Industrial PhD and research work in the private sector: an important clarification from the Italian Ministry of Education

by Elena Prodi

A notification dated August 31, 2016, issued by the Italian Ministry of Education to implement the "National Plan for Research 2015-2020", introduces some important novelties in the field of innovative doctorates and on-the-job training.

Apparently, these changes in the legislation seem to affect only the academic world, but in real fact they entail important repercussions for companies performing research and development activities, and for the whole private sector in general. The new ministerial guidelines lay down the criteria for distinguishing traditional philosophical doctorates (PhD) from innovative ones, that is the international doctorate (which reinforces the collaboration with partners abroad), the inter-sectoral / industrial doctorate (which promotes integration with sectors and actors outside the academia) and the interdisciplinary PhD (which spurs the fertile contamination between disciplines and research groups). These types are not to be considered mutually exclusive, but a combinations of distinctive elements of the three will be highly appreciated.

The ministerial note recalls the Principles for Innovative Doctoral Training established in June 2011 by the European Commission. At a European level, doctoral training has been included as one of the priorities to build a European Research ERA (EC, 2012). Indeed, today it is widely recognised that doctoral graduates make significant contributions to innovation and they need broad and creative skillset to do so. The seven Principles are then conceived as a tool or a common approach providing a framework of reference which Member states are invited to apply for guiding reforms of Doctoral Education in Europe.

Whilst preserving flexibility and autonomy for institutions and doctoral candidates, the principles encourage Member States to provide good working conditions and attractive institutional environment to empower researchers. Cross-fertilisation between disciplines can foster the necessary breadth and interdisciplinary approach. International networking and mobility opportunities are as relevant as the provision of transferable skills training in order to strive for excellent research. Business should also be more involved in curricula delivering and doctoral training so that skills better match industry needs, where “the term 'industry' is used in the widest sense, including all fields of future workplaces and public engagement, from industry to business, government, NGO’s, charities and cultural institutions”.

The ministerial note is worthy attention not only because of the introduction of new criteria and related innovative doctoral typologies. It finally explains which parameters are to be taken into account to accredit a doctorate as “industrial / inter-sectoral”. In particular, the new regulation exceeds the uncertainties related to the definition of industrial doctoral, which entered the Italian
legal debate through paragraph 2, Article 11 of the Ministerial Decree No. 45 of 8 February 2013, laying down the rules for the accreditation of doctoral programmes as well as the criteria for the establishment of PhD courses by certified bodies.

The previous regulation identifies as many as three different PhD tracks (“PhD in collaboration with enterprises”, “Industrial PhDs” and “Higher Apprenticeships”), without further specification on which parameters or criteria are to be considered to frame these notions in an accurate manner. The legislation generally argue that these programmes are somewhat more closely exposed to the labour market, businesses and other relevant employment sectors than the traditional philosophical doctorates. (M. Tiraboschi, *Industrial PhDs, Research Apprenticeships, and on-the-job training: The Case of Italy from a Comparative and International Perspective*, in DRI n. 1 / XXIV-2014).

According to the regulation, the “PhD programme in collaboration with enterprises” is supposed to be realised through agreements concluded between Doctoral or graduate schools and business engaged in research and development”. Industrial doctorates are actually different from the foregoing PhD courses. Unfortunately, the regulation does not provide a cut-clear definition of it or a distinctive feature of this PhD programme, since the law only express possibility of enrolling employees of companies engaged in a highly qualified activity in the doctoral path. Further indications issued by the Italian National Agency for the Evaluation of University and Research (ANVUR) led to think that the latter typology seemed limited to employees of the companies. For these reasons, over the past years, the above-mentioned Decree of 8 February 2013 has fuelled great uncertainty and ambiguity with respect to the practical implementation of both the “PhD in collaboration with enterprises” and of the “Industrial PhDs”.

The new ministerial guidelines specify that the PhD program labelled as "industrial PhDs" are, on the one hand, the courses in collaboration with enterprises (art. 11, paragraph 1, of the DM 45/2013) with the possibility of reserving a number of seats for employees of one or more companies (art. 11, paragraph 2 of the MD45 / 2013) (type 1); on the other hand, the conventional doctorate programs that have, internally, curricula developed and delivered in collaboration with the enterprises (type 2). The ministerial guidelines also highlight the main features that innovative industrial Phd should be equipped with: special attention should be devoted to the joint design of curricula and the opportunity for graduate students to spend a period of training at the enterprise or abroad. Furthermore, among the pivotal research topics around which to design the industrial PhD paths, great priority will be attached to the issues of Industry 4.0, IoT and industrial production (see F. Seghezzi and M. Tiraboschi, *Industry 4.0, A framework to understand (and implement) the Calenda industrial plan*, ADAPT Special Bulletin no. 10/2016).

Besides industrial PhDs, the note also provides a definition of "inter-sectoral" PhDs, which features cooperation with external bodies, either public or private ones, at the time of defining the research project, training, joint supervision, and, importantly, when it comes to mentoring in relation to candidates' career prospects. While they share the same goals and educational purposes, these two types of PhD schemes are different as regards the external bodies engaged in the student's education. Specifically, the note provides that, for certification purposes, the use of the terms "industrial" or "inter-sectoral" will depend of how the actors making up the partnership. If the latter mostly consists of businesses, Art 11 of DM 45/2013 will apply. Otherwise, the wording "Inter-sectoral PhD" will be used.

This is an important change of pace compared to the formalistic approach of the Ministerial Decree 45/2013, change that will hopefully be followed by a coherent revision of the criteria for the accreditation of courses and PhD locations. Indeed, the Ministerial Decree 45/2013 provides that only locations where the teaching staff is majorly made by university professors can award the title
of PhD, rationale that seems to hinder the substantial contribution of external partners which, to be fully involved in design of research activities, should be entitled equal dignity and validity (cf. M. Tiraboschi, *The legal framework of the research work in enterprises and in the private sector: current issues and future prospects*, in DRI n. 4 / XXVI -2016).

In addition to clarify the differences between inter-sectoral and industrial PhD, the ministerial guidelines introduce two other features characterizing an innovative doctoral path: the requirement of internationalization and the interdisciplinarity one, which represent strategic elements for the transition of the Italian model to a configuration closest to the best international practices. The doctoral courses accredited as international should be distinguished by a research environment open and characterized by high international mobility of doctoral candidates in the conduction of their research project, the use of joint-supervision, the international composition of the doctoral school, the issue of joint degrees and international strategies for recruiting doctoral candidates. The interdisciplinary doctorates will be distinguished by the presence of a topic of pivotal strategy around which aggregate different disciplines and methodologies in order to lead to a deeper understanding of the object of study and equip the graduate students with transferable skills. These are to be featured by all the types of innovative doctoral mentioned above, although in the latter model they constitute an aspect to be emphasised.

In line with the above-mentioned European principles, it seems that ensuring wide recognition at all possible forms of innovation and collaboration between academia and enterprises as part of the doctoral training represent the primary aim of the recent clarifying intervention of the Ministry of Education. As well, the Ministry aims at exploiting and enhancing the high quality doctoral-level training in and outside academia. This important step forward will hopefully enable the Ministry of Education to properly exploit the most innovative experience of doctoral training that are beginning to spread across Italy. The international and comparative experience shows that a governance system fostering joint committee between academia and the private sector enables the success of similar innovative doctoral courses and the enhancement of researchers’ career prospects through developing their skills in entrepreneurship, creativity and innovation.

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