Integration Experts and Expertise

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Abstract

Integration experts and expertise are crucial for unfolding the full potential of inter- and transdisciplinary (ITD) research. Expanding on the concept of ITD integration, this entry focuses on integration experts, who lead, administer, manage, monitor, assess, accompany and/or advise others on integration across different scientific disciplines (i.e., interdisciplinary integration) as well as across science, policy and practice (i.e., transdisciplinary integration). The entry identifies the diverse roles integration experts play in ITD research projects or programs as integrative leaders, bridge builders, boundary crossers, translators, catalysts, facilitators, contributors, mediators, advisors, or evaluators. It also discloses the personal qualities (e.g., curiosity, sociability, creativity, reflexivity, humility) and expertise (e.g., contributory expertise, interactional expertise, referred expertise) integration experts bring in to realize – together with all other project and program members – the integrative potential of ITD projects or programs.

Keywords: Interdisciplinarity, Transdisciplinarity, Integration, Expertise, Experts, Roles

Introduction

Integration experts and expertise are crucial for unfolding the full potential of inter- and transdisciplinary (ITD) research. Expanding on the concept of ITD integration (O’Rourke et al., 2016; Pohl et al., 2021), this entry focuses on integration experts, identifies the diverse roles they play in ITD research processes and discloses the expertise they contribute in order to ensure integration across different disciplines and fields as well as across science, policy and practice.

Definition

Integration experts are academics who lead, administer, manage, monitor, assess, accompany and/or advise others on integration (Hoffmann et al., 2022). Integration is here defined as the process of constructively combining a wide range of perspectives from different disciplines (i.e., interdisciplinary integration) as well as from science, policy and practice (i.e., transdisciplinary integration) with the aim of developing a more comprehensive understanding of complex problems and generating more promising solutions. It is also defined as the integrated output that emerges from this process (O’Rourke et al., 2016).
Roles

Integration experts play a range of different roles (Hoffmann et al., 2022). Depending on the specific purpose, scale and scope of integration as well as the ITD context in which integration takes place, integration experts are:

- *Integrative Leaders* who set and enforce boundary conditions for integration, mobilize necessary resources, and create protected niches that allow diverse perspectives to enter into productive conflict with each other and connect;
- *Bridge Builders* who bring together experts from different scientific disciplines, thematic fields and professional sectors, establishing relations with them and fostering connections among them;
- *Boundary Crossers* who cross social boundaries that separate different scientific disciplines, thematic fields, and professional sectors and embed themselves within social groups that embody different perspectives;
- *Translators* who recognize, discuss and reflect different perspectives, identify underlying concerns and assumptions, and explain such concerns and assumptions in ways that are meaningful and useful for others;
- *Catalysts* who analyze different perspectives, identify potential tensions and synergies between them, and generate new knowledge through constructive combination and critical connection of previously unrelated perspectives;
- *Facilitators* who design, plan, implement, and facilitate integrative processes, assign roles and responsibilities to the various experts involved, and support the generation of integrated outputs;
- *Contributors* who identify the integrative potential of ITD projects or programs and provide intellectual contributions to realize that potential by linking theoretical concepts, co-creating integrative frameworks, and developing inter- and transdisciplinary methods;
- *Mediators* who recognize power dynamics and interpersonal conflicts within and between various experts involved, and handle such dynamics and conflicts as consciously, transparently, and methodically as possible;
- *Advisors* who provide opportunities for learning, training and teaching on integration, and support, guide and coach others in leading integrative processes and achieving integrated outputs; and
- *Evaluators* who monitor and assess integrative processes and integrated outputs and serve as experts in evaluation committees, filling integration expert vacancies and reviewing ITD projects or programs in terms of integration.

Playing this range of different roles can be considered a role of integration experts in itself (Hoffmann et al., 2022). The different roles are socially constructed and negotiated within an ITD project or program and are therefore open to change over time (Hilger et al., 2021; Wittmayer et al., 2017). They are defined contextually and shaped by the overarching conditions for ITD integration at different levels, e.g., the levels of the individual, team, project, program, institution, and society (Deutsch et al., under review). The roles are not easily distinguishable in practice; i.e., rather than seeing them as strictly separate and distinct from each other, they can be considered a continuum of single roles that overlap and are part of a role constellation, i.e. “webs of roles that interact, interrelate and co-evolve with one another” (Wittmayer et al., 2017). Integration experts adopt such roles purposefully (‘role-taking’), or
they develop them gradually in the interplay of the purpose, scale and scope of integration, the contextual conditions for integration and the personal qualities and expertise they bring in (‘role-making’) (cf. Hilger et al. (2021)). Some of these roles (e.g., contributors) align well with the roles academics usually play, while others (e.g., advisors, evaluators, bridge builders, boundary crossers) transcend existing roles (Hoffmann et al., 2022) and require personal qualities and expertise beyond those academics usually possess, as discussed further below.

Notwithstanding the range of different roles integration experts play, they are often miscategorized as merely coordinators or facilitators of ITD integration or as merely administrators or managers of ITD projects or programs. Such miscategorization reduces their own intellectual contributions to scholarship to a mere «supportive service role» rather than a very essential «creative science role» (Hoffmann et al., 2022). Integration experts identify the integrative potential of ITD projects or programs and help realize that potential by recognizing the nature of the different scientific disciplines, thematic fields and professional sectors to be linked and related to each other and by combining the various contributions – including their own intellectual contributions – with a view to generating a more comprehensive understanding of complex problems and creating promising solutions (Hoffmann et al., 2022). In addition to those specified above, the intellectual contributions of integration experts include generating the big picture of complex problems and potential solutions by connecting all different facets and aspects of such problems and solutions.

**Expertise and personal qualities**

Integration experts possess three types of expertise which are essential for realizing – together with all other project and program members – the integrative potential of ITD projects or programs: contributory expertise, interactional expertise and referred expertise (Collins & Evans, 2007):

- **Contributory expertise** is defined as the ability to make substantive contributions to research in a particular field (Collins & Evans, 2007). Bammer et al. (2020) further divide contributory expertise into ‘knowing-that’ and ‘knowing-how’. ‘Knowing-that’ refers to understanding what is required to address complex problems and generate potential solutions in an integrative way. This includes grasping different perspectives (e.g., political, social, cultural, economic, environmental, technical, historical) and identifying critical connections between them. ‘Knowing-how’ refers to recognizing different methods and procedures to integrate such perspectives, understanding the strengths and weaknesses of such methods and procedures, and assessing potential challenges and opportunities related to their application. It also includes knowing when to use which combination of methods and procedures in which ITD context and how to effectively apply them in that context.

- **Interactional expertise** is defined as the ability to speak the language of a particular field without necessarily being able to contribute in detail to it (Collins & Evans, 2007). Interactional expertise thus involves the ability to interact with experts from different scientific disciplines, thematic fields or professional sectors in a meaningful and useful way without having been necessarily trained in such disciplines, fields or sectors.

- **Referred expertise** refers to experience of contributory expertise in some field that is applied within another field (Defila & Di Giulio, 2017). Interactional and referred expertise are particularly critical for leading integration in large ITD projects or programs, since integration experts will not possess contributory expertise in all disciplines, fields or sectors to be integrated.
In addition to these three types of expertise in integration, integration experts require a diverse set of personal qualities to lead integration. Such personal qualities include, among others:

- **curiosity** to cross boundaries of different disciplines, fields and sectors, **sociability** to embed within different social groups and **openness** to explore multiple perspectives on complex problems and potential solutions, by questioning such perspectives in light of the perspectives of others, reflecting on their underlying assumptions and readjusting them to tackle problems and create solutions in an integrative way;
- **creativity** to address complex problems and generate potential solutions, by applying, testing and further developing integrative methods and tools that allow diverse perspectives (including their own) to first diverge and contribute their unique perspectives (i.e., engaging in creative conflict) and then converge (i.e., bridging differences and brokering connections) in a common direction;
- **reflexivity** to critically reflect and act on the emerging cognitive, social and emotional challenges inherent to integration (Pohl et al., 2021) as well as **patience** and **persistence** in overcoming such challenges, withstanding scepticism and criticism from established disciplines, fields or sectors and persevering against the tendency to regress to more traditional approaches;
- **modesty** and **humility** to learn and unlearn, by appreciating that complex problems and potential solutions require multiple perspectives to grasp their multi-faceted nature, acknowledging that none of such perspectives have higher value than other perspectives and recognizing that the emergent new knowledge is always tentative and provisional; and
- **complexity** and **ambiguity tolerance** to deal with the bigger picture without feeling completely overwhelmed or paralyzed by the involved interdependencies, non-linearities, uncertainties, trade-offs, contradictions and alleged ‘messiness’ attached to it, enduring chaotic phases of integrative processes by remaining trustful and optimistic in the designed process (Hoffmann et al., 2022).

In short, to effectively lead integration in ITD projects and programs, integration experts need a combination of personal qualities, interactional expertise, and referred expertise, but not necessarily contributory expertise in all disciplines, fields and sectors being integrated. Eventually, referred expertise and other expertise becomes contributory expertise in integration when practiced repeatedly (Collins & Evans, 2007).

Building upon Lee Shulmann (cited in Boix Mansilla et al. (2006, p. 73)), who argues that for individuals “trained in deeply disciplinary ways, interdisciplinary work becomes an unnatural act (...) and difficult to sustain,” this essay asserts that integration experts should embrace ITD early on, rather than postponing ITD until disciplinary careers are firmly established. Recognizing that disciplinary excellence does not hinder one from becoming an integration expert and that certain disciplines or fields (e.g., environmental sciences, sustainability sciences) are more inclined towards ITD than others (e.g., mathematics), receiving training early on is particularly beneficial. Such training further develops (a) interactive abilities (Collins & Evans, 2007), which encompass establishing connections with others, engaging in conversations about their respective disciplines, fields or sectors, recognizing, discussing and reflecting on their perspectives, identifying underlying concerns and translating them into the language of other disciplines, fields or sectors (Hoffmann et al., 2022); and (b) reflective abilities which are not confined to reflecting on something specific but represent a general ability. Developing both interactive and reflective abilities will allow integration experts to better understand the socially constructed nature of different disciplines, fields and sectors and
appreciate their respective strengths and weaknesses, which is crucial not only for thinking, but also for acting in an integrative manner.

**Conclusion**

Integration experts and their expertise are crucial in realising the full potential of ITD research. Their expertise in combining heterogeneous contributions from different disciplines, fields and sectors – including their own – is much needed in academia to tackle complex environmental and societal problems and generate potential solutions to deal with them. However, the existence of integration expert positions within academia must not mean that ITD project and program members assume a passive role in such integrative efforts. Even the most qualified and talented integration expert can only be successful if team members are strongly committed and intrinsically motivated to contribute to such efforts and are provided with the necessary resources. Stated somewhat differently, creating integration expert positions in academia does not mean outsourcing such efforts to one individual, but providing ITD projects or programs with the required expertise for unfolding – together with all other project or program members – their integrative potential. Nevertheless, it can also be useful to share the integration expert role between two or more individuals who jointly contribute to realizing the integrative potential of ITD projects and programs, since the range of roles, personal qualities and expertise described above cannot always be covered by a single individual.

**References**


