THEMATIC SECTION

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Discourses on Research and Researchers: The Case of Portuguese Associated Laboratories

Abstract

This paper aims to map knowledge produced by associated laboratories in Portugal using the two-phase model of discourse analysis proposed by Sousa and Magalhães (2013). We analyse the mission of associated laboratories to understand what is (are) the privileged form(s) of knowing in science and the actors involved in that process. We identify discourse organisers (phase one of the model) and the way discourses become dominant/excluded (phase two of the model).

The application of the two-phase model of discourse analysis enables us to conclude that research is being constructed as academic science in a post-academic world and researchers are presented as "in training" or as professors.

Keywords: discourse analysis, research, researchers, associated laboratories.

Introduction

Associated Laboratories (AL) have emerged as one of the main structural components of the Portuguese science and technology research system. AL were selected as the object of study as they allow us to embrace science and knowledge as well as the diversity of the Portuguese research system relating

to disciplinary areas and researchers. AL embrace eight disciplinary areas: (i) Engineering, (ii) Oceanography, (iii) Social Sciences, (iv) Health Sciences, (v) Physics, (vi) Earth and Space Sciences, (vii) Life Sciences and (viii) Arts and Culture. The status of AL is being granted from 1999 for a maximum period of 10 years to institutions that demonstrate the capacity to cooperate in the pursuit of the scientific and technological policy objectives defined by the Government. They are subject to periodic evaluations conducted by the Foundation for Science and Technology. Until 2020, there were 26 AL, but, since then, the number has increased to 40. The researchers of AL are highly qualified. Typically, they are higher education professors and full-time researchers, although we can find some other related work posts (such as grant-holder researchers and laboratory assistants). Our approach to 'laboratory' is different from that used in science studies, where the place is traditionally used to design science experiments, whereas we use the notion to encompass science, technology and social sciences.

For discussing the mission of AL, we use a theoretical framework combining higher education studies and the sociology of science, considering the context of state policies for the science and technology research system. We focus on the discussion of the transformation of the scientific ethos, as values and norms of science (Merton, 1973; Merton & Barber, 2004). More specifically, we discuss the transformation of knowledge production as it can be framed in national science & technology research systems, which is the case of Portuguese AL.

Gibbons and colleagues (1994) published their work *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies* in 1994 (see also Nowotny et al., 2004). This is a major reference work due to its impact and consequent discussions on the transformation of modes of knowledge production, both in the academic and political realms (OECD, 2008). According to their argument, knowledge production is changing from Mode-1 to Mode-2. Mode 1 represents the classic perspective on the production of knowledge. Mode 2 refers to an emerging form of knowledge production. More specifically, as developed by Sousa and Magalhães (2004), in Mode-1, research and the quest for knowledge *per se* frame knowledge

production and it is contextualised by the ideal of academic knowledge as a contribution to human emancipation. In Mode-2, the key word is 'application'. It assumes the shift from pure and fundamental research to 'strategic science'. Mode-1 corresponds to a direct and privileged relationship between the academic community and knowledge, while in Mode-2, this relationship is mediated by other factors central to the application.

Hessels and van Lente (2008) argue that the Mode-2 diagnosis has severe conceptual problems. Although we acknowledge some of those problems, we consider that the Mode 2 thesis is too far widespread to be simply dismissed in an analysis such as this. Instead, we use the Mode 2 thesis complemented by other works about the transformation of the scientific ethos (Bohme et al., 1983; Irvine & Martin, 1984; Funtowick & Ravetz, 1993; Edquist, 1997; Slaughter & Leslie, 1997; Etzkowitz & Leydesdorff, 2000; Ziman, 2000). We particularly focus on the work of Ziman. Ziman (1994), in the same year as the work of Gibbons et al. (1994), argued that science is at risk due to major changes related to managerial discourse, such as accountability and assessment. Ziman opposed the concept of post-academic science vis-a-vis the concept of academic science, arguing that some explicit principles of a post-academic science are replacing the tacit demands of CUDOS – communalism, universalism, disinterestedness, originality and skepticism (Merton, 1973). Ziman suggested the acronym PLACE (proprietary, local, authoritarian, commissioned and expert) to characterise the work of the newly emerging environment. To minimise Mode-2 conceptual problems. we particularly focus on two aspects of the transformation of the scientific ethos, following the suggestion of Hessels and van Lente (2008): (i) the changes in the content of scientific research agenda towards research leading to applications in forms of innovation or policy, and (ii) a more interactive relationship among science, industry and government. The epistemological dimension of knowledge production has been dealt with through disciplines but we aim to extend it to deal with epistemic cultures, related to the creation and the warrant of knowledge (Cetina, 1999) that might represent, simultaneously, the dilution and the strength of science (Galison, 1996). Epistemic cultures and scientific ethos are strictly related, as the values and norms of science are the foundation of the creation and warrant of scien-

tific knowledge. The Portuguese case is approached considering some of the works on the Portuguese scientific community (Jesuíno & Ávila, 1995; Nunes & Gonçalves, 2001; Araújo, 2009; Carvalho & Santiago, 2010; Sousa, 2010; 2011; Santiago & Carvalho, 2012) framed by the European level (e.g., European Research Area and The European Charter for Researchers).

Method

To analyse the mission of AL, we focus on the text as explicitly stated on the websites of each of the AL. To analyse the mission, we selected the field that allows us to perceive the purposes and objectives of the AL regarding the kind of knowledge and actors involved. Due to the diversity of websites, some do not present an explicit field denominated as "mission". We also considered fields such as "about us", "objectives", "overview", "what we stand for", "mission and vision" and "welcome message" as equivalent to "mission". We could not find a website for 13 AL (out of 40) and hence excluded them from the analysis. We assume that what AL choose to present on their websites as their missions allow us to better understand the role assigned to knowledge production and its main actors.

Using the two-phase model of discourse analysis, we identify discourse organisers and discuss the construction of dominant/excluded discourses. As proposed by Sousa and Magalhães (2013), the model embraces the combination of two perspectives of discourse analysis: the critical discourse analysis by Fairclough (2001; 2002; 2003) and the theory of discourse by Laclau and Mouffe (1985). It is assumed that beyond their differences, they have complementary elements that are combined. In critical discourse analysis, we focus on the text (the corpus of analysis) and discursive practice. Drawing upon the theory of discourse by Laclau and Mouffe (1985), and as mentioned by Sousa and Magalhães (2013), we use the concepts of dominant discourses and excluded discourses to identify specific struggles about the (non-)hegemony of meanings. The discussion of the construction of dominant/excluded discourses implies assuming that the goal of all discourses is to become dominant and/or crystallised.

We use discourse organisers such as orders of discourse (the main arguments of discourse), nodal points (central elements of discourse) and fields of discursivity (what is excluded from discourse). The selection of those discourse organisers was made considering their relevance to the questions we seek to answer. If identifying orders of discourses allows us to understand what makes such discourses unquestioned and naturalised, the identification of nodal points sheds light on signs central to that process. Additionally, the identification of fields of discursivity allows us to discuss what is excluded by those discourses, thus entering the second phase of the analysis.

The use of citations in the following paragraphs is by no means exhaustive and is merely illustrative of the nodal points identified in the discourse.

Analysis and discussion of results

The analysis of 27 excerpts referring to the mission of the 27 selected AL enables us to identify two orders of discourse – one related to the knowledge assumed by AL to be desirable – ("Academic science in a post-academic world") and the other related to the actors involved in that same knowledge – "Professors and the others".

Regarding the actors, we could identify two nodal points, "training" and "PhD". Those are two signs around which the discourse of what a "researcher" signifies for AL is centrally constructed. The Phd emerges as a major requirement to be part of the AL and is discursively constructed as such. This is in line with the national legislation that regulates access to faculty and research careers, functioning as a gatekeeper to academia (Jackson & Tinkler, 2000). We can see a focus on the training and education of researchers ("support advanced training", "attract the best young researchers to be trained", "attract young gifted students to new areas of research", "a strong component of advanced training") but not a concern with a research career. The field of discursivity, meaning what is excluded from what a researcher is in an AL, plays a major role in the analysis. Except for 3 AL, none of them refer, in the mission analysed, to a research career or the relevance of integrating the

researchers being trained in the profession at the AL. The actors of AL can be considered thus as researchers who already have a profession (Professors) and researchers who do not have a career to follow. If we understand an order of discourse as a set of conventions and ideologies that constitute the background or the context of discourses (Sousa & Magalhães, 2013), we can identify "Professors and the others" as the order of discourse related to the main actors involved in AL and their status. It is clear that there is a lack of attention to the construction of a research career (as proposed in The European Charter for Researchers in 2005) and a major focus on Professors. The actors who do not have such titles and posts seem to be considered to be in training and formation and what might happen to them professionally is beyond the missions analysed.

Knowledge is organised around nine nodal points: (i) outputs, international work and excellence (ii) application, (iii) funding, (iv) generation of value, (v) give-back to community, (vi) industry and stakeholders, (vii) innovation, (viii) multi/interdisciplinarity, and (ix) public policies.

The triad outputs-international work-excellence is referred to characterise the knowledge being produced and privileged by AL, ("best international practices", "high level of scientific research", "foster innovative epistemologies and methodologies", "strengthen international cooperation with diverse organisations", "well-established relevant international collaborations", "international collaboration", "excellence and international reference", "high-level scientific production", "scientific outpu", "key performance indicators", "scientific papers in high ranked journals"). Although this nodal point was the only one identified that refers to knowledge based on a Mode-1 typology and a CUDOS perspective, being mainly based on the academic community and the peer review system, it is also the most identified transversally through all the excerpts.

The focus on the application of knowledge ("applied research strategy", "development of applied research", "apply scientific knowledge") is a major characteristic of Mode-2 typology. It is identified as a nodal point, being linked also to an idea of translation of knowledge ("create and translate knowledge", "translational").

The issue of funding is the third nodal point identified, assumed to be a kind of quest for funding in the mission of AL related to competition ("enhancing opportunities and income", "European funding, obtained on a competitive basis", "find new sources of funding"). This seems much closer to a Mode-2 typology and a PLACE perspective.

Generating value is another nodal point that does not seem to resonate with Mode-1 and CUDOS. The creation of added value is referred to in the mission of AL with much emphasis ("creation of value chains", "seeking value creation", "produce added value", "generation of value").

The identification of the nodal point related to giving back to the community can be interpreted as a Mode-2 dimension, related more specifically to the *Agora* proposed by Nowotny, Scott and Gibbons (2004). The declared mission of AL mentions "public awareness initiatives", "the benefit of society", "the dissemination of knowledge", "immediate social relevance", and "fostering public awareness, engagement and understanding".

Industry and stakeholders emerge as another nodal point ("linking research and stakeholders, knowledge transfer to industry", "assist stakeholders in making decisions", "respond to societal challenges and industry development", "transfer of new knowledge and technologies to industry, services and public administration", "stimulate new industry-science relations") translating the interactive relationship between science, industry and government proposed by Hessels and van Lente (2008).

The nodal point of innovation, also in line with the changing content of scientific research agenda towards research leading to applications in the form of innovation or policy, was proposed by Hessels and van Lente (2008), and can be identified through excerpts such as "to develop the scientific and technological knowledge necessary for the innovative production", "enable science-based innovation", "innovative solutions", and "transform this knowledge into clinical application and technological innovation".

Multi/interdisciplinarity is identified as a nodal point related to "cross-discipline interactions", "strongly multidisciplinary field", "multidisciplinary and diverse in nature", and "an interdisciplinary approach". We would expect, before the analysis, the identification of this nodal point due to the nature of AL

and the integration of several research centres and departments with each of the AL. Nevertheless, this reflects, the epistemic cultures too and the role of disciplines in the production of knowledge.

Contribution to public policies ("to support the formulation of public policies", "developing realistic public policy", "providing scientific and technical evidences able to sustain the public policies", "with relevance for public policies") is the last nodal point identified, which is significantly related to Mode-2 and PLACE.

Considering the aforesaid nine nodal points ((i) outputs, international work and excellence (ii) application, (iii) funding, (iv) generation of value, (v) giving back to the community, (vi) industry and stakeholders, (vii) innovation, (viii) multi/interdisciplinarity, and (ix) public policies), we can identify an order of discourse that frames the essence and nature of knowledge as Mode-1 and CUDOS, but in a context of Mode-2 and PLACE, which we can call "Academic science in a post-academic world". If the triad outputs-international work-excellence is the most striking and dominant in the discourses analysed that reflect Mode-1 and CUDOS, the context in which that kind of knowledge is produced is based on a major focus on application, funding, generation of value, giving back to community, industry and stakeholders, innovation, multi/interdisciplinarity, and public policies.

The field of discursivity, meaning the set of discourses that are being excluded, relating to knowledge, can be identified as basic science with no consideration for societal needs. What we did find was that even the AL that refer to basic science, do so in a contextualised manner, referring always to impact and the importance of giving back to society. Quite surprisingly, the managerial discourse related to accountability and assessment is residual in the discourses analysed.

Conclusion

The selection and analysis of the missions of Associated Laboratories (AL) were based on the premise that what institutions choose to post on their websites as their purpose, goals and views is relevant to what can be constituted as

a dominant discourse. As we analysed the mission of each of the 27 selected AL, the dominant and excluded discourses about the main actors and the type of knowledge produced became clear. For this, we use the two-phase model of discourse analysis proposed by Sousa and Magalhães (2013), enabling the identification of discourse organisers. This model enables emphasising the novelty of the findings of the analysis undertaken.

The use of the two-phase model allowed us to conclude that dominant discourses are related to an academic science in a post-academic world, in which researchers are presented as "in training" or as professors. Principally, we can conclude that regarding the mission of each AL, there are more numerous and additional elements and articulations regarding knowledge than related to actors involved in the process of knowledge production. Mapping knowledge produced by AL in Portugal seems, as a consequence, much more related to knowledge *per se* (as an essence) than to researchers who are producing that knowledge.

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