Training undergraduate students to search and use statistical information: a cooperation between professors and librarians

Raúl Aguilera
Servicio de Biblioteca.
Universidad Carlos III de Madrid

Tony Hernández-Pérez
Departamento de Biblioteconomía y Documentación.
Universidad Carlos III de Madrid

Mayte Ramos
Servicio de Biblioteca.
Universidad Carlos III de Madrid

Marina Vianello
Departamento de Biblioteconomía y Documentación.
Universidad Carlos III de Madrid

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Abstract:

In the context of the adaptation of undergraduate study programs to the European Higher Education Area, Carlos III University of Madrid has decided to include a 3 ECTS credits course on information literacy for all the students in all the degrees. This course is given by the faculty staff at the Department of Librarian Science and Documentation in cooperation with librarians.

In the School of Social Sciences, this experience is developed in those degrees related not only to law but also to economics, business, finance or statistics. The Information skills course tries to train the undergraduate students in basic information search skills as well as to introduce them in the use of the statistical information available in the databases.

The students receive some theoretical teachings but, above all, they have to solve case studies based on searches, comparisons and information presentations in databases such as Ecowin, OECD or the Spanish National Institute of Statistics and also in statistical finance databases such as SABI, OSIRIS, AMADEUS or BANKSCOPE among many others.

Cooperation between the Library Service and the Department of Library Science and Documentation has had beneficial results for both parts. For the professors, because it

allows them to enhance the case studies and makes them aware of the database updates. For the library, because its role and the importance of that role in the student information literacy has been strengthened. At the same time, this strategy is encourages the expanded usage of available databases.

Short biography of the authors

Mayte Ramos and Raúl Aguilera are head librarians at the multidisciplinary Library in the Colmenarejo Campus and at the Faculty of Social Sciences and Law Library in the Getafe Campus, respectively. Both of them coordinate the learning projects of the Library Service.

Marina Vianello, sub director of the Department and PhD in Documentation, is specialized in documental languages, documental analysis and usability among other research fields. Tony Hernández, PhD in Information Science, is specialized in information technologies, databases, e-learning and open access among other research fields. Both of them have coordinated the *Information skills* course in the academic years 2009-2010 and 2008-2009, respectively.

1.   Introduction

"Information society" and "knowledge society" are essential terms for describing both the society in which we live and the society on whose construction we have to focus our efforts. Internet and the new technologies are the driving forces of the deep change we are living, labelled by Manuel Castells as a "third industrial revolution" (Castells, 2005).

For several years the European Union has been working on a strategy to become the most competitive and dynamic knowledge based economy of the world. This objective has been confirmed by the recent publication of *Europe 2020: A strategy for smart, sustainable and inclusive growth* (European Commission, 2010). This document goes beyond the Lisbon strategy and establishes as one of three priorities smart growth based on knowledge, innovation, education and digital society.

In fact, during the last few years, the European universities, in order to adapt themselves to the European Higher Education Area, have been reassessing their study programs and learning methodologies to include a thorough assessment process. Their students must gain the competencies they need to become professionals in a future, and information literacy is one of these key competencies.

Carlos III University of Madrid, founded in 1989, has been one of the first Spanish universities to adapt its programs to the new European framework. This process, initiated in 2007, culminated in the academic year 2008-2009 through the implementation of new bachelor degrees in the School of Social Sciences and Law, the School of Humanities, Communication and Documentation and the School of Engineering.

Carlos III University, has a strong orientation toward the labour market, as the last report on admission of recent graduate students shows (which raises up to 94,9%) (Carlos III University of Madrid, 2010). This has favoured the implementation of an *Information skills* transversal course for the first year of all the new degrees. Actually, usage of computer tools

cannot be considered enough anymore, since it is necessary to gain skills which enable students to manage information effectively. This is the reason why experts are talking more and more about "multiliteracies" (Area, Gros, Marzal, 2008).

2. The *Information skills* course

1. Academic context

Information skills is a course given mainly in the first semester of the first year to more than 3,200 students from more than 120 groups of all the degrees. Its objective, following the European Higher Education Area philosophy, is to provide students from their very beginning in the University with the essential competencies to successfully search and use information, both in their academic life and their professional future as well as in their lifelong learning.

This course of 3 ECTS (European Credits Transfer System) is seven weeks long with three hours of classes and seven hours of personal work a week, providing a very practical approach. This is the reason why the course is given not only in conventional classrooms but also in computer rooms. Learning materials and communication tools for faculty, staff and students are available on the e-learning platform. To make it easier for students to follow the course they are offered a detailed timescale (Fig. 1).

DENOMINACIÓN ASIGNATURA: TÉCNICAS DE BÚSQUEDA Y USO DE LA INFORMACIÓN							
GRADO: CIENCIAS POLÍTICAS					CURSO: 1º	CUATRIMESTRE: 2º	
CRONOGRAMA DE LA ASIGNATURA*							
SE MA-NA	SE-SIÓN	DESCRIPCIÓN DEL CONTENIDO DE LA SESIÓN	Indicar espacio necesario distinto al aula (aula inform., audiovisual etc.)	TRABAJO DEL ALUMNO DURANTE LA SEMANA		HORAS PRESEN CIALES	HORAS TRABAJO (Sem. Máx. 7 H)
				DESCRIPCIÓN			
1	1	Presentación de la asignatura Explicación de los trabajos prácticos y del trabajo final en grupo Tema 1: Dónde encontrar información fiable Presentación de material informativo de los servicios de la biblioteca	Aula convencional	Formación de grupos para el trabajo final Presentación lectura obligatoria 1 Lecturas complementarias al tema		1,5	
1	2	Clase práctica Demostración del programa TURN-IT-IN	Por determinar	Realización y entrega de ejercicios prácticos Realización de cuestionario autoevaluación Tema 1 Inicio del trabajo en Grupo Realización de cuestionario autoevaluación Biblioteca		1,5	7
2	3	Debate lectura Tema 1 Tema 2: Uso ético de la información: Citación y Bibliografía (parte 1 – materiales impresos)	Aula teoría	Presentación lectura obligatoria 2 Lecturas complementarias al tema		1,5	
2	4	Clase práctica (parte 1)	Aula informática	Realización y entrega de ejercicios prácticos Realización de cuestionario autoevaluación Tema 2 – parte 1 Desarrollo del trabajo en Grupo		1,5	7

Fig. 1. *Information skills* timescale of the degree in Political Science:
http://www3.uc3m.es/reinaG/Fichas/CRONOGRAMAS/Idioma_1/2009/20514359.pdf

2. Organization

Information skills was born as a teaching project in cooperation between the Department of Library Science and Documentation, in charge of the course, and the Library Service.

In order to understand the origin of this project it is good to know that in 1991 Carlos III University of Madrid launched degrees in Library Science and Documentation, at the graduate and postgraduate level. This means there is faculty specialized in the subject of this

course with a good deal of experience. On the other hand, the Library Service, from the beginning, has directed an essential part of its activity to users training. The decision to have these two organizations participate in this course has been considered the most suitable formula to offer a complete view of the subject without forgetting either the scientific issues or the practical matters.

From the beginning of the course in the academic year 2008-2009, the Department of Library Science and Documentation started to work in coordination with the Library Service, with whom they periodically meet. Furthermore, to encourage cooperation and to share materials, a space was created in the e-learning platform of the University. The Department and the Library share a directory where all the information and the contents of the course are available, both those provided by professors and by librarians. Finally the model chosen consists of integrating the participation of the Library where it is responsible for organising guided visits to centres, for teaching two classes, and offering training materials and exercises. Thanks to the great work of coordination the results highly reward the efforts of both units.

One of the main difficulties we have had to tackle has been the access to the electronic resources from the computer classrooms as a consequence of classes being held simultaneously. Hence the selection of databases explained in the classes is based not only on being representative for learning purposes but also on their availability through institutional licenses with unlimited concurrent usage.

Another challenge of the course is the impact of subscriptions and cancellations of electronic resources. For instance, Ecowin, an economic database, was explained in the academic year 2008-2009 but not in 2009-2010, because Ecowin was replaced in January 2009 by Global Insight. In the academic year 2010-2011 the main economic database will be Global Insight.

3. Contents

The program of *Information skills* has common objectives, contents and structure for all of the degrees, although logically the specialized information resources whose usage is explained varies from one degree to another.

The course is articulated around four topics (see, for instance, the degree in Business: http://www3.uc3m.es/reina/Fichas/Idioma_2/204.14359.html). The first one familiarizes the students with the concept of documental sources depending on different media and nature. The second one introduces a reflection on the cumulative nature of science and the importance of making ethical and responsible use of citations and bibliographic references. It also introduces the students to the use of bibliographic managers. The third and the fourth subjects analyze information retrieval and evaluation in an electronic environment through the learning of search strategies in different search engines and specialized databases, many of those being about statistical information.

Every student passing this course should gain the following competencies:
      1. Recognize, determine and express in a proper manner their information needs.
      2. To know and be able to use effectively the main information sources in their discipline, both general and specialized.

3. Design and distinguish effective search strategies to retrieve information from any kind of information source.
4. Optimize searches, reducing the time spent, as well as getting and presenting the most relevant results.
5. Critically evaluate results in order to improve, if necessary, their information seeking patterns.
6. Synthesize and display the hits and retrieved data in different formats and media with different graphic tools.
7. Quote and cite the documents used and the information retrieved, using specific reference management software, to manage and understand its value for the student's career.

3.   Searching and using statistical information

1. Data in teaching and research

Carlos III University of Madrid considers essential that students gain, as soon as possible, competencies in using both documental and factual databases, as they are important in teaching as well as in research. The Library offers more than 230 electronic resources, 42.000 scholarly journals and 28.000 ebooks. Twenty of the 230 electronic resources are databases containing data.

These information sources comprise a large part of the annual general budget for bibliographic acquisitions requested by faculty, as well as the funds of research projects. In both cases the Library Service manages the purchases and subscriptions.

2. Type of databases

For the *Information skills* course the most pertinent statistical databases for each degree have been selected. In most of the degrees the more general resources are explained, such as Country Reports & Profiles (from Economist Intelligence Unit), INEbase (from the Spanish National Institute of Statistics), Eurostat (from the Statistics Office of the European Commission) and OECD data. Nevertheless, the more specialized ones are only explained in some degrees, such as SABI (Iberian Balance Sheets Analysis System) in those degrees related to business, or the Spanish Centre of Sociological Research (CIS) databases and the Eurobarometer series in those related to sociology and political science (Fig. 2).
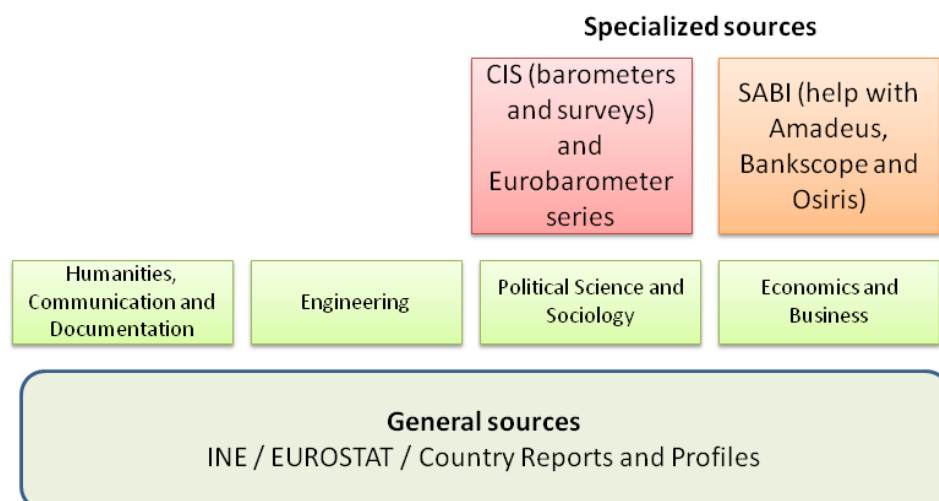
Fig. 2. Some databases are common for all the degrees whereas others are for specific degrees.

The statistical databases the students are exposed to include the following:

- INEbase (Spanish National Institute of Statistics): demography, society, economy, education, science and technology, energy…
- Eurostat (Statistical Office of the European Commission): economy, finance, demography, industry, trade, environment…
- OECD (Organization for Economic Cooperation and Development): economy, employment, health, agriculture, trade, telecommunications…
- Country Reports and Profiles (Economists Intelligence Unit): main economic indicators
- CIS (Spanish Centre of Sociological Research): surveys, public opinion barometers
- Eurobarometer (European Commission): public opinion
- SABI (Bureau van Dijk): financial data from Spanish companies (similar to OSIRIS, about companies worldwide; AMADEUS, about European companies; and BANKSCOPE, about banks worldwide)
- Global Insight (ISH): economic and financial data worldwide. Global Insight will be explained from year 2010-2011 on.

3. Methodology

During the classes, the explanation of statistical databases begins with a description of its contents, utility, main functionalities and search and browsing systems (Fig. 3). Students are informed that databases from the same producer are usually similar, such as SABI (Iberian Balance Sheets Analysis System). This also allows them to learn how OSIRIS, AMADEUS and BANKSCOPE work, as these are essential resources they will need during their studies later on.

Fig. 3. This slide belongs to the presentation of SABI, in which some of the main features and functionalities of the database are explained.

Theoretical explanations are constantly alternated with practical exercises based on problems students must solve (Fig. 4). The aim is to put into context this training with examples applicable to other courses in their degrees; for instance, the search of macroeconomic data in the course on *Economic structure* or financial ratios in *Accounting*.

Fig. 4. This slide belongs to the presentation of SABI, in which exercises are integrated trying to practice advanced searches, alerts set up and file exporting among many other tasks.

The cases analyzed involve not only searching for information but to use it. For instance, for studying the databases of the Spanish National Institute of Statistics or Eurostat, students are taught which type of information can be retrieved, how the data is structured, how different tables are combined and how to export the results to graphs or worksheets in order to generate the information they need.

Everything students learn in the classes must be practiced in their personal work time carrying out the assignments proposed by the professor.

As long as the course evolves, cases grow more complex, forcing the students to compare absolute figures and relative figures, for instance to know which regions have more immigrants or consume more electricity or other energy sources, bearing in mind they have different population. And, obviously, they learn to compare information in different databases in order to choose the most pertinent one.

4. Course evaluation

How do students evaluate the *Information skills* course? Do they consider it useful for their studies and their professional future?

One of the thermometers of teaching quality at Carlos III University of Madrid is the annual assessment each student makes of the faculty through a survey in which all the courses are

evaluated. In this evaluation three criteria are taken into account: the teaching planning, the teaching methodology and the learning results. The survey uses a scale from 0 to 5.

In general, the students' opinion on the course in the year 2009-2010 is most positive (Fig. 5).
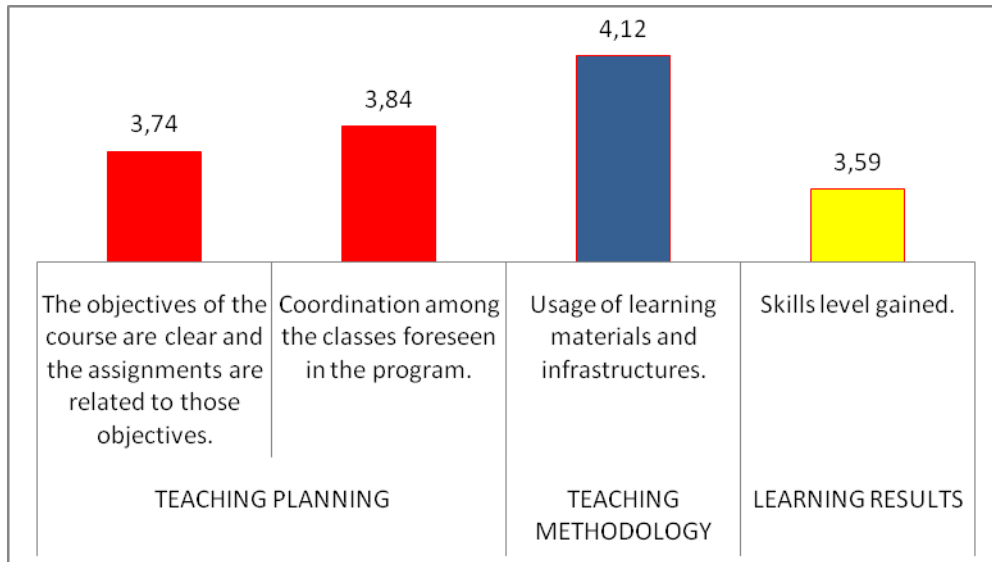

Fig. 5. Main results of the 2009-2010 survey.

The figures are quite similar in the School of Social Sciences and Law, the School of Humanities and the School of Engineering.

Besides this quantitative evaluation, students can make comments freely, which allows us to better understand their view of the course. Some students indicate "more time is needed for the program to be developed and to increase knowledge." The "practical nature" of the course is especially valued, underlining that "the content is necessary from the first day of class to carry out the assignments" and that "cases are related to the degree", yet some other students think that, given its importance for research, "it would be suited better in later years." There are students who go beyond the course and realize "the great importance of everything learned in the academic and professional future." They also are aware of "knowing better the library" and "the information resources of the University" thanks to this course.

5. Conclusions

The two years of experience with *Information skills* shows that the collaboration between the Department of Library Science and the Library Service is a great opportunity to foster the cooperation between faculty and librarians. Faculty must be permanently updated in the knowledge of the resources purchased by the Library, better understanding the difficulties arising for students in searching and solving information problems. Librarians, on the other hand, must adapt their services and collections to faculty and students needs as well as they have making their internal organization more flexible and improve their work processes.

The good evaluation students have provided for the course, and its positive results in the academic year 2009-2010, show they are conscious of the importance of searching and managing information, especially statistical data, as a key for their present academic success and their professional future.

From an economic point of view, a higher usage of information resources means making the most of the University investment in subscribing and managing information resources and general and specialized databases.

The *Information skills* course at Carlos III University of Madrid is a decisive step towards the integration of information literacy in higher education, necessary for building autonomous, reflective and critical professionals.

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