



Transdisciplinary collaboration on sustainability challenges: Toward new approaches for higher education institutions

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Abstract

Context:

Evidence from team science (Stokols et al, 2008), organizational learning (Senge et al 2007), and sustainability science (Mauser et al, 2013) all highlight the important role that transdisciplinary collaboration and knowledge co-production play in addressing sustainability challenges like climate change. The success of these practices is predicated on design, relational and systemic factors that must be understood and attended to (Cundill et al, 2018, Freeth & Caniglia, 2019). Unfortunately, an ever-growing body of literature is highlighting the continued failure of academic institutions to create the conditions that enable a collective approach to addressing sustainability challenges (Lotz-Sisitka et al, 2015; Irwin et al, 2018). As such, Irwin et al (2018) argue, “new mechanisms, policies and tools specifically designed to foster convergence and transdisciplinary sustainability research are required to bridge the barriers that currently limit the effectiveness of scholars and academic institutions” (p. 325).

The McGill Sustainability Systems Initiative (MSSI) is one example of a mechanism designed to foster this convergence by promoting transdisciplinary collaboration on sustainability challenges, and building a “robust and vibrant community of committed sustainability researchers and external stakeholders” within and around the university (mcgill.ca/mssi). Its approach is to fund collaborative sustainability research, host knowledge exchange and knowledge co-production activities (workshops, dialogues, symposia, etc.), and promote McGill sustainability research among the wider research and policy community. Achieving its lofty aims, however, means challenging deeply rooted norms, incentive structures, and assumptions that have shaped individual, institutional and disciplinary practices for decades. With similar initiatives being established in universities worldwide, better understanding the drivers and barriers to this transformation in academia may provide insights that can inform strategies for educational change.

Study scope and design:

This presentation reports on initial findings from an 18-month study of the roles of knowledge brokering and facilitated knowledge co-production processes on individual engagement in transdisciplinary sustainability research collaboration. Using the case of MSSI for study, this research has sought to understand:

1. How the design, dynamics and facilitation of knowledge exchange and knowledge co-production shape participants' perceptions of, and engagement with transdisciplinary collaborations on sustainability.
2. Whether such activities lead to more fundamental and lasting changes in the network of sustainability research across (and beyond) the campus.

We used a combination of complementary qualitative methods to develop a complex picture of activity-level experiences of participants, the MSSSI convening team and (where applicable) event facilitators, and network-level dynamics over the 18-month period.

*Activity-level inquiry: The activity-level inquiry adopted an action learning orientation (Zuber-Skerritt, 2002), building on MSSSI's own commitment to understanding and improving their practice. Action learning offers a means of systemic and iterative inquiry embedded in a shared commitment to acting on complex problems, including climate and sustainability challenges (Zuber-Skerritt, 2012). We studied three separate events, undertaking pre-event semi-structured interviews with the MSSSI convening team to understand how they sought to create a shared setting that is conducive to transdisciplinary exchange and collaboration. We then conducted surveys of participant experiences at each of these events, comparing participant interpretations of these spaces with the intentions of conveners and participants' sense of membership in these spaces. Post-event interviews reflected on the convergence and divergence between activity design and participant perception, with these reflections informing subsequent activities.

*Network-level inquiry: MSSSI's aims of collaboration and community-building suggest that it will affect changes in relations between individuals and influence the existing collaborative networks within the McGill community. To assess these evolutions we used longitudinal social network analysis (Chapman et al, 2016), to study relationships brokered through MSSSI over time as well as changes in the overall size and density of the network. A social network perspective moves the primary focus from the individual and the attributes of the individual to the dynamic supports and constraints of the network (Daly, 2010). We collected network statistics at two points in time and used UCINET software (Borgatti et al 2002) to visualize and compile network statistics for analysis.

Emerging findings:

While data collection and analysis are still underway, this study is already yielding insights that will be of interest to higher education institutions, and particularly researchers and administrators promoting action on sustainability challenges.

*Limited disruption of disciplinary domains: Science and engineering continue to dominate sustainability networks despite deliberate efforts to engage wider disciplines. Addressing this disparity in contexts like McGill may require addressing disciplinary hierarchies and norms in relation to research collaboration and academic work beyond one's traditional disciplinary domains.

*More than funding: While researchers appreciate the access to funding opportunities that MSSSI provides equally important to activity participants is ability to access a community of peers that extends beyond the disciplinary 'silos' that remain pervasive at McGill. As one respondent noted: "rarely is such an environment created such as this where individuals from such diverse backgrounds can interact in this manner."

*Brokering and intermediary functions are essential: Our social network mapping underscored the central role of intermediaries in enabling innovation and knowledge co-production. Despite the high capacity of academics to operate within their specific disciplinary domains, support is needed to facilitate the kinds of boundary-spanning work that sustainability challenges are seen to demand. Educational administrators may tend to undervalue these functions in more traditional metrics such as academic output. The skill-sets needed to sustain these functions also remain poorly integrated and undervalued.

*Individuals and structures: Our network analysis also reveals that, while the introduction of enabling structures and processes (such as the activities under study here) can play a catalytic role between existing network ties, network expansion may hinge more on individuals' activities beyond their work within initiatives like MSSl. This highlights the need for more fundamental shifts to the way we approach transdisciplinary action on sustainability than can be offered through 'complementary' initiatives like the one under study.