Knowledge transfer in the Human and Social Sciences: the importance of informal relationships and its organizational consequences

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Abstract

This study analyzes the characteristics of knowledge transfer in the social and human sciences within a large government research establishment. We deploy an innovative analytical framework and make an explicit link between the range of transfer processes it identifies and the organizational and analytical challenges that such variety poses. The results show that the characteristics of the transfer process (in terms of the type of agents involved, the content of the transfer, transfer mechanisms, receivers and the contextual factors, and barriers to transfer) are very different in the social sciences and humanities from those prevalent in the experimental sciences and engineering. Consequently the policies to support efficient knowledge transfer must also be different and tailored to the specific characteristics of knowledge production and use in the social sciences and humanities.

Introduction

Technology and knowledge transfer are complex concepts that have been evolving along with our understanding of the transfer processes. The literature has focused on the analysis of the actors and processes involved (Etzkowitz, 1994; Bozeman, et al., 1995), the content, form and commercialization of the object of the transfer, the management of the transfer processes (Gilbert and Cordey Hayes, 1996; Siegel et al., 2004) and the organizational factors with a bearing on the participation of researchers in the transfer activities (Lavis et al, 2003; Jacobson et al., 2004). Most studies have focused on the analysis of the relationships between the natural and experimental sciences and industry. We focus instead on the characteristics of knowledge transfer in the social and human sciences, where research has been scarce. Particularly in the late 70s and early 80s public policy analysts, concerned about the apparent disinterest with which practitioners were treating the results of their “applied” disciplines analyzed the types, conditions and factors under which the results of academic policy analysis could find practical application (Weiss, 1979; Knott and Wildavsky, 1980). This was a specific concern

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triggered by the contextual conditions of knowledge generation and application within a discipline: the problem was the use of social science research within the public policy process (Beyer and Trice, 1982).

From a wider perspective, however, the analysis of the application of social science research outputs remained a marginal concern until more recently, when the demands of the so-called “new social contract” for science extended to the social sciences. Often responding to requests from government departments and agencies, analysts have developed different techniques to study the impact of social and human sciences. They coincide in stressing the special difficulties that evaluation and impact assessment have in these fields (Moed et al, 2002; Molas et al., 2000; Ibarra, Barrenechea y Castro, 2006; Nederhof, 2006). One of the main problems these authors stress is the diversity in the types of knowledge their dissemination and use, across different branches of the social sciences.

This paper deploys an innovative analytical framework to analyze knowledge transfer in the social and human sciences and the factors that affect it. It will take as subject of its analysis the knowledge transfer activities among all the research groups working on Human and Social Sciences (HSS) in the Spanish Council for Scientific Research (CSIC-Consejo Superior de Investigaciones Científicas). The objectives of our study are (1) to identify the types of knowledge transferred by these groups, and the means through which knowledge is being transferred; (2) identify the receivers and beneficiaries of such transfers; (3) analyze how these activities are affected by the organization of the groups and the policies and management practices implemented by the parent organization – CSIC-, and to (4) analyze the effects of other contextual conditions on the transfer process.

We will first present a brief introduction to CSIC and the role that social and human sciences play within the Council. We will then discuss our analytical methodology present our analysis. We will close by making an explicit link between the range of transfer processes we will identify and the organizational challenges that such variety poses.

**Background**

CSIC is the most important public research organization in Spain. In 2006, it had a staff of 10263, out of which 25% were tenured scientists, 40% contracted and doctoral researchers, and the remaining 35% technicians and administrative personnel. Research activities are conducted by a large number of research institutes and centers (126 in 2006), some of which (41) are “joint” institutes with the participation of a public university (CSIC, 2007). Within this large organization the HSS represent a relatively small part of total activity accounting for only 8.4% of CSIC employees, including 263 tenured scientists and 270 doctoral and contracted researchers, working in 17 research institutes (6 in the social sciences and 11 in humanities). Within these institutes researchers organize themselves into smaller research groups: our research identified 86 research groups in the humanities and 33 in the social sciences. The areas covered are
very diverse, and we should therefore expect substantial variability in the ways researchers engage with non-academic users and beneficiaries. To account for this variability we have developed an analytical approach that will address in a structured manner the potential sources of variance.

Our approach
Our methodology is based on the taxonomy of different approaches to the study of technology transfer developed by Bozeman (2000). We have adapted this taxonomy to develop our conceptual framework and research instruments. Bozeman differentiates 5 main dimensions of the technology transfer process:

?? The transfer agents (the institution or organization seeking to transfer the technology). We have analyzed the research groups and the broader organizations within which they are inserted (institutes, centers, and the whole of CSIC), paying attention to factors like organizational practices, and history.

?? The transfer object (the contents and form of what is transferred). This can take on a broad variety of forms: tacit and codified knowledge, or knowledge embedded in research techniques and methods, products, designs, blueprints, etc. (Molas-Gallart 1997).

?? The transfer media (the means through which knowledge transfer occurs). We analyze whether knowledge is transferred through formal or informal mechanisms, and the role of commercial agreements vs. other forms of collaboration and knowledge transfer.

?? The transfer recipient (the organization or institution receiving the transfer object). These can be private individuals, firms, public sector organizations, industrial associations, etc.

?? The demand environment (market and other factors related with the social, cultural and economic need for transferred object). Here we pay special attention to the market conditions in the areas where the results from research in the social sciences and humanities can be applied. For instance, we are likely to find cases where well-established markets with clear price structures do not exist, and areas where the public sector is dominant as the immediate receiver.

This framework was used to structure our interview questionnaires and analysis. We designed an evaluation methodology with two instruments:

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3 The research activities of these institutes include Landscape Archaeology; Archaeometry and Ethnoarchaeology; Edition and study of Greek and Latin Texts; Hebraic, Sephardic and Arab Studies; History of Hispanic Literature; Current Spanish and its linguistic variance; Theory of Literature, Theatre and Media; Literary Criticism; Musicology; Moral Philosophy; Science, Culture and Society; International Relations in the Modern World; Population Movements and Interethnic Relations; Social and Cultural Change; Cultural Heritage and Humanities; Science, Technology and Society Studies; Environmental, Rural and Urban Economies; International and Development Studies; Demography; Globalization; Comparative Politics; Evaluation of Scientific Activity; Economic Analysis; Bibliometrics and Cybermetrics of Science and Technology.
A questionnaire to guide a program of semi-structured face to face interviews with a contact person for each one of the research groups we identified. The questionnaire included 23 open questions organized into three main areas: identification of the group, research activities and capabilities, knowledge transfer experience. The face-to-face interview format was first piloted with a sample of 11 researchers from diverse groups and 4 institute directors. After having collected available information on the group’s composition and activities, mainly from CSIC’s management database and other documents and research reports freely available from the Web, we carried out the full interview program between May 2006 and March 2007.

Following the face-to-face interview, the contact person was given a written questionnaire in the form of a “checklist” using four-point Likert scales for most of 48 questions structured according to the Bozeman categories discussed above. Each item was addressed by two different types of questions: one to identify the current situation in relation to a specific characteristic, the second to ascertain the opinion of the respondent as to what the optimal situation should be in relation to this same trait. The questionnaire was sent to our research population of 119 research groups. We obtained 110 answers; a response rate of 90% of the groups accounting for 92% of all Social and Human sciences researchers in CSIC.

Results

Characteristics of the transfer agents

Research groups

The way in which the institutes and research centers organized themselves in groups varied markedly across centers. In only three cases the whole institute worked as a group, adopting a project-based structure. More often, however, the institutes were internally fragmented. Ten per cent of the groups identified were composed by a single individual, and 33% had between 2 and 4 members. Only 13% of the groups had more than 10 members. Despite this fragmentation, the majority of interviewees (72%) assert that to support knowledge transfer the optimal average size of a research group should be between 5 and 10 members. Respondents argued that this size was needed to be able to combine core research tasks with the additional work needed to engage in knowledge transfer activities.

In practice, the researchers we interviewed invested little, if any, time in knowledge transfer (in average only 14% of the total working time is invested in knowledge transfer activities). Yet, there is a generic interest in knowledge transfer activities. The majority of researchers interviewed had, at some point, considered the applicability of their knowledge, argued that potential users and beneficiaries of their work could exist, and

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4 To prevent respondents to “escape” the question through the selection of the central answer (Nunnally 1978).

5 For a more detailed description of the checklist structure and approach see Castro-Martínez and Pérez-Marín (2007).
considered that it was important to find non-academic applications for the results of their work.

Larger, stable groups, oriented towards the achievement of well-defined common objectives displayed a more positive attitude towards technology transfer. Similarly, groups that participated in national and international networks displayed also a more positive attitude, as they did those researchers more acquainted with Information and Communication Technologies. In general, however, we encountered a culture that was not acquainted with knowledge transfer activities and techniques. For instance, interviewees often considered as “knowledge transfer” instances of patronage received from private firms. It was also common to find researchers who deemed that publishing in the popular press was tantamount to knowledge transfer. Researchers that published in high-circulation magazines or appeared often in the media considered their knowledge to have been successfully transferred, and did not distinguish between transmission and transfer (see below).

The parent organization: CSIC

The practices and policies deployed by the parent organization (CSIC) are crucial when it comes to define the knowledge transfer approaches that individual researchers and groups implement. The researchers interviewed did not consider that knowledge transfer was a CSIC priority. Although official CSIC literature stresses the importance of engaging with social actors and supports knowledge transfer, in practice researchers felt that neither personnel policies nor managerial practices encouraged such activities. Although this could be considered a general problem affecting all CSIC institutes and research groups, in the HSS the problems are compounded by the type of performance indicators in use in the whole of CSIC to evaluate the activities of individuals and research groups. In practice, the most important for individual promotion and the assessment of group performance is academic publication as reflected in articles printed in refereed journals. The indicators that refer to knowledge transfer activities focus on commercial activities (contract values, patent and licensing); these are relevant for some areas in the natural sciences but do not reflect most of the knowledge transfer activities conducted by researchers in the HSS. This approach to individual and group assessment drew almost unanimous criticism from the scientists we interviewed.

Further, researchers found management procedures to be cumbersome and CSIC bureaucracy overwhelming. The majority of interviewees felt that there was a lack of simple and transparent procedures to manage knowledge transfer, that the available contract models were not suitable for their own situation, and that there were no quality support services available. Similarly, the research institutes were found not to offer support to transfer activities; in particular, we heard complaints about institute directors offering very little help to establish links outside academia, and pointing out that the institutes lack “brand image” that could help them establish links with potential users.

Characteristics of the transfer object

This is the aspect in which the social and human sciences present more differences from their counterparts in the natural sciences. The latter frequently produce knowledge embodied in products and processes that can be protected through IP tools like patents or
utility models. The type of knowledge generated in the HSS is often much more difficult to trace to specific products, but is often applied through the provision of specialized services in tasks like, for instance, the edition of teaching materials, contributions to the organization of exhibitions, advice to theatre or cinema productions, participation in the edition of music records or archeological impact studies, among many others. The HSS can also yield new methodologies and instrumental techniques that cannot be legally protected for exclusive use. None of these activities are amenable to the application of the contractual tools used to transfer well-defined, technology-based products and designs. Only a few outputs of the SHS can be protected and its use licensed to third parties, like for instance data bases, software products, and forms of expression and presentation (from written outputs to pictures).

**Characteristics of the transfer media**

Although most respondents (74%) self-reported good knowledge of the potential users of the results of their research, a lower number (60%) declared that they were aware of the type of activities that were necessary to engage in knowledge transfer. Further, existing relationships were often informal (i.e. they were not backed by a contract or institutional agreement) specially in the Human Sciences, where almost 50% of respondents declared that more than 40% of the knowledge transfer relationships were occasional, carried out individually without institutional involvement, and often, without payment. Further, researchers were not particularly interested in formalizing such relationships, although they were open to alternatives to find new links that could help them move away from advisory and consultancy tasks towards work involving more research content. In contrast to the situation in the Human Sciences, Social Science groups routinely entered formal contracts.

The majority of respondents, in both the Human and the Social Sciences, wished to reduce occasional consultancy activities to increase longer-term research collaborations. Yet, such collaborations would call for formal contracts as they require a higher commitment of resources, and researchers are either unfamiliar with the CSIC institutional process to channel contracts, or consider that they are not adequate for the specific situation of the HSS. The preference for informal arrangements is therefore partially explained by the absence of adequate contractual mechanisms to support collaboration with non-academic agents and the lack of institutional assistance to manage formal contractual relationships.

**Characteristics of the transfer recipient**

The users and receivers of the knowledge generated by HSS researchers were, in the main, placed in the public sector. Government and its agencies emerged as the main clients for the Social Sciences; researchers found them well-informed, but the relationship was hampered by contractual difficulties and delays in payments. We also

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6 Specifically, the available contract templates include clauses that are crucial for experimental research areas (confidentiality and disclosure of results, property rights ownership, patents, royalties,...), but do not consider those aspects that would be most important in contracts involving researchers in the human sciences (recognition of contributions and authorship in written and audiovisual products, or copyright payments, etc.).
found instances of interactions with the private sector (firms in banking, tourism, etc.), NGOs (trade unions, business associations), and international organizations (International Monetary Fund, World Bank). In the humanities, most clients and collaborators were found in the cultural field (both private and public organizations): cinema, music and audiovisual producers, publishers, museums, public sector culture departments, tourism, cultural heritage, and media. Often the final beneficiaries were minority groups (for instance music lovers interested in medieval composition) conforming very small markets or clients seeking very specialized services.

There was some disappointment about the extent to which researchers had been able to connect with potential users and beneficiaries. This was not attributed to any specific trait of the user communities; on the contrary, most respondents pointed out that potential user organizations had personnel with university degrees able to engage in research collaborations. Instead the blame was placed on the lack of awareness. A majority of respondents (66%) believed that potential users and beneficiaries did not know about their group’s capacities and that potential users and beneficiaries had no or scant awareness of the possible tools and avenues to support institutional collaboration with CSIC researchers (64% of respondents).

The demand environment

Our analysis of the demand environment facing SHS scientists points to some common characteristics related to the nature of the knowledge “markets” in which they operate. These are markets that are not well-developed, with a strong presence of the public sector, and where the use of intellectual property takes place under different conditions from those predominant in the natural sciences. The respondents pointed out that potential users seldom felt they needed the knowledge of social scientists to develop their products and offerings. For instance, in a theatre play or a movie set in the XVIIth Century the audience would not realize whether the objects used in the sets belonged, instead, to the XVIIIth Century. The costs of achieving historical accuracy may not appear to the producer as justifiable. Similarly, an exhibition may be prepared by an organization without the necessary knowledge, but potential mistakes will only be perceived by experts.

In a similar vein, the potential commercial markets for the products to which SHS scientists contribute their expertise are typically very small. For instance many of the cultural goods are consumed by small audiences unable to support a market attractive for commercial ventures. One of the cases of application we identified was the collaboration of CSIC musicologists and historians in the development of a CD of poetry from “Don Quijote” and its period set to music of the time. There is clear cultural value in this production as it represents an important contribution to the recovery of Spain’s cultural heritage. It is, however, a production for which no significant commercial market exists. The immediate “client” supporting this work lies in public sector organizations.

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7 Work with the private sector included research on demographic trends, economic impact analysis of policy initiatives market studies and branding strategies.

8 For instance, archeology groups develop collaborations with construction companies and musicology researchers with orchestras and musical production companies.
involvement of the public sector as a main customer gives rise to peculiar market conditions.

From an Intellectual Property perspective, users in these sectors seldom require exclusivity or confidentiality. Users of SHS research are interested in the application of knowledge to a specific situation or problem: the preparation of an exhibition, the production of a music record, the design of a new policy or the writing of a tourist guide, for instance. The knowledge used for these tasks does not lose value as a consequence of such use; sharing the knowledge does not affect its economic value for further use. This is because it is ultimately the user who gives value to the transferred knowledge through a specific form of expression, or by including it in their productive or administrative processes. Take for instance the participation of a historian in a television program: the form in which the program is expressed (its script and the program itself) can be protected by copyright, but this is not the case for the knowledge that the historian has used in contributing to the program. The commercial value of the TV program depends also on production values, the technical means employed in its creation, etc. Yet, the economic value of the knowledge contribution made by the academic is very difficult to ascertain. Even the final products are often in sectors where a normal market does not exist: the customer for an art exhibition, for instance, will seldom bear the cost of its organization. Although a social utility can be attributed to this type of activities, this is not typically associated with a market value. Under these conditions impact assessment becomes difficult and knowledge diffusion channels can easily revolve informal and personal relationships. The informal nature of such relationships makes them invisible to the institution within which they take place; consequently they are not taken into consideration when assessing the work of the research groups, or for career promotion purposes.

Analysis: organizational challenges and methodological implications

Perhaps the most relevant outcome of our analysis has been the identification of many instances of knowledge transfer that could not have been recognized without a detailed study. The low visibility of knowledge transfer in the social sciences and humanities has important organizational and methodological implications. The dominance of informal means of exchange and the relative absence of contractual relationships processes contrasts with the substantial role of formal contractual relationships and long-term commercial exchanges in many natural sciences and engineering disciplines. From a methodological perspective we must we warned against indiscriminately applying indicators of commercialization activities to the analysis of knowledge transfer in the social sciences. The methodology we have applied, based on Bozeman’s model of technology transfer, has proved effective in structuring a detailed analysis of the strategies, process and conditions affecting knowledge transfer. In addition, the framework was useful to identify new opportunities to apply knowledge and results from HSS research.

The model, as we have used it here, is a good heuristic tool, but not necessarily a good description of the knowledge transfer process. The language used, with its emphasis on “transfer” processes and “recipients” provides a rather linear image of the utilization process. Instead, in line with our current understanding of knowledge utilization, we found many cases of close collaboration in which new knowledge was co-produced and
users brought to the exchange their own substantial knowledge and capabilities. These cases throw into contrast the difference between knowledge transfer and knowledge transmission. To transmit knowledge the originator of the information needs to make sure that the receiver understands what is being told (Weigold, 2001). Here the main interest is in presenting the message in such a way that the target audience can “decode” the message. Language has to be adapted to the target audience. Yet, knowledge transfer involves more than that: knowledge transfer occurs when the receiver uses and incorporates the knowledge to her own processes. To this end it is often necessary to adapt the knowledge to the user’s specific needs, and it is common for such adaptation to require collaboration between the generators of knowledge and the “transferees”. In the course of our study we found many cases in which the interviewees were confusing the mere transmission of knowledge with their effective transfer. They interpreted communication and outreach activities, like writing for popular magazines or newspapers, as examples of knowledge transfer. It was one of the objectives of the open questionnaire format to identify instances where this use of language could have led to confusion in interpreting the answers given by the interviewees.

Through the face-to-face interviews we identified many instances of transfer although most of the contributions were contributory in nature; that is, it was rare for the researchers to have developed on their own fully-shaped processes or products with a direct social or economic application. The contributory role of social and human sciences research differentiates it from the experimental sciences where the object of the transfer is often a well-defined, specific piece of technology (for instance, a product or a process that has already been the subject of a patent). In the social and human sciences, there was less concern about protection, confidentiality and exclusivity, and we attribute this trait to the different nature of transfer: transfer typically revolves around the application of knowledge in specific projects, where the users are the ones who add value and develop the final product. Accordingly, most knowledge transfer activities occurred through exchanges that were often informal and not supported by contractual relationships.

From an organizational perspective, this result suggests that knowledge transfer activities must be tailored to the specific characteristics of research and knowledge exchange in the social sciences. From a methodological perspective, it follows that most exchanges would not have been identified by existing data collection and monitoring activities; they were conducted, as it were, “under the radar”. The study has shown that a large number of research groups (41%) had links with non-academic users or had knowledge transfer activities already established and were looking for ways to increase such relationships. The problem was not, as we could have expected, that links did not exist; but rather that they were informal and occasional in nature, of limited reach and almost always invisible to the parent organization (CSIC).

It is important to note that this level of interest co-exists with the small amount of time currently being invested in outreach and knowledge transfer activities (in average less than 15% of all working hours). In other words, a low level of effort must not be confused with lack of interest in knowledge transfer activities.

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9 We have explored, within another context, the role of adaptation and collaboration in defining different types of technology (Molas-Gallart 1997)
References


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