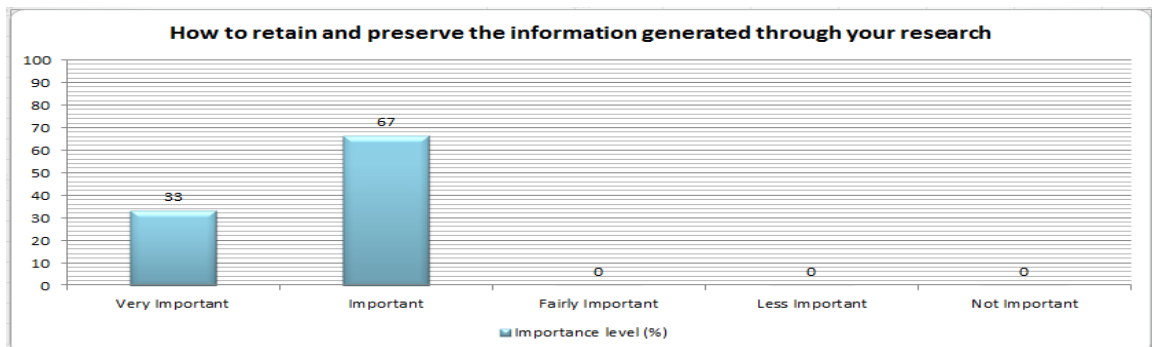


Regarding this competence, 53% of the PhD students assessed it as “very important” and 38% as “important”. Following, 7% of the students considered it “fairly important” and 2% of the students “not important”. Many PhD students said that this is a very important competence. Some of them said:

*“When I finished my PhD degree I’m sure that I’ll use all the works that I have been carrying out now but how am I preserve it? Where? I still don’t know. ” (Respondent 45, 31.09.2011)*

*“Yes, this is very important. We could’t discard hard work from these years” (Respondent 42, 26.09.2011)*

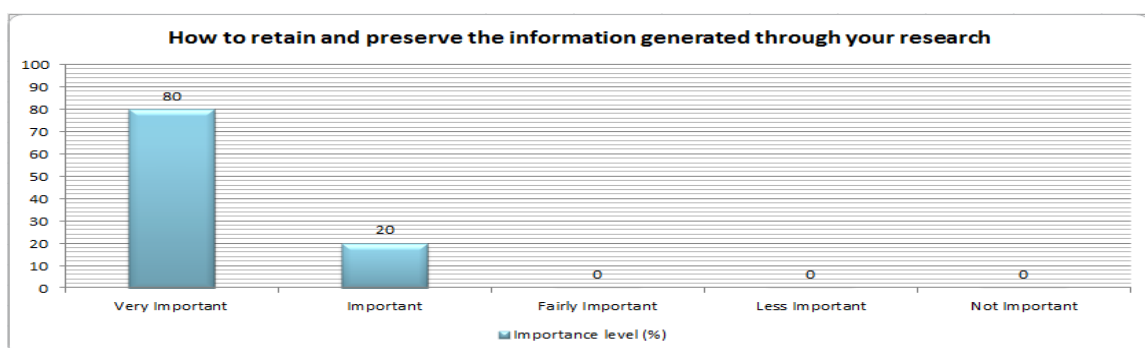
#### Information Literacy Providers:



The professionals interviewed considered this competence important for PhD students: 67% of them said this competence is “important” and 33% said it is “very important”. Their comments are:

*“Despite this competence just could be applied when students finished they PhD degree, they should be aware about it, and if they know how they will gone do it this is great for them” (ILP 3, 19.05.2011)*

#### Supervisors:



Also the supervisors considered this competence essential for PhD students: 80% of the supervisors rated it as “very important” and 20% as “important”. Their arguments for this competence are:

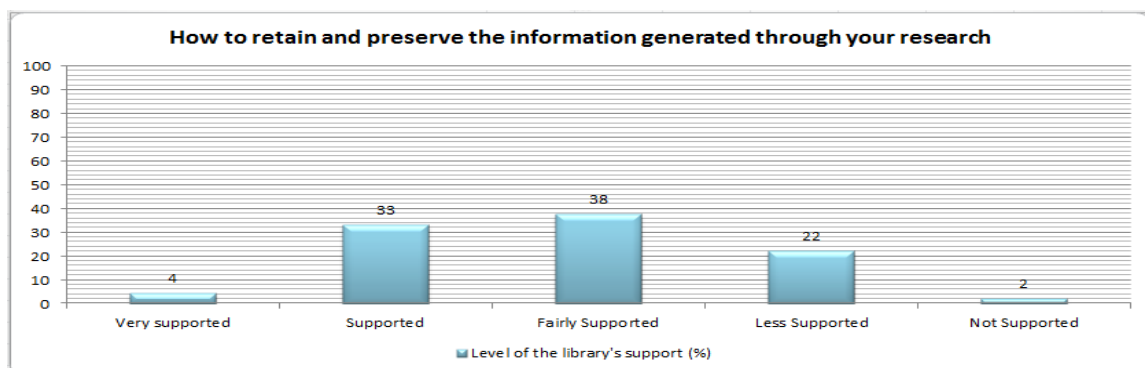
*“Knowing what to do with the information generated through a research is a very important question for these students. Lots of works were done and lots of information retrieved, so to not discard this they should be able to retain and preserve it” (Supervisor 7, 19.09.2011)*

#### Comparison:

Regarding this competence importance level, PhD students mostly assessed it as “very important”, information literacy providers as “important” and supervisors as “very important”. There is no considerable difference in this rating. All groups assumed this competence to be important for research students.

## Level of library's support

### PhD students:

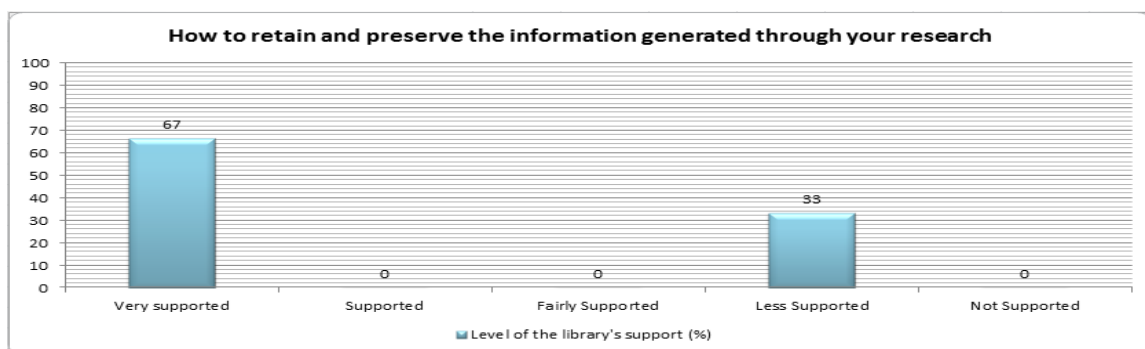


When analysing the level of library's support to this competence, 38% of the PhD students said it to be "fairly supported" and 33% "supported"; 22% of the PhD students as "less supported", 4% of the PhD students as "very supported" and 2% of the students as "not supported". Therefore PhD students, although they are not sure, felt few or none support from librarians, in relation to this competence, as it is perceived by the following comments:

*"Regarding this competence I don't think librarians provide any support but I never asked help to them about it" (Respondent 28, 19.09.2011)*

*"I'm not sure about it, but I think library doesn't supports this competence because this is just when students finished their researches" (Respondent 30, 20.09.2011)*

### Information Literacy Providers:





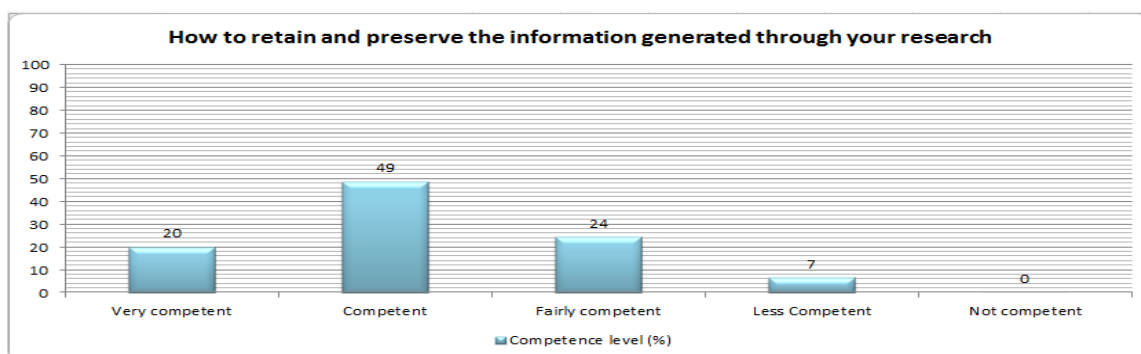
The level of support rated by all information literacy providers was the highest one for this competence – “very supported” (67% of the ILP) and lowest for 33% of the ILP.. Their justifications were that they are always available to give it to students.

Comparison:

When considering the level of library’s support, a considerable gap could be perceived between ratings. PhD students assumed it is “fairly supported”. This gap could be related to the fact that students considered library doesn't provide support to this competence.

### Competence level

PhD students:



Although students have recognised this competence important but a big problem for their future, most of them considered “competent” on doing that (49% of the PhD students). Others said they are “fairly competent” (24% of the PhD students) and “very competent” (20% of the PhD students). Only 7% of the PhD students think of themselves as “not competent”. They justify it as follows:

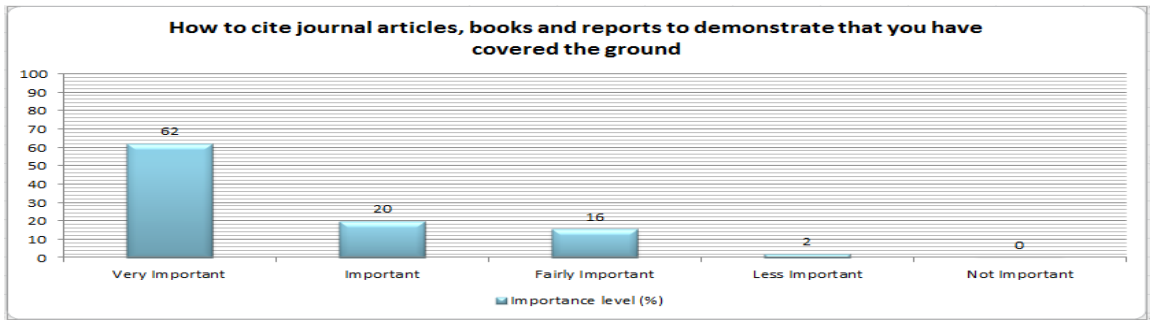
*“I could retain it in some CDROM and when I need it I could take the information” (Respondent 13, 13.09.2011)*

*“I’m sure I will found some way to do it” (Respondent 45, 31.09.2011)*

13. How to cite journal articles, books and reports to demonstrate that you have covered the ground

### Importance level

#### PhD students:

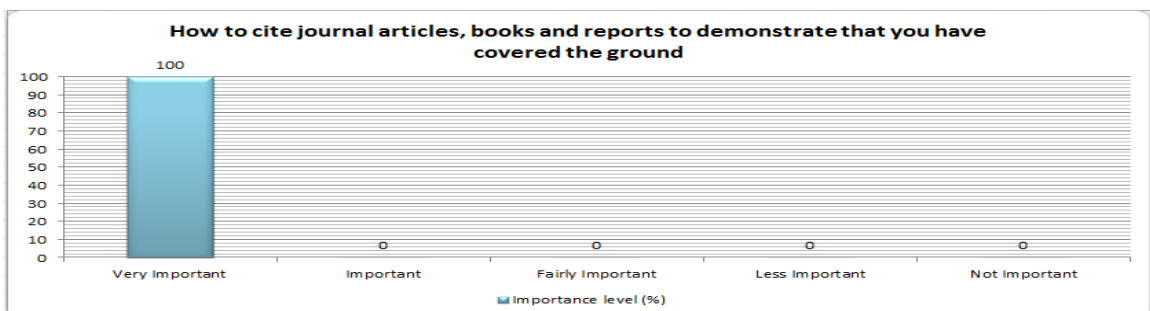


As could be seen through the bar chart, 62% of the PhD students considered this competence as “very important” for their researches, while 20% of the PhD students saw it as “important”, 16% as “fairly important” and just 2% of the PhD students saw it as “less important” for his research. These results are justified by students with the following comments:

*“Is very important in our work have references of experts in the area. This provides work some credibility and some grounding” (Respondent 19, 17.09.2011)*

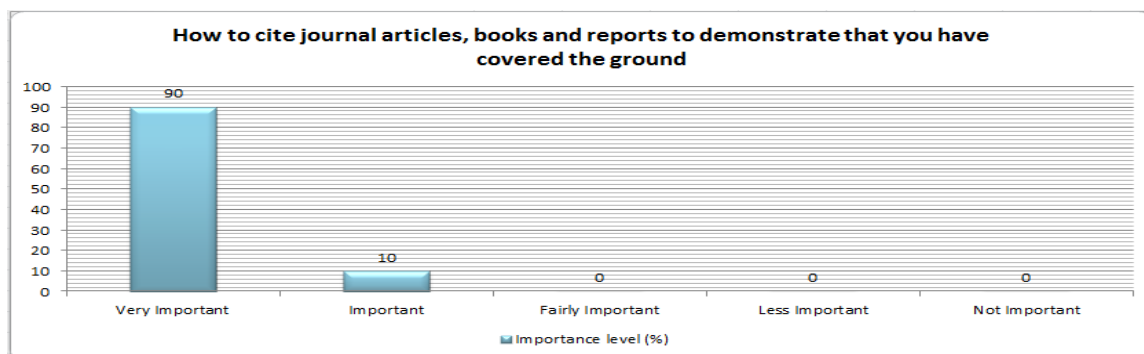
*“Having references and citations on research paper is very important, so is necessary to know how to do it well” (Respondent 22, 18.09.2011)*

#### Information Literacy Providers:



All information literacy providers for each faculty rated this competence as “very important” for PhD students to know. They all have the same view about this competence. They argued that knowing how to cite journal articles, books and reports is essential for them, because it has high influence in their research’s quotation.

#### Supervisors:



Regarding supervisors, 90% of them considered this competence “very important” and 10% as “important”. Their comments to this competence are as follows:

*“Well, is unthinkable a PhD student deliver a research without references and citations of authors or institutions well known in the area. They should be able to do that” (Supervisor 1, 03.09.2011)*

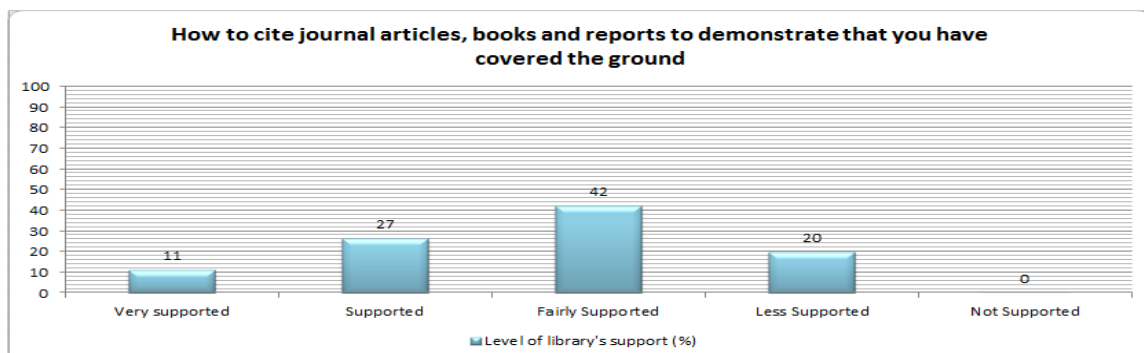
*“Students in this academic year must know they must use references and citations to demonstrate that they have covered the ground. They could have some doubt on doing it, but this normal. But they could ask library how to do the reference or citation” (Supervisor 5, 16.09.2011)*

#### Comparison:

All groups rated this competence as “very important”. So, there is no gap in this case, as all agree that knowing how to cite journal articles, books and reports to demonstrate that student have covered the ground is essential for research students.

## Level of library's support

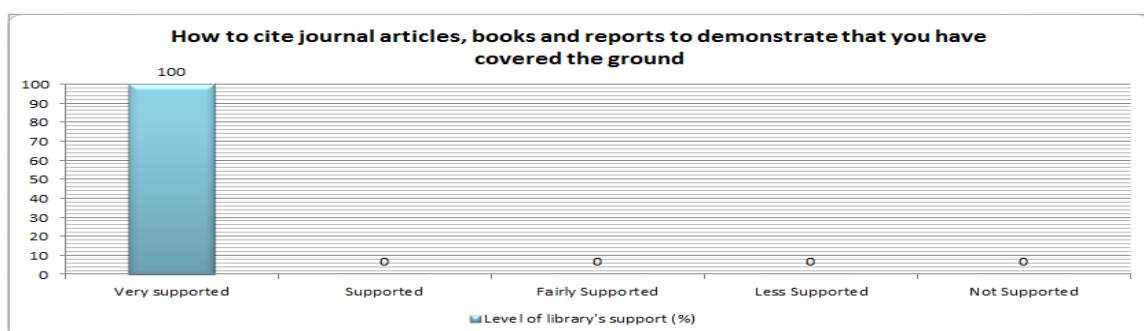
### PhD students:



Referring to the level of library's support, 42% of the PhD students said it is "fairly supported", 27% of the PhD students "supported", 20% of the PhD students "less supported" and 11% of the PhD students "very supported".

What most students said is that librarians provide support to students in this competence, but, in some occasions, they don't feel enlightened. For example, using EndNote to make references and citations, or using the standard to develop these references and citations.

### Information Literacy Providers:



All services' directors said that in this case it is important to provide support for students in a highest level. In order to justify it they argued that:

*"Students could always ask us these doubts, we are always available to do it" (ILP 1, 02.09.2011)*

*“Yes we provide support to students about these topics: references and citations” and we should be able to do it in all kind of standards that they use” (ILP 2, 09.09.2011)*

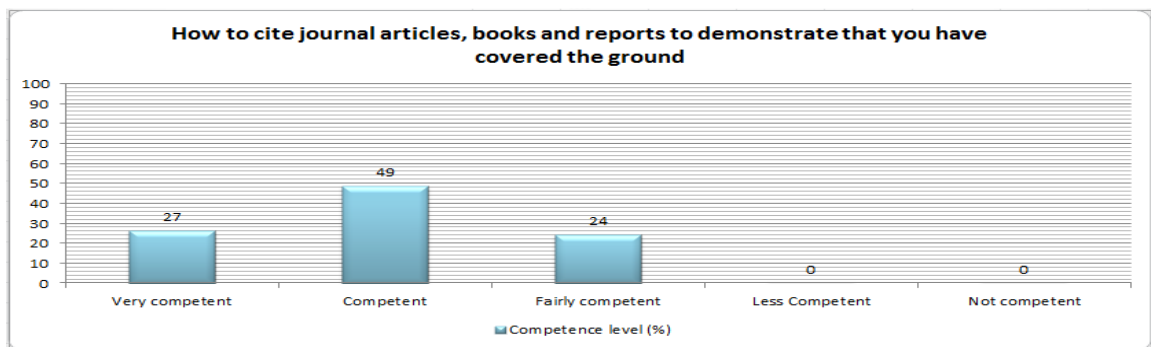
*“Of course, as this is essential for students we always try providing a very qualified support for them and until now we do it” (ILP 3, 19.05.2011)*

Comparison:

In this level of library’s support, a considerable gap could be perceived between ratings. PhD students understand it is “fairly supported” and librarians understand it is necessary to give a high level of support for PhD students in this competence. This gap could be related to the fact that students, in some occasions, do not feel completely enlightened and professionals could not perceive it.

### **Competence Level**

PhD students:



PhD students’ competence level citing journal articles, books and reports to demonstrate that they have covered the ground, mostly rated themselves as “competent” (49% of the PhD students). Moreover, other students rated themselves as “very competent” (27% of the PhD students) and as “fairly competent” (24% of the PhD students). No students assumed they had difficulties in this competence, as the follows comments show:

*“At my faculty the standard used is the NP 405 (Norma Portuguesa) and sometimes, in the beginning was a bit confused because it has lots of specificities, regarding the author’s*

name, it vary from country, and other things. But now, well I was gaining practice doing this” (Respondent 7, 09.09.2011)

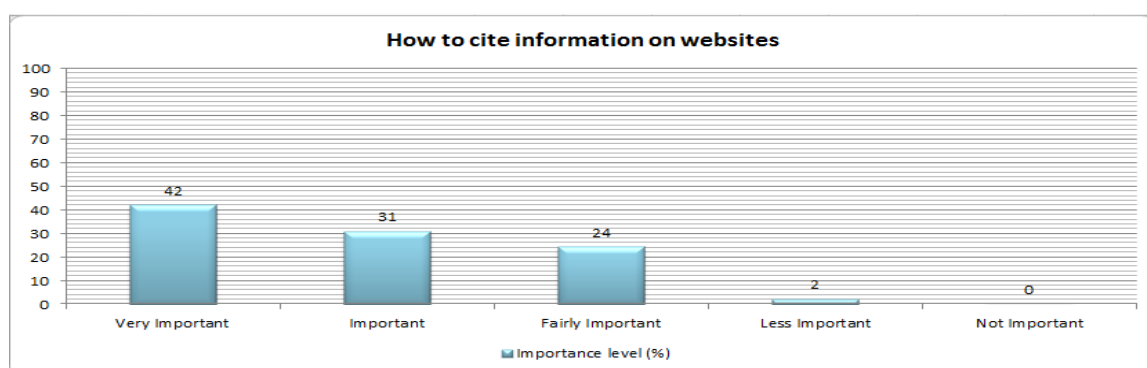
“I use EndNote to do my citations and references. I don’t feel difficulties it’s easy” (Respondent 15, 16.09.2011)

“EndNote is great to do citations. Having the reference done, tan is just necessary to press a bottom and citation appears on document word. It’s very easy” (Respondent 19, 17.09.2011)

#### 14. How to cite information on websites

##### Importance level

##### PhD students:



In this competency, some students categorised it as similar to the previous competence: concerned with knowing how to do citations. Therefore, the results don’t differ significantly from the previous competency: 42% of the PhD students rated it as “very important”, 31% of the PhD students as being “important”, 24% of the PhD students as being “fairly important” and just 2% of the PhD students as being “not important”.

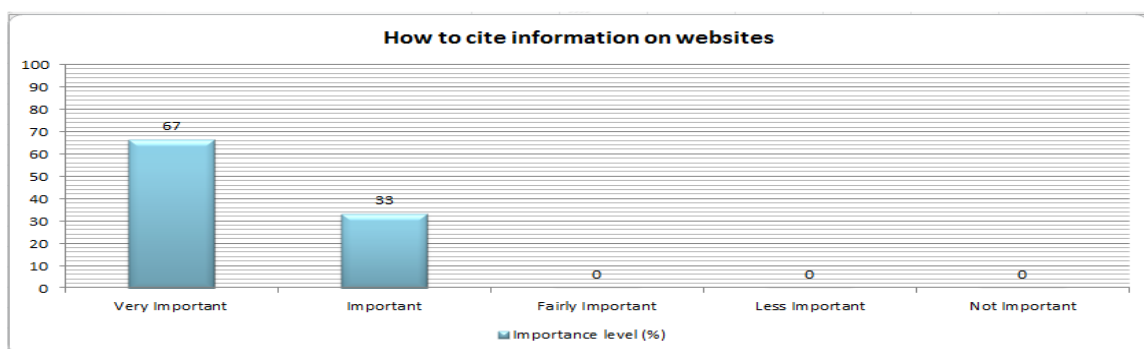
The biggest difference, from the previous results, is that these ones are distributed by level and only 1 student said this competence was “not important”. In the competence before this one, this didn’t happen.

In spite of students' comments not varying from the competence before, some of them considered that:

*"This competence is not so important because sometimes websites don't are good sources of information, they are outdated and sometimes we forget to check it" (Respondent 12, 13.09.2011)*

*"It in depth means the same from the previous but comparing both I think the previous more important than think one, because I think books, journal articles and reports have a character more scientific" (Respondent 24, 18.09.2011)*

#### Information Literacy Providers:



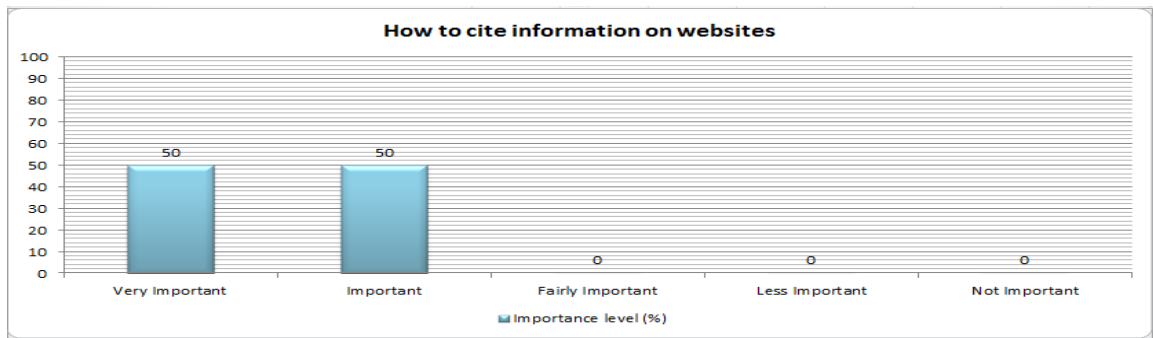
All professionals considered this competence important for PhD students: 67% of them considered it "very important" and 33% "important". Their comments don't vary that much from the competence on the point above, as they also considered it similar:

*"Yes it is also important but I considered the competence before more important" (ILP 1, 02.09.2011)*

*"Yes it is very important to, moreover as the competence before" (ILP 2, 09.09.2011)*

*"Well this is the same from the competence before: knowing how to do citations, so it is very important too" (ILP 3, 19.05.2011)*

Supervisors:



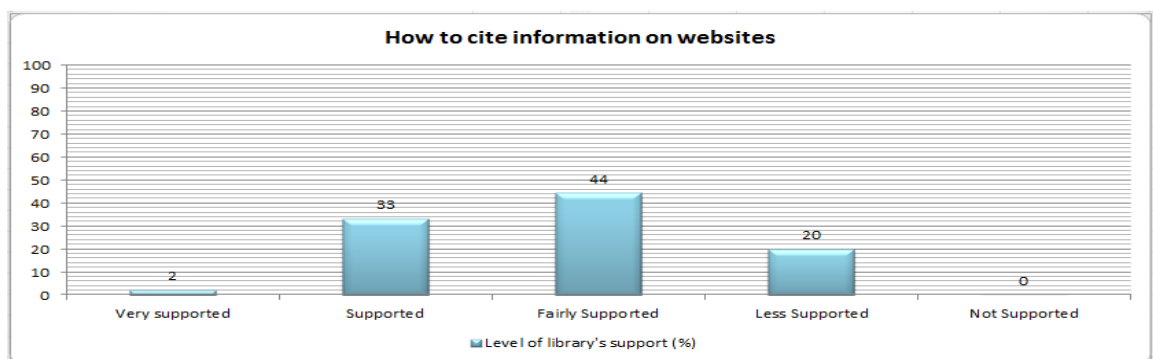
As could be perceived through the bar chart, supervisors were divided: 50% of the supervisors rated this competence as “very important” and the others 50% rated it as “important”. As such, this competence was perceived by supervisors as being important for PhD students. Although, this balance was most linked to the comparison made with the competence before: the great majority of supervisors considered knowing how to cite journal articles, books and reports as more important than knowing how to cite information on websites, in order to demonstrate that students had covered the ground.

Comparison:

In relation to the importance level, all groups rated this competence as “very important”. In fact, some of the respondents compared this competence with the previous one and thought of it as the most important. Despite this, all respondents agreed that knowing how to cite information on websites is an essential competence for PhD students.

**Level of library’s support**

PhD students:

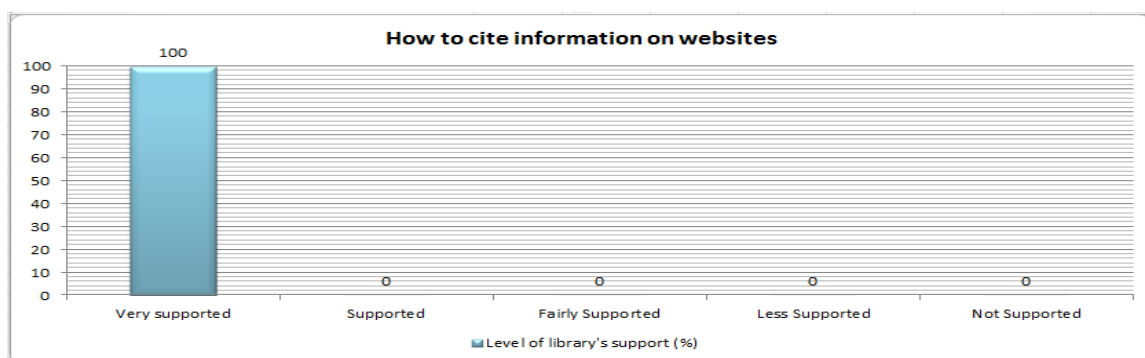




Again the rating doesn't vary significantly from the competence before: 44% of the PhD students rate it as "fairly supported" by librarians. Plus, 33% PhD students considered librarians "supported" them in this competence, while 20% of the PhD students "less supported". Only 2% of the PhD students said to be "very supported" by librarians on citing information on websites.

PhD students did not comment anything specifically related to this competence, regarding the level of library's support, because they considered the support was the same from the category analysed before.

Information Literacy Providers:



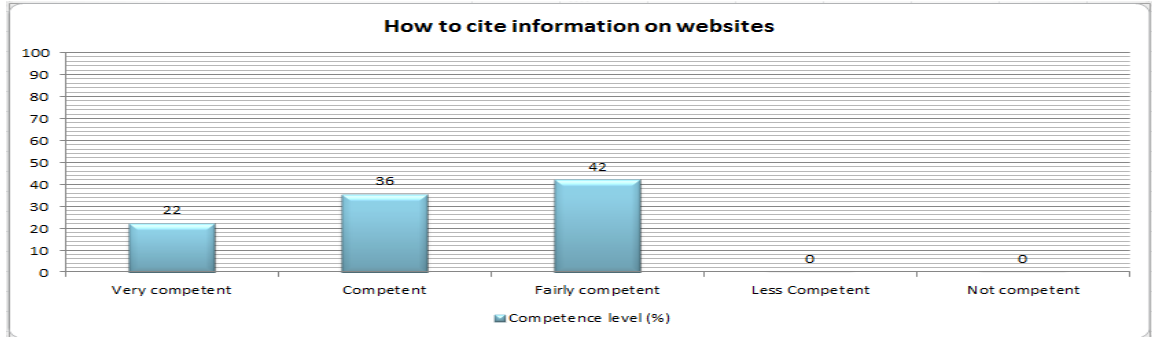
All professionals provide an important support to students, arguing the same as in the competence above, for they considered it to be very similar.

Comparison:

Through this level of library's support, considered by PhD students and information literacy providers, it could be observed that PhD students receive support from the library and the library considered giving them a good support in this competence. This is due to the same reason as in the previous competence: students in some occasions do not feel completely enlightened and professionals do not perceive it.

## Competence level

### PhD students:



Well, regarding this competence, most of the students saw themselves as “fairly competent” (42% of the PhD students), 36% of the PhD students as “competent” and 22% as “very competent”.

In this case, students have a different level of competence than in the previous topic, mainly because of:

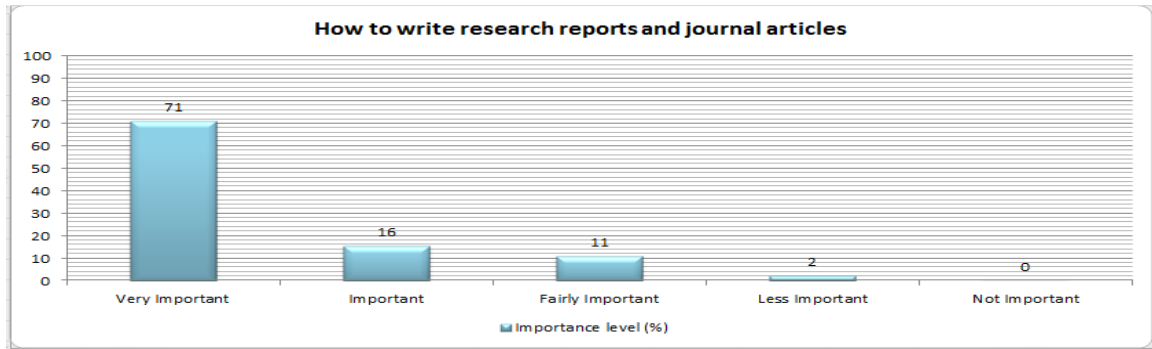
*“Sometimes web sites are confuses which difficult finding the specific data to use on citations” (Respondent 38, 24.09.2011)*

*“Doing web pages references/ citations could be for instance difficult because sometimes the author’s name or even the web page title do not are explicit” (Respondent 45, 31.09.2011)*

## 15. How to write research reports and journal articles

### Importance level

#### PhD Students:

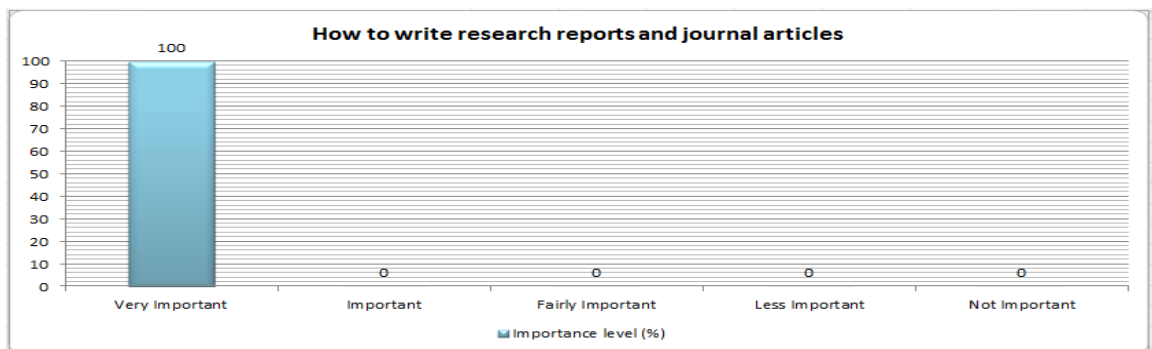


This competence was mostly rated by PhD students as being “very important” (71% of the PhD students). Then, 16% of the PhD students rated it as being “important”, 11% as being “fairly important” and just 2% of the PhD student as “less important”.

The majority of PhD students recognise that learning how to do it is important for their careers, for communicating with their investigations and achieving new findings. Although, they know they need to learn it before they engage in their career.

*“Communicate our findings through research reports and journal articles are very important for our doctorate and further for our careers. This is one of the principal requests to us” (Respondent 44, 30.09.2011)*

#### Information Literacy Providers:

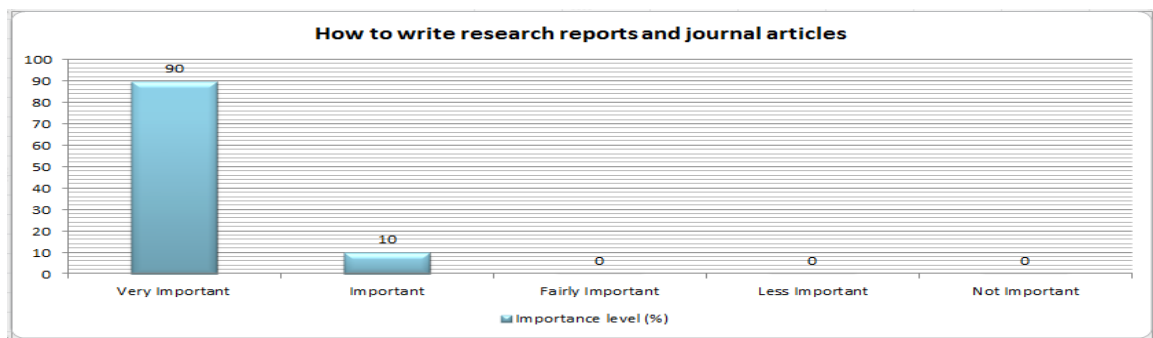


All professionals rated this competence as being “very important” for PhD students to learn justifying that:

*“This is crucial PhD students know” (ILP 1, 02.09.2011, ILP 2, 09.09.2011 and ILP 3, 19.05.2011)*

Their justifications are concerned with the fact that PhD students are becoming doctors and it is required for these people to write journal articles about their investigations.

#### Supervisors:



In a general basis, all supervisors found this competence “very important”, as could be perceived by the chart bar.

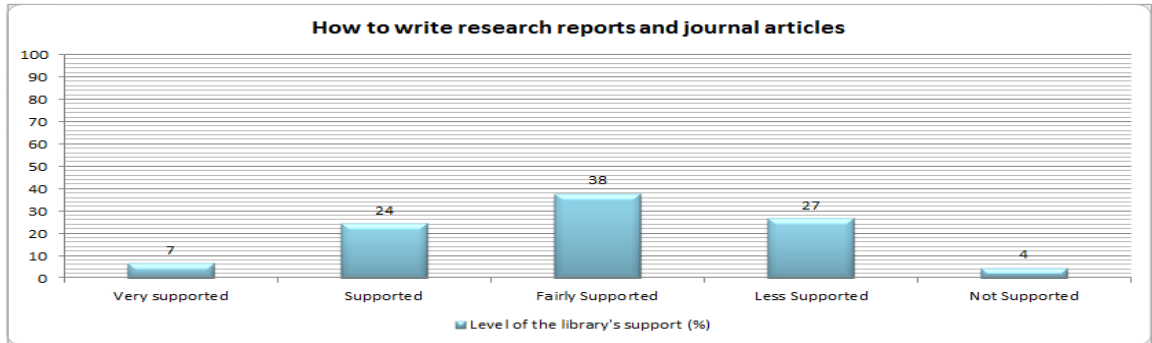
All supervisors considered this competence essential for PhD students. Although, in some situations, supervisors said that they don’t expect librarians to teach students how to do it, because they should be able to teach this to their students.

#### Comparison:

Concerning the importance level, all groups rated this competence as “very important”. As such, there is no gap, all agree that knowing how to write research reports and journal articles is essential for research students.

## Level of library's support

### PhD students:



The level of library's support is most rated by students, regarding this competence as "fairly competent" (38% of the PhD students), while the middle levels of quotation are "less supported" by 27% of the PhD and "supported" by 24% of the PhD students. Finally, the lowest levels of quotation are "very supported" by 7% of the PhD students and "not supported" by 4% of the PhD students.

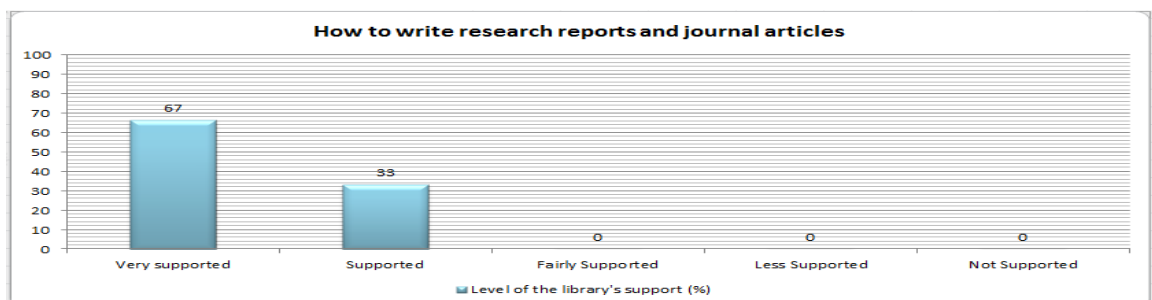
As could be perceived, this rating is divided, and students' comments are:

*"I think library could give some help to this but until now I don't have perceived anything"*  
(Respondent 25, 19.09.2011)

*"I don't feel any support by library on this competence"* (Respondent 29, 20.09.2011)

*"Yes, I think library provides some support to this"* (Respondent 34, 23.09.2011)

### Information Literacy Providers:



As the chart bar show in general professionals provide support to students in this competence. Their comments were as follows:

*“Yes, we provide very support to this because we have an online tutorial for students know how to structure these documents, and always they have difficulties they could ask us “(ILP 3, 19.05.2011)*

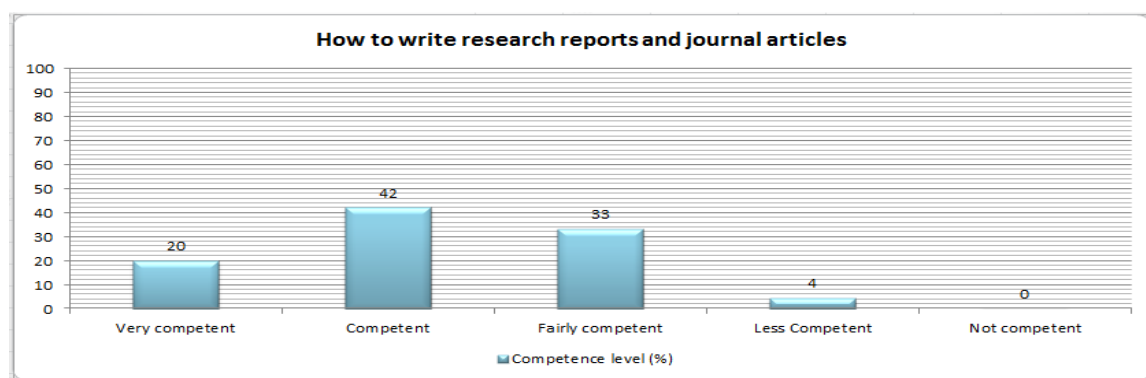
*“We are always available to present help to students” (ILP 1, 02.09.2011 and ILP 2, 09.09.2011)*

Comparison:

In what concerns this level of library’s support, a considerable gap between ratings was created. PhD students understand it to be “fairly supported”, while librarians give a high level of support to PhD students in this competence. This gap could be related to the fact that students don’t know librarians and could help them doing it, or simply not ask to help them, or, in other cases, they receive this support from their academics and supervisors.

## Competence level

PhD students:



PhD students are mostly rated as being “competent” (42% of the PhD students) and as “fairly competent” (33% of the PhD students). Then, 20% of the PhD students said they were “very competent” and 4% “less competent”.

*“I considered myself competent doing this kind of documents, I Know they should follow a structure and they should be very precisely. It’s not simple, but I could do it” (Respondent 2, 04.09.2011)*

*“Well, I have be competent doing it, is essential for students in a doctorate level” (Respondent 8, 09.09.2011)*

*“It’s complicate to elaborate a journal article. The writing should be very precisely and sometimes we could’t do this it’s very very difficult” (Respondent 21, 18.09.2011)*

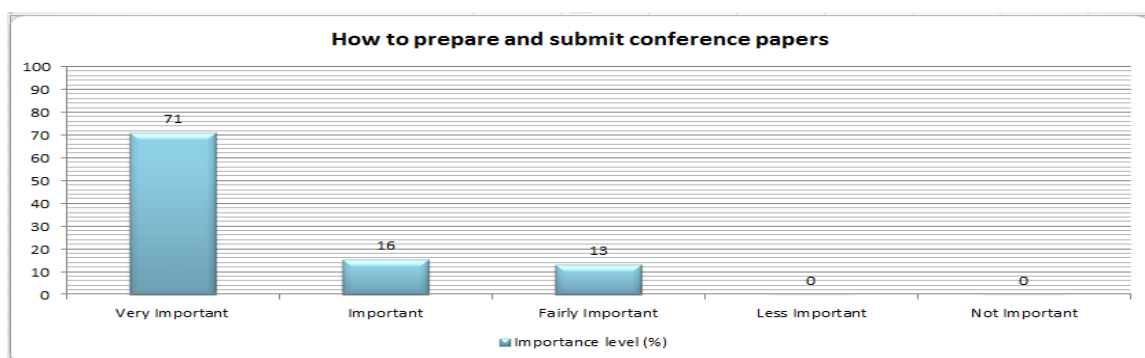
*“It’s hard, very hard doing it! And I think we could acquire very practice but is always difficult because the subject is different” (Respondent 34, 23.09.2011)*

Therefore, PhD students are considered to be competent writing research reports and journal articles. However, they recognized that is not an easy task, because of the specificity and objectivity of the writing.

#### 16. How to prepare and submit conference papers

##### **Importance level**

PhD students:

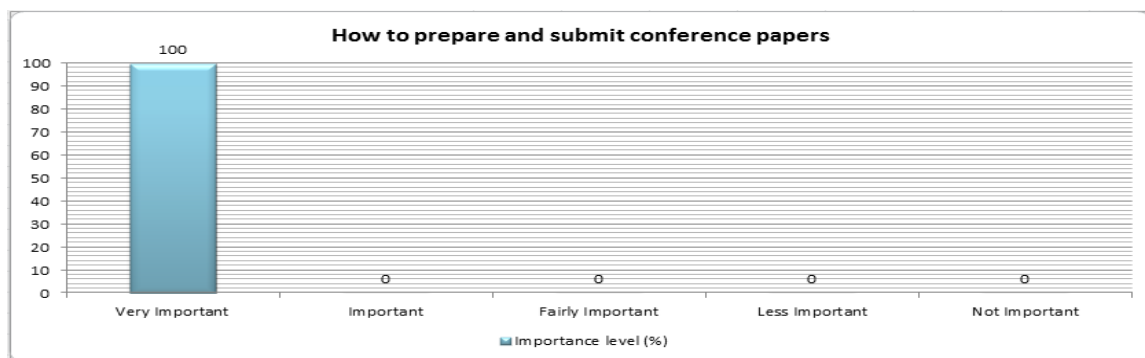


This competency results are related with the competency before. Students are similar, so the level of importance is the same. 71% of the PhD students found this competence “very

important”. Then, just 16% of the PhD students considered this competence “important” and 15% as “fairly important”.

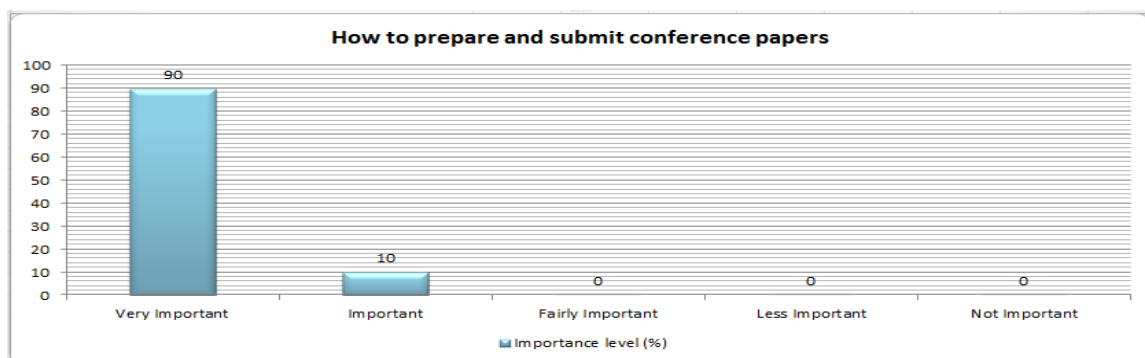
The PhD students’ comments didn’t vary from the competence before, as they considered very similar.

#### Information Literacy Providers:



All three information literacy providers interviewed also considered this competence very similar to the previous competence, as both concern the writing of scientific documents. So, all rated it as being “very important” for PhD students to learn. Their comments are the same as in the competence above.

#### Supervisors:



Also supervisors considered this competence similar to the competence before. So, the results, as could be perceived through the chart bar, are the same: 90% of the supervisors



considered this competence “very important” and just 10% considered it “important” for PhD students.

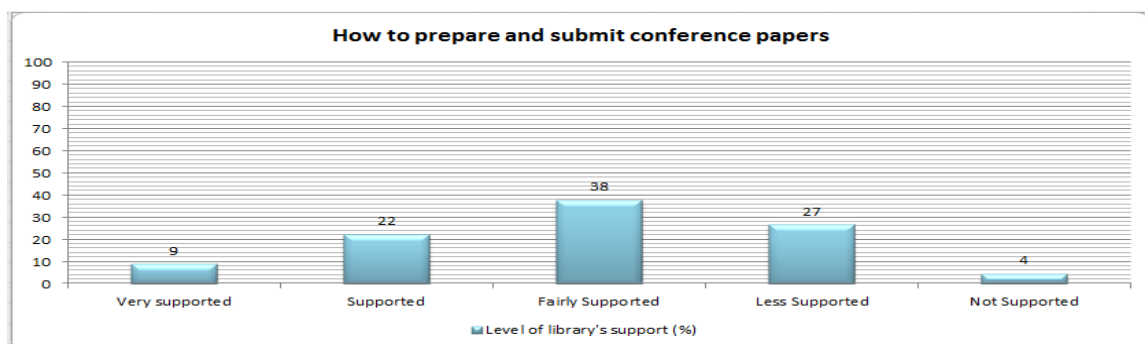
They also considered this competence essential for PhD students and again, in some specific cases (the same from the competence before), supervisors said that they don’t expect librarians to teach students, because they should be able to teach this to their students.

Comparison:

Concerning the importance level, all groups rated this competence as “very important”. As such, there is no gap here and all agree knowing how to prepare and submit conference papers is essential for research students.

### **Level of library’s support:**

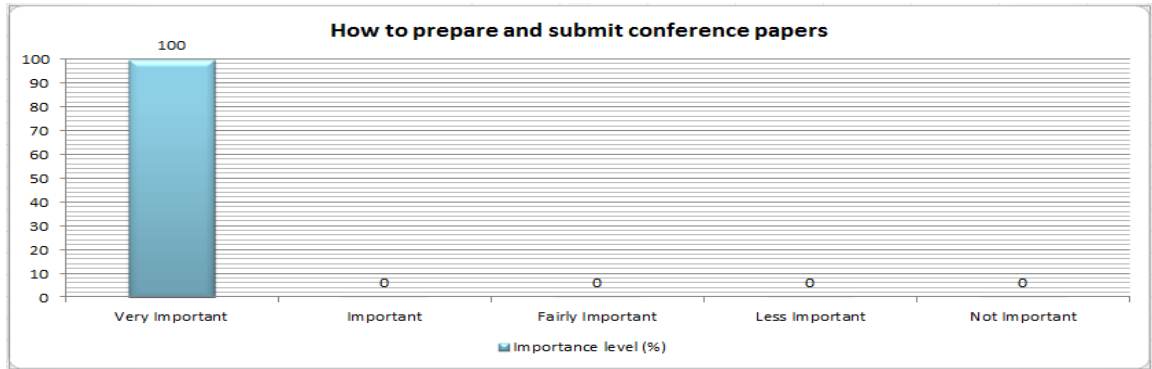
#### PhD students:



The level of library’s support rated by PhD students in this competence was very similar to the competence before: 38% of the PhD students rated it as “fairly supported”, 27% of the PhD students as “less supported”, 22% of the PhD students as “supported”, 9% of the PhD students as “very supported” and finally 4% of the PhD students as “not supported”.

PhD students didn’t vary their comments in relation to the previous competence. Some of them also think librarians could provide some help on this.

### Information Literacy Providers:



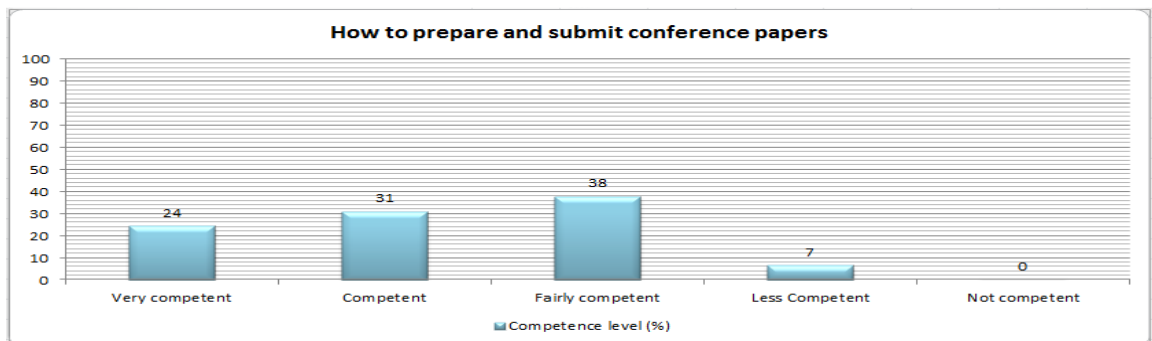
All professionals thought of present support to PhD students in a higher level. As they argued in the competence before: “*we are always available to present help to students*”.

### Comparison:

In this level of library’s support, a considerable gap between ratings could be perceived. PhD students are said to be “fairly supported” and librarians give a high level of support to PhD students in this competence. This gap could be related to the same fact of the competence before as they considered both similar: students don’t know librarians could help them doing it, or simply they don’t ask them help, or in other cases, they receive this support from their academics and supervisors.

### Competence level

#### PhD students:



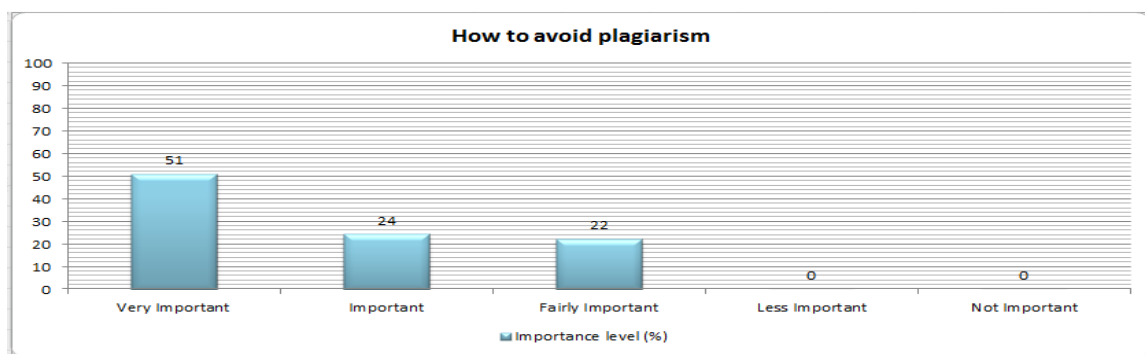
The results of the PhD students' competence level are a bit different from the competence before. In other words, the results are more divided by levels, let's see: 38% of the PhD students said it was "fairly competent", 31% categorised as being "competent", 24% assumed to be very competent and 7% of the students assumed to be less competent.

When comparing with the competence before, there are more competent students preparing and submitting conferences papers.

### 17. How to avoid plagiarism

#### **Importance level**

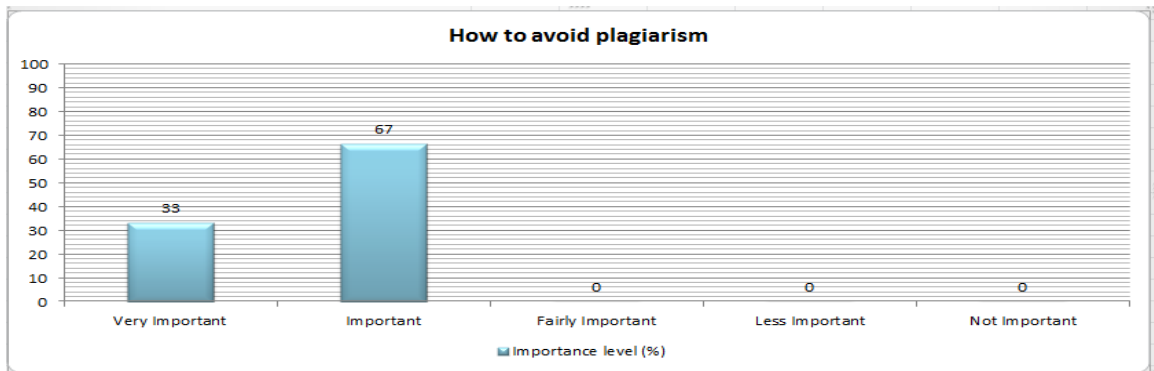
PhD Students:



It could be perceived that this competency is "very important" for 51% of the PhD students, "important" for 24% of the PhD students and "fairly important" for 22% of the PhD students.

On the one hand, some students argued that it is an important competency, on the other hand, every PhD students already knows that it is important and must be avoided". As such, this is not a crucial competency for PhD students, since they assume having this competency.

Information Literacy Providers:



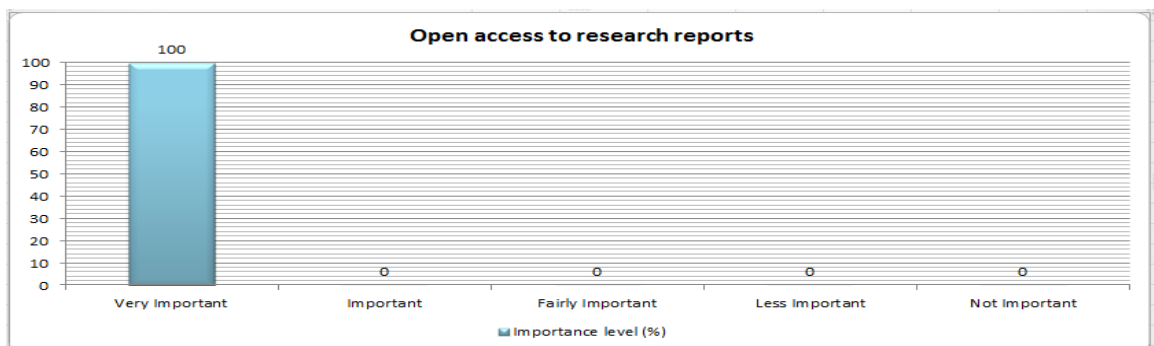
All information literacy providers considered this competence important for PhD students: 67% of them considered it “important” and 33% “very important”. Their comments don’t diverge a lot:

*“Being aware of the risks of doing plagiarism is very important for them. They know they should avoid plagiarism but when it happens they are punished and most of them don’t know they should be punished because of doing it” (ILP 1, 02.09.2011)*

*“This is an important competence for students, but considered their academic level they already should know how to do that” (ILP 2, 09.09.2011)*

*“PhD students already know that could’t do plagiarism, although for sure some of these students don’t are so aware about it” (ILP 3, 19.05.2011)*

Supervisors:



All the 10 supervisors interviewed, considered this competence very important for PhD students. Their arguments were, as follows:

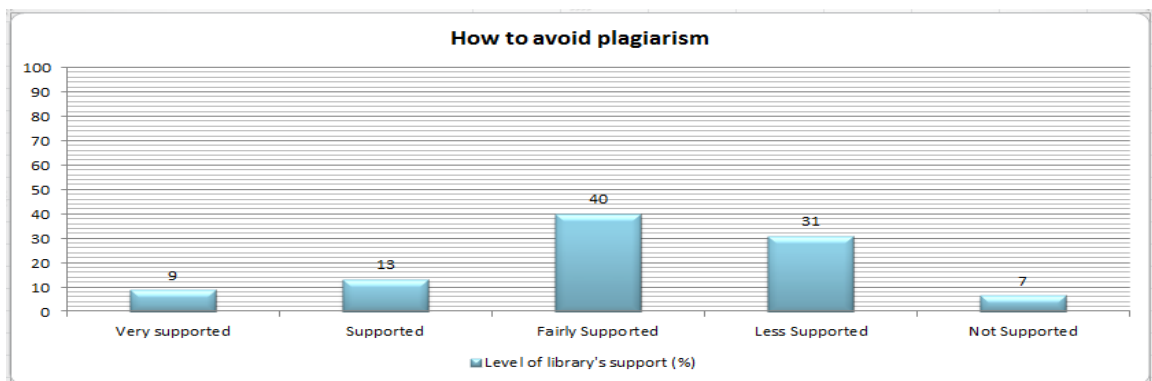
*“This is very very important PhD students do if they want their work be recognized and has a good classification” (Supervisor 8, 23.09.2011)*

Comparison:

Concerning the importance level, all groups rated this competence as “very important”. So, there is no gap in this case, all agree that knowing how to avoid plagiarism is essential for research students.

### **Level of library’s support**

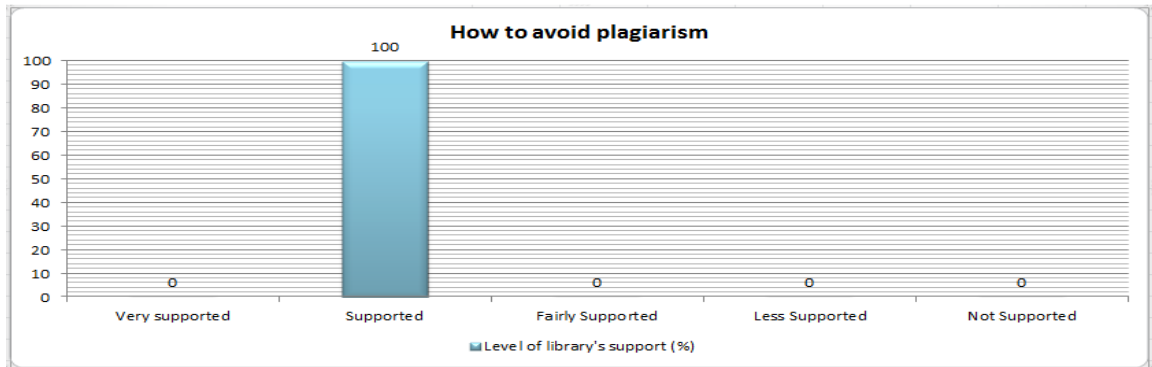
PhD students:



Regarding the level of library’s support about this competence, 40% of the PhD students considered to be “fairly supported”, 31% of the PhD students to be “less supported”, 13% of the PhD students to be “supported” and 9% “very supported” by librarians. Finally, 7% of the PhD students considered not be supported by library about this competence.

What PhD students most argued, regarding library support, is that they don’t have any specific training about avoiding plagiarism.

Information Literacy Providers:



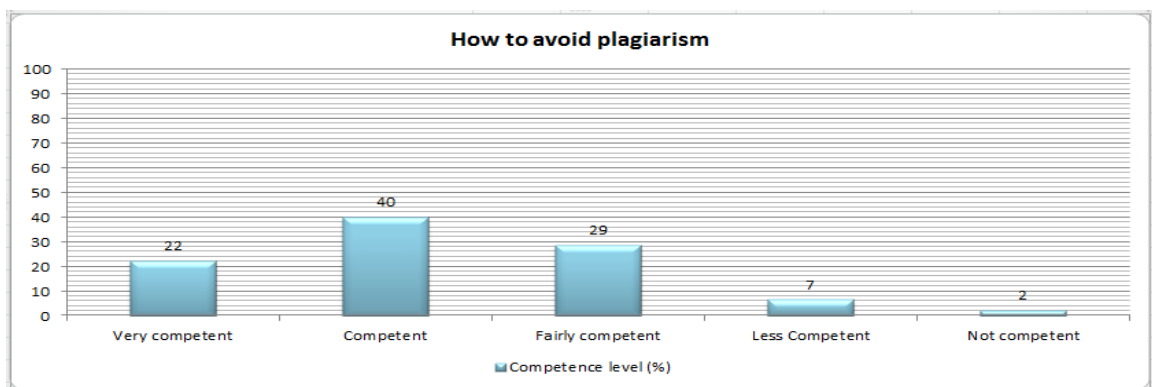
All of the information literacy providers interviewed considered that they give support to PhD students about this competence. They encourage students on writing their own sentences, on using citations and referring all the sources they consulted.

Comparison:

Therefore, in this level of library's support, a considerable gap between ratings could be perceived. PhD students said that librarians provide support to them about this competence and librarians, on their turn, considered to give support to students about their competence. This gap could be due to the fact that students do not benefit librarians and don't know what help librarians could provide them.

### Competence level

PhD students:



Regarding the competence level of PhD students, 40% rated themselves as “competent”, 29% as “fairly competent”, 22% of the PhD students as “very competent”, 7% of the PhD students as “less competent” and just 2% of the PhD student as not competent.

Comments:

*“I know I should use my own words and when I don’t use it I must cite the author’s name”*  
(Respondent 10, 11.09.2011)

*“This is not difficult, we just know how to write the same idea but with our words”*  
(Respondent 16, 16.09.2011)

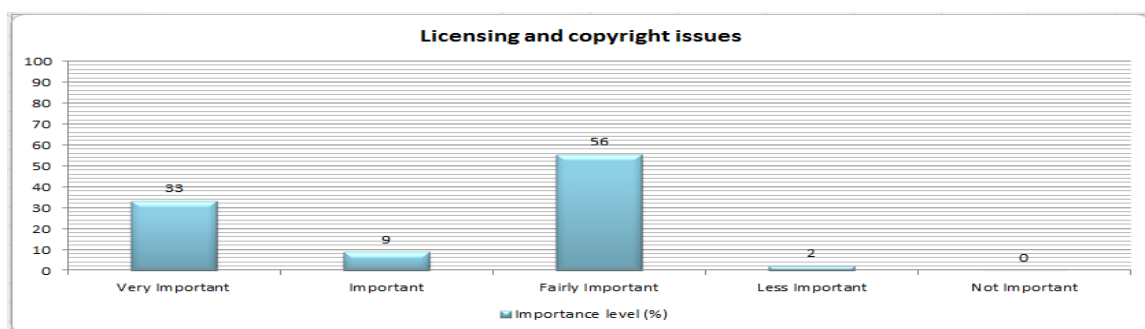
*“To avoid plagiarism what I do is citations or I try to write by my own words”* (Respondent 29, 20.09.2011)

So, what PhD students most argued is to do to avoid plagiarism and write their own words or citations.

## 18. Licensing and copyright

### Importance level

PhD students:



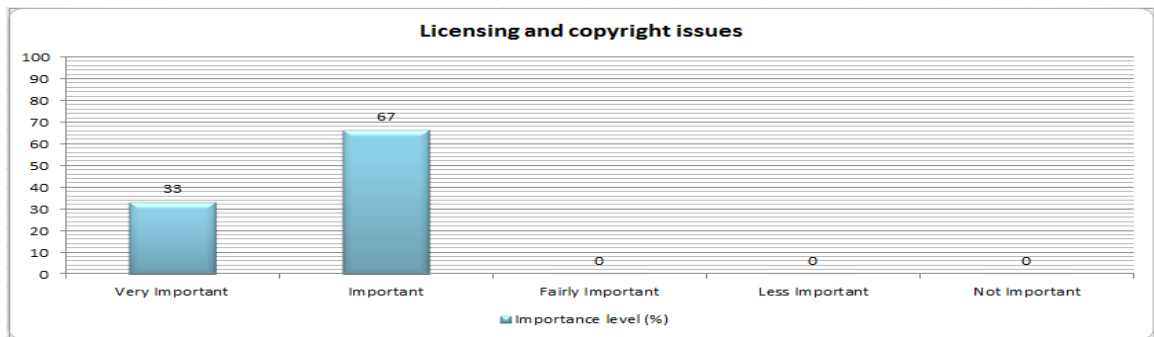
This competence was most rated as “fairly important” (56% of the PhD students) and as “very important” (33% of the PhD students). Then, 9% of the PhD students considered this competence “important” and just 2% of the PhD student “less important”.

Great part of the students argued that:

*“To carry out a research I don’t need to know these issues of licensing and copyright, I could always check them” (Respondent 32, 20.09.2011)*

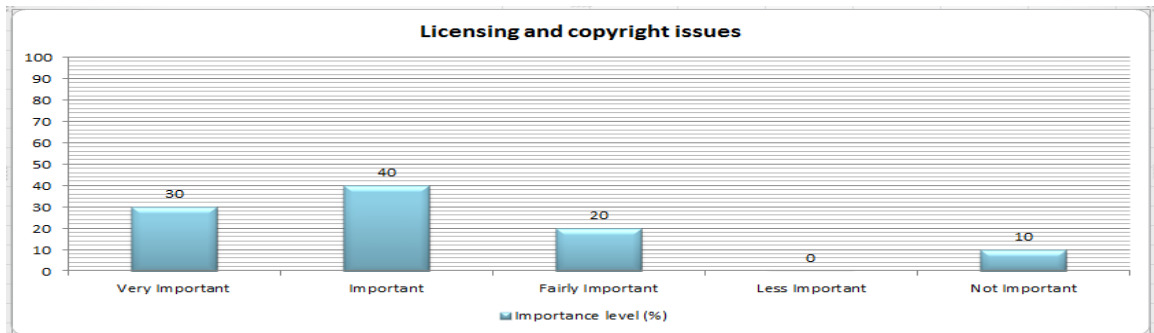
These ratings are justified by students with the fact that they don’t need to know exactly the licensing and copyright issues. Some students also said that to carry out a research this issues are not so important.

Information Literacy Providers:



As the chart bar shows, 67% of the professionals considered this competence “important” and 33% considered it “very important”. Although all professionals in general considered this competence important, everyone said that it is not essential for PhD students.

Supervisors:





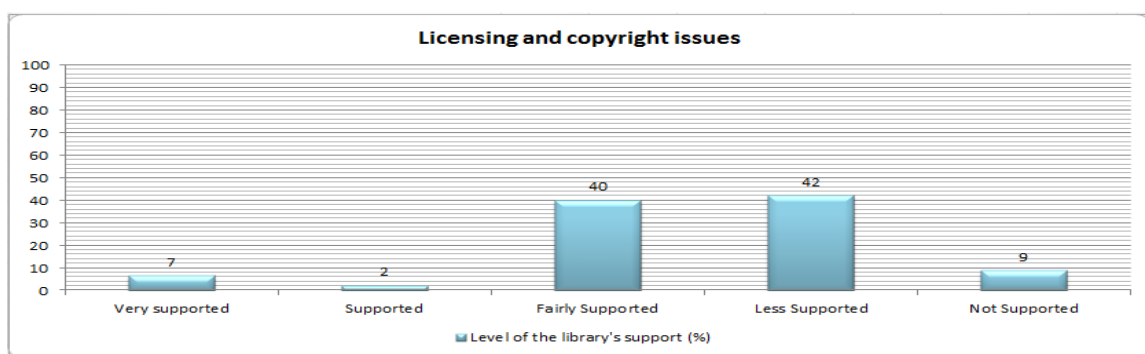
This competence was divided by supervisors: 40% considered it “important”, 30% “very important”, 20% “fairly important” and 10% supervisor “not important”. They also argued that PhD students don’t need to know this.

Comparison:

Regarding the importance level of this competence, it could be perceive that there is a gap between results: PhD students considered it “fairly important” and the information literacy providers and the supervisors considered it “important”. All groups found it non essential for PhD students to know about all the issues related with licensing and copyright, but supervisors and professionals found it important to have some idea about it.

### **Level of library’s support**

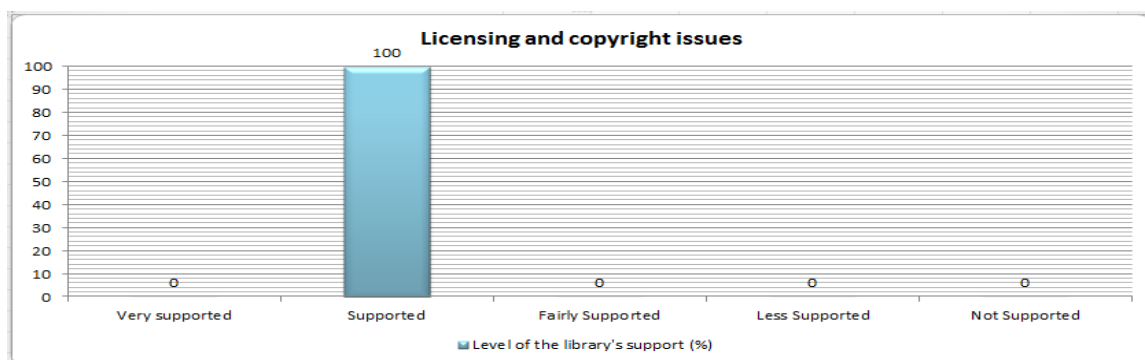
PhD students:



PhD students think that library provides less support (42% of the PhD students) or fairly support (40% of the PhD students). Then, 9% of the PhD students were not supported by librarians, 7% of the PhD students said they were very supported and 2% of the PhD students considered to be supported by library.

PhD students, when answering this question, just referred that they didn't feel this support.

### Information Literacy Providers:



All information literacy providers said they give students the support on this competence. Their comments were as follows:

*“When PhD students need help regarding these issues we are always available to help them” (ILP 1, 02.09.2011 and ILP 3, 19.05.2011)*

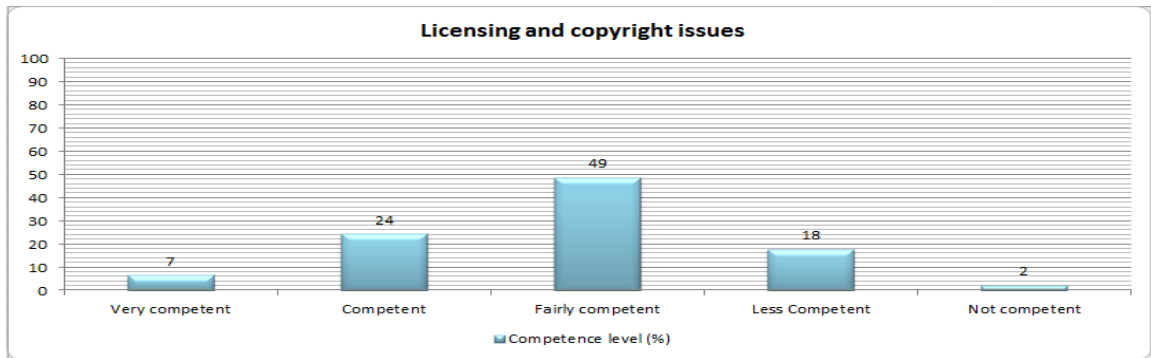
*“We could help them consulting the appropriated laws for these issues” (ILP 2, 09.09.2011)*

### Comparison:

As such, this level of library’s support, could be perceived as a considerable gap between ratings. PhD students thought that librarians provide fairly support in this competence and librarians in your turn gave support to students. This gap could be due to the fact that librarians don’t have anything explicit that shows students they could have support.

## Competence level

PhD students:



PhD students assumed themselves as being “fairly competent” (49% of the PhD students) and as being “less competent” (18% of the PhD students). Then, 24% PhD students assumed themselves as “competent” and 7%% as being “very competent”. Still, 2% of the PhD students are “not competent” when using information from these platforms on their researches.

The students’ comments were mostly linked to the fact that students didn’t feel completely integrated in these issues:

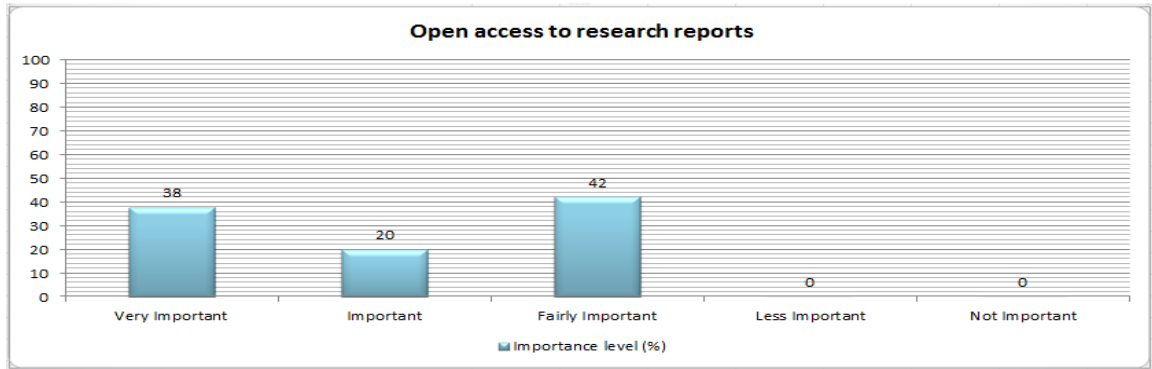
*“I need to consult this” (Respondent 34, 23.09.2011)*

*“I don’t know this without having the law with me” (Respondent 42, 26.09.2011)*

## 19. Open access to research reports

### Importance level

PhD students:



Regarding the importance level of this competence, 42% of the PhD students rated it as “fairly important” and 38% as “very important” and finally 20% of the PhD students rated it as “important”.

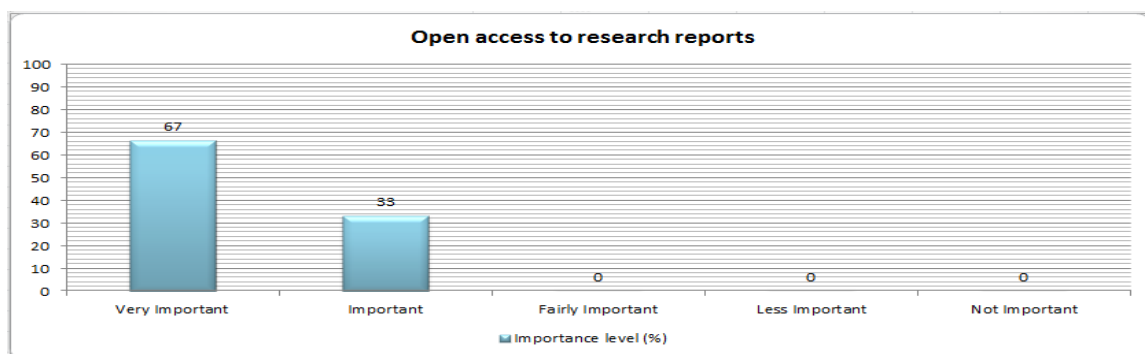
The students’ justifications for their rating were concerned to the fact that this could be a vital issue, in order to carry out a research. They said that:

*“Of course it will help a lot. If all documents were available in open access will be very helpful for us” (Respondent 29, 20.09.2011)*

*“Well, having the access to all research reports would be a very good help to us” (Respondent 37, 24.09.2011)*

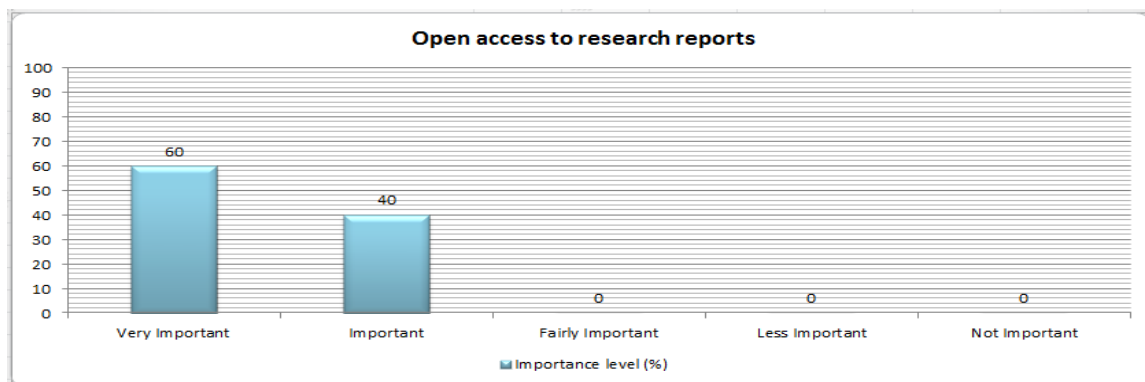
However, they know they don’t have open access, and what they think when improving this, is, for example, academic library or university subscribe information resources with maximum of information resources in full text, so that students could have access and retrieve the information needed.

### Information Literacy Providers:



In general, all 3 information literacy providers rated this competence as important: 67% of them rated it as “very important” and 33% as “important”. What professionals most argued was this essential for PhD Students. They need to search lots of information and for sure lots of them are not available, because it’s not in full text. Having open access to scientific information resources is very helpful for PhD students.

### Supervisors:



This competence was considered by supervisors as being important for PhD students: 60% of the supervisors rated it as “very important” and 40% as “important”.

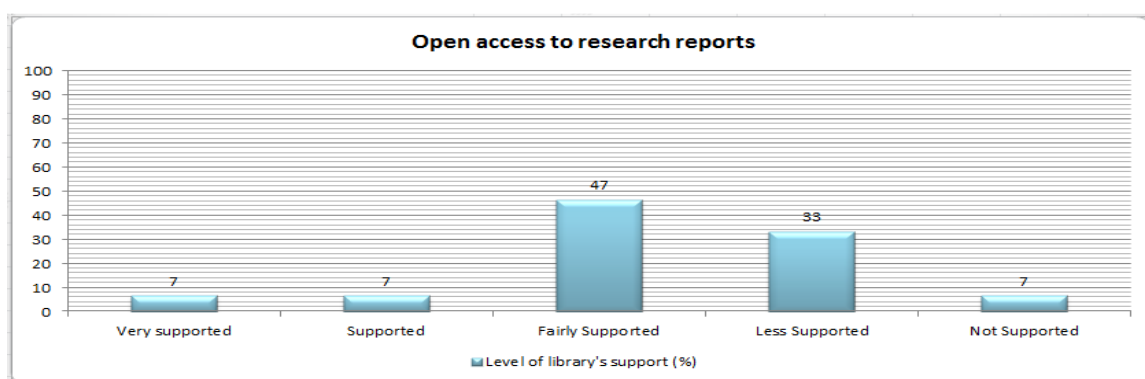
Open access has lots of implications and still it has poor developments. Due to this, supervisors recognized that PhD students should become more and more capable of using the information resources available by the library, in order to access and retrieve as much information as possible, so they can avoid this problem of opening access to documents.

Comparison:

It could be perceived that these ratings couldn't be compared: PhD students rated this competence as “fairly important” and the information literacy providers and the supervisors as “very important”. This gap is because of the way each group sees the problem of the open access to information. In other words, PhD students know that having this is important, but as they don't think their academic library should subscribe more information resources, they could have more options for search. Furthermore, information literacy providers argued that it is essential for them, in spite of it still being poorly developed; and supervisors also argued this is important, but as it still is poorly developed, students should become more and more capable of using the information resources available by library, in order to access and retrieve as much information as possible.

### **Level of Library's support**

PhD students:

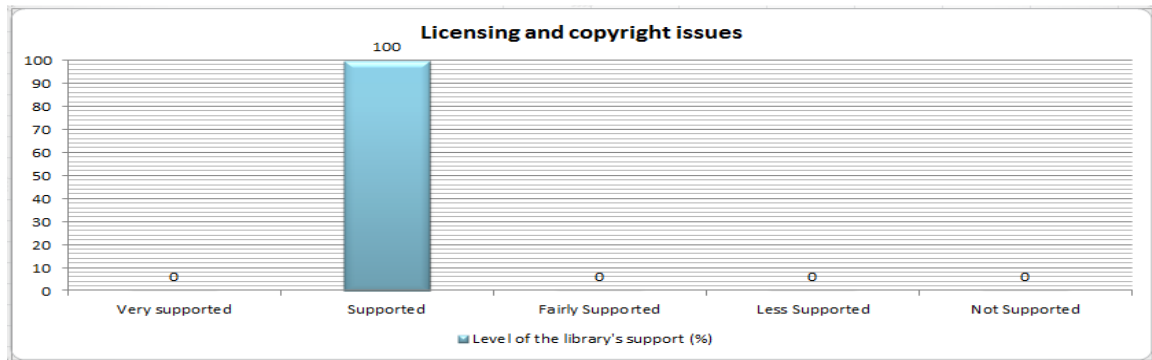


Regarding the level of library's support, 47% of the PhD students considered to be “fairly supported”, 33% of the PhD students “less supported”, 7% of the PhD students “very supported”, “supported”, and “not supported” by librarians.

Through the website of each library, students didn't perceive any resource in open access, as the follows comments demonstrates:

*“I think library don’t has any information resource in open access, at least that I’ve perceived” (Respondent 15, 16.09.2011)*

**Information Literacy Providers:**



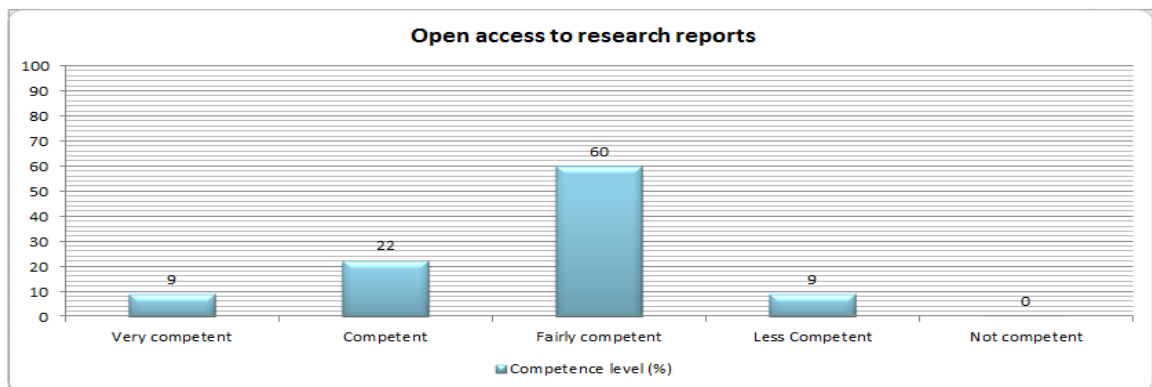
What the librarians interviewed said, regarding their support, is that this competence is supported by library. In other words, PhD students could ask librarians to help them in this issue.

**Comparison:**

So exist a considerable gap between these assessments of PhD students and information literacy providers. This gap could be due to the fact students don’t know what information resources library has in open access.

**Competence level**

**PhD students:**



Regarding the level of students' competence, 60% of them said they were "fairly competent", 22% of the PhD students were "competent" and 9% of the PhD students "very competent" and "less competent". What students most argued about was that:

*"This is not a competence that just depends of me, if don't are information resources in open access in my area what could I do? Nothing" (Respondent 24, 18.09.2011)*