Knowledge Classification:
A Problem for Scientific Assessment in Spain? †

Carla López Piñeiro* and Elea Giménez Toledo**

Centro de Ciencias Humanas y Sociales del CSIC, Instituto de Estudios Documentales
sobre Ciencias y Tecnología, Albasanz 26-28, Madrid, 28037, Spain,
*<carla.lopez@cchs.csic.es>, **<elea.gimenez@cchs.csic.es>

Carla López-Piñeiro (degree in Information Science 2006, and Advanced Studies Certificate (DEA) at University of A Coruña, Spain, 2009) is research personnel in training (with a Professional Researcher Training Scholarship, FPI) at the Human and Social Sciences Center (CCHS, within the Spanish National Research Council, CSIC). She is developing her PhD Thesis, under Elea Giménez Toledo's supervision, about the evaluation of Spanish social Science and Humanities journals. One of her research lines is the effect of knowledge organization on research evaluation.

Elea Giménez-Toledo (PhD in Information Science at University Carlos III of Madrid 2002), has been a research fellow at the Spanish National Research Council (CSIC) since August 2006. Within the Human and Social Sciences Center (CCHS, one of the research centers of the Spanish National Research Council, CSIC), she works mainly on Social Science and Humanities publications evaluation, particularly on journals and research monographs. She is co-author of two websites on Spanish Journal Evaluation on Social Sciences and Humanities: RESH (epuc.cchs.csic.es/resh) and DICE (epuc.cchs.csic.es/dice).

ABSTRACT: Agreements and disagreements among some of the most important knowledge classifications involved in Spanish scientific activity assessment are presented here. Knowledge classifications used by two Spanish platforms for journals evaluation, RESH and In-RECS/In-RECJ; the one used by Web of Knowledge; and those used by the three main agencies working on scientific evaluation in Spain, ANECA, ANEP, and CNEAI are compared and analysed in order to check the differences between them. Four disciplines were traced across these knowledge classifications, and none of them tally with others. This state favours failures in the assessment system, especially in those disciplines whose position on classifications seems to be less clear. In this paper, the need for a rapprochement to the subject exposed is expressed. The opening of a debate is offered, with the aim of stimulating the improvement of the whole system, especially in Humanities and Social Sciences fields.

1.0 Introduction

The starting point for the research on which this paper is based was the creation of a new information system in Spain. The objective of this system is to centralize the information relating to the evaluation of scientific journals in Human and Social Sciences and provide rankings, or simply indicators, which will serve to inform decisions related to scientific assessment. The system we are referring to as RESH/

368

Knowl. Org. 38(2011)No.5
C. L. Piñeiro and E. G. Toledo. Knowledge Classification: A Problem for Scientific Assessment in Spain?

IN-RECS is now in the third year of its formation process; it is the result of the joining together of RESH (Spanish journals of social and human sciences, Evaluation of Scientific Publications Research Group (EPUC), Spanish National Research Council (CSIC)), and INRECS/INRECJ (impact index of Spanish social science journals/impact index of Spanish law science journals, Evaluation of Science and Scientific Communication Research Group, EC³, University of Granada). RESH and INRECS/INRECJ are two tools used for the evaluation of Spanish scientific journals. As mentioned, they were created by two different research groups: EPUC and EC³. These two groups, separately, provide various bibliometric indicators (e.g., impact index, accumulative impact, half impact index, self citation index, co-author index), as well as some formal and qualitative indicators (e.g., periodicity observance, systems for originals' evaluation, external referees, peer review, journal presence on quality international databases, experts opinion), that together determine the global quality of the journals evaluated (to date, more than 2,000).

The arrival of the new RESH (resulting from the merger of RESH and IN-RECS, and available now at http://epuc.cchs.csic.es/resh, involves confronting a number of problems including selecting one or another system for the classification of knowledge. Despite the fact that RESH and IN-RECS are generally compatible and complementary, they present some divergences regarding their disciplinary organization:

– RESH includes social and human sciences in its analysis, while IN-RECS/IN-RECJ only includes social sciences and law sciences;
– IN-RECS includes among its disciplines communication, whereas RESH classifies this area within sociology;
– IN-RECS includes economics among its disciplines, whereas RESH does not. Economics is not in RESH because research in this discipline has a strong international character (except for subdisciplines like local development or regional economy), and most of the researchers in this area agree with using the impact factor (IF), provided by Thomson Reuters, or the national impact factor provided by IN-RECS, as a quality reference; and,
– RESH includes law as a discipline, whereas those responsible for IN-RECS have provided a specific information system for this area, i.e., IN-RECJ.

RESH	IN-RECS
Anthropology	Anthropology
Library and Information Sciences	Library and Information Sciences
Political Sciences	Political and Administration Sciences
(In Sociology)	Communication
(Not included)	Economics
Education Sciences	Education
Geography	Geography
Psychology	Psychology
Sociology (Communication included)	Sociology
Town planning and spatial planning	Town planning
Law	(In IN-RECJ)
Archaeology	(Not included)
Fine Arts	(Not included)
Philosophy	(Not included)
History	(Not included)
Linguistics/Literature	(Not included)
Latin America	(Not included)
Miscellaneous	(Not included)
Psychiatry	(Not included)

Table 1. Distribution of Disciplines/Areas in RESH and IN-RECS

In addition to a conventional organization of disciplines, the creation of the new RESH also involves the distribution of work between two teams that face integration. One of them will assume the processing of data of social sciences and the other of human sciences. This leads us to new difficulties concerning how to make this division (e.g., what is included in social sciences and what is in humanities), what classification criteria must be applied (is anthropology a discipline of social sciences or humanities?), and, should communication be included within sociology, or would it be better to place it separately, as it is in IN-RECS? Examples of this lack of definition, beyond the systems analyzed, can be found in *ERIH*, the *European Reference Index for Humanities* (European Science Foundation 2011), in which the inclusion of some disciplines in the area of humanities is far from clear, for example, in the cases of education, anthropology, and psychology.

The complex scenario presented exceeds the internal organization of the project. Knowledge organization has many repercussions on scientific development, so scientific literature has treated it broadly, es-

pecially in those aspects related to how knowledge is (or should be) organized in disciplines and links between them (Thompson Klein 1990; Freitas, Morin, and Micolescu 1994; McAllister, Dowrick, and Hassan 2003; Morillo Bordons, and Gómez 2003; Bordons, Morillo, and Gómez 2004; López-Huertas and Jiménez Contreras 2004; Van Raan 2005; Porter et al 2007; Porter and Rafols 2009; Frodeman, Thompson Klein, and Mitcham 2010; Huutoniemi et al 2010).

Classification of journals by disciplines and their allocation to either humanities or social sciences has an effect on how they are placed in a ranking and how they are considered by thematic committees in charge of evaluating projects or researchers. The institutions evaluating scientific activity in Spain, ANEP, the National Evaluation and Foresight Agency (http://www. micinn.es/portal/site/MICINN/menuitem.29451c2ac 1391f1febebed1001432ea0/?vgnextoid=3cb39bc1fccf 4210VgnVCM1000001d04140aRCRD; España. Ministerio de Ciencia e Innovación); ANECA, the National Evaluation Agency of Quality and Accreditation (http://www.aneca.es/; Agencia Nacional de Evaluación de la Calidad y Acreditación); and CNEAI, the National Research Assessment Commission (http:// www.educacion.es/horizontales/ministerio/organismo s/cneai.html; España. Ministerio de Ciencia e Innovación) refer to the *Web of Knowledge* (Thomson Reuters) rankings, although they also consider other information systems such as DICE (http://dice. cindoc.csic.es/; Evaluation of Scientific Publications Research Group. Spanish National Research Council (CSIC)) or Latindex (http://www.latindex.unam.mx/; cooperative system coordinated from Universidad Nacional Autónoma de México, UNAM) and journals not included in *Web of Knowledge*. For that reason, it has been decided, in this paper, to trace five disciplines in particular through the various classifications of knowledge. By studying these specific cases, we hope to open up a debate that can be extended to other areas. With this aim, the classifications used by CNEAI, ANECA, and ANEP at the national level and by *Web of Science* (*WoS*) at the international level have been selected.

The main objectives of this paper are to:

– Analyze the relationship between the classifications of scientific knowledge and the evaluation of research activity;
– Conduct an in-depth study of the difficulties resulting from interdisciplinarity in the process of evaluating science, especially in the Spanish academic world;

– Open up discussion about the possibility, or not, of creating an optimum classification system to maintain the balance between the organization of disciplines, with the subsequent assignment of scientific journals to them, and conformity to the committees in charge of the evaluation of scientific activity; and,
– Contrast several knowledge classifications with the aim of studying knowledge organization within humanities and social sciences, and analyse the repercussions that this organization has on the assessment of Spanish researchers.

2.0 Methodology

Classifications were selected and analyzed in order to attain greater clarity regarding the organization of knowledge by various institutions and organizations at national and international levels. To do so, CNEAI, ANECA, and ANEP classifications were selected, because the task of evaluating scientific activity is mainly distributed among these three organizations in Spain. ANEP is in charge of assessing research projects and programs, as well as producing studies and analyses of scientific research and technological development. ANECA is in charge of the evaluation, certification, and accreditation of teachers, lecturers, and institutions. Finally, CNEAI is in charge of the evaluation of university lecturers and Spanish National Research Council scientists. At the international level, *WoS* was selected because its rankings of scientific journals and its classifications of them are used for scientific evaluation in many countries around the world (including Spain, where ANEP, ANECA, and CNEAI use *WoS* as the main reference when assessing publications). RESH and IN-RECS/IN-RECJ classifications were included within the comparison because both of them were created for two research groups that are now in the midst of their convergence process towards consolidation into one specific evaluation system for humanities and social sciences publications in Spain.

The thematic areas of social sciences and humanities for each of the classifications mentioned above were extracted and separated by disciplines/sciences and compared. Next, in order to move the research to a less abstract discussion, the positions occupied by five specific disciplines in each of the selected classifications were analyzed to create a comparison of how they are identified and in which areas of the RESH, IN-RECS and *WoS* systems. Subsequently, the committees of ANEP, ANECA, and CNEAI in charge of

370

Knowl. Org. 38(2011)No.5
C. L. Piñeiro and E. G. Toledo. Knowledge Classification: A Problem for Scientific Assessment in Spain?

their evaluation were observed in order to decide if it is correct to situate them within social sciences or humanities and why.

To carry out this task, geography, documentation/ information science, anthropology, and communication were selected. This selection was based on unpublished preliminary results obtained from research in progress, according to which, after the analysis of location in various classifications, it was concluded that these disciplines had a high level of interdisciplinarity. In addition, the results obtained from the evaluation could be very different if they were included in social sciences or humanities. The four disciplines were tracked across the six classifications selected. We then analysed how each of these classifications placed these disciplines in terms of location and frequency.

It is not possible to compare classifications whose objectives and structures are so different. Consequently, it is not the comparison among classifications that is important in this study, but a major understanding about knowledge classification and factors that have an influence on it. The idea is to find ways of improving the assessment of scientific publications and, by extension, of researchers. Therefore the number of times disciplines appear in the area and the position in which they appear (humanities or social sciences or both) are analysed.

The lack of a universally accepted knowledge classification has caused the proliferation of several knowledge classifications across the world. Some of them are more frequently used than others, but none of them are considered for all the countries. Nonetheless, *WoS* is the tool mainly used as a global reference for people and publications assessment. A practical example is presented here: the evaluation of a professors' collective in library and information science in Spain. If one of these researchers wants to request CNEAI for a six years' research period recognition, he or she would be evaluated by the philosophy, philology, and linguistic committee (where CNEAI includes library and information science). During 2010, and, according to official data in *Boletín Oficial del Estado* (España 2009), the areas evaluated by this committee were several types of philology (Spanish, French, etc.), philosophy (moral, political, etc.), linguistics (general, Indo-European, etc.), and literature (Spanish, comparative, etc.) apart from library and information science/documentation. As will be shown in this article, library and information science is the only discipline evaluated by this committee that, according to other classifications (*WoS*, for example), is usually placed in the area of social sciences, while all

the others are usually categorized as humanities disciplines.

It is obvious that the evaluations of information science or documentation researchers can be negatively affected by the absence of experts in these areas within the committee, and this is likely due to the fact that all the other disciplines are specializations of philosophy, philology, and linguistics. Aside from that, there is another disadvantage for information science with respect to the others disciplines included in this committee: researchers whose work is evaluated by the philosophy, philology, and linguistic CNEAI committee receive more favourable reviews when they publish their articles in journals included in the *Arts and Humanities Citation Index* or in the *Social Sciences Citation Index* by Thomson Reuters, or in those journals highly classified by the *ERIH*. Information science is not included in *ERIH* because it is considered a social science, so only *WoS* journals are available to information science researchers who want to publish and obtain a high evaluation by CNEAI. However, researchers of the other disciplines evaluated by this committee still have the possibility of publishing their papers on journals in their own specialties covered by *ERIH*. Nevertheless, it is important to highlight that, during the last decade, CNEAI has gradually improved its evaluation process, introducing some particular criteria concerning social sciences and humanities (España 2008), and now INRECS, LATINDEX, Scopus, and DICE are considered as references for scientific assessment, although not at the same level as *WoS* and *ERIH* (España 2009).

3.0 Social sciences and humanities: a challenge for knowledge classifications and assessment systems

The implications of diversity in knowledge organization and specifically of interdisciplinarity (used here in a broad sense, to cover all kinds of cross-disciplinary research) have been widely recognized and studied in the scientific literature. Porter and Rafols measure and map cross-disciplinary research interchanges over time, in a paper in which they analyze the behavior of six disciplines (biotechnology & applied microbiology; engineering, electrical, & electronic; mathematics; medicine-research & experimental; neurosciences; physics) in *WoS* from 1975 to 2005 using several indicators. According to their results, science is becoming more interdisciplinary, "but in small steps;" the number of *WoS*-cited subject categories has increased, but the recently created subject categories

tend to be in the vicinity of previous categories (Porter and Rafols 2009, 741). Interdisciplinarity is so complex that it has been the subject of multiple studies over the years, and several books and papers have treated it broadly. One of the most recent examples is *The Oxford Handbook of Interdisciplinarity*, which deals with how disciplines are born and links are made between them, covering interdisciplinarity from a broad range of different perspectives (Frodeman, Thompson Klein, and Mitchaum 2010). However, few studies have located that focus in how knowledge interdisciplinarity affects research evaluation. Both of these aspects are considered separately below. Studies about knowledge organization in humanities and social sciences are analysed in this section.

José María Izquierdo Arroyo writes about the impossibility of deciding which disciplines should be in humanities or in social sciences. In addition, he considers two epistemological attitudes in view of the problem dividing thematic areas within the framework of humanities and social sciences: either separate them, or build a super-class, combining identity and difference, in which both areas would be integrated (Isquierdo Arroyo 2000). Gloria Carrizo Sainero (2000) also points out the difficulty of deciding with certainty which disciplines are in the social area. She declares that the main reason for the existence of this variety of criteria for knowledge organization of the social sciences is that they are considered a "discipline or group of disciplines for the study of human beings and their problems in the social context." This implies that it is difficult to separate humans' interactions from their environments and to do so could create doubt that every human activity has a social character (Carrizo Sainero 2001, 11).

The *Cambridge Handbook of Social Sciences in Australia* explains current knowledge organization going back to the nineteenth century, the moment at which universities expanded, and with them "their formal academic structure and methods of instruction." Scholarly journals emerged too, promoting research and debate in disciplines more developed by universities. Then, major libraries used these disciplines "as a basis for classification …. As the division became ever more formalized, the options for reorganization of the social sciences have become ever more limited" (McAllister, Dowrick, and Hassan 2003, 2). During the last years of the twentieth century, "increasing diversity" was "the hallmark of the Social Sciences," and because of that, today "disciplinary boundaries are becoming weaker." Despite this, "the majority of universities in the advanced societies … are organized

around, and identify themselves by, disciplinary labels" (McAllister, Dowrick, and Hassan 2003, 2). Currently, social sciences must face several challenges (McAllister, Dowrick, and Hassan (2003, 11-12):

– The growth of interdisciplinary research—has become a priority in the social sciences area as a result of two essential changes: a) social science problems are every day "more complex and interrelated, transcending traditional disciplinary boundaries," so "scholars have appropriated the ideas, innovations and methodologies of other disciplines to try to solve them;" and, b) the structure of higher education is changing. Social sciences have become more international, thanks to the fact that scholars can travel more easily and more frequently between countries, and that "global communications have facilitated the free flow of information and ideas." Now the number of students has grown, and some researchers work in external research-only agencies, whose "bodies are small and multidisciplinary, further leading to the cross-fertilisation of ideas."
– The importance of remaining "relevant to, but independent of, government and the state."
– "The essence of the social sciences, unlike the natural sciences, is that there is no core problem to solve. This raises the issue of relevancy, particularly with government, for scholarly endeavour will necessarily be spread across a diverse range of areas and disciplines, with varying degrees of success in providing answers to the problems raised. A closely related problem is how to contribute to policy debates, yet remain objective and independent while still providing informed advice and analysis."

There is no doubt that information organization is affected by interdisciplinarity, but in what way? The complexity and diversity of classifications reverberate not only in information products, but also in the manner in which the information is retrieved.

Science is characterized by its ever-increasing interdisciplinarity. This plural perspective of research problems is transferred to its publications, and they can be associated with several categories within every classification. Thematic classifications used in bibliographic databases and other document sources are not universal, and the word structure that works well in one database is not the one that is most desirable in other databases. Moreover, thematic classifications in multidisciplinary databases are very limited because they include terms from several scientific specialities. However, this isolated, scattered and divided way of

372

Knowl. Org. 38(2011)No.5

C. L. Piñeiro and E. G. Toledo. Knowledge Classification: A Problem for Scientific Assessment in Spain?

looking at information does not satisfy the multidimensional approach of science, which nowadays requires a plural perspective as the basis of research. Interdisciplinarity does not happen with the same intensity among all scientific disciplines; it is stronger among some of them and is practically absent in other cases (López Ferrer et al. 2009).

To allocate disciplines to one area or another can be quite abstract. Giménez Toledo and Rubio Liniers (2009) work on the practical side of the problem in relation to historical sciences. According to these authors, that group of sciences possesses some documental characteristics that separates it from other sciences: the interdisciplinary and holistic character of history and its thematic transverse through time makes it difficult to establish history-graphic boundaries and frame its publications in classificatory systems and scientific taxonomies.

The diversity of knowledge classifications entails difficulties similar to those generated by the use of international or commercial databases, whose selection criteria are not only related with journal quality. In fact, they discriminate positively for some journals, for example, those that are in English, as Hicks and Wang (2011) point out. Using *Scientometrics* for assessment has been mostly limited to the natural sciences and engineering, but now it has been extended to the social sciences and humanities. Differences between the scientific communication practices of scholars in the natural sciences and engineering and in the social sciences and humanities are too huge, starting with the detail that humanist and social sciences researchers' production includes a remarkable percentage of books, and their research orientation is more local (Archambault et al. 2006).

The features presented in this section define a conflict that seems without end, due to administrative motives and the difficulties that organizing knowledge implies. In addition to the complexity of building (or rebuilding) a knowledge classification together with the joining of numerous cultures and ways of understanding the world, it is inevitable that there will be a clash among political and economic powers that a revolution of reform of state and regional structures, processes and institutions like universities and research centres would imply. The aim of this article is to show the differences and disagreements between some of the most important knowledge classifications involved in the Spanish scientific assessment system to design an appropriate, better, and fairer research evaluation process in the areas of social sciences and humanities.

4.0 Results

It is clear from analyzing the classifications used by RESH, IN-RECS, *WoS*, ANECA, ANEP, and CNEAI that the phenomenon of interdisciplinarity is reflected in the various ways in which the classifications organize knowledge. In order to demonstrate this, cases of selected disciplines will be presented, first as a whole and then individually. Figure 1 illustrates how many times the different specialities of the four disciplines examined appear through the six classifications, reflecting their degree of interdisciplinarity. Geography stands out from the rest, especially in the CNEAI classification. Knowing CNEAI is an evaluation institution, it is supposed to specify most of the possible sub-disciplines within geography, a discipline that has links with others from humanities, social sciences, and
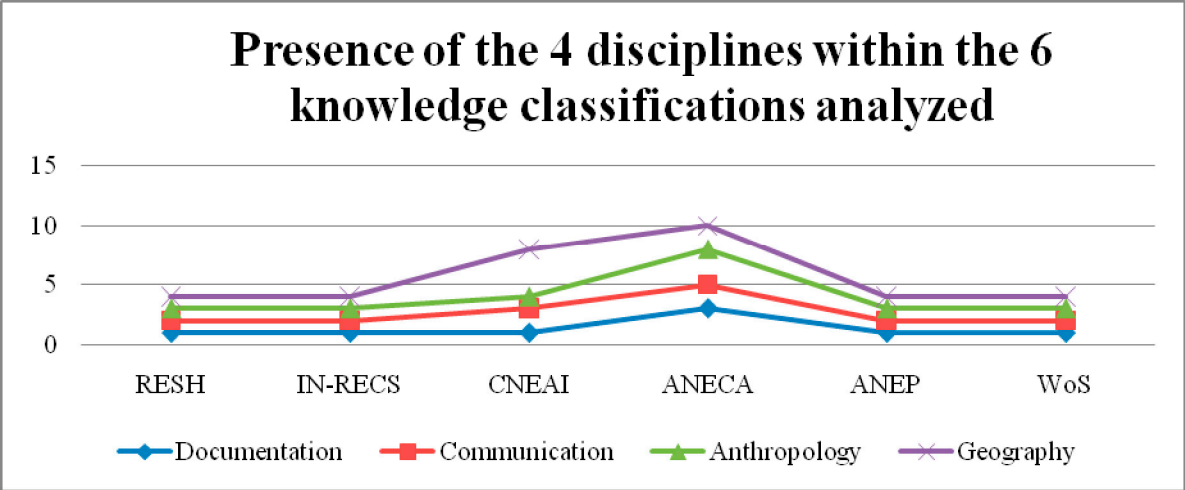

Figure 1. Presence of the Four Disciplines within the Six Knowledge Classifications Analyzed

even exact and natural sciences. According to our analysis, anthropology is in a similar situation, but on a lesser scale.

Figure 2 depicts the areas in which the four disciplines are placed, taking into account their presence and positioning in social sciences, in humanities, or in both of them, in the six classifications. Here it is possible to observe with some clarity the interdisciplinarity that characterises some of these disciplines.

This discussion has to be understood as taking into account the links between evaluation agencies, knowledge classification, and interdisciplinarity because it is fundamental to know how the evaluation agencies determine the place for a researcher or a project to be evaluated.

CNEAI, ANEP, and ANECA use knowledge classifications for positioning researchers, projects, and institutions like universities, and decide which committees will be in charge of the evaluation of every discipline. They use different evaluation criteria, based on researchers' or research groups' ascription areas, but they agree about giving preference to the opinion of the researcher (or main researcher in the case of projects) when they have difficulties choosing which committee will be in charge of assessing some interdisciplinary projects or researchers. For instance:

– According to CNEAI, it can be the case that the evaluation area for a certain application is not univocally determined. In this circumstance,

CNEAI will value the option expressed by the petitioner (España 2008).
– In ANEP, they respect the main researcher's election, but if they observe this election is wrong, the best option is to address it to the corresponding area (España. Ministerio de Ciencia e Innovación 2009).
– ANECA ascribes applications for evaluation by a specific committee and evaluation field taking in account the applicant's request or selection, but this is not binding;
– ANECA will take into account curriculum vitae and the applicant researcher's connections with the chosen field (España 2008).

As it can be observed, all of these disciplines have some complexities with regard to their situation in the six knowledge classifications analysed and the frequency with which they appear in them. In geography and anthropology, our ignorance about the disciplines themselves were an added difficulty, so experts and specialized reference works were used to cover them.

4.1. Geography

The case of geography, which appears as a discipline in RESH, IN-RECS and *WoS*, is presented. The most notable difference is the fact that, when assigning geography to social sciences or humanities, only RESH
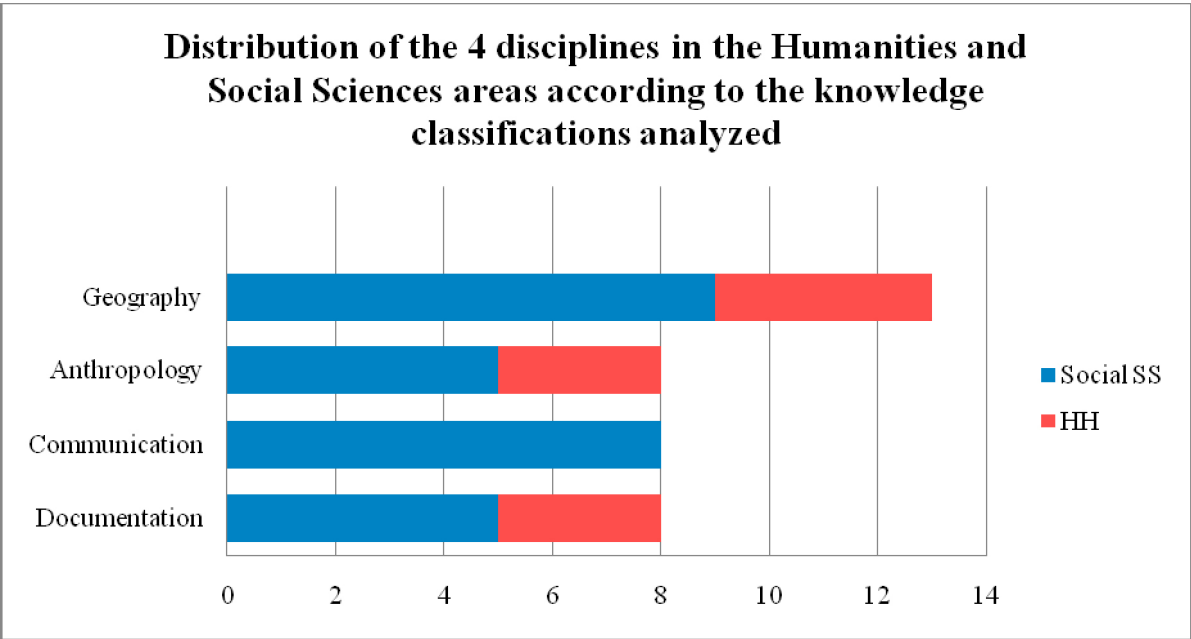

Figure 2. Distribution of the Four Disciplines in the Humanities and Social Sciences Areas According to the Knowledge Classifications Analyzed

374

Knowl. Org. 38(2011)No.5
C. L. Piñeiro and E. G. Toledo. Knowledge Classification: A Problem for Scientific Assessment in Spain?

preferred humanities, whereas it was assigned to social sciences in the other five classifications (Figure 3).

With regards to the Spanish evaluation organizations, both ANECA and CNEAI divide geography into two blocks in their classifications: physical geography and human geography. The former is evaluated by the humanities committee of ANECA and by the economic and business sciences committee of the CNEAI. In the case of human geography, there are two committees in ANECA in charge of its evaluation: the social and law sciences and the humanities committees. CNEAI devotes two committees, as well, to the evaluation of human geography: the committee of social, political, behavioural, and educational sciences and the economic and business sciences. ANEP, for its part, only contemplates human geography and puts the committee of social sciences in charge of its evaluation.

By observing geography's positioning in every classification, the difficulty of placing it in the right position becomes evident. At the same time, the interdisciplinary role that geography fulfils in social sciences and even between social sciences and science becomes clear. The Royal Geographical Society (2010) confirms this, defining geography as: "the study of the earth's landscapes, peoples, places and environments." In addition, it emphasizes that this discipline "is unique in bridging the social sciences (human geography) with the natural sciences (physical geography)" and "puts this understanding of so-cial and physical processes within the context of places and regions—recognising the great differences in cultures, political systems, economies, landscapes and environments across the world, and the links between them." Here the Royal Geographical Society provides an explanation of the high interdisciplinarity detected in geography based on the analysis presented in this work. Some experts consulted affirm that geography can be divided into three sub-disciplines: human geography, physical geography, and geographic regional analysis, the first being closest to social sciences, and the other two to natural sciences; however, the experts would not include either of them in humanities.

It is likely that connections between geography and humanities are related to legal, academic, or administrative interests. Geographic knowledge has its origins in ancient Greece, despite the fact that the professionalization of this discipline does not appear until it is introduced with autonomous character at universities during the nineteenth century. In some countries, geography was first taught at arts schools, while in other countries, it was first taught at sciences schools, and, in some other countries, it was distributed between those schools (Fontanillo Merino 1986). Consideration of geography as a discipline within humanities in RESH is related to the inclusion of it in arts schools, and perhaps that is why the ANECA Humanities Committee is in charge of human geography evaluation.
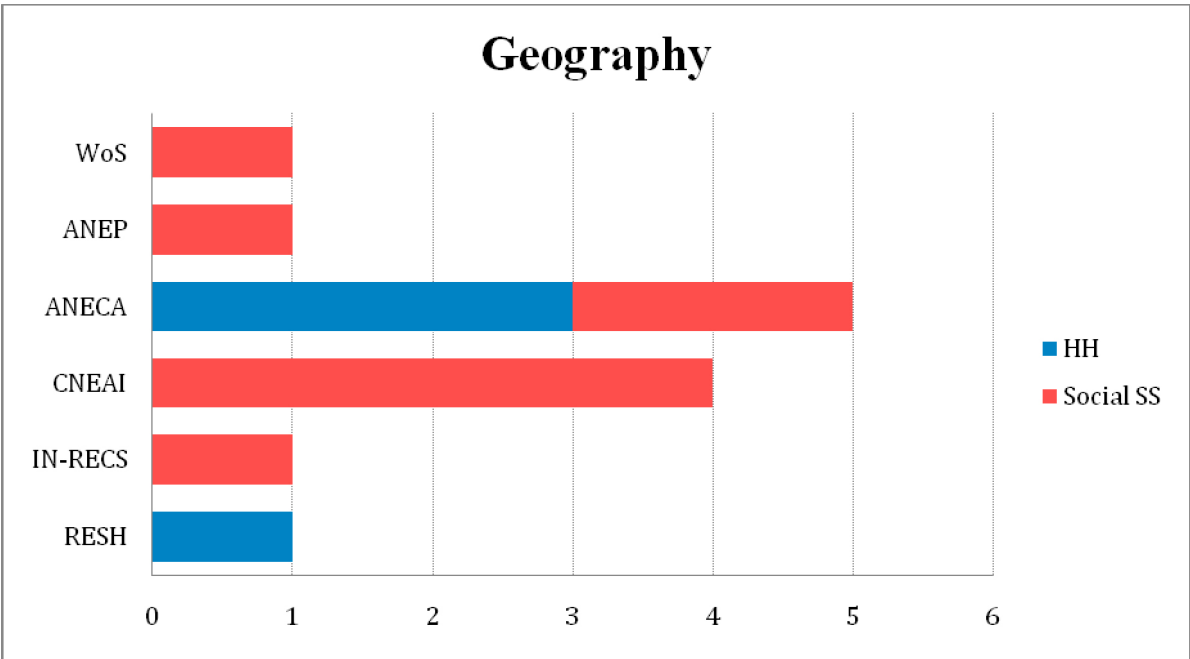

Figure 3. Geography in the Six Knowledge Classifications

Finally, it is interesting that the discipline, as a whole, has to resort to some natural sciences (geology, meteorology, oceanography and hydrology, edaphology, botany) and social sciences (anthropology, demography, sociology, economy) to build its terminological body (Fontanillo Merillo 1986, viii). This is reflected in the physical geography location within earth or nature sciences, according to ANECA, ANEP, and CNEAI. In the same way, one of the conclusions obtained in a study about international citations received by Spanish geography journals is remarkable: the international journals that most Spanish geography papers cite are included in the *Science Citation Index* of *WoS* and not within the *Social Sciences Citation Index* (García Ruiz 2008).

4.2. Anthropology

Anthropology is defined as "the study of humans, including their origins, physical attributes, and cultures" (Colman 2001). It is a science dedicated to the study of human beings, so it must be interdisciplinary, and that is what is reflected in our analysis, which shows the lack of a unanimous stance about its position in knowledge classification. Anthropology figures as a discipline in RESH, IN-RECS, and *WoS* classifications. ANECA includes social anthropology, which is evaluated by the Social Sciences and Law

Committee and by the Humanities Committee, and physical anthropology, which is evaluated by the Humanities Committee. CNEAI includes social anthropology, and it is evaluated by the Social Sciences, Behaviour, and Educational Policies Committee. ANEP includes social anthropology, which is evaluated by Social Sciences Committee.

As in the case of physical geography, physical anthropology is found outside of the target areas of this study: in ANECA, it is positioned within nature science and health sciences and in CNEAI within natural sciences (Figure 4). Anthropology is usually positioned in the social sciences, but, in certain times and classifications, it is included within humanities for fundamentally historic or administrative reasons (for example, university structures, study plans, etc).

4.3. Information science and documentation

Information science is "The branch of knowledge concerned with the storage, organization, retrieval, processing, and dissemination of information," "a cluster of separate but related branches of knowledge, including computer science, information systems, and library science" (Daintith and Wright 2008). It is obvious that the links of this discipline go beyond humanities and social sciences, even if we only look at the precedence of previous definitions,
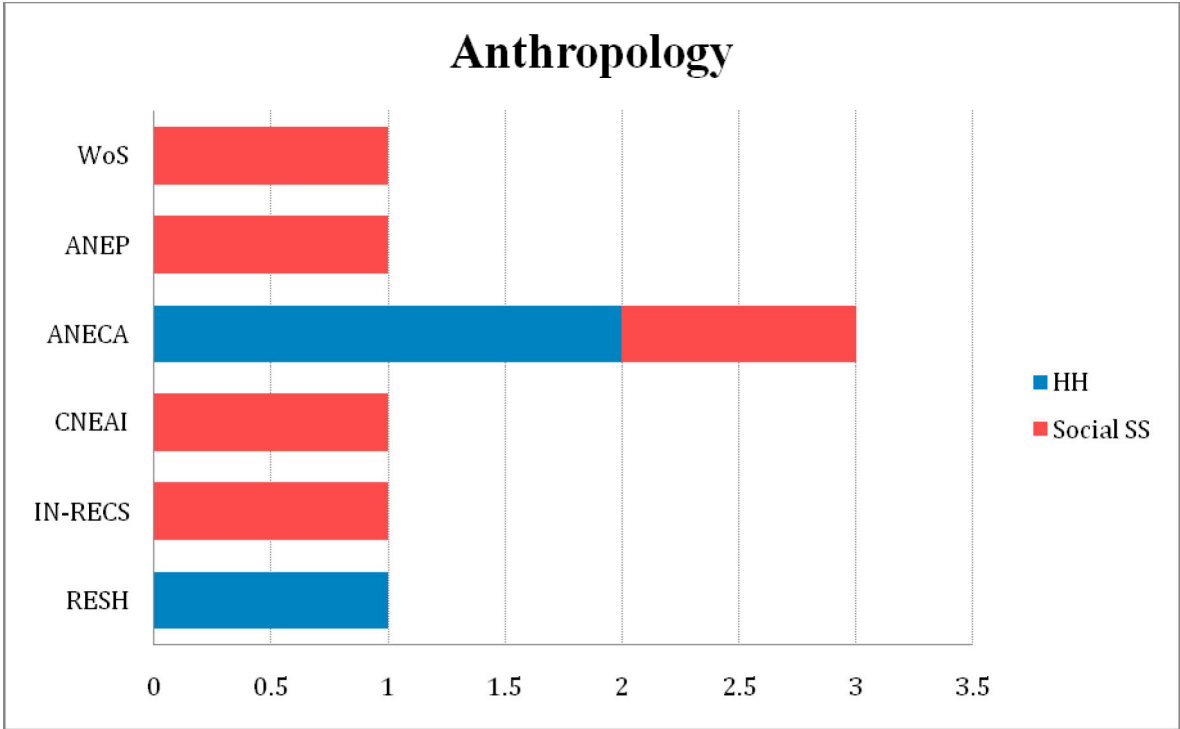

Figure 4. Anthropology in the Six Knowledge Classifications

which relates information science and computer science, for example.

Information science, associated in all cases to library science, figures as a discipline in RESH, IN-RECS, and *WoS*. ANECA considers information and library science as a discipline that can be evaluated by the Humanities Committee or by the Social Sciences Committee, whereas CNEAI's committee in charge of its evaluation is the philosophy, philology, and linguistic one. As far as ANEP is concerned, information and library science has to be evaluated by the Social Sciences Committee (Figure 5).

Information science placement in CNEAI's Philosophy, Philology, and Linguistic Committee could be related to the fact that information science has strong links with applied linguistics, according to authors like Alexander Heard (2003, 91): "neither information science … nor the multitude of new branches springing up under some general name like 'linguistics, sociology and new information technologies' [can] be equated to applied linguistics … for neither of them has the language … as its subject." He concludes that "on account of the unpredictable nature of classes and types of the possible applied problems, it would be rather short-sighted to reduce applied linguistics to some information technologies which are currently new and to information science in general." So, it could be that information science and applied

linguistics complement and help each other, but is this relation stronger than those that information science has with other disciplines? Even if arguments like that exposed and traditions exist that connect information science and linguistics, the truth is that information science has more links with social sciences than with humanities nowadays. This is demonstrated in this paper and, furthermore, by information science research methodologies and its objects of study.

4.4. Communication

Communication is "the field of study concerned with the transmission of information" (Soanes and Stevenson 2005). This definition means that we have to consider that this discipline is linked not only with all sciences but also with all aspects of human life. This connection is one of the reasons why it is so difficult to find a definitive position for communication in a specific knowledge area.

Communication is a discipline in IN-RECS and *WoS*, but not in RESH, because this last classification system includes communication scientific journals in the sociology list. ANEP, ANECA and CNEAI do not consider communication on its own, but rather include knowledge areas like audiovisual communication, publicity and journalism. These areas are evaluated by the Social Sciences and Law Committee in
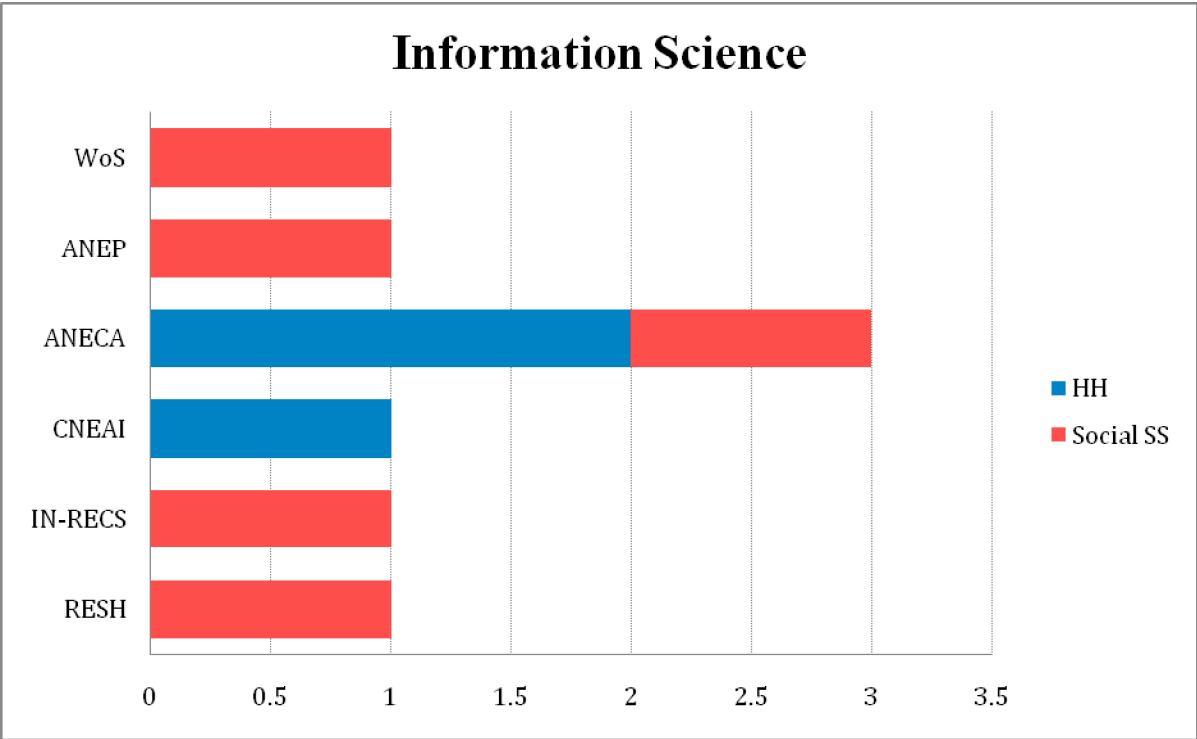

Figure 5. Information Science/Documentation in the Six Knowledge Classifications.

Knowl. Org. 38(2011)No.5
C. L. Piñeiro and E. G. Toledo. Knowledge Classification: A Problem for Scientific Assessment in Spain?

377

ANECA, the Social Sciences, Behaviour and Educational Policies Committee in CNEAI, and by the Social Sciences Committee in ANEP. Thus, even though communication is not considered a discipline in name, it is considered in the three agencies as a social science discipline. So it must be taken into account the fact that some communication branches, like rhetoric and semiotics, are linguistic-related and linked with the most humanistic side of this discipline (Figure 6).

5.0 Discussion and Conclusions

The problem of interdisciplinarity regarding scientific assessment in Spain is evident from the following reasoning: a journal located in two different categories of a classification will probably be situated in different positions in rankings, but this is not necessarily a disadvantage for the journal, as the evaluators of committees usually opt for the most favourable value. However, the same does not occur when it is the researcher who applies for project funding or requests assessment, as he or she has to choose in which area to be included for evaluation, without the possibility of changing once the assignment has been made. The areas covered by a particular committee can be a benefit or a disadvantage for the researcher, as, logically, there are some areas that are more competitive or that elicit more proposals than others.

The committee structure is probably the cause of situations like those mentioned above, but those disadvantages could also be produced if there were rankings or categorizations of journals applied to large areas (humanities, social sciences, law sciences), as, when working at that level of aggregation, the nuances of evaluation by disciplines are lost. So it seems appropriate that committees are divided into disciplines in order to compare or relate projects and researchers of the same discipline, without amalgamating some of them; nevertheless, this division by discipline could be detrimental as well, as projects, lines of research, scientific production, and researchers are frequently interdisciplinary.

The first solution the authors found was the creation of a committee especially devoted to assessing, in the first instance, those projects or curriculum vitae which are most interdisciplinary, redirecting them to the committees considered most pertinent, but that would be, essentially, an administrative answer to the problem. A deeper assessment system change is needed, and that should involve as many quality and quantity indicators as possible according to journals' geographical context. So, there would be two evaluation levels: a) Spanish researchers' articles published in Spanish journals and b) in journals from abroad. Articles published in Spanish journals would be evaluated based on the quality of these journals, instead of on the quality of the databases in which these journals have been indexed. Spanish journals have been evaluated for years by research groups such as EPUC (editorial quality) or EC^3 (international and national citations, Impact Index at national level, etc.). Even at an international level, there are tools as *Latindex*, offering information about journal quality from South
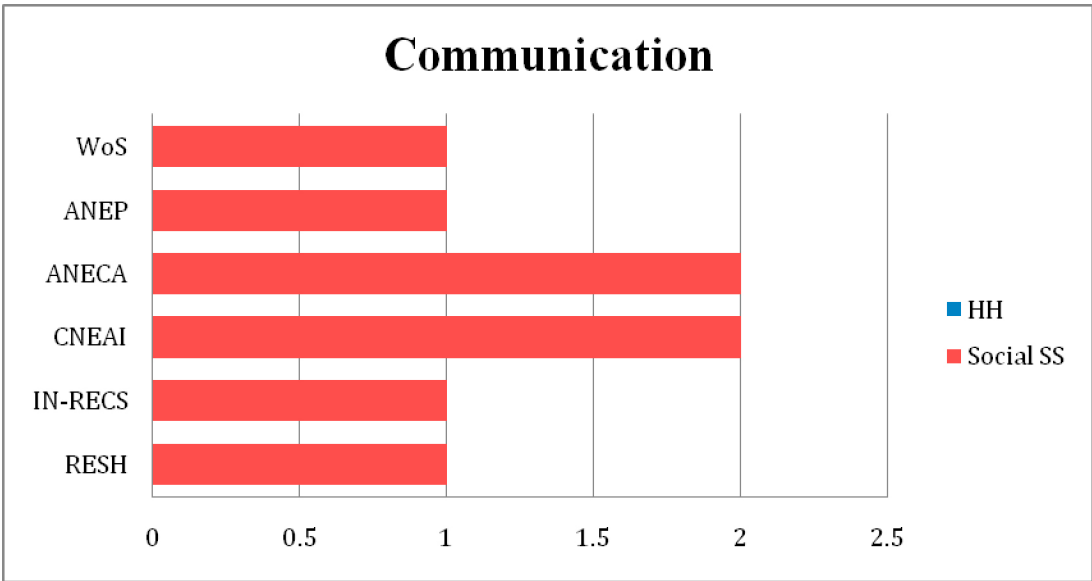

Figure 6. Communication in the Six Knowledge Classifications

American and Caribbean countries, Portugal, and Spain, making it possible to solve the problem of journal under-evaluation not only for Spain.

In cases of articles published in journals from abroad, databases like *WoS* or Scopus must be employed as references. The problem is that classification schemes used do not match exactly with each other or with Spanish evaluation institutions' classifications. So they should be evaluated using all available sources and taking combined results of all of them. Regarding the most practical data dealt with in this paper, and in light of how both the analyzed classifications and the assessment committees are conceived, we have found some meaningful differences.

– First, geography would be located *a priori* in the new information system within social sciences, but the final decision would result from other factors, which would seem to help define in which area each discipline is included; on the one hand, the study of citations received by the journals of the discipline, and on the other hand, the analysis of the subjects addressed in their articles. Likewise, the division of geography into physical geography and human geography seems adequate in order to evaluate the needs of each one, taking, as a basis, the option chosen by both ANECA and CNEAI; however, this option implies a new obstacle, as ANECA requires that physical geography be evaluated by a Humanities Committee, whereas CNEAI requires that it be evaluated by an Economic and Business Sciences Committee. Similarly, human geography must be evaluated by two committees, one from social and law sciences and another from human sciences, against one from social, political, behavioural and educational sciences, and the other from economic and business sciences.
– Second, in both anthropology and geography, ANECA and RESH classifications mark the differences, because they include the whole of the discipline (in case of RESH) or part of it (in case of ANECA) within the humanities area. If we go by what experts have said, this choice by ANECA and RESH is related to historic and administrative reasons more than to knowledge organization.
– Thirdly, information science has resemblances to anthropology and geography. ANECA includes part of the discipline in humanities and part in social sciences, and CNEAI includes the whole of the discipline in humanities. Also, information science shares with these disciplines the commonality

of having links with humanities and social sciences foreign disciplines: in this case, the main connection is with computer science.
– Following this path, communication can be considered different than the other analysed disciplines, because it is always positioned in social sciences.

Based on the selection of evaluation committees for these four different disciplines made by each of these organizations, it is possible to conclude that such selections were not made following any criteria of organization of knowledge, but taking into account the aims of these organizations such as their administrative and even political objectives. One may ask whether the classifications adopted to organize scientific journals must strictly agree with the classifications of evaluation committees and why.

Subject categories selected to evaluate journals must include a sufficient number of publications to be able to compare the quality of journals by establishing levels and in order to avoid disparity in the treatment of disciplines as much as possible. This is a key consideration for the evaluation carried out by committees, as the probability that a journal is situated in first place is higher in a limited area than in a larger area. That is the reason why the amalgamation of disciplines, sometimes artificial, can be so negative when creating journals rankings. As an example, it is interesting to observe the different positions occupied by scientific journals of the area of communication in RESH, where communication journals are included within the ranking of sociology, and IN-RECS/IN-RECJ, where they have an independent ranking: the journal *Revista Latina de Comunicación Social* appears in the first position in the ranking of IN-RECS, but it appears in the 32nd position in the ranking of RESH. These disciplinary amalgamations are often made by following criteria not related at all to the organization of knowledge, which results in very ambiguous situations when trying to base them on a classification of science. The lack of unanimity in knowledge organization and in-depth studies about knowledge classifications with an evaluation approach seems to be the main reason why situations like the one mentioned in the introduction may occur. If this happens with a discipline like information science, which has quite similar positions in the five classifications analysed, what can be expected from disciplines like geography and anthropology, where dispersion is so remarkable? Nowadays, interdisciplinarity is not a new concept for anybody, and it is an advantage for

Knowl. Org. 38(2011)No.5
C. L. Piñeiro and E. G. Toledo. Knowledge Classification: A Problem for Scientific Assessment in Spain?

379

knowledge development as much as it is a problem that needs to be solved for scientific assessment systems in Spain. Interdisciplinarity creates a challenge for assessment systems, because they try to adapt themselves to international canons, while knowledge organization is marked by the differences among cultures, countries, and even regions.

This article has, as its origin, the need to illuminate a practical problem. Currently, we are aware that we have found some answers. The problem is that these have generated new queries that show us, once again, that those things that at the beginning may look like only a small difficulty are, in fact, problems of not yet comprehensible proportions. For example, we must face up to the fact that some experts believe that Humanities and Social Sciences must be only one group. From this perspective, the grade of interdisciplinarity observed in these areas, the multiple connections between disciplines, and the constant difficulty of separating them seems more logical than if they were two groups. However, the difficulty of establishing boundaries between disciplines in humanities and social sciences is not always an indication that they have to be united: it is not convenient, for example, to compare or to evaluate the publishing habits of economists and historians in the same way. The intention of this article is to open up debate on the necessity of reforming the current Spanish scientific assessment system, with the objective of achieving a more dynamic and fairer scientific evaluation, able to adapt to the ever-changing configuration of knowledge.

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380

Knowl. Org. 38(2011)No.5

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