Knowing that and knowing how – Applying expertise to complex problems

Expertise is often understood in disciplinary terms, as the mastery of knowledge within a particular field of study. In this repost, **Gabriele Bammer** *argues for the particular nature of expertise in research integration and implementation and suggests how this form of expertise is key to addressing the complex challenges currently facing society.*

What is expertise in research integration and implementation? What is its role in helping tackle complex societal and environmental problems, especially in those dimensions that define complexity?

Expertise in research integration and implementation

Addressing complex societal and environmental problems requires specific expertise over and above that contributed by existing disciplines, but there is little formal recognition of what that expertise is, or reward for contributing it to a research team's efforts. In brief, this kind of expertise includes the ability to: identify relevant disciplinary and stakeholder inputs, effectively integrate them for a more comprehensive understanding of the problem and support more effective actions to ameliorate the problem.

I have discussed how this kind of experience can be recognised, even suggesting that it might constitute the basis for its own form of disciplinary knowledge. Here, I would like to focus on how this expertise in research integration and implementation is necessary to deal with five key dimensions of complexity:

1. Delimiting the problem
2. Managing contested problem definitions
3. Managing critical, unresolvable unknowns
4. Managing real-world constraints on ameliorating the problem
5. Appreciating and accommodating the partial and temporary nature of solutions.

Building on work by Collins and Evans and Gobet, it is helpful to see expertise in research integration and implementation as having the following components: **Contributory expertise**, which is the expertise required to make a substantive contribution to a field, divided into: *knowing-that* and *knowing-how*. **Interactional expertise**, which is the ability to understand disciplines, professional practice and community experience, without being trained in those disciplines or professions, or having lived in those communities. Such expertise can be explicit (ie. codified in forms such as writing and transferable), or tacit (ie. drawn from experience and less easily expressed and transferred).

Deploying expertise to tackle the 5 elements of complexity

1. Delimiting the problem

Know-that expertise is required to understand that complex real-world problems have no natural boundaries and that problems have many disparate causes, which are tangled and not easily apparent, or readily inferred.

Know-that expertise also includes understanding that: addressing a single aspect of a problem causes changes in other aspects and may lead to the emergence of new issues. The problem and the system in which it is embedded evolve and change. That from both a research and an action perspective, everything cannot be dealt with, so artificial but necessary boundaries must be set.

At this point, Know-how and interactional expertise are required to draw out (from disciplinary and stakeholder subject matter experts) what the relevant interconnections are, what issues may emerge, what changes are likely, as well as to help set effective boundaries around the problem.

2. Managing contested problem definitions

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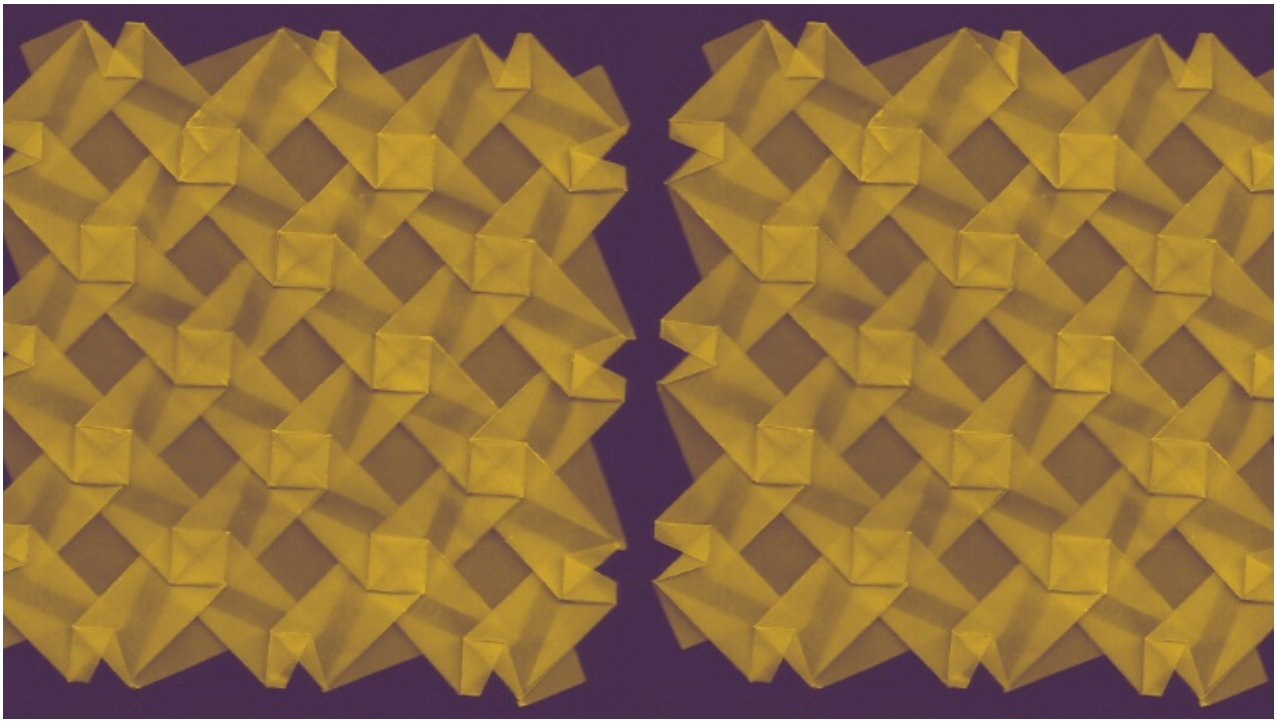
Know-that expertise is required to appreciate that the various parties involved in a complex societal or environmental problem, have different ideas about the 'real' problem and its causes. Further, know-that expertise entails understanding that definitional challenges are intrinsic to any complex problem and can only be effectively dealt with by understanding the history of conflict around the problem and its impact on the ability of groups with different perspectives to trust, listen to, and engage with each other.

Know-how expertise, in turn, is needed to interact with different perspectives, to manage conflicts among them, to provide an understanding of how different perspectives may affect how research and action proceed, and to decide how the problem will be framed.



3. Managing critical, unresolvable unknowns

Appreciating that it is not possible to know everything about a complex real-world problem is another dimension of know-that expertise: Not everything that could be known will be investigated, because there is not enough research capacity, funding or interest to address every conceivable, and potentially important, question. Some critical issues cannot be researched effectively. Interpretations of available information are often in conflict.

Know-how expertise is then required to identify and chart a way of managing unknowns, so that they do not lead to adverse unintended consequences or nasty surprises.

4. Managing real-world constraints on ameliorating the problem

Know-that expertise is required to appreciate that: Ideological, cultural, political, economic and other circumstances constrain how any complex real-world problem can be tackled, and also limit the influence of research-based evidence. Options for moving forward are often hampered by current ways of managing the problem and may change the distribution of benefits and losses amongst the parties involved. Effectively addressing a problem often requires action across multiple poorly connected organisations. That the multi-faceted circumstances in which a problem is embedded can make it resistant to change and that those involved in dealing with the problem are likely to disagree about which constraints are open to modification.

Know-how expertise, for its part, is required to find openings for doing things differently and to overcome resistance to change.

5. Appreciating and accommodating the partial and temporary nature of solutions

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Know-that expertise is required to understand that no effort to tackle a complex real-world problem can take all aspects of complexity into account and that any way of moving forward will: Cause changes in interconnected problems. Sacrifice a way of seeing the problem that some stakeholders want to preserve, or even hold as non-negotiable. Open the door to adverse unintended consequences. Miss some real-world constraints. It also requires appreciation that the search is for best-possible or least-worst, rather than definitive, solutions.

Know-how expertise is required to identify and address these limitations to understanding and action.

Knowing this..?

Do these ideas about expertise in research integration and implementation resonate with you? Do you have examples to share of how such expertise has been employed in practice? How do you think such expertise could be recognised and rewarded?

This post draws on the authors co-authored paper: Expertise in research integration and implementation for tackling complex problems: when is it needed, where can it be found and how can it be strengthened?, published in Palgrave Communications and originally appeared as How can expertise in research integration and implementation help tackle complex problems? published on the Integration and Implementation Insights Blog.

Note: This article gives the views of the author, and not the position of the LSE Impact Blog, nor of the London School of Economics. Please review our comments policy if you have any concerns on posting a comment below.

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