

ARMANDO MALHEIRO DA SILVA  
VIVIANA FERNANDEZ MARCIAL  
FERNANDA MARTINS  
[Eds.]

# A LITERACIA DA INFORMAÇÃO EM PORTUGAL

UM DIAGNÓSTICO, UM MODELO E  
UMA REFLEXÃO PROSPETIVA  
(2007-2010)

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Editores: Armando Malheiro da Silva, Viviana Fernandez Marcial, Fernanda Martins

Autores: Armando Malheiro da Silva, Viviana Fernandez Marcial, Fernanda Martins, José Azevedo, Maria Manuela Azevedo Pinto, Susana Guedes, Leticia Silva, Maria Helena Padrão

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ARMANDO MALHEIRO DA SILVA  
VIVIANA FERNÁNDEZ MARCIAL

**Resumo:** Com esta comunicação pretende-se apresentar um projeto que, embora focado no caso específico de Portugal, faz uma abordagem científica dos desafios do Espaço Europeu do Ensino Superior (EEES) e do seu impacto no campo da literacia da informação, considerando o actual contexto da Sociedade da Informação. As principais questões a que se pretende responder são: entender como os estudantes universitários enfrentam as novas competências exigidas pela criação do EEES; saber como esses alunos estão preparados em termos de competências de informação, em três momentos diferentes, isto é, antes da universidade, durante o período de frequência da universidade e no final do diploma universitário. A abordagem inter e transdisciplinar entre a Educação, Ciências Cognitivas e Ciência da Informação é claramente indicada na epistemológica e no modelo teórico que o sustenta, beneficiando da interação entre as necessidades de informação produzidas no contexto educacional e o universo informacional do aluno e sua dinâmica, sem esquecer de considerar as conexões entre o comportamento informacional do aluno e o seu contexto e as exigências pessoal e social. O estudo será realizado numa escala nacional, de modo a permitir comparações entre as regiões com diferentes níveis de desenvolvimento. A amostra deverá incluir estudantes de ambos os ciclos de estudos. A metodologia utilizada neste estudo será de dois tipos, pesquisa qualitativa e quantitativa. A pesquisa qualitativa permitirá obter preciosos indicadores sobre o comportamento informacional, as expectativas, as necessidades e o uso da informação dos alunos. Os indicadores obtidos na pesquisa qualitativa serão utilizados para conceber questionários que serão aplicados em 17 escolas secundárias e 17 universidades, numa amostra estimada de cerca de 2.000 estudantes. O resultado final desta pesquisa será a construção de um mapa do comportamento informacional, a nível universitário, bem como o desenvolvimento de um modelo relativo à promoção das competências da informação nos alunos de universidades Portuguesas.

**Abstract** With this communication we intent to present a project which, although focused on the specific case of Portugal, intents to make a scientific approach of the challenges of the European Higher Education Area (EHEA) and its impact in the field of the information literacy, considering the actual context of the Information Society. The main questions that it intents to answer are: understand how the university students face the new competences required by the creation of the EHEA; know how these students are prepared in terms of information competences, in three different moments, i.e., prior to the university, during the university frequency period and at the end of the university degree. The inter and transdisciplinary approach between the Education, Cognitive Sciences and Information Science are clearly stated in the epistemological and theoretical model that supports it,

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<sup>25</sup> Silva, M. A. M. & Fernández Marcial, V. (2010). In H. K. Achleitner & A. Dimchev (Eds.) *Globalization and the Management: papers from the international conference held in Sofia, Bulgaria, 12-14 November 2008* (pp. 47-56). Sofia: St Kliment Ohridski University.

profiting of the interaction between information needs produced in the educational context and the student's informational universe and its dynamics, without forgetting to consider the connections of student's informational behaviour with their personal and social context and demands. The study will be performed on a national scale, in order to allow comparisons between regions with different development levels. The sample will include students from both study cycles. The methodology used in this study will be divided in two areas, qualitative and quantitative research. The qualitative research will permit to obtain precious indicators about the students' information behaviour, expectations, needs and use of information. The indicators obtained in qualitative research will be used to design questionnaires, which will to be performed in 17 high schools and 17 universities, with an estimated sample of approximately 2000 students. The final result of this research will be the design of an informational behaviour map, at the university level, and the development of a model concerning the promotion of information competences in Portuguese university students.

## Introduction

To develop an information literacy project in Portugal we had to consider the national and international context. In the first case, we analyzed and studied the IL Portuguese bibliography production to know the level of implementation of it. In this process we could check two aspects, one was that the theme was still in an incipient state, and two was that there weren't any Portuguese projects similar or with the same aims and approach. In relation with international area we detected a very high bibliographic production, especially between middle of 90's and first years of this century. But we did not found initiatives where a research group tries to make an IL diagnosis of a country. Some research investigated about a group of library users or a group of students but there wasn't an integrated and global perspective.

The major purpose of this research is to investigate the information competences levels in Portuguese universities students. But to get these results we need to hold other objectives. We have considered education as a system. For this, we decided to analyze precedent educational level, the high school. We understand that information competences acquired in this level are going to determine the information behaviour in university students. A secondary objective in our project is to investigate how students arrived to university level. For this, we investigated not only information skills in university students also high school student's population.

We can divide our project in two important phases: diagnosis and design of strategies. Final aim is to define an information skill strategic plan in order to adapt the Portuguese universities to EHEA and Information Era. Although, our purpose will not be complete if we don't consider a last objective which is to sensitize academical and political authorities on information literacy problematic.

In connection with our aims we part from several ideas in order to develop eLit project.

They are:

- a) It is necessary to carry out a specific study in Portugal with the purpose of determine information literacy level;
- b) In order to determine the aptitude and attitude of the university students the higher education information literacy level must be assessed;
- c) The informational background is potentially different in distinct geographic areas of Portugal;
- d) The information behaviour is connected to expectative, needs and lifestyle;
- e) The creation of information literacy strategic program would be a warrant to an optimal way to adapt Portugal to the EHEA and to the Information Era.

Not dissociated and functioning as a structural reference of this project is the definition of a theoretical-practical model that must be reached in order to show the

importance of the connection between information literacy and information behaviour, as we have described before.

## **Theoretical point of view**

According to these conceptual premises there are some inevitable inferences implied in the theoretical corpus on which this project is based and from which the results of the research will interpreted:

- (a) information and explicit knowledge are synonyms, both differing from cognition (in which the concept of implicit or tacit knowledge becomes dilute);
- (b) information and communication are not symmetric concepts but rather complementary and indissociable;
- (c) information (or explicit knowledge) comes from a binomial, which we can characterize referring to Reuven Feuerstein, a Piagetian psychologist (Varela, 2006), to whom biological ontogeny (which considers the human being as a set of cells, connected with the environment) continuously interacts with the socio-cultural ontogeny (responsible for the social, moral and communicational structure of the human being);
- (d) information substantially differs from document, although a document cannot exist without it;
- (e) from the perspective of Information Science, information literacy is related to the process of learning and acquiring competences and skills directly connected with the creation, search, organization, storage, diffusion, transmission and transformation of information or knowledge;
- (f) information literacy is a fundamental topic within information behaviour, having developed significantly in the USA and disseminated from there; and
- (g) the Information Science approach to information literacy presumes a natural and fertile interdisciplinary intersection with Education Sciences, Cognitive Psychology and the Neurosciences.

These assumptions allow us to explore how the approach to information literacy is built in two complementary moments or periods: (1) a period that is internal or inherent to Information Science; and (2) and a period that is external to Information Science or interactive with other approaches. In the first period it is important to understand that which can be specific to Information Science. To this end, it is urgent to highlight the following statement from a recently published note on information literacy: based on this wider spectrum, in Information Science it is convenient to work with the concept of information literacy to refer to the competences and selective and synthetic ability to search for and use information. (...) Determine the type of learned

competences, as well as the spontaneous or induced needs, during the learning process, in what concerns the search, reproduction/reference (citation), interiorization and communication of information (Silva, 2006, pp. 153-154). It is also important to remember, as a key mission of Information Science, the study and determination of individuals in their various contexts, of their need for information, of their performance in terms of use and communication of information with a specific purpose, generating new information and creating new information needs; of their efficiency in considering the implications of their actions and the knowledge generated, concerning ethical, political, social and economic aspects, performing intelligent interventions (Dudziak, 2001); and, last, of their ability to independently learn during life, assuring a continuum of competences which interact with the social, professional and personal demands.

The scientific investigation of the above-mentioned aspects leads, inevitably, to degrees of demand and depth that imply a dialogue between Information Science and other scientific disciplines. Among these scientific disciplines, Psychology and Pedagogy have a more relevant role, but we must also consider the Sociology of Education and Culture. Thus, we have designed a new model that sustains and explains our research. Two key aspects have been integrated in the model: information literacy and information behaviour. In all the literature dedicated to information literacy we did not find a model that explains this concept as a process. On the other hand, in the area of information behaviour, the contribution of Tom Wilson (1999, 2000) is very important but requires a new approach where access to, the evaluation and communication of information should be integrated, an approach which projects its transversal dimension on to every aspect and situation of social life and not only on those where the subject/person interaction occurs, or in conventional services and/or technological information systems.

In Appendix A, we present our methodological proposal. This model assumes that information skills are co-determined, at first, by environmental conditions and by human action, contextually and situational focused. This environment includes political, economic, legal, social and cultural factors. This situation cannot be changed by students but does influence them. For example, the creation of the EHEA has brought about changes in the university students' life but they cannot avoid this process. On the contrary, they must adapt to it. If an environment cannot be changed by students, the context becomes all the more pressing for them. Thus, we distinguish these two concepts. Environment refers to a generic framework where, within the reality of a country, broader international community or even a diffuse geographical-civilizational sphere (such as the Western World), human and social life is contextually and structurally being developed, including the even more intense and extensive activity developed in cyberspace. The context is a more personal situation, not only in terms of family, but also in academic, psychological, educational terms and, in general, all matters directly related with students. Environment determines the context, and context is the way to understand the extension and characteristics of the environment, as well as of its particularities.



We believe that motivation defines information needs. Motivation will be determined by the way of life, aspirations, familial influence and other aspects that shape a student's context. In other words, a student's context influences information needs. This reference is particularly important in our study. An IL program will never change the information behaviour of students if they do not have an internal mechanism that facilitates a change in conduct. Thus, information needs determine the way in which student's access information. If a student has low aspirations the information resources used to satisfy his/her information needs will also be low. We also consider that in the Information Era students can satisfy information needs in different ways. Not only in a formal way (library, educational resources), but also in an informal way, using different media, undoubtedly the Internet, but also the radio, television, videogames and people (teachers, friends, family), among others. When students access information a process of evaluation and selection is automatically activated. Obviously this process is influenced by situation, context and environment. If a student uses a restricted number of poor quality information resources, his/her perception about the need to evaluate information will be low. We can postulate that if the risk of the use of information is high, the need to evaluate information and the variety and quantity of indicators is also high. The result of this process is the satisfaction or non-satisfaction of the student. If he/she is satisfied, the information will be used and communicated in any format and for any purpose. Consequently, a certain use of information leads to a new reality and, thus, to new expectations and new questions, and finally new information needs appear. In this process, the usual situation is that the student uses a formal channel to interpret and access information. This formal channel is represented by the education system, that is, teachers and an academic or school library. But, what happens when the student is not satisfied with the information results?

First, the information is not used; second, the information cycle is subverted because a frustrated process leads to a weak formulation of an information need. In this case, students reject formal channels and start to use informal methods, such as Google.

## **Practical approach**

With this theoretical basis we have planning and carry out our research. First, we identified our population and research's sample. For this we applied following criteria:

- It is necessary to investigate the same geographical area (mostly city) for high school and university;
- The Portuguese selected cities are: Porto, Vila Real, Bragança, Covilhã, Castelo- Branco, Coimbra, Lisboa, Évora, and Faro(see attach 2)

- The selected regions reflect different socioeconomic situations;
- We try to be present north, center and south of the country and we also combined
- Littoral and countryside area;
- The sample includes students from the last year of high school education (12<sup>th</sup> grade) as well as university students (of the 2<sup>nd</sup> year). The idea is, at this moment, to compare the skills in two different moments: prior to the university and during the university period;
- We have selected 18 high schools according a national ranking (published in the “Student Guide” of the national newspaper Expresso, 3<sup>rd</sup> of November 2007). We chosen two schools by city, the best and worse one (when possible);
- We applied the survey to all the 12<sup>th</sup> grade students in order to cover all the existing areas and have the participation of a reasonable number of students;
- In higher education, we differentiated between polytechnic and universities students because we considered that there is going to be different levels of information literacy;
- The selected Universities are: University of Porto, University of Trás-os-Montes e Alto Douro, University of Coimbra, University of Beira Interior, University of Évora, University of Lisboa / Universidade Nova de Lisboa / Universidade Técnica de Lisboa and University of Algarve;
- In all this universities we selected the same degrees: Psychology, Civil Engineering, Biochemistry, Architecture, Administration, Languages and Literatures;
- In polytechnic area we chosen Instituto Politécnico do Porto, Instituto Politécnico de Bragança, Instituto Politécnico de Castelo Branco, Instituto Politécnico de Coimbra and Instituto Politécnico de Lisboa;
- In this case, we have selected the following careers: Civil Engineer, Administration and Nursing;
- In all segments we apply the survey to all the students in order to consider, in almost cases, a minimal number of 50 students.

The research method that has been applied is divided in two approaches: qualitative and quantitative. The qualitative research (interview to the focus groups) permitted to obtain valued indications about the information behaviour, expectative, needs and the use of information. The indicators obtained in qualitative research were used to design the model of the questionnaires.

We retrieved and consult the most important literature on information literacy. With this information we elaborated a grill whit the main concepts, models and indicators. Based on the principal models we designed a mix of items that will integrate the script of the interview. The interview was applied to a reduced number of students of high school and university at Porto city, in January 2008.

This interview, in a total of 41 questions, was divided in four main groups: Needs; Research (and evaluation of the research); Use (and evaluation of the results and of their application); Ethics. It was applied to three focus groups: two in the 12<sup>th</sup> grade of high school of the secondary school; and one of the 2<sup>nd</sup> year of the higher education level. One of the groups of the secondary was composed by 9 students of the 12<sup>th</sup> grade of Escola Secundária Rodrigues de Freitas, from Language and Literatures and of Sciences and Technologies areas. The other group was composed by 8 students of the 12<sup>th</sup> grade of Escola Aurélia of Sousa, from Arts area. The university focus group was integrated by 8 students of the 2<sup>nd</sup> year of the degree course in Sociology of Faculty of Arts of the University of Porto.

With the analysis of the information results of qualitative phase we design a draft of questionnaire. This draft was discussed inside the *eLit.pt* research team. Then we initiated, at April 2008, the quantitative phase. This period started with a pilot stage. The survey was carried on a group of 28 students from 12<sup>th</sup> grade of Escola Secundária Rodrigues de Freitas. In university, the questionnaire was tested in 19 students of Information Science of Faculty of Arts of University of Porto. The obtained answers were introduced in the statistical software named SPSS, version 15.0, and were subject of a descriptive analysis. With the pilot stage analysis results, the *eLit.pt* group discussed changes and a new proposal for the questionnaire emerged. On May 2008, survey was initiated with the final version integrating 54 questions. It has four kinds of questions. There are:

- Basic group: Included familiar and scholar context. We define context as a space where the students develop his/her information behaviour structure. Where they configure a way to face to the information literacy.
- Functional group: Integrated by mediation role of institution as library and school.
- Transversal group: Included all the question relation with the way that students mixer and use diverse information. For example: information access, information evaluation and use.
- Introspective group: Internal mechanism (motivation) linked with information need. We present here the results of the first results obtained from the survey applied in May, June, September and October 2008. The sample is integrated by 1624 students of institutions of Porto, Vila Real, Bragança, Coimbra, Covilhã, Castelo Branco and Lisbon. Of these, 1242 are students of the higher education, while the remaining ones 346 are for high school. We analyzed results in SPSS 15.0

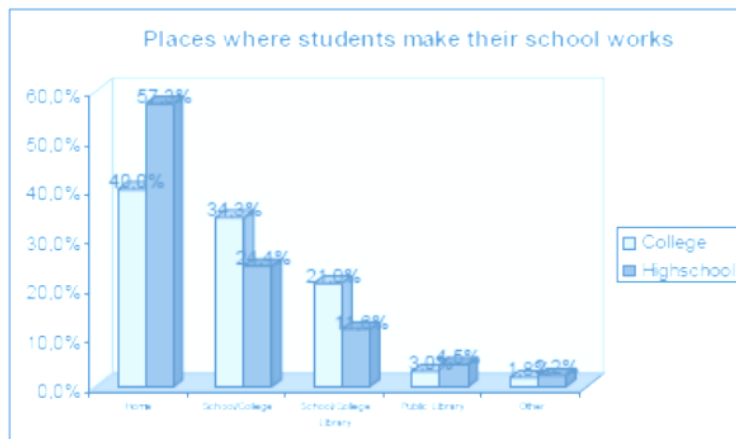
When we analyzed surveys first results we can detect that information literacy level in high school and university's students is almost the same but certainly in some indicators universities students have best results. In our research we can confirm some ideas or hypotheses. Some of them are:

- a) Young generation have a very high access to information technology infrastructure. 64% of high school and 72,6% of universities students have 1 or 2 computers at home. In both, the 90% have internet connection at home. Almost 100% of both segment manifested to get net access at school/university.
- b) Young people used frequently Internet and they prefer access to it from home. This information connects with results obtained when they are question about place where they do homework.
- c) In this sense we confirm that students are using general resources, we mean not qualified resource as virtual library. If we can explain this situation with the absence of presence of ICT training we can verify that this variable has not relationship. The values in two segments are different, while 97,1% of high school' students manifested to get training in school on technology , only the 52,3% of university's students are this kind of instruction. But information behaviour is the same.
- d) Leisure is the major motivation for use information resources. We can confirm that Youtube and Messenger have a very high uses in our sample.
- e) Our investigation shows that students have a high number of homework per year. Then, 76,8% of high school make 2-4/year while 73,2% of universities have 2-6 one/year. But the question is: what kind of resource is using them for prepare their homework?
- f) We can answer that Wikipedia is a very demanded resources use frequently or very frequently by 56 % of high school students and by 54,5 % universities students. Also teacher note are very frequently use by 68,9% and 79,7% respectively. But digital library is almost never used. Only 14.2% of universities and 3,6% of high school manifested uses it. Similar values appear for library web site use.
- g) In connection with this idea, we confirm that library use is low. At least low that we hope. It is particular worrying for public library. To confirm this we present this data. A 85,7% of higher school students and a 82,3% of universities students declares that never o rarely use it.
- h) About school and academic library we detected different behaviour between our two segments. First difference is that while 59,1 % of the students of high school indicates that never or rarely use the school library, this percentage in university student descends to 23,8 % and almost 50 % declares to come to the university library frequently. Second, university

students made a better use of the library resources of than another segment. This way while 88.6 % of the students of high school indicate not to use the OPAC near 30 % of the university students shows use this one with certain frequency. Something similar happens with the use of the databases and the use of the documents of free access. Third, it is necessary to emphasize that the values in two segments are not excellent, but near 90 % of the students of high school and of 80 % of the university students indicate that they not have difficulties at the moment of acceding to the resources of the library.

eLit.pt project will be finish on November 2009. We cannot to express final and definite conclusion about our research. Anyway we can identified some trends, such as, motivation determine information behaviour, information literacy in university's students is better that high school students and even though these results refer to Portugal, we cannot talk about an isolated and individual situation because, although considering different contexts, other papers and research have shown similar results and it will be necessary develop similar projects in other countries, namely in the European area.

Gráfico 6- Places where students make their school works





## 7 INFORMATION LITERACY IN PORTUGAL A perspective from European higher education area<sup>26</sup>

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VIVIANA FERNÁNDEZ MARCIAL  
MARIA MANUELA PINTO  
LETICIA SILVA

**Resumo** Este trabalho toma como referência geral o Espaço Europeu do Ensino Superior (EEES) que se empenhou em criar uma abordagem educativa transversal a todos os países da União Europeia. Um novo modelo educacional deve prever que o desenvolvimento de novas capacidades e competências de informação constitui um dos requisitos mais importantes de que os estudantes universitários precisam na Era da Informação. Essas capacidades foram efetivamente priorizadas na concepção do modelo educativo europeu e, conseqüentemente, deveriam ter impacto sobre o processo de ensino-aprendizagem.

Assim, é importante conhecer e entender como esses alunos estão preparados em termos de competências e capacidades relativas ao acesso, utilização, (re)produção e difusão da informação recolhida e aplicada em diferentes contextos. Também é necessário estabelecer uma conexão entre a formação e a aquisição de competências de informação antes da entrada na universidade, durante o período de frequência universitária e no final do grau universitário.

Isto configura uma abordagem abrangente que vai considerar o contexto educacional, o comportamento informacional dos alunos e os seus contextos e exigências pessoais e sociais.

O projeto de investigação que se encontra a decorrer sustenta o presente trabalho e incorporou estes elementos que são os seus aspetos centrais. Este projeto configura um estudo sobre o comportamento informacional centrado na questão da literacia informacional dos modelos atuais de aprendizagem portuguesa e europeia, na determinação das competências adquiridas contextualmente, e nas capacidades intrínsecas para procurar e utilizar informação.

O modelo teórico-prático em desenvolvimento contribuirá para a definição de uma estratégia que irá apoiar o esforço de universidades portuguesas neste domínio.

**Abstract** This paper takes as its general reference the European Higher Education Area (EHEA), whose creation endeavoured an educational approach across all the European Union countries. A new educational model must foresee the development of new skills and information skills constitute one of the most important requirements that university students need in the Information Era. These skills were effectively prioritized in the conception of the European educational model and, consequently, they should have an impact on the teaching-learning process.

So, it is important to know and understand how these students are prepared in terms of competences and skills, regarding the access to, use, (re)production, and diffusion of information gathered and applied in different contexts. It is also necessary to establish a connection between training and the acquisition of information skills prior to university, during the university attendance period and at the end of the university degree.

This configures a comprehensive approach that will consider the educational context, the students' informational behaviour and their personal and social contexts and demands.

An ongoing research project, that supports the present paper, has incorporated these elements and they are positioned at the core of the work. It configures an information behaviour study focused on the issue of information literacy in the current Portuguese and European learning models, the determination of the contextually acquired competences, and the intrinsic abilities to search for and use information.

The theoretical-practical model in development will contribute to setting a strategy that will support the effort of Portuguese universities in this field.

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<sup>26</sup> Fernández Marcial, V., Pinto, M. M. G. & Silva, L. (2009). [CD-ROM]. In *International Symposium Bobcatsss, 17º, Porto, 2009: Challenges for the new information professional*. Porto: Faculdade de Letras da Universidade do Porto.

## Introduction

This paper presents the first results of the research project Information Literacy in the European Higher Education Area: Study of the Situation of Information Skills in Portugal (eLit.pt) that is being developed in Portugal since June 2007 and will be concluded in December 2009. Focusing on the field of information literacy (IL), the eLit.pt project is funded by the Science and Technology Foundation (Ministry of Science, Technology and Higher Education) and coordinated by Professor Armando Malheiro da Silva from the University of Porto, Information Science area. The multidisciplinary project team includes five researchers (Information Science, Cognitive Psychology, Sociology and Linguistics), a research consultant and two scholars.

This project connects two key factors that determine the current European educational system: the European Higher Education Area (EHEA) and information literacy. The second key factor is part of the EHEA, which we can verify in the Tuning project, but not only as a consequence of the needs of the Information Era regarding information literacy. In fact, it reflects a reform process that includes educational structures, content of studies, players, roles, profiles and competences, in a dynamic context that combines knowledge, understanding, skills and abilities. An integrated education for the student, embracing the acquisition of generic, transversal and specific competences (knowledge, capacities and skills), gives priority to the “access to” and “use of” information, which is considered fundamental for his/her future role in society: as a professional, as a citizen, as a person.

This is an example of a change defined by the American Library Association (ALA) as follows:

Information literacy has progressed from the simple definition of using reference resources to find information. Multiple literacies, including digital, visual, textual, and technological, have now joined information literacy as crucial skills for this century" (American Association of School Librarians [AASL], 2007)

Even though the term information literacy originated in the 1970s, its effective development is related with IT expansion and the evolution of the Information Era. In the 1990s, different countries initiated a reorganization of their educational systems. In 1994, the USA defined its education goals - National Education Goals - where it was demonstrated that information literacy is a key factor in the Information Era. In this period, European countries such as Finland or the United Kingdom also developed similar actions.

Information Literacy is a core issue for governments and professional, cultural, organizational and educational institutions. Organizations such as UNESCO, OECD and the European Union have expressed a keen interest in this matter. In the European context, several projects have been developed, such as DEDICATE (Distance Education Information Course Through networks), EDUCATE (EnD User Courses in information Access through communication Technology), VERITY (Virtual and Electronic Resources for Information Skills Training for Young People), among others.

With the eLit.pt project we intend to study the issue of information literacy in Portugal taking as a starting point the educational context modelled by the recent impact of the Bologna Process and assuming the interpretation and conceptualization of this phenomenon in the scope of the theoretical corpus of Information Science, as developed

at the University of Porto by authors like Armando Malheiro da Silva or Fernanda Ribeiro, among others, and which is, since 2001, at the basis of a new education model in Information Science (IS) at the University of Porto (Ribeiro, 2007).

## Theoretical basis

Information Literacy is an issue to which studies started to dedicate greater attention in the 1990s. However, the term was first used in 1974. P. Zurkowski, president of the US Information Industry Association at the time, used the phrase *information literates* to describe people *trained in the application of information resources to their work*. In this sense Burchinall, in 1976, expressed that *to be information literate requires a new set of skills. These include how to locate and use information needed for problem-solving and decision-making efficiently and effectively*.

In the next decade, information literacy came to the fore in the context of education. In 1989, ALA provided this definition:

To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information. "Ultimately, information literate people are 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. They are people prepared for lifelong learning, because they can always find the information needed for any task or decision at hand.

Bruce (1996) defined in a concise expression the essence of IL: "Information literacy is usually described as the ability to locate, manage and use information effectively for a range of purposes". From then until now, the issue of information literacy has always been connected with the educational system, in particular with the university level, and also with information seeking and retrieval in the context of libraries. Diverse institutions in the United States (ALA), the United Kingdom (Sconul) and Australia (CAUL) have identified several standards in information literacy. All of them have a common spirit. The first was defined by the American Library Association in 2000, as follows:

...Standard 1: [The person] who is information literate accesses information efficiently and effectively Standard 2: [...] who is information literate evaluates information critically and competently Standard 3: who is information literate uses information accurately and creatively Standard 4: who is an independent learner is information literate and pursues information related to personal interests. Standard 5: who is an independent learner is information literate and appreciates literature and other creative expressions of information Standard 6: who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation Standard 7: who contributes positively to the learning community and to society is information literate and recognizes the importance of information to a democratic society. Standard 8: who contributes positively to the learning community and to society is information literate and practices ethical behaviour in regard to information and information technology Standard 9: who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information (American Libray Association [ALA], 2000).

The information literacy problem is not an isolated aspect in Information Science (IS/LIS). We interpreted this as a part of information behaviour studies, led by authors like Dervin & Nilan (1986), Nicholas J. Belkin (1993), Ross J. Todd (1999) and Tom Wilson. With these references we believe that the development of information skills is connected



to others factors. In particular, we explore the idea that there are motivational factors that determine information behaviour, but without forgetting that we should always understand their multifactorial articulation, that is, their interdependency with the cognitive, emotional, social-mimetic and economic factors, among others.

To understand this positioning, it is important to briefly highlight here some aspects of our theoretical corpus, namely the operative definition of information, with all its theoretical and practical implications: information is a scientific object which entails the structured set of mental and emotional codified representations (signs and symbols) and modelled with/through the social interaction, able to be recorded on any medium (paper, film, magnetic tape, compact disc, etc.) and, therefore, communicated in an asynchronous and multidirectional way (Silva, 2006, p. 150). Information is the object of Information Science, which benefits from the adoption of a method, also employed by other Social and Human Sciences, and it is conceived as a social science that investigates the problems, topics and study cases related with the information/communication phenomenon perceivable and cognoscible through the confirmation, or not, of the intrinsic proprieties of the information flow origin, organization and information behaviour (origin, collection, organization, storage, retrieval, interpretation, transmission, transformation and use of the information) (Silva, 2006, pp. 140-141). This conception assumes the existence of an emergent paradigm – post-custodial, informational and scientific – which tends to substitute or dominate the still dominant paradigm – the custodial, historical, patrimonial and technical paradigm (Silva, 2006).

According to these conceptual premises there are some inevitable inferences implied in the theoretical corpus on which this project is based and from which the results of the research will interpreted:

- (a) information and explicit knowledge are synonyms, both differing from cognition (in which the concept of implicit or tacit knowledge becomes dilute);
- (b) information and communication are not symmetric concepts but rather complementary and indissociable;
- (c) information (or explicit knowledge) comes from a binomial, which we can characterize referring to Reuven Feuerstein, a Piagetian psychologist (Varela, 2006), to whom biological ontogeny (which considers the human being as a set of cells, connected with the environment) continuously interacts with the socio-cultural ontogeny (responsible for the social, moral and communicational structure of the human being);
- (d) information substantially differs from document, although a document cannot exist without it; (e) from the perspective of Information Science, information literacy is related to the process of learning and acquiring competences and skills directly connected with the creation, search, organization, storage, diffusion, transmission and transformation of information or knowledge;
- (e) information literacy is a fundamental topic within information behaviour, having developed significantly in the USA and disseminated from there; and
- (f) the Information Science approach to information literacy presumes a natural and fertile interdisciplinary intersection with Education Sciences, Cognitive Psychology and the Neurosciences.

These assumptions allow us to explore how the approach to information literacy is built in two complementary moments or periods:

- (1) a period that is internal or inherent to Information Science; and
- (2) and a period that is external to Information Science or interactive with other approaches.

In the first period it is important to understand that which can be specific to Information Science. To this end, it is urgent to highlight the following statement from a recently published note on information literacy: based on this wider spectrum, in Information Science it is convenient to work with the concept of information literacy to refer to the competences and selective and synthetic ability to search for and use information. (...) Determine the type of learned competences, as well as the spontaneous or induced needs, during the learning process, in what concerns the search, reproduction/reference (citation), interiorization and communication of information (Silva, 2006, pp. 153-154). It is also important to remember, as a key mission of Information Science, the study and determination of individuals in their various contexts, of their need for information, of their performance in terms of use and communication of information with a specific purpose, generating new information and creating new information needs; of their efficiency in considering the implications of their actions and the knowledge generated, concerning ethical, political, social and economic aspects, performing intelligent interventions (Dudziak, 2001); and, last, of their ability to independently learn during life, assuring a continuum of competences which interact with the social, professional and personal demands.

The scientific investigation of the above-mentioned aspects leads, inevitably, to degrees of demand and depth that imply a dialogue between Information Science and other scientific disciplines. Among these scientific disciplines, Psychology and Pedagogy have a more relevant role, but we must also consider the Sociology of Education and Culture.

Thus, we have designed a new model that sustains and explains our research. Two key aspects have been integrated in the model: information literacy and information behaviour. In all the literature dedicated to information literacy we did not find a model that explains this concept as a process. On the other hand, in the area of information behaviour, the contribution of Tom Wilson (1999, 2000) is very important but requires a new approach where access to, the evaluation and communication of information should be integrated, an approach which projects its transversal dimension on to every aspect and situation of social life and not only on those where the subject/person interaction occurs, or in conventional services and/or technological information systems.

In Appendix A, we present our methodological proposal. It is a consensual model that departs from Silva's ideas and positioning on this matter, which the author elaborated upon in different studies. This model assumes that information skills are co-determined, at first, by environmental conditions and by human action, contextually and situationally focused. This environment includes political, economic, legal, social and cultural factors. This situation cannot be changed by students but does influence them. For example, the creation of the EHEA has brought about changes in the university students' life but they cannot avoid this process. On the contrary, they must adapt to it.

If an environment cannot be changed by students, the context becomes all the more pressing for them. Thus, we distinguish these two concepts. Environment refers to a generic framework where, within the reality of a country, broader international community or even a diffuse geographical-civilizational sphere (such as the Western World), human and social life is contextually and structurally being developed, including the even more intense and extensive activity developed in cyberspace, or “space of flows” (using the very suggestive expression by Castells). The context is a more personal situation, not only in terms of family, but also in academic, psychological, educational terms and, in general, all matters directly related with students. Environment determines the context, and context is the way to understand the extension and characteristics of the environment, as well as of its particularities.

We believe that motivation defines information needs. Motivation will be determined by the way of life, aspirations, familial influence and other aspects that shape a student’s context. In other words, a student’s context influences information needs. This reference is particularly important in our study. An IL program will never change the information behaviour of students if they do not have an internal mechanism that facilitates a change in conduct.

Thus, information needs determine the way in which student access information. If a student has low aspirations the information resources used to satisfy his/her information needs will also be low. We also consider that in the Information Era students can satisfy information needs in different ways. Not only in a formal way (library, educational resources), but also in an informal way, using different media, undoubtedly the Internet, but also the radio, television, videogames and people (teachers, friends, family), among others.

When students access information a process of evaluation and selection is automatically activated. Obviously this process is influenced by situation, context and environment. If a student uses a restricted number of poor quality information resources, his/her perception about the need to evaluate information will be low. We can postulate that if the risk of the use of information is high, the need to evaluate information and the variety and quantity of indicators is also high.

The result of this process is the satisfaction or non- satisfaction of the student. If he/she is satisfied, the information will be used and communicated in any format and for any purpose. Consequently, a certain use of information leads to a new reality and, thus, to new expectations and new questions, and finally new information needs appear. In this process, the usual situation is that the student uses a formal channel to interpret and access information. This formal channel is represented by the education system, that is, teachers and an academic or school library. But, what happens when the student is not satisfied with the information results? First, the information is not used; second, the information cycle is subverted because a frustrated process leads to a weak formulation of an information need. In this case, students reject formal channels and start to use informal methods, such as Google.

## **Aims of *elit.pt***

To develop an information literacy project in Portugal, we had to consider the national and international environment. In the first case, we analyzed and studied the Portuguese IL bibliography production to find out its level of implementation. In this process, we were able to determine two aspects: one was that the topic was still in an incipient state and, two was that there were no other similar Portuguese projects or with the same aims and approach. At the international level, we discovered a very high bibliographic production, particularly between the mid-1990s and the early 2000s. But we did not find any initiatives where a research group aimed to make an IL diagnosis of a country. Some research focused on a group of library users or a group of students but an integrated and global perspective was not found. The eLit.pt project not only aims to cover an entire country – Portugal -, but will also try to connect output and input.

The major purpose of this research is to investigate the information competences levels in Portuguese university students. Our ultimate intention is to find out how university students face the EHEA requirements. But so as to obtain these results, other objectives have to be pursued. We consider education as a system. Consequently, we decided to analyze the preceding educational level, high school. It is our understanding that the information competences acquired at this level are going to determine information behaviour in university students. A secondary objective in our project is to investigate how students arrived at university level. To this end, we also analyzed information skills and information behaviour in high school students.

We can divide our project into two important phases: diagnosis and design of strategies. The ultimate aim is to define a strategic information skills plan in order to adapt the Portuguese universities to the EHEA and the Information Era. However, our purpose would not be complete if we did not consider a final objective which is to raise awareness among academic and political authorities on the issue of information literacy.

In connection with our aims we departed from several ideas as follows:

- a) It is necessary to develop a specific study in Portugal in order to determine the existence, or not, of several information literacy standards;
- b) In order to determine the aptitude and attitude of the university students, the higher education information literacy level must be assessed;
- c) The information background is potentially different in distinct geographic areas of Portugal;
- d) Information behaviour is connected to expectations, needs and lifestyle;
- e) The creation of a strategic information literacy program would be a warrant to an optimal way to adapt Portugal to the EHEA and to the Information Era.

An essential aspect, functioning as a structural reference in this project, is the definition of a theoretical-practical model that must be reached in order to show the importance of the connection between information literacy and information behaviour, as we have described before.

## Methodology

### Population and Sample

Our first idea was to select a sample integrating 2000 Portuguese students. But we moved forward to a new approach and established segments and stratified the sample. Our criteria to select the sample were:

- a) To examine the same type of geographical area (mostly cities) for the high school and university;
- b) The selected Portuguese cities are: Porto, Vila Real, Bragança, Covilhã, Castelo-Branco, Coimbra, Lisboa, Évora, and Faro (see Apêndice B);
- c) The selected regions reflect different socioeconomic situations;
- d) we try to be represent the north, center and south of the country and we also combined coastal and countryside areas;
- e) The sample includes students from the last year of high school education (12th grade) as well as university students (from the 2nd year). The idea is, at this point, to compare skills in two different moments: prior to university entry and during the university period;
- f) We selected 18 high schools according a national ranking (published in the “Student Guide” of the national newspaper Expresso, 3 November 2007). We chose two schools per city, the best and worst one (when possible);
- g) We applied the survey to all the 12 -grade students in order to cover all the existing areas and guarantee the participation of a reasonable number of students;
- h) In higher education, we differentiated between polytechnic and university students because we considered that there were going to be different levels of information literacy;
- i) The selected Universities are: University of Porto, University of Trás-os-Montes e Alto Douro, University of Coimbra, University of Beira Interior, University of Évora, University of Lisboa / Universidade Nova de Lisboa / Universidade Técnica de Lisboa and University of Algarve;
- j) In all these universities we selected the same degrees: Psychology, Civil Engineering, Biochemistry, Architecture, Administration, Languages and Literatures;
- k) In the polytechnic area we chose Instituto Politécnico do Porto, Instituto Politécnico de Bragança, Instituto Politécnico de Castelo Branco, Instituto Politécnico de Coimbra and Instituto Politécnico de Lisboa;
- l) In this case, we selected the following careers: Civil Engineering, Administration and Nursing;
- m) In all segments we applied the survey to all the students in order to consider, in most cases, a minimum number of 50 students.

## **Research method**

As mentioned previously, and among other references, our research considered, as a starting point for the project's theoretical-practical model, Tom Wilson's model (more precisely its macro level). It was the inspiring basis to build a new model adapted to the scope and results of the eLit.pt project.

The research methodology applied is divided in two approaches: qualitative and quantitative. The qualitative research (interviewing focus groups) allowed us to obtain valuable indications about information behaviour, expectations, needs and the use of information. The indicators obtained in the qualitative research were used to design the model of the questionnaires.

We gathered and consulted the most important literature on information literacy. With this information we designed a grid with the main concepts, models and indicators. Based on the main models we prepared a mix of items that were to integrate the script of the interview. The interview was applied to a reduced number of students in high schools and universities in Porto, in January 2008.

This interview, in a total of 41 questions, was divided into four main groups: Needs; Research (and evaluation of the research); Use (and evaluation of the results and of their application); Ethics. It was applied to three focus groups: two in the 12th grade of secondary school; and one in the 2nd year. One of high school groups was composed by 9 students in the 12th grade of the Escola Secundária Rodrigues de Freitas, from the areas of Language and Literatures and sciences, and Technologies. The other group was composed by 8 students in the 2nd year of the degree course in Sociology at the faculty of arts of the University of Porto.

With the analysis of the information results from the qualitative phase, we designed a draft of a questionnaire. This draft was discussed by the eLit.pt research team. The quantitative phase was then initiated, in April 2008. This period started with a pilot stage. The survey was carried out on a group of 28 students in the 12 grade of the Escola Secundária Rodrigues de Freitas. At university level, the questionnaire was tested on 19 students in the Information Science degree at the Faculty of Arts of University of Porto. The answers obtained were processed in the SPSS statistical software version 15.0, and were subject to a descriptive analysis.

With the results of the pilot stage analysis, the eLit.pt group discussed changes and a new proposal for the questionnaire emerged. In May 2008, the survey was initiated with the final version including 54 questions.

## **Questionnaire**

The questionnaire was structured into four main groups of questions (see Appendix A). They were:

- Basic group: Includes family and school context. We define context as a space where the students develop their information behaviour structure. More precisely, context means a space composed by material, technological and symbolic elements

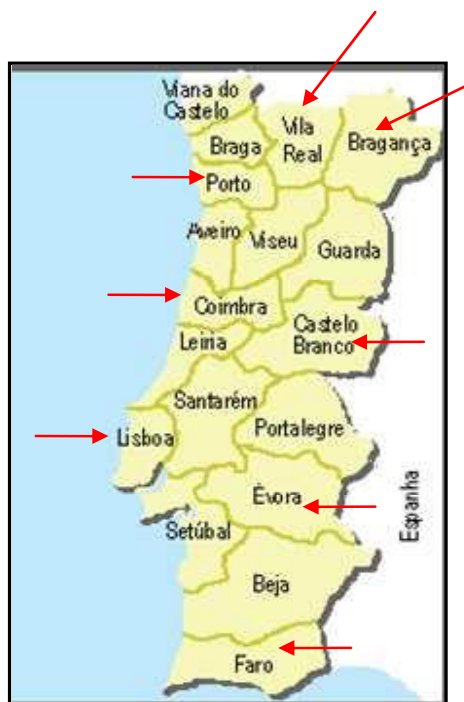
(the institutional dimension of an entity, roles and status of actors) and, in the specific situation of students, it includes the school building (considering here the building itself, the technological structure, and the institution/school) with the roles and social status of the respective actors. Here students configure a way to deal with information literacy.

- Functional group: Includes the mediation role of institutions such as the library and school.
- Transversal group: Includes all the questions related with the way in which students mix and use diverse information. For example: information access, information evaluation and use.
- Introspective group: Internal mechanism (motivation) linked with information needs.

## Preliminary results

We present here the preliminary results obtained from the survey applied in May, June, September and October 2008. The sample includes 1624 students from institutions in Porto, Vila Real, Bragança, Coimbra, Covilhã and Lisbon. There are 1242 students from higher education, while the remaining 346 are from high schools. As was the case in the previous analysis, we used the SPSS statistical software for data processing.

Figura 4



In the analysis of the first results from the surveys, we can see that the information

literacy level in high school and university students is almost the same, although in some indicators, university students clearly obtained the best results. At this time, our research pointed to the confirmation of some ideas or hypotheses, such as:

- a) The younger generation has a very high access to information technology infrastructure. 64% of high school students and 72.6% of university students have 2 or 3 computers at home. In both cases, 90% have an internet connection at home. Almost 100% of both segments confirm the existence of conditions to access the internet at school/university.

Gráfico 7- Number of computers in the household

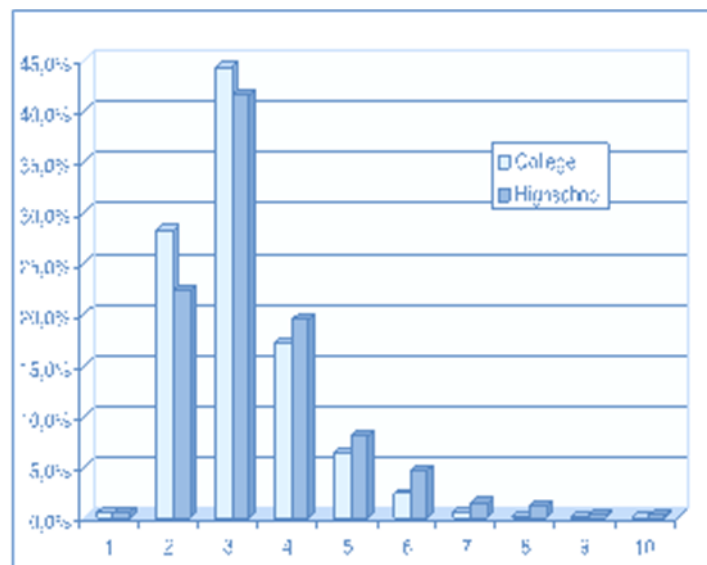
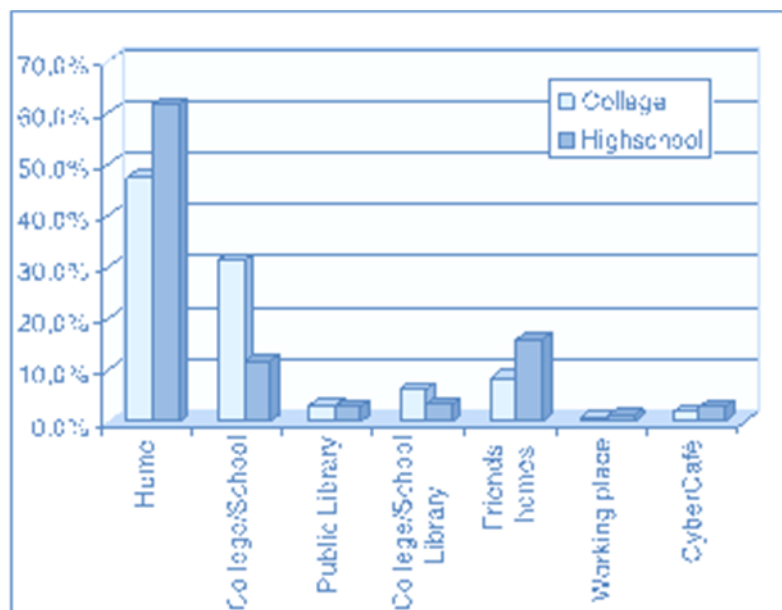


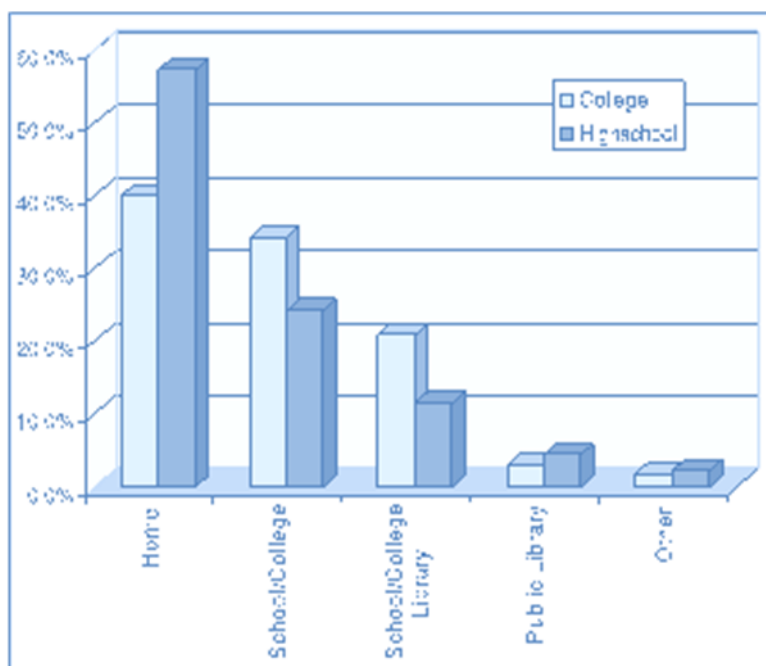
Gráfico 8- Places from which students access Internet





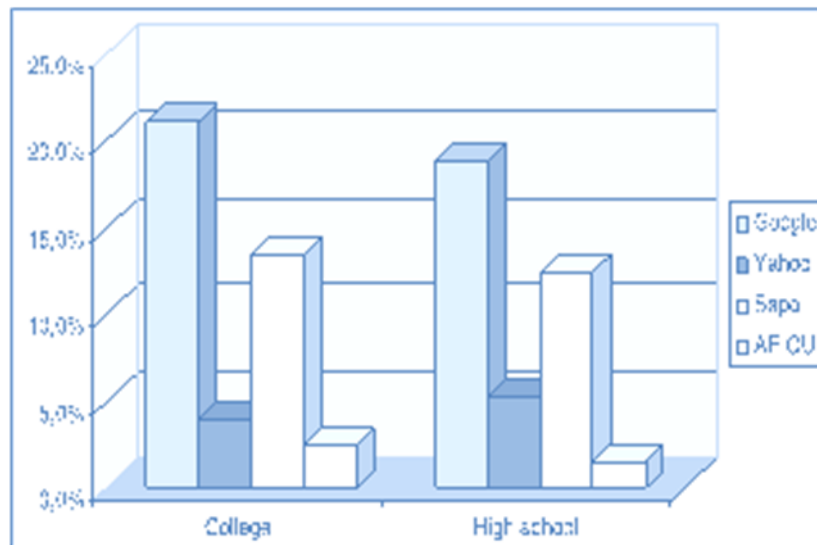
b) Young people use the internet frequently and they prefer to access it from home. This information connects with the results obtained when they were questioned about the place where they do their school work, also at home.

Gráfico 9-Places where students do their school work



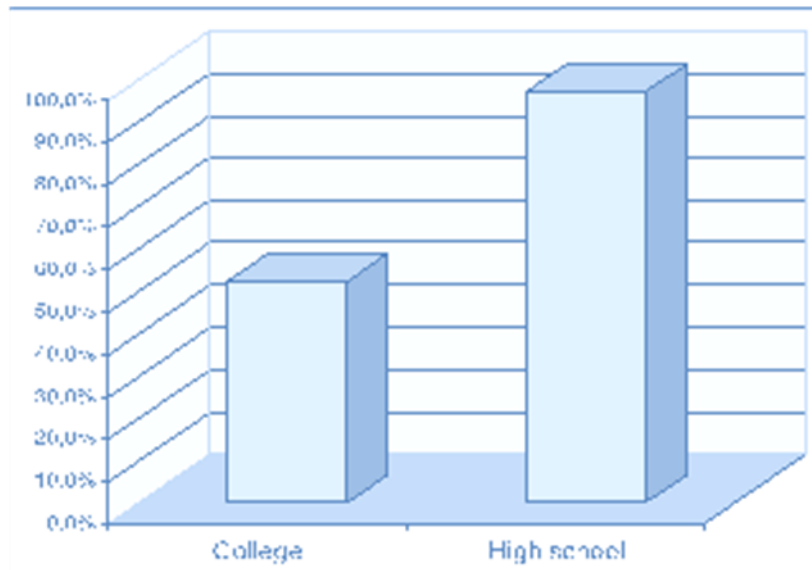
c) Google is the preferred web search engine. Almost 100% of the sample use it frequently or very frequently. Other options such as Yahoo or inclusive Portuguese portals, such as AEIOU, have very low percentages; however, at the national level the Portuguese search engine Sapo is the preferred one.

Gráfico 10- Search engines use: frequent



d) Thus, we confirm that students are using general resources, but this does not mean that they are qualified resources, such as a digital library. If we can explain this situation with the absence or presence of ICT training we can verify that this variable has no relationship. The values in the two segments are different, while 97.1% of high school students declared getting training in ICT at school, only 52.3% of university students have this kind of instruction. But their information behaviour is the same.

Gráfico 11- Students with formal IT training



- e) Leisure is the major motivation for using information resources. We can confirm that Youtube and Messenger have a very high use in our sample.
- f) Our study shows that students have a high number of school assignments per year. Thus, 76.8% of high school students have 2-4/year while 73.2% of university students have 2-6 /year. However only 58% of university students and 65% of high school students have the advice from the teacher regarding the information search, but, regarding the assignment structure we find, respectively, 73.8% and 87.2%.

Gráfico 12- Number of classes with school assignments

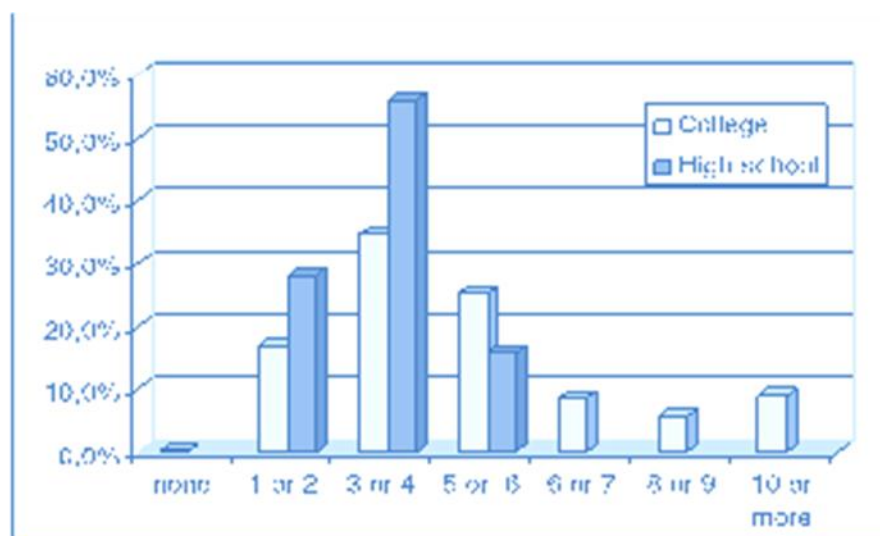
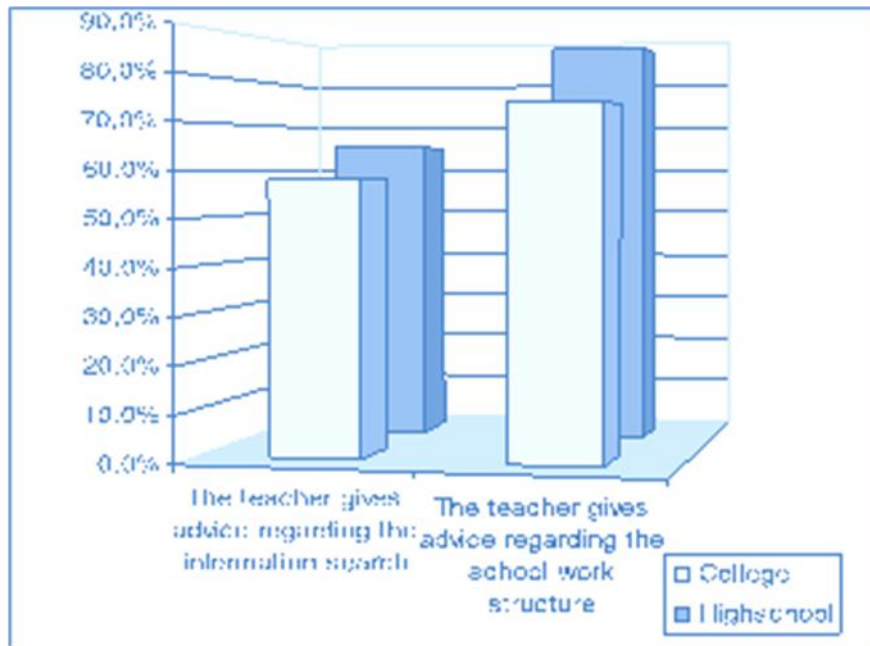
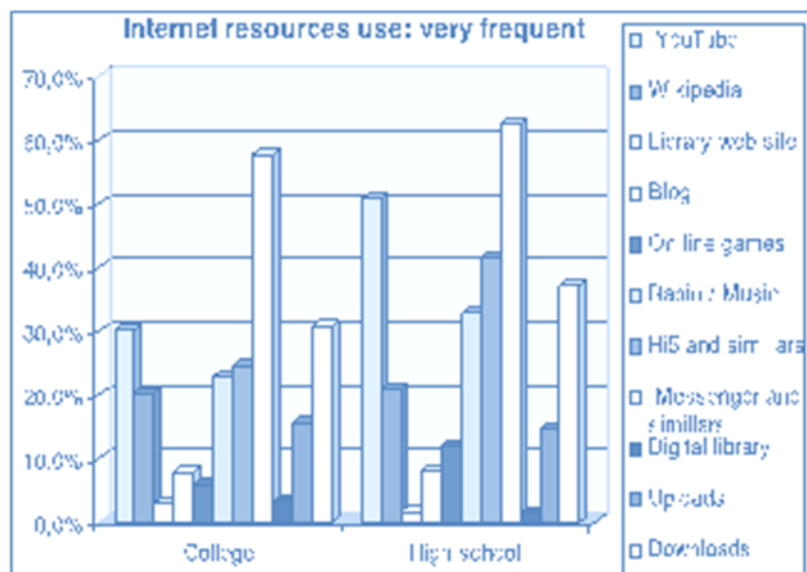


Gráfico 13- Advice from the teacher: YES



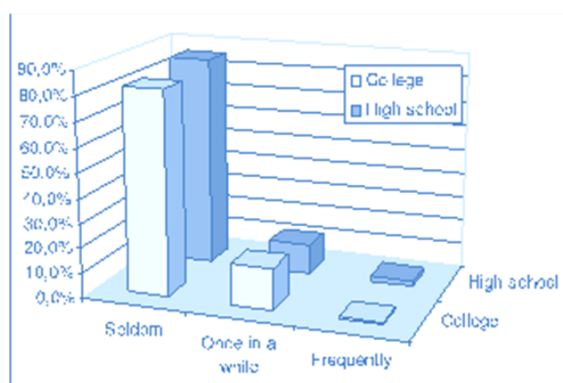
g) But the question is: what kind of resources are they using to prepare themselves? We can answer that Wikipedia is a very sought-after resource, used frequently or very frequently by 56% of high school students and by 54.5% of university students. Also the teacher's notes are very frequently used, 68.9% and 79.7% respectively. But the digital library is almost never used. Only 14.2% of university students and 3.6% of high school students declared using it. Similar values appear for library web site use.

Gráfico 14- Internet resources use: very frequent



- i) In connection with this idea, we confirm that library use is low. At least, lower than we expected. This is particularly worrying for public libraries. To confirm this we present the follow data: 85.7% of high school students and 82.3% of universities students declared that they never or rarely use them.

Gráfico 15- Use of public library



- j) In relation to the school and academic library we detected different behaviours between our two segments. The first difference is that while 59.1% of high school students indicated that they never or rarely use the school library, this percentage in university student decreases to 23.8%, and almost 50% declared going to the university library frequently. Second, university students made a better use of the library resources than the other segment. Thus, while 88.6 % of the high school students indicated not using the OPAC, nearly 30% of the university students indicated using this resource with a certain frequency. A similar trend happens with the use of electronic information resources (digital library, databases, among others) in free access. Third, it is necessary to emphasize that the values in the two segments are not excellent, but nearly 90% of high school students and 80% of university students indicated that they do not have difficulties at the moment in accessing library resources.

Gráfico 16- Use of school library

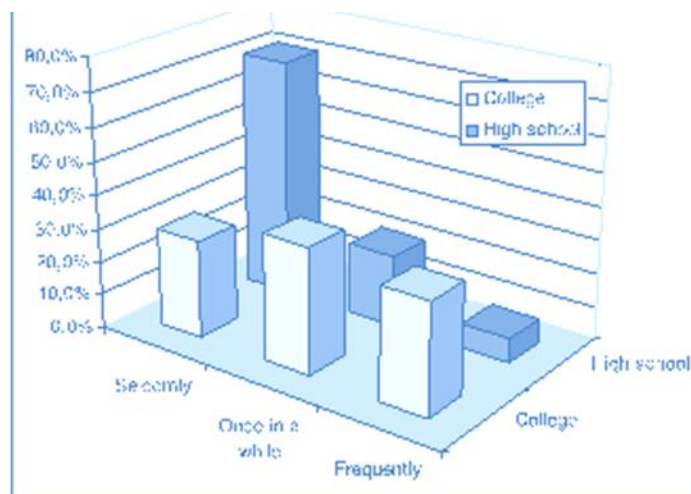
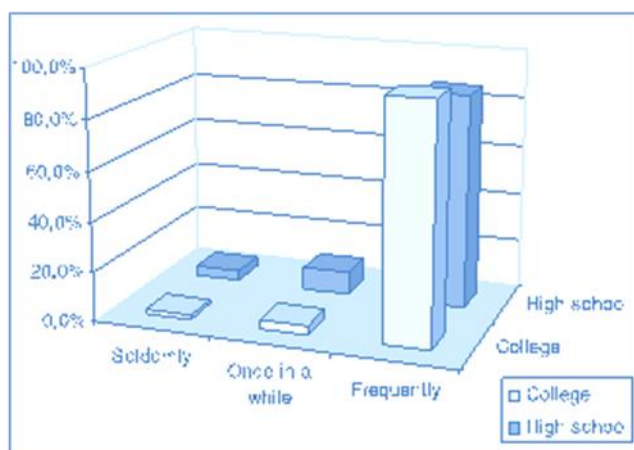


Gráfico 17- How often students access the Internet



- k) With regard to the students' self-assessment, we found similar results. In what concerns the abilities to search information and evaluate and select results, tasks considered by both segments as less important than text writing and results analysis, both considered that they have the adequate abilities to do so, reaching, respectively, around 70.4% and 71%, in universities students, and 62.7% and 67% in those from high school. As for the abilities to systematize the information and produce the work, they also considered that they were adequate, 67.7% in university students and 68.6% in high school students.

Gráfico 18- Phase considered the most important in preparing school assignments

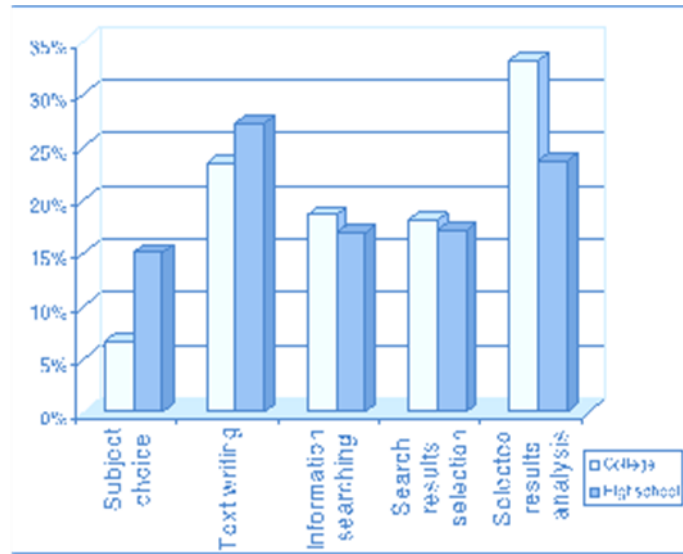
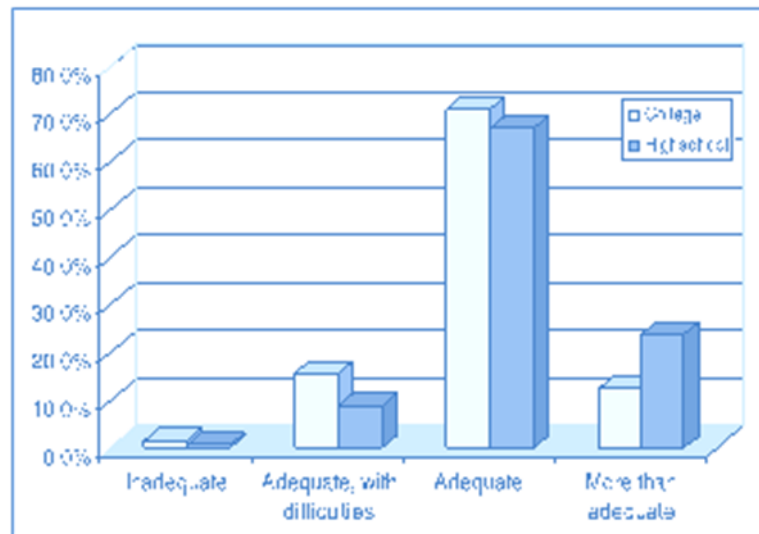


Gráfico 19- Self assessment: ability to evaluate and select the results of an information search



## Conclusions

Given the current stage of the research, the results obtained - preliminary results – are insufficient to draw specific conclusions and how significant they are, considering not only apparent differences but complete statistical tests. Despite this, we can put forward some tendencies.

First, this information seems to confirm the fact that, through our theoretical model, we will be able to explain the information literacy phenomenon. Globally, we can verify that motivation defines information behaviour. For this reason, when a student has greater obligation or commitment to access information, evaluation and use is higher. Thus, it was demonstrated throughout that there are differences in some indicators between university and high school students.

A second idea is that according to the eLit.pt model (see Appendix A), and bearing in mind the results obtained, an operational action is appropriate and necessary, directed at the improvement of the general informational behaviour of high school and university students. This requires closer and more dynamic articulation between the formal education system triad (teacher, student and school library) and the informal level composed by mix groups, without forgetting the role of ICT and its influence on the students' motivation and satisfaction, considering that we are facing a digital native generation.

Third, we can verify even though these results refer to Portugal, we cannot talk about an isolated and individual situation because, although considering different contexts, other papers and research have shown similar results and it will be necessary develop similar projects in other countries, namely in the European area.



