33. The Relationship of Integrative Applied Research and I2S to Multidisciplinarity and Transdisciplinarity

This chapter looks specifically at two of the initiatives that have informed this book: multidisciplinarity and transdisciplinarity. I argue that rather than rating one better than the other (almost always transdisciplinarity is rated preferable to multidisciplinarity), both have advantages and disadvantages, making each more useful in some circumstances than others. Further, their attributes can be variously combined into hybrid approaches that will change the balance of benefits and shortcomings. The aim of this chapter is to demonstrate one of the core arguments of this book—namely that there are no perfect ways to investigate complex real-world problems, but there are many viable possibilities.

Multidisciplinary and Transdisciplinary Research

Let us begin by drawing together and expanding the thumbnail sketches presented in previous chapters, examining in turn the three domains (synthesising disciplinary and stakeholder knowledge, understanding and managing diverse unknowns and providing integrated research support for policy and practice change).

Multidisciplinary research involves juxtaposing knowledge from different disciplines and stakeholders about a particular issue. Each discipline approaches the problem, interprets the results and reports them in a manner that is conventional for the discipline. The potential for different disciplines to contribute is relatively equal, or at least primarily determined by the extent of what they can usefully offer. While the ways for stakeholders to participate are less well defined, individual stakeholder groups may be represented by the contributions of a prominent individual or subgroup or by one of the disciplines (for example, a sociology-based survey of particular stakeholders could be conducted, with that discipline then speaking for those parties). Overall, multidisciplinary research has the scope to include many disciplinary and stakeholder perspectives. The weakness of this approach is that there is little emphasis on drawing general lessons through synthesis of these different contributions. Such synthesis can be particularly challenging, especially when problem definitions and methods used by the various disciplines and stakeholders do not fit together comfortably.

The approach to unknowns is confined to understandings and methods that are conventional for the participating disciplines and stakeholders. This can provide some breadth in the consideration of unknowns, as disciplines and stakeholders vary in how they tackle them,[1] but there is also usually no attempt to bring their insights together into a comprehensive picture.

Finally, providing *integrated* research support for policy and practice change is constrained both by the absence of knowledge synthesis and by the limited approach to unknowns. Usually the research outcome is that the independent disciplinary and stakeholder reports are presented side by side, often in a one-day seminar or a book. It is up to the individual policy makers and practitioners to extract and pull together the knowledge that is useful for them. While this is generally seen as a limitation because of the expertise and time investment required of policy makers or practitioners, it can have advantages in that they are in the best position to decide what is apposite and can therefore tailor what they hear or read to their own purposes.

Transdisciplinary research starts with the team building a common framework and agreed methods for tackling the problem. The approach to including disciplinary perspectives can vary. In some projects, strong discipline experts are involved and they aim to work together to build a transcending scaffold for the investigation and to agree on the primary methods. But this can lead to battles as disciplines compete for priority. To overcome this, other approaches draw on generalist rather than discipline-based skills. In the worst cases, this can result in a low-grade blancmange of concepts and methods, sometimes falling into methodological holes that specific disciplines overcame a long time ago.[2] The importance of stakeholder perspectives is generally well recognised, but—as in multidisciplinary research—there are no standard ways of including them. They may be consulted in various ways, such as through surveys or focus groups, or representatives may be invited to be team members. While the aim is usually for all those involved to have equal standing, the outcome of negotiating an agreed approach up front is often that some disciplines and stakeholders are restricted in their ability to contribute. Nevertheless, the development of the common framework and agreed methods means that the synthesis of the different disciplinary and stakeholder perspectives that *are* included in the investigation is generally strong. Furthermore, the synthesis is enhanced by the team working together in gathering new evidence and developing a shared interpretation, which aims to transcend the understandings of single disciplines and stakeholder groups.

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1   Described in Chapter 10.
2   For example, some transdisciplinary researchers ignore standard statistical know-how about choosing study samples to maximise the generalisability of study findings or psychometric skills for designing questionnaires that give clearly interpretable results.

Implicit in negotiating the approach to the problem is which unknowns will be considered and how they will be managed. But consideration of unknowns is often poorly developed because they are not well understood, and their importance is inadequately recognised. Indeed, as I discuss below, having a better appreciation of different ways of understanding and managing diverse unknowns may assist the negotiations of transdisciplinary teams and help them achieve better outcomes.

Transdisciplinary research aims to support policy and practice change, usually through an engaged approach with end-user policy makers and practitioners, seeking to involve them in the development of the framework and interpretation of the results. The strong knowledge synthesis means that there are often useful outcomes on which change can be based; however, the lack of explicit and comprehensive attention to diverse unknowns means that the research support for policy or practice change faces the danger that action (based on evidence alone) may be misguided.

Enhancements that I2S Can Provide

Let us examine how I2S can strengthen these two approaches. The strengths and weaknesses for each domain are summarised in Tables 33.1–33.3.

Table 33.1 Strengths and Weaknesses of Multidisciplinary and Transdisciplinary Research for Knowledge Synthesis

Multidisciplinary	Transdisciplinary
Each discipline can contribute its perspectives in a relatively unconstrained way, enhancing the richness in understanding the problem. In theory this is also possible for stakeholders.	The contributions of the disciplines and stakeholders are constrained by the transcending approach taken to the problem.
Flexible—that is, can easily add disciplinary and stakeholder perspectives that were missed when the research was originally designed.	Adding new perspectives may require renegotiation of the whole approach.
No coherent approach to synthesis and it may be hard to meld diverse approaches.	Synthesis is strong as the process of bringing together the discipline-based and stakeholder knowledge starts at the research design phase with the development of the common framework and agreed methods for tackling the problem.

I2S concepts, methods and guides, as well as lessons from case examples, can strengthen all aspects of knowledge synthesis in both types of research. One obvious contribution is through the collections of knowledge synthesis methods. These provide additional methods for consideration and can therefore significantly enhance both types of research.[3]

It is worth noting that in multidisciplinary research it is likely that some of the findings of the discipline-based research will be so different because of their problem framing that they will not be able to be included in the synthesis. On the one hand, this may be considered as wasted effort. Alternatively, the perspectives that cannot be synthesised can still be presented, making the limitations of the synthesis apparent in a way that is not possible in transdisciplinary research.

Scoping and boundary setting also warrant further discussion. For these, the contribution of I2S is to ensure that considerations in both multi- and trans-disciplinary research are appropriately wide ranging and that specific attention is paid to what is included, excluded and marginalised. This may be particularly helpful in transdisciplinary research in building richer transcending frameworks.

Table 33.2 Strengths and Weaknesses of Multidisciplinary and Transdisciplinary Research for Understanding and Managing Diverse Unknowns

Multidisciplinary	Transdisciplinary
Has scope for including different kinds of unknowns through the diverse disciplinary and stakeholder perspectives.	Although not inevitable, the scope of considerations may be narrowed early in the problem definition phase.
Can better accommodate vagueness and has reduced transaction costs.[a]	Needs specification about processes, outcomes and participants in order to proceed. Less able to accommodate vagueness and has higher transaction costs.

a. The importance of vagueness is discussed in Chapter 13, under exploitation as a method for managing unknowns.

I2S can strengthen both multi- and trans-disciplinary research by supplying concepts and methods for improved understanding and management of diverse unknowns. In multidisciplinary research it is conceivable that additional perspectives on unknowns are laid side by side with the disciplinary and stakeholder perspectives. For example, these could include ways of dealing with the problem by accepting the unknowns (through scenarios, hedging, applying the precautionary principle, and so on), rather than reducing them, as is most likely to occur in the discipline-based approaches. I2S gives transdisciplinary

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3   Although different perspectives are likely to be better synthesised in transdisciplinary research, access to a range of synthesis methods can also enhance such research by providing more options for pulling insights together. This can allow the synthesis to be better tailored to the circumstances or overcome prescriptive thinking about how synthesis should be undertaken (for example, that dialogue between equals is the only synthesis method).

research the opportunity for a rich and complex approach to unknowns to be built in at the beginning of the research process when the transcending framework is developed. This can influence both how the problem is thought about and how it is dealt with.

Table 33.3 Strengths and Weaknesses of Multidisciplinary and Transdisciplinary Research for Providing Integrated Research Support for Policy and Practice Change

Multidisciplinary	Transdisciplinary
Both are weak in providing *integrated* support because of poor attention to unknowns. Multidisciplinary research also has poor synthesis of available knowledge.	
Tends to rely on fairly low-level communication, with the onus on policy makers and practitioners to identify and use the research in meaningful ways. This can be a strength, as it allows them to select the findings most pertinent for their purposes, as well as to choose the framing for the integration, rather than relying on what is proposed by the researchers. On the down side, many recipients will not have the time or expertise to get the maximum value from the range of insights, so that the advantages of having conducted a multidisciplinary investigation are lost.	Transdisciplinary research seeks a more engaged approach with policy makers and practitioners in the planning, conduct and use of the research. While this can lead to strong engagement, transaction costs are high, which may reduce the willingness of recipients to participate. It can also be hard to accommodate turnover in personnel and changes in policy and practice priorities.

The advantage of I2S is that it can open up a broader range of possibilities for both approaches. It can help both multi- and trans-disciplinary teams target their efforts more effectively, by better understanding the policy and practice arenas and identifying the key players. It can also provide a wider range of options for interacting with policy makers, drawing on communication, advocacy and engagement as the bases. For example, multidisciplinary research might conclude with an advocacy phase. In transdisciplinary research, I2S can assist in considering alternatives when engagement is not possible. It can also help transdisciplinary teams appreciate and plan for the possibility of changed priorities by the time their research is completed—in other words, that their findings are no longer relevant or of interest to current policy and practice concerns.

Hybrid Approaches

The preceding discussion also starts to provide an inkling of how hybrid approaches combining elements of multi- and trans-disciplinary research could be used. These aim to exploit the different strengths, such as the robust disciplinary contributions and flexibility of multidisciplinary research and the strong synthetic focus of transdisciplinary research. It is relatively

easy to conceive, for instance, of a program of research that starts with a multidisciplinary phase, which also maximises the benefits of vagueness, using those results to move into a transdisciplinary study, which has a clearer outcome-related focus. For example, the hypothetical Resilience Overcomes Vulnerability study described in Chapter 31 might have started with a multidisciplinary investigation, comprising

- demographic evaluations of the numbers of children growing up in the most adverse conditions and how these estimates have changed in the past 40 years
- geographic examination of how adverse conditions vary by location and how this has changed
- studies combining psychological, sociological and anthropological perspectives on parenting and how it is influenced by the experiences of mothers and fathers when they were children
- economic investigations of living conditions
- theoretical and practical considerations of resilience from history, psychology, psychiatry, anthropology, sociology, economics and philosophy
- epidemiological studies of how living conditions affect life expectancy.

If these investigations were undertaken in the first year of the Resilience Overcomes Adversity study, team leader, Mandela, and the I2S specialists Moore and Wang could use the findings to then pull together a core team to operate in a transdisciplinary manner. Perhaps the other members might be an anthropologist, a public health expert, a psychologist, an international public policy expert and an economist. This team could then develop an overarching conceptualisation for the next three-year research phase, with the final year being devoted to provision of integrated research support for policy and practice change.

Hybrid multi- and trans-disciplinary approaches can also be conceived as a transdisciplinary study embedded in a larger multidisciplinary investigation, rather than a transdisciplinary study following one that is multidisciplinary. The specific hypothetical examples for the Resilience Overcomes Vulnerability study used above can be rearranged to illustrate such an option. In this case, let us imagine that the eight members of the transdisciplinary team started with an overarching conceptualisation for a five-year project based on existing knowledge. The transdisciplinary team may then have commissioned the multidisciplinary add-ons described above. These may address questions that the transdisciplinary team needs for its ongoing research or may provide additional context.

Another advantage of hybrid approaches is that they allow the disciplinary experts and stakeholders to be involved in diverse ways tailored to their own interests and needs. Thus, it is conceivable for integrative applied research projects to be designed so that participants who want a highly engaged process of working together (like Mandela, Moore and Wang) can be accommodated, as can those who wish to offer their disciplinary or stakeholder insights in a less engaged way (such as Ritter) or who want to make a specific contribution and then move on (for example, Gregory).

The purpose of providing these examples is to open thinking about a range of hybrid methodological options and to demonstrate the variability that integrative applied research accommodates and that I2S supports.