

Designing and Implementing Web-Based Tools to Assess Information Competences of Social Science Students at Spanish Universities*

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Abstract. We describe the process of designing and applying four web-based tools that assess information competences, focused on Social Science students at Spanish universities. We draw on our previous experience in developing web resources, tests and tutorials for learning information skills (E-coms, Alfamecia, Alfinees, Infolitrans, IL-HUMASS). The toolkit includes: 1) a corpus of texts with a controlled degree of difficulty to be used by students when acquiring the required competences; 2) the IL-HUMASS questionnaire, which measures students' attitudes and perceptions on the importance and self-effectiveness of information competences; 3) a knowledge test, organised in four categories (information search, evaluation, processing, and communication-dissemination); and 4) assessment rubrics, designed to prove students' know-how by fulfilling a set of objective tasks. The combined application of these instruments to a sample of students of Social Science degrees allowed us to confirm the internal validity and reliability of our tools.

Keywords: Assessment, information competences, social science students, higher education, information literacy programs.

1 Introduction

The assessment of information competences is probably the most complex part of the process of teaching and learning them. It is a key element of this process, since it

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determines the way students learn, and it is also a requirement to prove the acquisition of knowledge. If this is not properly done, information literacy programs can lose their value. In Higher Education, teaching and assessing information competences might be hindered by a number of factors, such as the lack of expertise in assessment methodologies that lecturers and librarians may hold [1-2], the extracurricular, or even out of the curriculum, nature of this competence until recent times, and the scarcity of general purpose tools that simplify the process of carrying out and assessing tests.

Today, the acquisition of information competences is a requirement for all the degrees at Spanish universities, according to the framework provided by the European Higher Education Area (EHEA), and because of this, most librarians are working together with faculty, using different assessment methods.

In this context, one of the aims of the Spanish network of university libraries, REBIUN, stated in their Strategic Plan 2020 is “to incorporate computer and information competences in a progressive way to university studies as an educational strategy to develop lifelong learning capabilities”. In order to achieve this goal and the curricular implementation of these competences, it is essential to create and validate competence assessment tools. Likewise, an assessment based on a competences’ model cannot be limited to a question-answer test about concepts or to merely testing the degree of correctness in following a procedure. A socio-constructivist model of learning should be able to acknowledge the ability for solving complex information problems that may be typical within a particular social or community practice [3].

For this reason, our research aims to design a set of tools to assess information competences, which can be applied and transferable to different contexts, and which all together lead to an efficient assessment of information-related knowledge among students.

2 Instruments for Assessing Information Competences

A number of projects have been undertaken to design information competences assessment instruments since year 2000. Mainly:

- SAILS (Standardized Assessment of Information Literacy Skills, drawing on ACRL’s standards [4] and designed at Kent State University. Online test with 45-55 questions focused on assessing knowledge, rather than skills.
- Information Literacy Test (ILT). Computer-based test also based on ACRL’s guidelines. Developed by James Madison University (JMU) in collaboration with researchers from the Center for Assessment and Research Studies (CARS) and JMU libraries [5]. It differs from SAILS in the number of items (ILT is a 60-item multiple-choice test) and in that it does not assess ACRL’s guideline 4 (use information to accomplish a purpose) [6].
- iSkills. [7] Test designed at the California State University (CSU) to assess the ability to think critically in a digital environment through a range of real-world tasks. It measures abilities to navigate, understand and critically evaluate the variety of digital information available.

- ISS. Information Skills Survey. Survey designed by Australian librarians, led by Catts [8], to measure information competences among students of Education, Social Sciences and Law according to the standards of the Council of Australian University Librarians (CAUL) and the Australian and New Zealand Institute for Information Literacy (ANZIIL).
- EduDOC-CIUF questionnaire. Based on the Canadian questionnaire CREPUC (Conférence des Recteurs et des Principaux des Universités du Québec) [9]. Used in Italy, Austria, Denmark, Finland, Greece, Sweden, and Belgium, its aim is “first to determine incoming students’ information literacy skills so as to identify their needs and to provide more appropriate services, and secondly to provide university libraries with reliable data to support recommendations for the integration of information literacy courses into the university curriculum” [10].
- IL-HUMASS. Questionnaire designed to self-assess and report university students’ perceptions and expectations about their information competences, developed by Pinto [11].
- INFOLITRANS. Test for assessment and acquisition of the information competence among students of translation and interpreting university degrees. Uses an online set of questions on the information cycle that can be used in the contexts of guided learning, self-learning, and assessment of learning outcomes [12].

In Spain, REBIUN librarians working on learning support organised a conference in 2011 on “Assessing and acknowledging computer and information competences”, and another one in 2012 on the “Results of implementing computer and information competences at universities”¹. Their contents present many advances in terms of theory, organisation, and assessment of the training undertaken, but they do not describe assessment tools to evaluate students’ results. For this reason, in 2013 REBIUN is developing a model to certify the information competence through a number of tests that will be run by two agencies, ACTIC and CERTIUNI. A committee of experts has defined the information competence in university degrees and it is expected to examine and certify students who want to include this competence in their degree diploma by the end of 2013.

3 Integrated Assessment of Students’ Information Competence

Our experience in developing and using web resources and tutorials for learning information skills confirms our interest for designing and applying tools from an integrated approach that achieves a comprehensive assessment of the information competence that takes into consideration knowledge, skills, attitudes, and prior expectations. For this purpose, we have designed and implemented four key tools: 1) a corpus of documents containing a set of validated texts to assess information comprehension through a number of questions after reading them and to evaluate the

¹ IX Jornadas CRAI, Universidad de Santiago, 2011. <http://www.usc.es/es/congresos/crai/> and X Jornadas, Universidad de La Rioja, 2012. <http://biblioteca.unirioja.es/crai2012/>.

degree of acquisition of certain competences or skills; 2) a questionnaire to self-assess students' perceptions on the importance and self-effectiveness of a number of specific tasks; 3) a knowledge test to measure students' objective knowledge about their information competence; and 4) assessment rubrics to prove students' know-how in applying their information competence to solve problems. These tools will be publicly available at the website <http://www.infocompetencias.org/eval-ci/>.

3.1 Corpus of Experimentally Validated Texts

The first instrument consists of a set of texts that have been validated through an experiment to identify certain important perceptive characteristics for students and lecturers, so that they can be used successfully to measure and assess competences, skills, and comprehension.

This corpus was compiled following a peer-reviewed selection process (three experts filtered the texts selected by students) among a larger set of texts that met a number of homogeneity, quality, and seriousness criteria. Namely, the texts: a) came from an official and reliable source; b) were written in Spanish and English; c) had a brief length (around 2500 words); and d) were about a current, interesting, and easy to understand topic. A questionnaire was designed so that a sample of students could evaluate variables such as text comprehension, interest, credibility, and quality, among other. 324 students from Journalism, Audiovisual Communication, Information Science, and Psychology degrees at Malaga and Granada universities participated. An intergroup experiment design was followed and each group of students only evaluated one text. Results allowed narrowing the corpus selection to the 9 texts with the highest average scores on credibility and interest, and a good level of comprehension and quality. More specifically, the experimentally validated texts were about diverse and current topics, such as food safety, nutrition and health, environment, consumption of digital news, labour safety, crisis in education, and sexual exploitation. All the texts had a Spanish and an English version (thus ensuring their usage in different countries) and came from sources that are international organisations, such as FAO, UNESCO, the EU, and the ILO.

These texts can be used as a useful and valid educational tool in teaching and learning processes and as to assess skills, competences, and comprehension, depending on the learning objectives defined by lecturers and the characteristics of the students. Their usage and application with these purposes are guaranteed through experimentally validated indicators.

3.2 The IL-HUMASS Test

The previously described IL-HUMASS test [11] was adapted to self-assess and report perceptions on information competences. The design of the instrument followed a two-tier process. First, a positivist approach to reality, assuming an objective perspective to describe measurable properties that are independent from the observer. Secondly, an interpretative approach, assuming access to reality through social constructs such as language, consciousness, and shared meanings [13]. The final version of the IL-HUMASS test included 26 items grouped into four categories (information search,

evaluation, processing and communication/dissemination) and three self-reporting dimensions (motivation, self-efficacy and favourite source of learning). These dimensions were finally defined as follows: the importance of the competences for academic progress (motivation), the level of skill in the competences (self-efficacy), and selecting among class, library, courses, self-learning, and others as the way of learning the competences (favourite source of learning). Students are requested to indicate their assessment of the competences by marking their answer on a scale from one (low competency) to nine (excellent competency) for each of the dimensions.

The self-reporting nature of this test involves a self-assessment approach that has rarely been proposed so far and only in a limited way. It is a singular and complex diagnostic tool that will enable a better understanding of the user groups involved through a mixed analysis that includes two quantitative dimensions (motivation and self-efficacy) and one qualitative dimension (the preferred source of learning).

To validate the IL-HUMASS test it was applied to two important samples: firstly, to 2072 Social Science and Humanities students from three Spanish universities, in an attempt to gain a better understanding of their information literacy from an internal perspective [14]. Secondly, it was also recently applied to 452 first-year students of six degrees of Social Sciences' studies. Some of the key findings revealed a significant positive relationship between motivation and self-efficacy, providing an opportunity to highlight these internal information literacy dimensions as an academic and institutional issue. On the positive side of the balance, schematising and abstracting information, and writing documents, reports, and academic assignments were found to be the best assessed competences. On the other hand, the use of informal electronic sources of information, the use of database managers, and the use of bibliographic references managers presented lower assessment scores, thus suggesting a need for further training, for instance, in the form of specialised courses.

3.3 Information Competence Knowledge Test

The knowledge test was designed as an objective way of measuring knowledge about the competences as a whole, both of general and specific nature. It consists of 78 items with 4 possible answers each and follows the same categories of competences defined for IL-HUMASS, so that they can be subsequently compared. There are questions about the four categories and the 26 competences of IL-HUMASS, i.e.: information search (in printed and electronic sources, informally and in the internet, in catalogues and secondary sources, about terminology, and about search strategies), information evaluation (quality, main ideas, updated information, relevance of authors and organisations), information processing (recognising text structure, schematising and abstracting, using database and reference managers, and installing and using statistical and spreadsheet software), and communication/dissemination of information (communicating in public, communicating in other languages, writing academic documents and preparing presentations, knowing the code of ethics of academic/professional field, knowing the laws on the use of information and intellectual property, and disseminating information on the internet).

This test, in combination with IL-HUMASS, provides us with subjective and objective feedback on students' perceptions and knowledge about information competences. It was piloted on a sample of Information Science students and it showed high internal consistency indexes and that it fulfilled its objective in an efficient manner.

3.4 Information Competence Assessment Rubrics

After getting to grips with “knowing how to be” information literate and the “knowledge” of information competences, we developed a set of assessment rubrics to measure students' “know-how” in applying their competences to solve problems related to information search, evaluation, processing, and communication/dissemination. Assessment rubrics were developed for the following information competences according to an experimental design: being familiar with specialised terminology, being acquainted with information search strategies, evaluating the quality of information resources, identifying an author's idea in a text, schematising and extracting information, recognising the structure of a text, and designing academic presentations. A pilot test was applied to first-year Information Science students and some capabilities and limitations were found. They were familiar with the terminology of the analysed text, although they had difficulties to interpret it. In *being acquainted with information search strategies*, they used keywords in their searches proficiently, although they found it very hard to use diverse types of sources. In *identifying an author's idea in a text*, students scored highly when identifying the goals of the text, even though they showed more difficulties in its comprehension. The competence that caused more problems to them was *schematising and extracting information*, in particular when performing cognitive tasks for arranging ideas in order of importance and synthesising the information. Similarly, when *recognising the structure of a text*, the biggest problems were found to deal with understanding the logic behind the organisation of the text. Finally, students were best skilled when *designing academic presentations* to present their assignments.

4 Conclusions

Assessment of information competences must be able to acknowledge the ability to comprehend texts, students' information skills, their command of suitable procedures, and their capacity for knowing how to apply such know-how in an integrated manner to solve typical information-related problems. The tools presented here have been validated and can be applied to students of Social Science degrees in their early years at university.

The fact that students' learning assessment is not systematically performed in many programs at university libraries, or that lecturers do not have tools to assess these competences as part of the learning objectives of their modules, indicates that the information literacy paradigm is still in the process of being consolidated in Spain and therefore has not been firmly established among the teaching culture of our universities yet. According to the overall findings of applying the IL-HUMASS

survey and the knowledge test, it is suggested that its 26 variables should be considered as standards for assessing and measuring information competences, and closely linked with learning outcomes and, above all, with the learning programs of the degrees and faculties involved.

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