BRIDGING SCIENTIFIC DISCIPLINES REQUIRES TRUST, GROUP IDENTITY

Successful scientific networks require collaborators that bring intelligence and expertise. But they also require an emotional connection among collaborators, and even a sense of joy. Scientists must connect on three levels for success — emotional, cognitive and social.

FOCUS OF STUDY

This study analyzes how interdisciplinary research networks operate, and what makes them successful. Through case studies across nine networks, the paper compares the experiences of the researchers involved and emphasizes the importance of understanding the role of emotions and social interactions in the research process as well as intellectual aspects.

BACKGROUND

Interdisciplinary research is gaining prominence. More scientific papers mention terms like interdisciplinarity than ever before, and an increasing number cite other papers outside of their primary discipline. In recent decades, institutions have funded more interdisciplinary collaboration and there has been an increase in the number of initiatives designed to connect researchers with those from different disciplines as well as with industry.

Research on the process of interdisciplinary research has also increased as researchers strive to understand how to measure its results and ensure that it is fruitful. Much of this research has focused on cognitive aspects, such as the degree to which researchers gain knowledge from other disciplines in their interdisciplinary work and how they bridge barriers between their knowledge and that of their colleagues.

Few studies have addressed the role of emotions in the process, however. The authors sought to address the research gap and challenge the dismissal of the social and emotional factors through a thorough analysis of nine interdisciplinary research networks funded by three institutions: the Canadian Institute for Advanced Research, the MacArthur Foundation and the Santa Fe Institute. Case studies looked at how researchers came to join the networks, how they felt about their experiences and how the funding institutions created a context that shaped their approach to carrying out their collaborations.

FINDINGS

Successful interdisciplinary collaboration requires connecting on emotional, cognitive and social levels. The group of collaborators must be able to exchange ideas across disciplines, but also develop a group identity and trust each other enough to defer to others’ expertise.

In the cognitive realm, researchers joining a network that seeks to advance an area of science, produce policy insights or solve big global problems must have the necessary academic expertise and intellectual tools to exchange knowledge in the subject area. Case studies of participants reflected an appreciation
“I strongly believe that a common language needs to be developed within any group undertaking interdisciplinary research. Our group, I think, is an excellent example of a successful group as we are able to discuss topics with different disciplinary viewpoints [e.g., psychology versus economics] ... There is no domineering personality or “research turf” needing defending.

— Respondent

for how adding perspectives from many disciplines, such as economics and psychology, could advance knowledge in a given area. Most researchers said that excellence and the exchange of ideas across disciplines were important indications that their work was a success. Most (65 per cent) suggested that in order to be successful, researchers in these collaborations needed to have the expertise for the project and be open-minded.

Although intellectual connections are important, more than half (58 per cent) of the researchers in the study said it was a sign of success when researchers shared a commitment to interdisciplinary collaboration and felt a sense of collective intellectual excitement as a result. More than a quarter (28 per cent) made comments about the joy of collaborating in general.

In addition, 77 per cent of participants mentioned interactional factors, such as learning from each other and building deep social connections as markers of success for their networks. About half described their collaborators as good leaders and sociable people, and said the atmosphere was friendly. These comments reflect the value of a social environment that reinforces participants’ commitment to the network and contributes to their sense of being able to achieve big things with their research collaborations.

When participants described interdisciplinary collaborations gone wrong, they used language that reflected a similar focus on the social, emotional and cognitive. For example, they said groups had failed to build a “common mission,” and described communication styles that clashed. They referred to closed-mindedness and unrealistic expectations for the research.

The researchers also found that the way funders design networks shapes the nature of interactions. For example, some institutions design their networks around developing specific policy recommendations, while others take on broader questions with longer time horizons. Many researchers in the study said the funding institution’s goals need to align with the researchers’ goals to achieve success.

“A lot of people here are very respectable and we do scholarly work. But the idea is that ... you’re not stopped by the fact that there are questions outside your domain ... you just go, “OK, that’s an interesting question. What do people know about that question?” You ask around ... and the big question is usually enough.”

— Respondent

METHODOLOGY

The researchers analyzed biographical data and publications, distributed surveys, observed meetings and conducted interviews with 57 members of the nine research networks, which are all considered successful, to determine what makes them work. The research networks covered a broad range of subjects in many fields, including social interactions and well-being, early experience and brain development and the geochemical origins of life.

The responses led them to develop the concept of shared cognitive–emotional–interactional platforms as a framework for understanding such collaborations. They divided the responses among these three categories, counting how often researchers made comments related to each dimension. They analyzed which elements facilitate success, such as a group identity, and elements that are common to successful networks, such as shared intellectual tools and meaningful relationships.
The researchers used the following categories to analyze responses:

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<th>MARKERS OF SUCCESS</th>
<th>FACTORS THAT FACILITATE SUCCESS</th>
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**IMPLICATIONS**

The finding that successful interdisciplinary collaboration requires cognitive, emotional and social engagement is relevant for institutions that run interdisciplinary networks and the researchers and industry professionals who participate in them. This study suggests that in designing elements of these programs, such as the selection process for participants and the format of meetings, organizations should consider, for example, how members will interact with one another and whether they share common goals, compatible communication styles and a similar sense of excitement about the promise of interdisciplinary collaboration.

**REFERENCE**


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