

Recognising interdisciplinary expertise: is it time we established the integration and implementation sciences?

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Embedding interdisciplinarity into the academic mainstream has proved a

*constant challenge. **Gabriele Bammer** asks whether it might help to define the relevant expertise as a new discipline, one that recognises important skills such as the ability to combine knowledge from different disciplines, determine which disciplines and stakeholders have valuable perspectives, examine how elements of problems are interconnected, assess the likely consequences of critical unknowns, and use research to support evidence-based change. Integration and implementation sciences (I2S) would codify such knowledge and skills, proving especially valuable to teams tackling complex societal and environmental problems.*

Could we overcome the challenges of embedding interdisciplinarity in the academic mainstream if relevant expertise were defined and recognised as a new discipline? What is this relevant expertise? Here I consider team-based interdisciplinarity addressing complex societal and environmental problems and argue that it needs specific expertise over and above that contributed by disciplines. This set of knowledge and skills is currently poorly defined and recognised. If contributing such know-how was an established role, it could provide a way of more adequately integrating interdisciplinary researchers into academic institutions. Furthermore, the time is ripe to codify that expertise by pulling together lessons from decades of experience.

To illustrate what is needed, let us look more closely at research on illicit drug use as an example of a complex problem. Each relevant discipline brings an important, but only partial, understanding to bear. For example, pharmacologists contribute knowledge about the effects of these drugs, epidemiologists about estimated levels of use in the population, criminologists about impacts on property theft and other crime, legal experts about regulations and laws, historians about how those laws came into being, and so on. But it is no existing discipline's business to combine these disciplinary perspectives to allow illicit drug use to be viewed more comprehensively. To do this effectively requires a solid base of concepts and methods over and above those contributed by the existing disciplines.



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What if we established a new discipline to underpin team-based interdisciplinary research on complex societal and environmental problems? A discipline that sets out an organised approach to dealing more comprehensively with such problems? As well as combining disciplinary perspectives, such a discipline could also encompass other aspects of researching complex social and environmental problems that are not covered by existing disciplines, particularly figuring out:

- which disciplines have useful knowledge to contribute
- which stakeholder perspectives would be valuable, such as from police and drug users in the case of illicit drug use
- whether and how different elements of the problem are interconnected, such as examining all the impacts of criminalising drug use (including on deterrence, punishment, willingness to seek help, and reintegration into paid employment)
- the likely consequences of critical unknowns for understanding illicit drug use (such as rates and causes of cessation) or for changing illicit drug policy (such as the potential impact of a yet-to-be developed synthetic drug or an unforeseen change in popular culture which alters perceptions about illicit drug use)
- how research can best support evidence-based change.

Particularly significant is that the relevant concepts and methods can be used for a wide range of problems, not just illicit drug use.

One aspect of such a discipline would be to provide a repository for the concepts and methods required to undertake the tasks described above that are currently no other discipline's business. These new disciplinary experts would then join teams tackling complex problems to – among other things – make them aware of, and help them apply, the best available concepts and methods. These currently unrecognised concepts and methods can be categorised into two broad groups:

- concepts and methods for **integration**; i.e. synthesis of disciplinary and

- stakeholder knowledge and understanding and managing critical unknowns
- concepts and methods for **implementation**; i.e. providing integrated research support (bringing together both what is known and an approach to critical unknowns) for policy and practice change.

I have therefore proposed that a new discipline could be called integration and implementation sciences (i2S).

A discipline is, of course, more than a repository of concepts and methods. Nevertheless, the relevant concepts and methods are currently highly fragmented by being scattered throughout the published and grey research literatures, so the task of developing a repository would be a good starting point for building the new discipline.

In addition, the process of identifying relevant integration and implementation concepts and methods could help build an i2S discipline identity. It could help interdisciplinarians tackling complex real-world problems recognise commonalities with other groups, including transdisciplinarians, systems thinkers, action researchers, community operational researchers, sustainability scientists, and so on. The aim of an i2S discipline identity is not to replace or subsume these other identities but to provide a conduit connecting them.

An i2S discipline could also provide an identity for so-called “T-shaped researchers”, who often do not identify with any of the above groups, although they share many of the same skills. Their name recognises not only their skills in a traditional discipline (the vertical bar), but also their ability to collaborate across disciplines (the horizontal bar). There is currently no unified community of T-shaped researchers sharing and promoting these “horizontal bar” skills.

The aim of i2S is to provide a unifying focus and rationale for banding together. As Rick Szostak also points out in [his blog post on why we need to listen to interdisciplinarity's critics](#), the lack of cohesion among like-minded individuals and groups means that none has the critical mass to speak with authority about interdisciplinarity in policy discussions about funding, research, or education.

What do you think? Does the interdisciplinary skill set described here resonate with you? How do you describe yourself – as an interdisciplinary researcher? T-shaped researcher? Systems thinker? Or something else? What do you think about also describing yourself as an integration and implementation scientist?

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About the author

Gabriele Bammer is a professor at the Australian National University in the Research School of Population Health's National Centre for Epidemiology and Population Health. She is developing the new discipline of Integration and Implementation Sciences (i2S) to improve research strengths for tackling complex real-world problems through synthesis of disciplinary and stakeholder knowledge, understanding and managing diverse unknowns and providing integrated research support for policy and practice change. She leads the theme "Building Resources for Complex, Action-Oriented Team Science" at the National Socio-Environmental Synthesis Center (SESYNC).