



Attitudes toward Information Competency of University Students in Social Sciences

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abstract: This paper examines students' self-assessment of their information literacy, presenting a study involving 1,575 social science students at five Spanish universities. Data were collected and analyzed through a validated instrument that measures the variables of (1) the students' belief in the importance of information literacy skills; (2) self-efficacy, the students' faith in their ability to master those skills; and (3) the students' main source of learning information competencies. The groups of competencies studied were information search, information evaluation, information processing, and information communication. The results reveal an overall low perceived self-efficacy and provide a clear overview of the current state of information literacy among social science students in Spain.

Introduction

Skills related to information management and information usage are core competencies of university degrees within the European Higher Education Area (EHEA), a group of European countries that cooperate to maintain uniform educational standards. The EHEA considers information skills an essential part of the training of university students from any scientific domain.

The relevance of these competencies has led to collaboration between academic librarians and information literacy (IL) instructors to improve students' acquisition of these skills. However, acquisition of competencies related to information literacy relies heavily on assessment tools that guide the learning process and provide an objective way of measuring success. Assessing success in acquiring information competencies



is a complex task. It is made even more complex by a scarcity of assessment tools that specifically address the components of each competency.

This work is part of a research project undertaken by investigators from five Spanish universities who set out to measure the acquisition of information competencies by undergraduates nearing the completion of their studies through a self-assessment approach.¹ This paper presents the overall outcomes of the research, which focused on students' motivations and attitudes. Data were gathered and analyzed through the application of the Information Literacy Humanities and Social Sciences (IL-HUMASS) questionnaire. The model behind this questionnaire measures three variables: (1) the students' belief in the importance of information literacy; (2) the students' self-efficacy—that is, their confidence in their ability to succeed; and (3) the main sources from which the students learn information skills, such as classroom or library instruction. This self-assessment of the students' competencies provides an important measure of their perceptions while raising their awareness of the scope and relevance of information competencies.

The main aims of this paper are:

- To profile students from several social science degree programs in relation to their information competency.
- To test whether significant differences exist between the students' belief in the importance of IL and their self-efficacy scores, and to search for correlations between those two dimensions.
- To explore the ways and sources through which students learn information competencies.
- To discover the latent structures behind these competencies, the better to focus educational efforts and the design of learning resources.
- To explore students' motivation and attitudes about information competencies.

Such goals led us to formulate a number of suppositions based on the expected findings from the research and their relevance for the academic community. These suppositions were:

- A greater perception of the importance of information competencies among students would correlate to higher motivation levels.
- Students would find information search and communication competencies more relevant than skills focused on evaluating and processing information, the importance of which might be less obvious to their eyes.
- Information science and journalism students would obtain better results than the other social science students in their perception of the relevance of information competencies and their self-efficacy, because information competencies form the core of their studies.

The research tried to provide information literacy academics and practitioners with empirical evidence of the students' perceptions, which would serve as the basis for recommendations to improve specific areas of IL training.



Literature Review

The study of learning processes and the assessment of information competency in higher education has become an emerging research topic. Most research efforts have focused on assessment methods, assessment instruments, and the design of academic curricula and study programs.

The development of information competency involves jointly using abilities, knowledge, and skills in different contexts to solve specific problems or to succeed in achieving a goal. Most educators recommend that information competencies be taught by setting out typical problems for the students.² An optimal assessment would entail qualitative methods, such as interviews,³ information search tasks, assessment rubrics,⁴ and analyses of portfolios. There are numerous examples of such methods,⁵ although they are difficult to design and apply.

In contrast with qualitative approaches to judging information literacy, most assessment methods involve quantitative tests based on standards.⁶ They present a number of advantages, such as ease of obtaining an objective score. However, they provide only a nonsignificant, formal assessment of the competencies involved. In addition, they are costly, and the questionnaires sometimes require a long time to administer.⁷

Some of the most used instruments are:

- Project SAILS (Standardized Assessment of Information Literacy Skills),⁸ based on the Information Literacy Competency Standards for Higher Education developed by the Association of College and Research Libraries (ACRL).⁹ The assessment, designed by Kent State University in Ohio, consists of an online test of 45 to 50 questions focused on assessing knowledge rather than skills.¹⁰
- The Information Literacy Test,¹¹ also based on the ACRL Standards, developed by the Center for Assessment and Research Studies at James Madison University in Harrisonburg, Virginia.¹² The test consists of 60 multiple-choice items. Unlike Project SAILS, the test does not assess ACRL's Standard Four, "uses information effectively to accomplish a specific purpose."¹³
- The Information Skills Survey, designed to measure information literacy among education, social science, and law students according to the standards defined by the Council of Australian University Librarians (CAUL) and the Australian and New Zealand Institute for Information Literacy (ANZIIL).¹⁴ Librarians from six Australian universities, led by the assessment expert Ralph Catts, created the survey.¹⁵
- The INFOLITRANS (INFOrmation LIteracy for TRANSlators) test, focused on translators and interpreters. The test was designed to be used in the contexts of taught courses, self-learning, and learning outcomes assessment.¹⁶

Undergraduates' self-concept of their IL competency has great importance. Awareness of their own perceptions of IL can make them more receptive to reinforcing their weakest points, and the process of analyzing their self-assessment can help them to consciously embrace the whole breadth of information competency.



- The IL-HUMASS test, aimed at self-assessing IL among undergraduates and at gaining insights into their perceptions and expectations about IL.¹⁷

Undergraduates' self-concept of their IL competency has great importance. Awareness of their own perceptions of IL can make them more receptive to reinforcing their weakest points, and the process of analyzing their self-assessment can help them to consciously embrace the whole breadth of information competency.¹⁸ Following this line of thinking, S. Serap Kurbanoglu, Buket Akkoyunlu, and Aysun Umay developed a 28-item validated scale to measure students' self-efficacy for IL.¹⁹ Melissa Gross and Don Latham compared scores from interviews with results from the Information Literacy Test to identify the disparity between students' perceptions of their competencies and an objective assessment of their capabilities.²⁰ The authors concluded that students focused more on the result than on the process, that their motivation determined how successfully they completed their information-related tasks, and that they drew heavily on their personal sources of information.

María Pinto designed the IL-HUMASS model to analyze, for the first time, belief in the importance of information literacy, sense of self-efficacy, and preferred sources from which to learn information literacy among students of the humanities and social sciences in Spanish universities.²¹ This model draws on a survey of 26 sub-competencies. Similarly, Raziye Demiralay and Sirin Karadeniz studied perceptions of self-efficacy among 1,081 students working for education degrees from five Turkish universities. Demiralay and Karadeniz obtained results like Pinto's in relation to the students' familiarity with IL competencies and their self-efficacy, their perception of their own ability to use such competencies.²² The two authors applied a test called the Information Literacy Self-Efficacy Scale to assess the students' belief in their ability.

With regard to students' needs, Rosanne Cordell and Linda Fisher confirmed the usefulness of analyzing students' reference questions as a way to improve curriculum planning.²³ Alison Head and Michael Eisenberg conducted a vast research project called Project Information Literacy aimed at understanding students' information-seeking behavior at the University of Washington Information School in Seattle.²⁴ First, Head and Eisenberg used discussion groups to investigate how students from seven universities in the United States sought contexts as part of their research process.²⁵ They found that the main problems arose when students tried to find the specific materials they desired and needed through complex and changing information landscapes. Later, Head and Eisenberg surveyed 2,318 college students from six U.S. campuses to analyze their research process. The students turned to the same set of information sources at the initial

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stages of their research regardless of their information goals. The sources used by students were course readings and Google for course-related research, and Google and *Wikipedia* for everyday life search.²⁶ The two authors concluded that the students under-

took research as a competency learned by rote, rather than as an opportunity to learn, develop, or expand their IL strategy.



Pinto and her team of José-Antonio Gómez-Hernández, Aurora Cuevas, Ximo Granell, Susana Puertas, David Guerrero, Carmen Gómez, and Rocío Palomares studied the assessment process of social science undergraduate students at five Spanish universities. The investigators employed the IL-HUMASS questionnaire to gain insights into the students' belief in the importance of IL, their self-efficacy, and their preferred sources from which to acquire information literacy. The team also administered a knowledge test and a task-based examination.²⁷ Margaret Bausman and Sarah Ward used an online assessment tool to investigate the engagement of social work students with library resources and services.²⁸ Wendy Holliday, Betty Dance, Erin Davis, Britt Fagerheim, Anne Hedrich, Kacy Lundstrom, and Pamela Martin applied the VALUE (Valid Assessment of Learning in Undergraduate Education) rubric to assess students' IL through the analysis of 900 student papers.²⁹ Katelyn Angell sought to test the reliability and validity of assessment rubrics used to evaluate student learning outcomes in information literacy classrooms.³⁰

In many instances, scholars combined or compared self-assessment with an objective evaluation.³¹ Such combinations can reveal "how students' self-assessment of their ability compares to their actual skill as demonstrated through testing." This pairing of objective and subjective tools can "provide a look at the relationship between a standardized measurement of student information literacy skills and students' estimates of their information seeking skills."³² The study described in this article is unique in simultaneously applying several self-assessment methods, drawing on students' perceptions and also measuring their competencies, to obtain evidence of the actual acquisition of IL skills. In summary, before any assessment of IL-related competencies, it is advisable to explore the perceptions of the students to gain a better understanding of their attitudes and motivations, and their different conceptions of IL.

Research Method

In this project, the investigators gathered data through the IL-HUMASS online survey, an attitudinal test including 26 items grouped into four interrelated macro-competencies: (1) search, (2) evaluation, (3) processing, and (4) communication or dissemination.³³ This survey was designed drawing on a wide body of literature on IL, including both general and specialized research. This research instrument focuses on understanding the level of acquisition of IL-related competencies among students from the perspective of their own perceptions regarding three dimensions: (1) belief in the importance of IL (BI), (2) self-efficacy (SE), and (3) preferred sources for learning information skills. Specifically, belief in importance is defined as how vital students consider the competencies for academic progress. Self-efficacy refers to their own estimates of their levels of skill in the competencies. Preferred sources of learning allows students to select their favorites from a set of possible means of acquiring IL skills, including class, library, courses, self-learning, and others.

The investigators gathered data using a proportional stratified sampling method, dividing the population into smaller groups called strata and taking random samples of each group in proportion to its size. This method guaranteed that the information obtained would be representative and provide a considerable level of consistency for drawing inferences. The population of the study was drawn from students at five public



Spanish universities: (1) Complutense of Madrid, (2) Granada, (3) Jaume I of Castellón, (4) Málaga, and (5) Murcia. The sample included third- and fourth-year students enrolled for the year 2013–2014 to earn degrees in audiovisual communication, information science, journalism, pedagogy, primary education, psychology, social work, and tourism.

Once the survey was conducted and the fieldwork completed, the investigators performed data processing and analysis with the statistical software SPSS. The analyses included descriptive analysis of the statistics, such as calculating the means—that is, the average or middle scores—and the ranges and dispersion, measures of how spread out the results were. The analyses also included correlation analysis, to measure linear relationships among variables, and factor analysis, a technique used to analyze data from a multivariate perspective.

Instrument Consistency and Validation

Other studies by some of the authors had previously validated the scales used by the IL-HUMASS instrument.³⁴ In addition, the instrument in the present study had a Cronbach's alpha coefficient of 0.938, further confirming its validity and indicating a high level of internal consistency—that is, showing that all the items in the test measured the same concept.

Characteristics of the Sample

The sample for this study was drawn from the register of third- and fourth-year students working toward the eight degrees listed earlier. The sampling process involved the total number of students from each university, degree program, and year. Finally, the size of each stratum of the sample was increased by 20 percent to prevent potential nonresponse bias.

The investigators gathered 1,575 responses. Table 1 presents the responses according to the distribution among the stratified sample. Responses came from 500 men and 1,075 women. Seventy percent of the subjects were enrolled in their third year and 30 percent in their fourth, 1,101 and 474 students, respectively.

Results

Belief in Importance of IL and Self-Efficacy

As an overview, the investigators calculated mean scores for each group of competencies on a Likert scale of one to nine according to the students' expressions of how important they considered a particular skill: less than five (not important/scarcely), between five and six (moderately important/moderate), between six and seven (important/normal), between seven and eight (very important/high), and more than eight (excellent) (see Figure 1).

Table 2 shows the main descriptive statistics after analyzing responses to the survey. The rows show the degree programs of the sample surveyed. The columns show the group of competencies (namely, information search, information evaluation, information processing, and information communication) and the values for the mean or average and (between parentheses) for the standard deviation—that is, how tightly the mea-



Table 1.
Distribution of the sample

Degree program	Students per university					Total	%
	Complutense of Madrid	Granada	Jaume I of Castellón	Málaga	Murcia		
Audiovisual communication	33	26	29	82	28	198	13%
Information science	59	39	0	0	24	122	8%
Journalism	43	0	53	85	55	236	15%
Pedagogy	15	45	1	22	30	113	7%
Primary education	24	166	55	42	83	370	23%
Psychology	35	131	27	11	19	223	14%
Social work	27	73	0	18	19	137	9%
Tourism	30	67	23	36	20	176	11%
Total	266	547	188	296	278	1,575	
Percentage	17%	35%	12%	19%	18%		

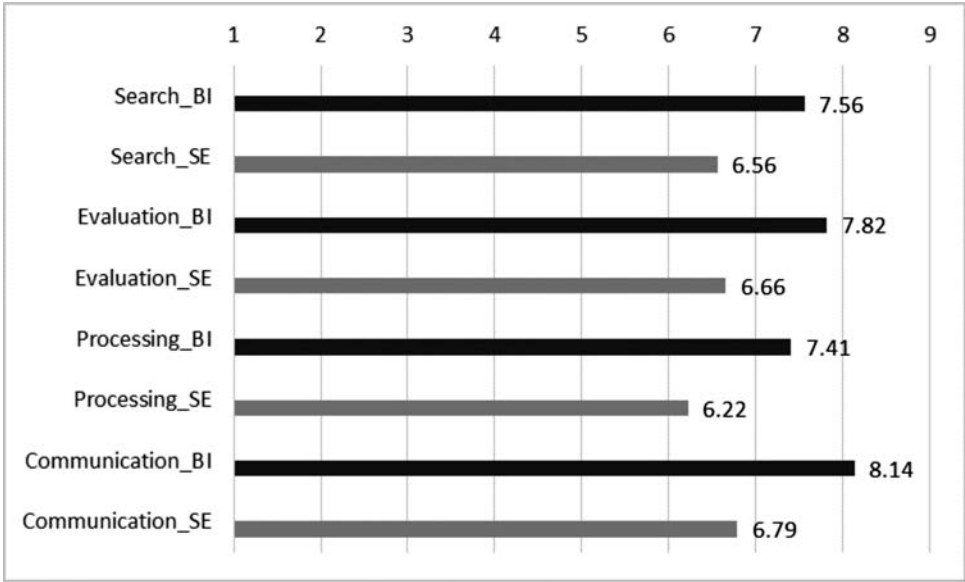


Figure 1. Overall scores for the students’ belief in importance (BI) and self-efficacy (SE) for each group of information competencies

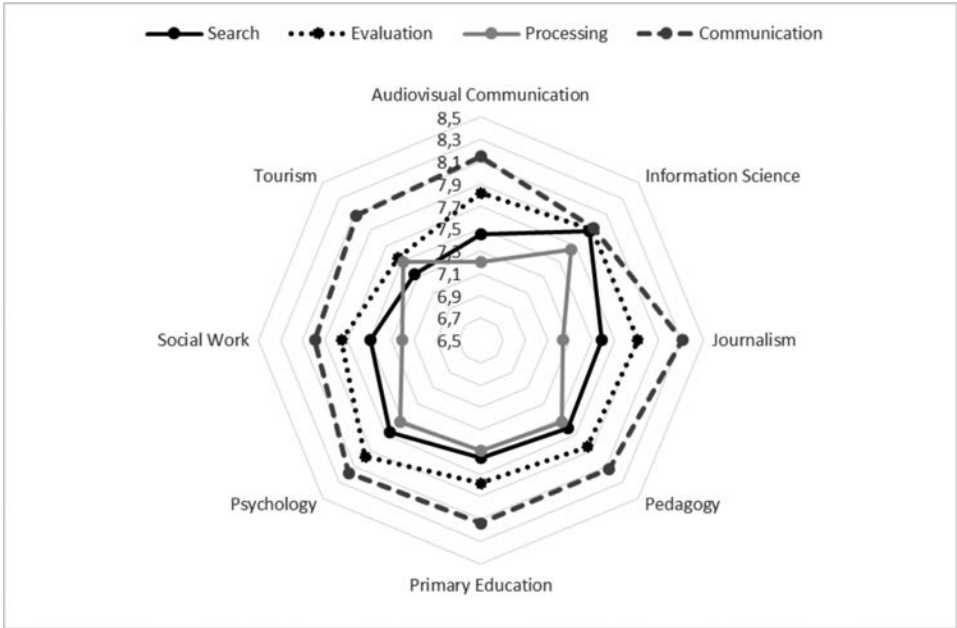


Figure 2. Map of the students’ belief in importance for information competencies



Table 2.
Descriptive statistics by degree program for belief in importance of IL and self-efficacy

Information competency	Search		Evaluation		Processing		Communication	
	Belief in importance	Self-efficacy	Belief in importance	Self-efficacy	Belief in importance	Self-efficacy	Belief in importance	Self-efficacy
Degree program								
Audiovisual communication	7.45* (0.86)	6.61 (1.07)	7.82 (0.87)	6.68 (1.08)	7.2 (1.21)	6.16 (1.16)	8.15 (0.8)	6.94 (1.01)
Information science	7.88 (0.88)	7.02 (0.94)	7.91 (0.97)	6.91 (1.03)	7.65 (0.88)	6.73 (0.89)	7.93 (0.89)	6.7 (0.94)
Journalism	7.59 (0.86)	6.67 (0.99)	7.91 (0.90)	7.02 (0.95)	7.24 (1.07)	6.11 (1.14)	8.31 (0.75)	7.1 (0.93)
Pedagogy	7.61 (0.96)	6.58 (1.02)	7.85 (1.06)	6.57 (1.1)	7.53 (1.03)	6.23 (1.17)	8.13 (0.85)	6.72 (0.95)
Primary education	7.55 (0.86)	6.53 (1.09)	7.78 (0.98)	6.64 (1.06)	7.49 (1.02)	6.23 (1.24)	8.14 (0.71)	6.82 (0.98)
Psychology	7.66 (0.9)	6.46 (1.13)	7.97 (0.94)	6.5 (1.19)	7.53 (1.01)	6.11 (1.25)	8.18 (0.73)	6.61 (1.1)
Social work	7.49 (1.11)	6.14 (1.22)	7.75 (1.2)	6.31 (1.21)	7.21 (1.29)	5.89 (1.27)	7.99 (1.02)	6.35 (1.08)
Tourism	7.34 (1.02)	6.51 (1.07)	7.55 (1.1)	6.56 (1.05)	7.49 (1.06)	6.45 (1.05)	8.08 (0.87)	6.84 (1.02)
Overall	7.56	6.56	7.82	6.66	7.41	6.22	8.14	6.79

* The first number in each column represents the mean or average, and the number below it in parentheses represents the standard deviation, how far the measurements spread out from the mean.

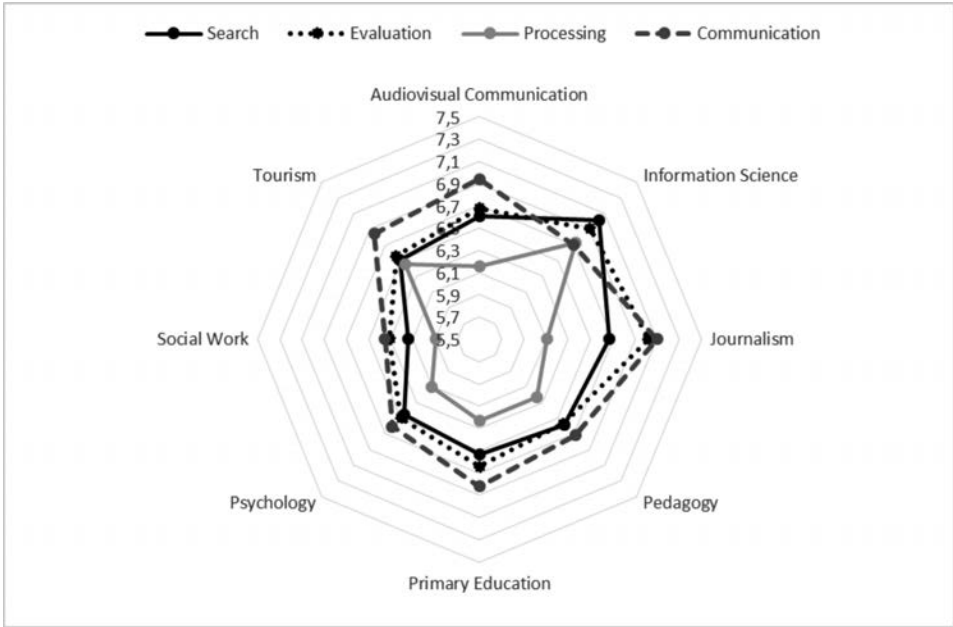


Figure 3: Map of the students' self-efficacy for information competencies

surements cluster around the mean—for the two dimensions of belief in importance of IL and self-efficacy.

The authors transformed these values into graphs to better visualize and understand the relationships between belief in the importance of IL and self-efficacy reported by the students for all four groups of competencies across the eight degrees under study (see Figures 2 and 3).

As presented in Figure 2, the pedagogy, psychology, and social work students have similar attitudes regarding the information search group of competencies, all of them falling into the same ring of the graph. Audiovisual communication and primary education also show similar results, whereas the results from information science students display a considerably greater level of belief in importance for this category of IL in comparison with that of students working toward other degrees. The information evaluation competency shows a clear division between the results for students of information science and tourism, who confer a higher magnitude to this group of competencies, and students working toward the other degrees. As for the perceptions of the relevance of information processing, the results show a lower level among students in audiovisual communication, journalism, and social work, in contrast with students in information science, pedagogy, primary education, psychology, and tourism. Lastly, the relevance given to the information communication competency is similar among all the degree programs, except for information science, where a lower belief in importance is observed.

Figure 3 presents the scores obtained from the students about their self-efficacy for each group of information competencies. When focusing on the information search competency, there were clear differences between the self-perceptions of students in information science (the highest) and those in social work (the lowest). Information evalu-

ation showed a similar attitude among students in all degree programs except information science and journalism, which presented a higher self-efficacy value than the other groups. Scores spread more widely for the information processing competency, with all mean scores lower than those of the other competencies. Self-efficacy scores were scattered across the different rings of Figure 3. For self-perceptions regarding information communication, students from

For self-perceptions regarding information communication, students from audiovisual communication and journalism showed similar values, the highest among all the degree programs.

audiovisual communication and journalism showed similar values, the highest among all the degree programs. Tourism and primary education fell into a middle ring, while information science, pedagogy, and psychology presented results slightly lower than the average. Social work showed the lowest scores among all, with a similar level of self-efficacy for the evaluation and communication groups of competencies.

Interrelations among Competencies

A correlation analysis among all the groups of competencies revealed a high correlation among the middle levels of belief in importance and self-efficacy ($p < 0.05$). When looking for correlations between belief in importance and self-efficacy, significant given the large sample, moderated values were found for the four groups of competencies. In Table 3, figures in *italic* represent the correlations between belief in importance and self-efficacy for each group of competencies. **Boldface** figures show the correlations among groups of competencies for belief in importance, and underlined numbers show those for self-efficacy. As expected, correlations between belief in importance and self-efficacy among different competencies were lower. These results further confirm the behavior presented by the maps of competencies.

At the same time, the analysis of the overall belief in importance and self-efficacy levels of the correlated samples according to the groups of competencies showed statistically significant differences among these distributions. Analyzing these pairs reveals that the mean values for belief in importance were significantly higher for all the groups of competencies under study (measured by the Wilcoxon test, $p < 0.05$).

Gender, Degree Program, and University Variables

The sample did not follow a normal distribution, as determined by a statistical technique called the Kolmogorov-Smirnov test, $p < 0.05$. Thus, the investigators applied distribution-free methods to perform comparisons. More specifically, this section presents the results of the potential influence of gender and degree program over the scores obtained for each group of competencies.

Statistically significant differences were found between genders for the belief in importance mean for all groups of competencies (determined by the Mann-Whitney U test, $p < 0.05$). On the other hand, no significant differences were found according to the

Table 3.

Descriptive statistics by degree program for belief in importance of IL and self-efficacy

Competency	Search		Evaluation		Processing		Communication	
	BI*	SE†	BI	SE	BI	SE	BI	SE
Search	BI	1	0.64	0.77	0.45	0.64	0.44	0.59
	SE		1	0.37	0.83	0.28	0.64	0.21
Evaluation	BI			1	0.49	0.64	0.20	0.65
	SE				1	0.30	0.57	0.32
Processing	BI					1	0.73	0.64
	SE						1	0.44
Communication	BI							1
	SE							

*BI: Belief in importance.

†SE: Self-efficacy.

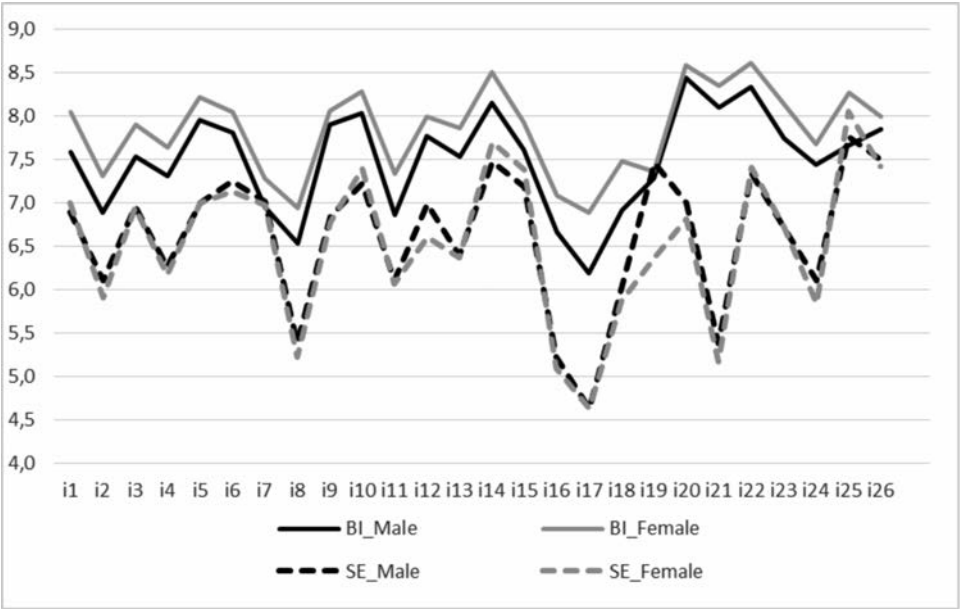


Figure 4: Mean values by gender for belief in importance (BI) and self-efficacy (SE) for information competencies

self-efficacy mean values between men and women (Mann-Whitney U test, $p < 0.05$). Figure 4 shows these results.

The investigators applied the Kruskal-Wallis test to determine the influence between the degree being studied and the self-reported levels of belief in importance and self-efficacy. In this way, the overall belief in importance and self-efficacy scores were compared among the different degree programs. All groups of competencies showed statistically significant differences, both for belief in importance and for self-efficacy (measured by the Kruskal-Wallis test, $p < 0.05$). A closer look at this result revealed considerably higher values for information science students in all groups of competencies but fairly homogeneous results among students in the other degree programs.

The investigators performed this analysis independently for each of the five participating universities, and once again there were significant differences among the overall belief in importance and self-efficacy scores for the same degree programs (not all the degrees are offered by the five universities under study). These results suggested a more in-depth study to detect the sub-competencies presenting similarities and differences among future graduates, so that learning programs can be effectively improved.

Developing and Acquiring Information Literacy

When social science students in this study were asked how they developed their capabilities for seeking and using information, they stated that their main source was IL instruction in the classroom as part of the university courses they had taken. A slightly lower portion of the surveyed students reported that they had acquired IL competencies by themselves, that is, through “self-learning.” The third and fourth most common sources of learning, selected by just 4 percent of the students, were specific courses and the resources offered by university libraries (Table 4).

The breakdown of learning sources by informational competence group reveals different behaviors: making use of library resources was the least common choice for acquiring the processing and communication competencies, while taking specific courses was the least common choice for the evaluation and search competencies (see Figure 5).

When social science students in this study were asked how they developed their capabilities for seeking and using information, they stated that their main source was IL instruction in the classroom as part of the university courses they had taken.

Underlying Structures Linked to the Importance of IL and Self-Efficacy

The investigators conducted factor analysis over the subjective dimensions of importance and self-efficacy to gain further insights into the potential relationships among the sub-competencies under study. This analysis facilitated the identification of latent dimensions called factors that might underlie and explain the inner structure of information competencies. The empirical results provided by this study showed, once again, the

Table 4.

Preferred sources for learning information competencies

Self-learning	43.75%
Library	3.93%
Classroom	47.89%
Courses	4.43%

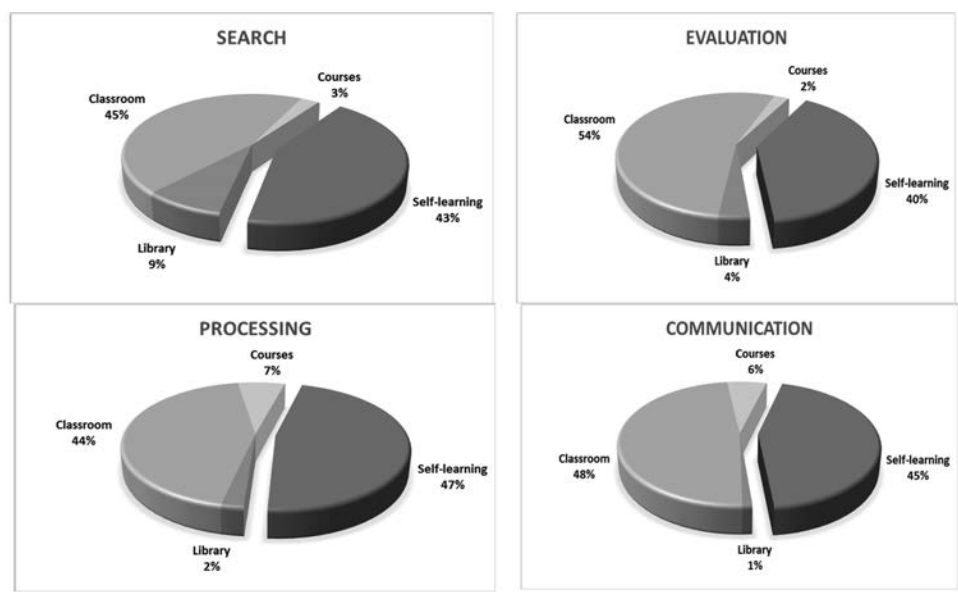


Figure 5: Distribution of preferred learning sources for each group of competencies

suitable design of the IL-HUMASS as an instrument for measuring the dimensions of importance, self-efficacy, and preferred learning source.³⁵ Lih-Juan ChanLin had previously used factor analysis to determine the competence structures behind LIS undergraduates’ perception of their capabilities.³⁶ Thomas Mackey and Jinwon Ho used such analysis to identify dimensions of IL and information technologies.³⁷ Bruce Thompson applied it to a large-scale international study involving faculty and graduate student perceptions of academic libraries.³⁸

The sampling size was found to be adequate for conducting factor analysis,³⁹ and the resulting model of the importance dimension included 17 sub-competencies grouped in five factors. A new factor was identified in relation to the technological competencies, including two sub-competencies initially part of the information communication and dissemination category. A closer examination of Table 5 confirms the existence of a first factor after the group processing, representing 42.65 percent of the variability. The



Table 5.
Factor model of the dimension belief in importance

Related sub-competency	Factor				
	1	2	3	4	5
i1 (using printed sources of information)				0.675	
i3 (looking up and using primary electronic sources of information)				0.777	
i4 (using secondary electronic sources of information)				0.673	
i6 (searching and retrieving information from the Internet)				0.613	
i8 (knowing information search strategies)				0.689	
i9 (assessing the quality of information resources)		0.717			
i10 (recognizing the author's ideas within the text)		0.782			
i11 (knowing the typology of scientific information sources)		0.686			
i12 (determining whether an information resource is updated)		0.771			
i16 (using databases)	0.794				
i17 (using reference managers)	0.802				
i18 (using statistical and spreadsheet software)	0.746				
i20 (communicating in public)			0.803		
i21 (communicating in other languages)			0.768		
i22 (writing academic documents)			0.842		
i25 (undertaking academic presentations)					0.698
i26 (disseminating information on the Internet)					0.754
Variance explained	42.65%	54.91%	63.91%	68.78%	72.69%



second factor was linked to the evaluation competencies (12.26 percent). The third factor included the competencies linked to communication (9 percent). The fourth factor was linked to information search competencies (4.87 percent). A fifth factor was found to be linked to technological competencies (3.91 percent of variability).

The resulting factor model of the self-efficacy dimension included 19 sub-competencies grouped in five factors (see Table 6). The first factor for this dimension was linked to the information search competencies, explaining 38.67 percent of variability. The second factor was linked to evaluation (9.20 percent), and the third to processing (6.58 percent). Lastly, the fourth and fifth factors were linked to communication and technological competencies respectively, explaining 5.10 percent and 4.06 percent of variability.

According to this factor analysis, the following sub-competencies have a higher weight in relation to belief in importance among social science students—that is, they contribute more significantly to the dimensions under analysis:

- The category information search included five key sub-competencies, namely using printed sources of information (i1), looking up and using primary electronic sources of information (i3), using secondary electronic sources of information (i4), searching and retrieving information from the Internet (i6), and knowing information search strategies (i8).
- The factor linked to the information evaluation category excluded sub-competency i13, namely knowing relevant authors and organizations of the subject field.
- The factor related to information processing was made up of the following sub-competencies: using databases (i16), using reference managers (i17), and using statistical and spreadsheet software (i18).
- The sub-competencies linked to the information communication category were found to be communicating in public (i20), communicating in other languages (i21), and writing academic documents (i22).
- Lastly, a new factor in relation to technological competencies included the sub-competencies undertaking academic presentations (i25) and disseminating information on the Internet (i26).

The sub-competencies that made up the self-efficacy factor model were essentially the same as those related to the belief in importance dimension (see Table 6), except for the factor linked to information search, where two sub-competencies were also found to be significant: accessing and using automated catalogs (i2) and using informal electronic sources of information (i7).

Discussion

The selected sample for this study is widely representative of the social sciences student population in Spain, including 1,575 valid responses from five universities and eight degree programs. This sampling frame guarantees a proportional participation of all degree programs.

Students mostly find themselves not sufficiently trained in IL competencies.

Students' self-assessment of their own efficacy in relation to the competencies is lower than the importance they give to the competencies in almost



Table 6.
Factor model of the self-efficacy dimension

Factor	1	2	3	4	5
n2	0.695				
n3	0.695				
n4	0.687				
n6	0.621				
n7	0.627				
n8	0.616				
n10		0.713			
n11		0.664			
n12		0.648			
n14			0.831		
n16			0.860		
n17			0.820		
n18			0.698		
n20				0.627	
n21				0.630	
n23				0.708	
n24				0.688	
n25					0.705
n26					0.731
Variance explained	38.67%	47.87%	54.45%	59.55%	63.61%

all the cases. Students mostly find themselves not sufficiently trained in IL competencies. The only case where self-efficacy is high is among information science students, a degree that is closely related to these competencies and with specific contents directly related to IL. Students studying for degrees linked to providing assistance to people or groups (social work, psychology, and pedagogy) are less self-efficacious. This finding could be explained by a higher level of critical awareness about their work and the complexity involved in combining documentary information with direct information from patients or clients.

There is little evidence of disparity of information literacy levels between men and women, and studies that have looked into this variable have found no significant differences between men and women.⁴¹ Similarly, research that has addressed gender differences focusing on the access and use of information on the Internet has found no significant differences between men and women,⁴² although there are signs of a gender gap in some particular cases, for example, when self-reporting active use of resources such as *Wikipedia*, for example contributing to its contents.⁴³ A deeper analysis of the



data from this study (see Figure 4) reveals that the mean values for belief in importance of women were higher than those of men, while self-efficacy mean values were almost identical, except for sub-competency i19, related to the installation of computer programs, where men reported a higher level of competency.

Breaking the results down by degree program provides a clearer perspective of students' perceptions of IL-related competencies among the social sciences. Accordingly, information and communication-related students confer the highest relevance to and find themselves most self-efficacious in competencies linked to searching and processing information. Information science and journalism students report the highest importance of and self-efficacy in information evaluation competencies. Likewise, journalism students report the highest belief in importance and self-efficacy in communication competencies. Such results are coherent with the profiles of these degrees, because information science is a degree in which information-related competencies are essential, and journalism a degree in which information processing and communication are core competencies. On the other hand, social work students confer the lowest relevance and self-efficacy to the competencies, showing scores below overall mean values for all four groups of competencies, a deficiency already identified by some studies in the United States.⁴⁴

A number of significant differences have been found among the degree programs in connection with the mean levels of belief in importance and self-efficacy for all four groups of competencies. Information science shows higher levels than the rest of the

...most students reported that they developed their information-related competencies as part of their classes at the university, and to a slightly lesser extent they claimed to have learned by themselves.

degree programs. On the other hand, most students reported that they developed their information-related competencies as part of their classes at the university, and to a slightly lesser extent they claimed to have learned by themselves.

Understanding how students develop their IL competencies and the different ways they experience IL is essential to better design academic

curricula and IL education.⁴⁵ Some studies have interviewed students about their understanding of information literacy and about how they attained their information-related competencies. Many students reported a perception of achieving information skills on their own.⁴⁶ There is also a tendency toward seeking assistance from other people as a source of information, although not necessarily in academic contexts, and in particular not from librarians.⁴⁷ A number of studies have detected this reluctance to rely on librarians as facilitators of IL training, even leading to so-called "library anxiety." A considerable number of initiatives have tried to address this issue and improve instruction programs.⁴⁸ In this study, the finding that students claimed to learn about the competencies as part of their studies seems logical to some extent in a lecture-driven learning environment like that in Spanish universities. Similarly, self-learning seems to make sense in today's hyperconnected world, where information and communication are dominated by the Internet, virtual campuses, and social networks. Subject-centered courses or library activities play only a secondary role, something that should raise an alarm about the need for rethinking the training provided by libraries.



The maps of competencies presented in Figures 2 and 3 show the global behavior of future graduates in relation to their belief in importance and self-efficacy measures. This visualization allows the identification of those groups of competencies that are found more relevant and the interrelations in the degrees under study. The students confer the highest importance to communicative competencies, while they consider information processing competencies the least important. Students reported the strategic relevance of communication competencies for a degree in journalism, while students in information science find a similar value for all the competencies. Tourism and social work are the degree programs that overall present the lowest levels of relevance for all the competencies. Heterogeneous self-efficacy levels are observed among all the degrees under study. Information science students claim a higher level of self-efficacy for all groups of competencies, while journalism students report a high self-efficacy in the communication and evaluation groups of competencies. Social work students find themselves the least efficacious. Correlation analysis further confirms high values for both belief in importance and self-efficacy and a moderate crossed correlation between both dimensions for each group of competencies.⁴⁹

Finally, the investigators applied factor analysis to define the underlying dimensions that explain the inner structure of the instrument. The empirical results further validate the suitability of the IL-HUMASS instrument to measure the dimensions of belief in importance, self-efficacy, and preferred learning source. Factor analysis confirms the existence of five factors—that is, five groups of information-related competencies. A new fifth factor related to technological competencies has proved statistically significant and added two sub-competencies initially allocated to the communication and dissemination group of competencies. A clear difference in the structure of both factor models has been found: while belief in importance links the first factor to the processing group of competencies (explaining 42.65 percent of the model's variability), self-efficacy identifies information search competencies as the group explaining the highest variability (38.67 percent). The second factor in both cases corresponds to information evaluation competencies, and the fourth and fifth factors are linked to the communication and technological competencies, respectively.

Conclusions

Given the statistical representativeness of the sample under study, the results of this study provide a clear overview of the current state of IL among social science students in Spain. Although this representativeness cannot be directly extended to other countries due to differences in the IL training included in social science degree programs, this study does provide a solid and validated benchmark to compare the development of information competencies in other environments. This comparison and the measurement of belief in importance and self-efficacy levels in relation to the integration of IL training within social science and IL programs could lead to an interesting avenue for future research.

The students' assessment of their self-concept about the IL competencies contributes to greater awareness of their weak points. In addition, the process of self-assessment can help students to better understand the dimension and relevance of these competencies for the learning process throughout their academic lives, and also for their lifelong



learning. This further confirms our initial supposition and supports acknowledgment of the importance of developing information competencies.

The IL-HUMASS survey proved itself a reliable instrument for measuring belief in importance and self-efficacy. Cronbach's alpha results in the present study (0.938) further confirmed the validity and the high internal consistency of this instrument.

Information science and communication students confer the highest relevance to and find themselves as most efficacious in competencies linked to searching and

processing information. Information science and journalism students report the highest importance of and self-efficacy in information evaluation competencies. Likewise, journalism students show the highest belief in importance and self-efficacy in communication-related competencies.

The study revealed significant differences among the degrees in connection with the mean values of belief in importance and self-efficacy for all four groups of competencies. Information

science shows higher levels than the rest of the degree programs, which seems to some extent logical since the curricular design of this degree program includes courses where information skills are core competencies. This leads us to suggest that all the degree programs should include a minimum component of IL contents to ensure the acquisition of these competencies.

There is an overall correlation between belief in importance and self-efficacy, which means that a high motivation may bring about a higher self-concept.

The factor models originated by this study further consolidate the validity of IL-HUMASS to quantify the perceived relevance and self-efficacy of IL competencies. Factor analyses undertaken for the belief in importance and self-efficacy dimensions revealed the existence of five groups of competencies and provide a deeper understanding of the particular competencies that have greater weight. While belief in importance is more strongly linked to the processing group of competencies, self-efficacy is more closely tied to information search competencies.

The students state that their main source of learning for developing their IL competencies is part of their university training; at the same time, they regard it as being insufficient. Library courses and training activities play only a secondary role. The students do not perceive libraries as key sources of learning for developing IL competencies.

We find that a generalized program for developing IL competencies could help strengthen the identified weaknesses. A training program endorsed by empirical research and freely accessible to anyone could provide valuable support to academic learning networks and virtual campuses.

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Notes

1. The full name of the research project is "EVAL-CI (Assessment of Information Competencies of Social Science Students in Higher Education: Designing Web Tools and an E-Learning 2.0 Training Proposal)." The Spanish Ministry of Science and Innovation (EDU2011-29290) funded this project. The principal investigator was María Pinto.



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