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Fostering Interdisciplinarity: Implications for Social Sciences

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Abstract

At a time when interdisciplinarity is encouraged, the aim of this article is to analyse some of its implications in contexts of teaching, research and professional practice. For this purpose, and through a literature review, the concept of interdisciplinarity is discussed. Subsequently, the paper discusses its importance and the implications of its promotion, focusing on the following aspects: scientific disciplinary identity, institutional consequences, and professional consequences. It is concluded that interdisciplinary collaboration, while being, in general, difficult to achieve, can, provided that it is controlled, be both a source of recognition and scientific and/or professional opportunities for social sciences. However, there are also potential risks not to be overlooked, being important to be aware of them.

Keywords: interdisciplinarity, social sciences, sociology, collaboration, scientific knowledge

1. Introduction

Sciences have been created and institutionalised through processes of specialisation, through which different areas of scientific knowledge have consolidated an epistemology, a methodology and a body of knowledge that tend to be specific to each scientific discipline and capable of being used in the establishment and analysis of its object of study.

However,

> "specialization is the way to start a discipline, but it must not become a religion. When rigid, it is an impediment to advancing knowledge: the more rigidly specialized, the less relevant to advancing knowledge. Currently this rigidity seems to be the key problem in social and behavioral studies and in the humanities as well" (Scheff, 2015: 116).

As a way to combat some of the limitations of this specialisation, there are processes of convergence between the various scientific disciplines that can be named multi-inter-pluri-transdisciplinarity. These concepts are, sometimes, used in a similar way, although they have subtle differences (Barthel, & Seidl, 2017; Stock, & Burton, 2011). Something similar happens regarding the concept of interdisciplinarity itself (Razmak, & Bélanger, 2016). In a concise way, and according to the purposes of this article, there is a difference in depth, but not only, between these four concepts. Multidisciplinarity, the parallel use of several disciplines, without necessarily establishing relations between them (Morval, 1993; Hamel, 1997), seeks to solve problems through the involvement of several scientific disciplines, each tending to analyse different dimensions of a problem. Interdisciplinarity, the combined use of some disciplines that can promote reciprocal transformations in each of these disciplines (Morval, 1993; Hamel, 1997), is characterised by an intense collaboration between disciplines to the point of a potential dissolution of their boundaries in the development of synergies; pluridisciplinarity, the combined and restrictive use of disciplines or elements of these disciplines without such use modifying the elements or the disciplines (Morval, 1993; Hamel, 1997); transdisciplinarity, the interaction between two or more disciplines aiming at the creation of a new discipline on the basis of the articulation of certain constituent elements of these disciplines (e.g. criminology and Morin's theory of complexity; Morval, 1993; Hamel,

1997), involves the cooperation between scientists and other publics, such as practitioners, decision makers or the public (Barthel, & Seidl, 2017).

Several authors highlight a growth of interdisciplinary in science and in academia (Andersen, 2016; Leahey, Beckman, & Stanko, 2017; Robinson, Vasko, Gonnerman, Christen, & O'Rourke, 2016; Razmak, & Bélanger, 2016). Political factors may also be related to this increasing promotion of an interdisciplinary perspective in order to legitimise public investment in science also in terms of its funding (Huutoniemi, 2016; Lowe, Phillipson, & Wilkinson, 2013; Gardner, 2014; Abramo, D'Angelo, & Di Costa, 2017; Evans, 2016).

However, interdisciplinarity is not a process that can be easily implemented (Bi, & Yang, 2015; Barthel, & Seidl, 2017; Lowe, Phillipson, & Wilkinson, 2013; Morval, 1993; Hamel, 1997) and may even challenge the existing institutionalised disciplinary and professional identity (Shandas, & Brown, 2016).

Within this context, this article presents below some contributions for the study of the effects of interdisciplinarity, an under-researched collaborative area (Shandas, & Brown, 2016; Barthel, & Seidl, 2017). For this purpose, through a short literature review, the concept of interdisciplinarity is discussed, following an analysis of its importance and implications in the promotion of interdisciplinarity, focusing on the following aspects: scientific disciplinary identity; institutional consequences; and professional consequences. The article ends with a discussion on the promotion of interdisciplinarity in particular in social sciences. It is a stance that starts from our academic experience in the area of Sociology and that is based on the use of literature of the field.

2. Importance of Interdisciplinarity in Scientific Knowledge

There are numerous definitions of interdisciplinarity. It can be considered a research process that involves the mobilisation of different scientific disciplinary perspectives in the construction of an object and in the study of a problem, being able, in this process, to cross the traditional disciplinary boundaries and to lead, ultimately, to the establishment of a new scientific area:

> "an interdisciplinar approach, in contrast, involves the use of an innovative conceptual framework to synthesize and modify two or more disciplinary approaches to deal with a research problem" (Shandas, & Brown, 2016: 412);
>
> "there needs to be a combination of integration of perspectives and methodologies, a complex issue that exceeds the borders of a single discipline, and cognitive advancement that would not be possible through the lens of single disciplines" (Wardley, & Bélanger, 2015: 47);
>
> "interdisciplinarity exposes alternative possibilities opened by new forms of thinking and practice besides the sciences. Interdisciplinarity in short vaccinates us against reductive and oversimplified thinking just as it enriches and adds sophistication through cross-disciplinary cross-fertilization" (Fosl, 2016: 3).

The importance and richness of interdisciplinary collaboration may, then, result in the creation of new scientific areas such as, for example, biochemistry, neuroscience, or business innovation (Razmak, & Bélanger, 2016).

It may be considered that interdisciplinarity, which aims to establish communication between disciplines, stems from a metatheory, i.e., a theory that aims to build bridges between theories, a theory of theories (e.g. the intersection of psychoanalysis and anthropology in Foucault's "archeology of knowledge", the federation of various scientific disciplines and their articulation with philosophy, mathematics, art, and literature in Serres's "transport theory" (Hamel, 1997: 195).

In the context of the present work, we will consider the concept of interdisciplinarity with a broader scope and define it as the promotion and mobilisation of synergies of two or more different scientific disciplines. Yet, it does not necessarily generate a new scientific discipline, approaching, to a certain extent, the concept of multidisciplinarity, given the possibility of maintaining the autonomy of the scientific disciplines (Žažar, 2016).

3. Implications of Fostering Interdisciplinarity

Although the heuristic potential of interdisciplinarity is generally acknowledged, it is not easily promoted and developed in academia, research, or teaching. It is not enough to have a discourse to promote interdisciplinarity; rather, it is necessary to create the conditions for this type of teaching to be implemented in a successful way (Shandas, & Brown, 2016: 420).

The mobilisation and transfer of concepts from one discipline to another is not an obvious process and it is not necessarily a guarantee of heuristic fecundity, especially since the method that rules this process may not be explicit enough to provide demonstration. However, it should be borne in mind that any discipline is characterised by a view of knowledge whose unity, or specialisation, does not preclude interdisciplinarity on the strict plan of methods. Yet, the term interdisciplinarity should not be used to designate a simple combination of methods that do not change the disciplinary nature of the approach (Hamel, 1997: 205), but rather to foster a perspective that favours relationships of

interdependence between objects and that allows globalisation of knowledge (Hamel, 2005).

Interdisciplinary research may have several potential benefits, such as innovation, promotion of lateral thinking, and promotion of reflexivity in the research process (Pilnick, 2013).

Promotion of interdisciplinarity has implications in several dimensions. Next, we will address implications in terms of scientific disciplinary identity, institutional consequences, and professional consequences, in an academia that is shaped for the maintenance of disciplinary boundaries (Jay, Rose, & Milligan, 2017; Shandas, & Brown, 2016; Sáez, & Sancho, 2017; Santos, & Silva, 2017; Waldman, 2013; Žažar, 2016; Chan, 2012).

Concerning scientific disciplinary identity, each scientific discipline involves a different specific stance with a specific intellectual culture (Miranda, 2009; Robinson et al, 2016; Huutoniemi, 2016; Wardley, & Bélanger, 2015; Lowe, Phillipson, & Wilkinson, 2013; Chan, 2012), which, to some extent, shapes the perception and practice of interdisciplinarity and hinders communication between disciplines (Pilnick, 2013, Robinson et al., 2016).

As stated by Stephenson et al. (2010), interdisciplinary research involves dealing with uncertainties. Uncertainty and lower control resulting from an interdisciplinarity in which there is no established tradition, contrary to what happens in the consolidated scientific disciplines, call into question the existing disciplinary identity that is often expressed in institutionalised rigid boundaries (Bammer, 2016; Jay, Rose, & Milligan, 2017; Razmak, & Bélanger, 2016). Likewise, it hampers peer control (an essential element for science) (Huutoniemi, 2016).

In terms of institutional implications, the need for organisational and administrative support is very important in fostering interdisciplinary processes both in research and in teaching (Shandas, & Brown, 2016; Lowe, Phillipson, & Wilkinson, 2013; Chan, 2012; Gardner, 2014).

Regarding research, the difficulty in the process of evaluation for funding of interdisciplinary research projects is another topic that raises special difficulties (Ali, 2012; Huutoniemi, 2016; Bammer, 2016; Renwick, 2016; McLeish, & Strang, 2016). One of the factors for this hindrance is the absence of evaluation criteria clearly shared by the scientific community (Bammer, 2016; Pilnick, 2013). The fact that different scientific disciplines have different statuses (Hoenig, 2017) also has profound implications for the attainment of funds for research.

In what concerns teaching, the shift to a teaching that fosters interdisciplinarity has several risks, for example: "(1) difficulties in teaching students from heterogeneous disciplinary backgrounds; (2) heavy student workload; and (3) difficulties in creating a coherent curriculum" (Gantogtokh, & Quinlan, 2017: 580). Thus, it entails a clear institutional support to be successful, as such a deep a cultural shift is not easy to achieve (Sáez, & Sancho, 2017).

Stakeholder support itself is also very important to legitimise interdisciplinarity in science at the academic level and may have an important institutional influence (Bammer, 2016; Huutoniemi, 2016).

Finally, regarding professional implications, interdisciplinarity influences several dimensions (Lyne, 2015; Stephenson et al., 2010):

> "interdisciplinarity is more than 'just working together'. It involves paying attention to how we think, how we relate, how we behave, what language we use, how we communicate, and how we co-create knowledge. It may also require certain types of people – those who are comfortable working outside the knowledge base and practices of their own discipline, and who are happy to be challenged and occasionally discomfited" (Stephenson et al., 2010: 280).

In the teaching processes, most teachers will need to find a new identity (Sáez, & Sancho, 2017; Santos, & Silva, 2017) for which many academics are neither prepared nor motivated.

In the scholar's assessment, a consequence of interdisciplinarity seems to be located at the level of publications and citations, although further studies on this specific topic are still necessary. According to Abramo et al. (2017):

> "while it is intuitive that interdisciplinar outputs would be cited in broad sets of fields, and therefore gain more citations, it seems more difficult to understand a ''negative" result from interdisciplinarity. Perhaps the publications co-authored by researchers from very distant fields experience delayed recognition and are highly cited only in the long run, thus not showing up in a short citation window" (Abramo et al., 2017: 325).

For Leahey, Beckman, and Stanko (2017), interdisciplinarity seems to foster, on the one hand, a lower number of published papers, but, on the other hand, an increase in the possibility of being cited, being a high-risk strategy for the scholar.

Professional assessment tends to value the logic of disciplinary specialisation (Waldman, 2013) in what Shanda and Brown (2016) appropriately designate as "'paradox of change' by seeking to strike a balance between cultivating interdisciplinary collaborations and maintaining its disciplinary and professional identity" (422).

The implications explained above, as well as others, occur in a context in which the different scientific disciplines have different scientific and academic, but also social statutes (Pedersen, 2016; Hoenig, 2017). Gardner (2014) states that issues such as the statute of the scientific discipline, representations and hierarchy, culture and power in their different paradigms contribute to hinder the processes of interdisciplinarity and posits, as one of the results of her study, that "biophysical scientists expressed a lack of appreciation or respect for the methods and methodologies used by social scientists" (76).

Especially in this relationship between exact and natural sciences – social sciences and humanities, there are specific tensions that contribute to a sharp division (Gardner, 2014; Barthel, & Seidl, 2017), the second often playing a merely auxiliary and subsidiary role (Lowe, Phillipson, & Wilkinson, 2013; Bammer, 2016; Žažar, 2016; Pilnick, 2013).

Finally, another implication of the interdisciplinarity processes that needs to be considered is what Pilnick (2013), on her stance focused on Sociology, considers the urgent need to regard and respect the positions of the several scientific areas present, involving them in the research concerned. In the clear words of Pilnick herself:

> "for research to be truly interdisciplinar, it is of fundamental importance that sociologists are not just to be the people who turn up with the 'armoury of tools' when the plans have already been drawn up. Instead, there is a need to be involved in the formulation of the research questions from the outset, and to ***critically*** engage with the aims, aspirations and desires of collaborators" (Pilnick, 2013: 7).

4. Conclusion

Notwithstanding all the challenges presented above, which generate tensions inherent in this process, interdisciplinarity may be a focus with increasing visibility and a source of opportunities (McLeish, & Strang, 2016; Renwick, 2016):

> "even if the individual-level costs of such work are substantial, the societal-level benefits—in the form of more useful and valuable science—seem clear. This suggests that scientists and the scientific community need to reassess how to evaluate scholarship if scientists are to be encouraged to continue to engage in interdisciplinary research" (Leahey, Beckman, & Stanko: 132).

One of the possibilities to foster interdisciplinary collaboration in scientific knowledge is the proposal of Shandas and Brown (2016), who, on the basis of a review of the literature, present the following framework with three dimensions necessary to promote the development of interdisciplinarity in higher education teaching: the pedagogical dimension (learning of a research logic centred on the study of a problem through several perspectives); the programmatic dimension (implementation of a syllabus that focuses on problem solving through the promotion of an interdisciplinary perspective); and the institutional dimension (with organisational and stakeholders support in the promotion of this logic).

Specifically for the promotion of interdisciplinary collaboration in scientific knowledge between natural sciences and social sciences, Balmer et al. (2016) identify the need for: collaborative experimentation, taking risks, collaborative reflexivity, opening-up discussions of unshared goals, and neighbourliness in the recognition and relevant exploration of the differences.

This whole analysis allows concluding that interdisciplinarity has potential, but it also adds challenges and even limitations that must be addressed (Cooper, 2012; Jay, Rose, & Milligan, 2017; Leahey, Beckman, & Stanko, 2017) whenever necessary in favour of scientific knowledge.

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