

43. The Brazilian Experience with Institutional Arrangements for Interdisciplinary Graduate Programs: I2S may provide a way forward

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In Brazil, as in other countries, researchers are increasingly working in interdisciplinary teams. In general this cooperation has not effectively leveraged the experiences of team members and the variety of concepts, methods and tools available in their original disciplines. Despite the development of interdisciplinary research and practice, and the exponential growth of interdisciplinary masters and doctoral programs (described below), there are still no initiatives to bring together the knowledge generated. There has been no large-scale attempt to gather the richness of integrative experiences, which are poorly documented and subjected to only very limited analysis. Nor are there standard procedures for establishing what an interdisciplinary program is in concept and practice, or how it can be evaluated and monitored. This creates a vicious cycle of lack of knowledge and communication.

This commentary is based on our studies of the evolution of the debate on interdisciplinarity,² and we briefly discuss two issues: institutionalisation within universities and the National System of Accreditation and Evaluation³ of graduate programs in Brazil.

Interdisciplinary Arrangements in Brazil

In general, new disciplines have been created by fragmentation (for example, the separation of sociology and anthropology within the field of social sciences and the division of natural sciences into geology and biology) or by aggregation of pre-existing disciplines (for example, biology plus physics into biophysics).

¹ Marcel Bursztyn was invited because of his 'expertise in sustainability science, especially in Brazil'. He invited Maria Beatriz Maury to co-author the commentary.

² Some authors prefer the use of the term transdisciplinarity; others adopt a multidisciplinary approach. In this commentary, we have adopted the term interdisciplinarity.

³ In Brazil, a strict system centralised by the Coordination for the Improvement of the Higher Education Personnel (CAPES) agency of the Ministry of Education not only coordinates the accreditation of graduate programs (more than 4000 in all), but also regulates the process of evaluation, ranking and grant provision.

Interdisciplinary programs have very different characteristics. They are not a result of either fragmentation or aggregation: they are multiform and nonlinear spaces of integration. Shaped largely in reaction to problem-oriented demands, these programs have, by definition, a complex identity. In particular, the hierarchies of disciplinary components are diverse and ad hoc. Teams organised to address the challenges can (and should) have flexible compositions, responding to the nature of the problem. This represents a challenge in coordination, for which Bammer's work makes an important contribution.

Brazilian experiences follow a global trend where interdisciplinary programs have two kinds of personnel: a few permanent members and a larger group with joint appointments in various disciplines. This is a combination that also provides two-way communication between the disciplinary departments and the interdisciplinary programs. The tenure of those members with joint appointments is likely to vary, depending on the extent of their possible contributions to the topics addressed by the interdisciplinary program. The permanent personnel of the interdisciplinary program are responsible for ensuring continuity, integration and implementation. For that reason, they need special skills, methods and tools, which I2S can provide. After the recent proliferation of interdisciplinary programs in Brazil, faculty and administrators are debating the most effective and productive ways to gather, analyse and evaluate relevant concepts and methods.

The National System of Accreditation and Evaluation

In order to operate and issue degrees, masters and doctoral programs in Brazil need to be accredited by the National System of Accreditation and Evaluation. After meeting initial entry criteria, there are also performance evaluations every three years. Programs are classified into eight 'major areas', 76 'areas' and 340 'sub-areas' of knowledge, using the following definitions.

- Major area: a group of various areas of knowledge aggregated according to the affinity of its objects, cognitive methods and instrumental resources reflecting specific contexts and identities.
- Area: a set of collectively constructed, interrelated knowledge, assembled according to the nature of the object of investigation for purposes of teaching, research and practical applications.
- Sub-area: segmentation of the area of knowledge established on the basis of the object of study and methodological procedures widely employed and recognised.

There is also a fourth category—namely ‘specialty’, which is the thematic characterisation of research and teaching activities. The same specialty can occur in different major areas, areas and sub-areas.

In 1999, the National System of Accreditation and Evaluation created a ‘major area’ called ‘Multidisciplinary’ for programs that did not fit the usual categories. Whereas there has been a 12 per cent increase per year in all new programs over the past two decades, the annual increase in multidisciplinary programs has been 25 per cent. In 2008 the *multidisciplinary* major area listed 293 accredited courses.⁴ This was 11 per cent of the total programs and placed this major area on a par with engineering, applied social sciences, exact and earth sciences, and agricultural sciences, and ahead of languages and writing, and biological sciences. Fifty-seven courses focusing on the environment and/or sustainable development were accredited in 2008.

It is worth pointing out that the approval rate for *multidisciplinary* programs, at 15 per cent, is half that of other programs. There are two likely causes, which both seem to operate. On the one hand, there are less adequate program proposals, especially from smaller universities where disciplines lack critical mass. On the other hand, there is a more cautious approach by the accrediting agency to such programs. Particular challenges for programs in the *multidisciplinary* major area also need to be recognised in that they are innovative not only in dealing with complex contemporary issues, but also in terms of their structures within bureaucratic university organisations.⁵

Despite the popularity and expansion of interdisciplinary programs in Brazil, there are still many challenges for implementation, consolidation and evaluation. One is that faculty and students are building new models of research and teaching at the same time as implementing them. This has been likened to building a bicycle while simultaneously riding it. Further, because interdisciplinarity is poorly defined, the analogy is actually more like peddling a moving vehicle without being entirely sure what it is; it might be a bicycle, tricycle or monocycle, or even something completely new. This is also a challenge for evaluators, who are often additionally hampered by strong disciplinary backgrounds and lack of sensitivity to the distinctive characteristics of interdisciplinarity. As a consequence, evaluators are often unable to provide true peer review, especially if they perceive interdisciplinarity as shallow, in contrast with ‘deep’ established disciplines. This shallow–deep comparison is key to the cautious accreditation approach described earlier.

4 <<http://www.capes.gov.br>> (accessed 20 September 2011).

5 Bursztyn (2004, 2008).

Based on the 2009 evaluation of *multidisciplinary* programs,⁶ we suggest that the further development of interdisciplinarity requires

- a search for new theoretical and methodological research, teaching and innovation that will lead us beyond the traditional paradigms of science
- increasingly close dialogue between and among different disciplines to tackle the epistemological challenges that theoretical and methodological innovations pose in interdisciplinary research and teaching
- gradual incorporation of interdisciplinary methodologies in faculty and student research projects
- recognition that interdisciplinary research and teaching are heterogeneous, and valuing this diversity
- definition of the characteristics of pluri-, multi-, inter-, and trans-disciplinarity, especially the underlying theories and methods, recognising that these terms are currently used in loose, overlapping ways.

Final Considerations

The challenges identified in institutionalising interdisciplinary graduate programs in Brazil are similar to those expounded by Bammer's book. Unifying proposals, such as Integration and Implementation Sciences (I2S), may provide a way forward. To this end, we recommend the following.

1. Broadening the debate about the meaning of the new field of research—Integration and Implementation Sciences (I2S)—and its proposal to provide an effective means to document and transfer concepts and methods that support integrative applied research.
2. Recognising and identifying the variety of experiences that can provide relevant material for I2S, especially concepts, methods and study cases. We support the idea of a large-scale project (the I2S Development Drive) to build a more unified and integrated knowledge base for interdisciplinarity.
3. Recognising that we need to make space for creativity and improvisation, as well as a unified, integrated knowledge base.

Nevertheless, we strongly caution against turning interdisciplinarity into a discipline. Interdisciplinarity is a process; it can constitute specific fields, and even lead to the formation of epistemic communities with their own identities. But there will be no integration if the processes of institutionalisation follow

6 Relatório de Avaliação 2007–2009—Trienal 2010 (Evaluation Report 2007–09, Triennial 2010), in <<http://www.capes.gov.br>> (accessed 20 September 2011).

the previous practices of creating university departments. We do not oppose formal interdisciplinary arrangements, but we see these as opening a space where complex problems can be addressed by teams comprising researchers with varied backgrounds. Interdisciplinarity is not anti-disciplinarity, but a bonding environment. The I2S proposal is an important step towards creating such an environment.

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Portugese original available at <http://i2s.anu.edu.au/sites/default/files/i2s-book/bursztyn_2012.pdf>

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Brief Biographies

Marcel Bursztyn has a BSc in economics and a Masters in urban and regional planning, both from the Federal University of Rio de Janeiro, as well as a Diploma in Planning Studies from the University of Edinburgh and PhDs in social and economic development from the Université de Paris I—Panthéon-Sorbonne (1982) and in economics from the Université de Picardie-France (1988). He was a postdoctoral fellow in public policy at the Université Paris XIII and at the Ecole des Hautes Etudes in Sciences Sociales—Paris (1989–91) and a Senior Research Fellow at the Kennedy School of Government's Sustainability Science Program, Harvard University (2007–08), as well as a former president of Coordination for the Improvement of the Higher Education Personnel (CAPES). He is currently an Associate Professor at the Center for Sustainable Development at the University of Brasilia and Co-Editor of the journal *Sustainability in Debate*. He is the author of 14 books and more than 100 scientific articles and book chapters.

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