

How scientists cooperate

# Getting to know the enemy

There are increasing calls for greater cooperation between scientists from different disciplines. Under certain circumstances such interdisciplinary research can add value. A new publication, *Building Bridges*, offers some advice for sceptics and enthusiasts.

By **Frans Bieckmann**

Science is a systematic intellectual endeavour that requires specialist methods and logic. Each branch of science has its own dynamics, which colleagues working in other disciplines may find difficult to understand. This reality makes collaboration between the disciplines difficult, despite the many arguments in its favour.

Four Dutch umbrella organizations recently set out to identify what conditions are necessary for interdisciplinary research to produce its presumed added value, in the form of new insights and integrated ideas. To do this, they interviewed 15 scientists from such varied fields as demography, social geography, nanotechnology, philosophy of science and environmental science. The result of this enquiry, *Building Bridges*, offers an overview of the possibilities for and obstacles to interdisciplinary research, and ways to improve it.

It begins by describing five types of interdisciplinary research. The first four differ in the degree of integration between the collaborating disciplines, and when – from the start of the research process, through ongoing exchanges between several independent projects, or only at the end when the results are brought together. The fifth type, probably the most controversial, involves not only collaboration between several disciplines throughout the process. It also requires interactions with other ‘stakeholders’ such as policy makers, civil society or the private sector. All participants design the research programme together, but then follow separate but parallel paths. This is anathema to the proponents of fundamental research.

There are several arguments why interdisciplinary research is important. Society and policy makers are increasingly calling for research that can provide practical solutions to everyday problems, and therefore want to be involved in formulating the aims of the research. But there is also another (more or less) scientific argument supporting the approach. It means that different forms of knowledge can be included – experiential or informal knowledge, for example, as well as academic knowledge. Through this concept of transdisciplinary research, ‘the relationship between science and society and policy is in fact redefined’.

*Building Bridges* refers to several large research projects that have embraced an interdisciplinary approach, such as the Intergovernmental Panel on Climate Change (IPCC). Environmental research is a good example of a field where knowledge of natural processes, technologies that can be applied, and human behaviour can be combined in order to understand and solve complex problems.

## Barriers

But to make academic cooperation work, many obstacles have to be overcome. Mono-disciplinary research still has much more prestige, and is thus better rewarded. This is due not only to

academic stubbornness, but also to the difficulty in proving the quality of interdisciplinary projects. But these problems, according to one interviewee, do not exist in the higher regions of science: ‘Nobel prize-winning research is often at the interface between disciplines’.

Although things are changing, institutional settings are often not favourable for improved cooperation between the disciplines. Universities need to do much more to encourage interdisciplinary research, and to change their organizational and financial structures accordingly.

The classic example of a barrier between disciplines is that between the natural and social sciences. Another, which is common in development studies, is the lack of understanding between economists and more qualitative social scientists. Many of the interviewees dismiss such descriptions as caricatures. But others note that it is usually those with most experience and knowledge of other disciplines who find it easy to understand the concepts, definitions and methods – of data collection and processing, or of experimentation, for example – of other branches of science.

The starting point for improving understanding seems to be dialogue, exchange and communication – not only between methods, theories and institutions, but in particular between people, since all successful collaboration begins and ends with relationships between individuals. *Building Bridges* suggests many practical ways forward, but maybe the most useful piece of advice, provided by Swedish researcher Sverre Sjölander (1985), is to bear in mind that all interdisciplinary collaboration proceeds through ten stages:

- 1 Everyone sings the old songs
- 2 Everyone on the other side is an idiot
- 3 Retreating into abstractions
- 4 The definition sickness
- 5 Jumping into tussocks
- 6 The glass bead game (*Das Glasperlenspiel*, Herman Hesse)
- 7 The great Failure
- 8 What happens to me?
- 9 Getting to know the enemy
- 10 The real beginning

It appears that we may be just one step away from the real beginning. ■

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- Ymkje de Boer et al. (2007) *Building Bridges: Researchers on their Experiences with Interdisciplinary Research in the Netherlands*. KNAW, NWO, RMNO and COS. Free copies can be ordered at [www.nwo.nl](http://www.nwo.nl)