Inter- and Trans-disciplinary Research: A Critical Perspective

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Introduction

Contemporary sustainable development challenges are complex, and tackling them demands cooperation between specialists with diverse backgrounds in both the natural and social sciences (Sillitoe 2004; Farrell 2011). There is growing recognition that new approaches and different types of expertise are needed to renew science, and among the most cited of these are the concepts of inter- and trans-disciplinarity research. In academic literature and in funding bids it is becoming increasingly common to mention the importance of bridging divides within academia as well as between scientific communities and the rest of society. While the creation of more spaces for science to engage with different publics and vice-versa is a laudable objective in itself, it is essential to take a closer look at what these concepts entail in order to better understand the challenges associated with these types of research.

Defining inter- and trans-disciplinarity

There are many definitions of inter- and trans-disciplinary research, and this can lead to misunderstandings. For example, a common misconception confuses multi-disciplinary and inter-disciplinary approaches. "Multi-disciplinarity draws on knowledge from different disciplines but stays within their boundaries. Inter-disciplinarity analyzes, synthesizes and harmonizes links between disciplines into a coordinated and coherent whole" (Choi, 2006). Inter-disciplinarity is not just research in two or more different disciplines, nor is it adding methodologies from other disciplines to an already discrete project;

rather, it is an integrated approach to answering a question that recognizes the limitations inherent in the compartmentalized system of academic research. While the ultimate aims of inter-disciplinary research can either be theoretical (towards the consilience of knowledge) or practical (providing solutions for society), it is most often connected with applied research that starts with a real-world question and uses different disciplinary ideas and methods not just as guideposts, but rather as tools. As such, this approach can result in novel, unexpected answers to familiar, timeworn questions.

Trans-disciplinary work moves beyond the bridging of divides within academia to engaging directly with the production and use of knowledge outside of the academy.

In this approach, societal impact is laid out as a central aim of the research at hand. Solutions that emerge from the research may additionally be put into place through an action-oriented process built on direct collaboration with the groups involved (Klein 2004). This way of doing research has also been referred to as post-normal science, Mode-2 thinking, or co-produced knowledge, and can be linked to theories and methods that were first established by social reformists in the mid-20th century, and that were defined both by participation and a determination to produce knowledge in the interest of social change (Stokols 2006). While both inter- and trans-disciplinary research offers great hope for bringing holistic, out-of-the-box thinking to an increasingly-specialized workforce of experts, it is necessary to outline some of the main concerns for the effective promotion of these approaches in social and environmental research.

A Critical Perspective

The radical roots of inter- and trans-disciplinary approaches are important for understanding that one of the original aims was that of 'conscientization',

defined as "a process wherein people develop critical consciousness through collective inquiry, reflection, and action on the economic, political, and social contradictions they are embedded in" (Torre 2014, 3). Whether bridging disciplinary divides between different ways of knowing within academia (inter-disciplinarity), or extending the 'right to do research' to marginalized communities and groups (trans-disciplinarity), a key feature of these processes is that of reflection – both of the world and of one's role in that world.

However, with the increasing use of inter- and trans-disciplinary as buzzwords for leveraging funding bids and to make research seem 'current', these concepts are being co-opted in less thoughtful ways and there is a danger that the terms will lose credibility (and could be used to advance powerful agendas without consideration of the true definitions). Critical scholars have noted that when it comes to evaluating the impact of science on society, more weight is often given to research impact on powerful actors, such as policy or industry, as compared to less powerful groups such as local communities or marginalized populations (Pain et al. 2011). For example, new partnerships between universities and multinational corporations are developing under the banner of trans-disciplinary research – where the science that is produced by experts is mobilized to support existing unequal structures of economic dominance (Leach et al. 2005). As these collaborations may be built around profit motives advanced through the 'greenwashing' of existing practices, this motivation leaves little space for the kind of reflection or concientization that original understandings of trans-disciplinarity seek to inspire in practitioners.

Much of the discussion around inter- and trans-disciplinarity deals with the notion that knowledge is or should be co-produced between academics and other groups. But the whole process of cooperatively creating new ways of thinking and doing are dependent on several aspects that are often left out of the ways inter- and trans-disciplinarity are talked about in the mainstream. For example, projects involving co-produced knowledge should invoke relations that are reciprocal and have high levels of trust between the different groups involved (Marzano et al. 2006). They should foster relations where power differences are accounted for and attempts made to balance them. This is why the process of reflection is so important – to establish awareness early on in the research process about the intergroup dynamics and their potential influences on the (in)equalities in the group. If this is not considered, there is the threat that the inter- and trans-disciplinary research is seen as new kind of imposed 'tyranny' from above, much in the same way 'participation' was appropriated for top-down development by powerful institutions like the World Bank in the 1990s (Cooke and Kothari 2001). Thus, especially in the case of trans-disciplinary research, care should be taken to ensure that the research questions and methods have been developed in collaboration with those social groups who are intended to be 'impacted' by the work at hand.

Another major concern with these new research trends is that they may be used to (re)produce existing disciplinary hierarchies. For example, Castree et al. (2014) critique the partial and selective uptake of social science and humanities into global environmental change science, observing that approaches emphasising human diversity and social inequality are given little room amidst the more dominant perspectives from the physical sciences and mainstream economics. With growing calls from powerful institutions for inter- and trans-disciplinarity research to be enacted, there is a risk that these approaches will decrease rather than increase critical capabilities by displacing crucial disciplinary research, which continues to have important insights into 'real-world' problems (Strengers 2012).

Recommendations

There is a strong case for inter- and trans-disciplinarity in environmental and sustainable development research, alongside existing disciplinary research efforts. However, as discussed above, such research needs to be embraced in a critically reflective manner. To aid this process, we put forward the following recommendations:

1. Funding calls for inter- and trans-disciplinary research should clearly define these terms so as to give better guidance for applicants. Examples of exemplary research should be given as guidance.
2. There is a need to build time and opportunity for reflection into inter- and trans-disciplinary research processes to build trust within the

group(s), and to emphasize the importance of the entire process, not just the delivery of measureable outputs.

3. There is a need to ensure that big funding calls for 'scaling-up' projects do not diminish smaller efforts. As both inter- and trans-disciplinarity approaches to research are in their infancy, it makes sense for researchers to start small and learn from those projects before contributing to an 'Inter- / Trans-disciplinary Revolution'.

4. We need to foster critical inter- and trans-disciplinary scholars by questioning entrenched disciplinary structures. Some suggestions: a) allowing submissions to research assessment schemes to be from more than one discipline; b) providing more funding opportunities where project outcomes can be more flexible / less defined up-front; and c) support early career inter- and trans-disciplinary scholars through support networks and training.

References

Castree, N., Adams, W.M. and Barry, J. et al. (2014). Changing the intellectual climate, *Nature Climate Change,* 4: 763–768.

Choi, C.K., Pak, A.W.P., (2006). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. Definitions, objectives, and evidence of effectiveness. *Clinical Investment in Medicine,* 29 (6): 351-364.

Cooke, B., and Kothari, U. (2001). *Participation: the New Tyranny?* Zed Books, London.

Farrell, K. N. (2011) Snow White and the wicked problems of the West: a look at the lines between empirical description and normative prescription. *Science Technology Human Values,* 36: 334-361.

Klein, J. T. (2004). Prospects for transdisciplinarity. *Futures,* 36: 515-526.

Leach, M., Scoones, I., and Wynne, B. (Eds). (2005). *Science and Citizens: Globalization and the challenge of Engagement*. Zed Books, London.

Marzano, M., D. N. Carss, and Bell, S. (2006). Working to Make Interdisciplinarity Work: Investing in Communication and Interpersonal Relationships. *Journal of Agricultural Economics* 57:185-197.

Pain, R., M. Kesby, and Askins, K. (2011). Geographies of impact: power, participation and potential. *Area*, 43: 183-188.

Sillitoe, P. (2004). Interdisciplinary experiences: working with indigenous knowledge in development. *Interdisciplinary Science Reviews*, 29: 6-23.

Stokols, D. (2006). Toward a Science of Transdisciplinary Action Research. *Am J Community Psychol,* 38: 63-77.

Strengers, Y. (2012). Interdisciplinarity and industry collaboration in doctoral candidature: tensions within and between discourses. *Studies in Higher Education*, 39: 546-559.

Torre, M. E. (2014). Participatory action research in T. Teo (Ed). *Encyclopedia of Critical Psychology*. Springer, New York.