

Note to Readers

Addressing Complex, Societal Challenges through Interdisciplinary Research

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Introduction

The complexity of societal problems drives the need for interdisciplinary research. For example, the current COVID-19 pandemic illustrates the need for various disciplines to address worldwide challenges. Clearly, epidemiologists in a well-funded public health system (Maani and Galea, 2020) are needed to generate the basic science on the disease spread. However, beyond the disciplinary boundaries of epidemiology are the need for public organizations to effectively collect and act on the data, coordinating between elected and appointed officials (Kirlin, 2020). Moreover, disciplines researching budgets and finance and connecting lessons learned across nations provide valued insights in understanding the varied dimensions of responding to the pandemic (Holzer and Newbold, 2020). The *Journal of Interdisciplinary Sciences (JIS)* welcome submission, offering an opportunity to bring together varied research traditions, across varied disciplines to address complex, dynamic societal problems.

Interdisciplinary Research Successes

The need for interdisciplinary research to address complex social challenges is not new to the COVID-19 pandemic. The Nobel Prize for Economic award to Elinor Ostrom in 2009 recognizes a powerful example of interdisciplinary research. In her acceptance speech, Ostrom (2010) finds at the start of her research on protecting common pool resources such as fisheries and water from depletion, that the researchers in the disparate disciplines of environmental science, law, political science, economics, and others were not aware of each other's research. The recognition of the research's interdisciplinary nature was the first step required to address the complexity and seeming inevitability of the *tragedy of the commons* (Hardin, 1968).



Ostrom's research succeeded in convening researchers from various disciplines each summer at the University of Indiana to share research findings and develop standard research methods. This summer workshop produced shared methodologies searching for effective mechanisms that explained cooperation. This 40-year coordinated effort generated in-depth and deeply nuanced case studies across each continent across various common-pool resources, including forests, irrigation, underground water, fisheries, and others (Ostrom, 1990). In addition to case studies, Ostrom applied game theory from economics to research the decision-making dynamics, resulting in an understanding of the micro-situational variables that could explain successes- and failures- across varied resources in different nations.

The research by Bolman and Deal (2017) applying multiple frames to explain organizations' complexities offers a compelling example of the utility of interdisciplinary research to deepen understanding. Bolman and Deal build a compelling case that organizations- which are a pervasive mechanism for societies to solve problems (Simon, 1995)- defy explanation from any one perspective. Similar to the argument developed by Gareth Morgan in outlining varied "images of organizations' from different metaphors, Bolman and Deal find that four different analytical lenses each provide a new set of insights, while each is limited. Bolman and Deal draw on four different disciplines, sociology, psychology, political science, and anthropology, as different lenses to describe the structure, human resources, negotiations, and culture for organizations. The multi-frame analysis argues that not only do different frames offer stronger explanatory power individually and collectively, but that any one frame fails to fully explain the dynamics of organizational decision making and strategy.

Interdisciplinary Approaches to Social Problems

For public problem solving, long-standing scholar Raadschelders offers an extended discussion for public administration as inherently interdisciplinary, serving as "...an umbrella discipline that serves as the intellectual harbor for the many ships that probe aspects of the role and position of government in society" (2011, 206). He argues that "the world is multifaceted and cannot be captured adequately in any one framework, theory, or worldview" (2011, 72). Too narrowly defining a field and moving away from interdisciplinary research has consequences by failing to account for a broader set of forces that profoundly affect collective action (Roberts, 2014).

Well-developed research literature has emerged for the study of wicked social problems (Rittel and Webber, 1973; Alford and Head, 2017, Kettl, 2006). The research literature suggests a set of wicked policy problems with a social and political complexity that defy simple solutions. Researchers find wicked problems confront contemporary societies- in research that predates the COVID-19 pandemic, but which aligns with the current findings on shortcomings in the response (Quammen, 2020). Collaborative research teams can more effectively address the complex engineering, social, economic and legal dimensions of dynamic, real world problems, in complex economies such as small-scale gold mining in Columbia (Pimentel, Flórez, & Restrepo Baena, 2019).



The need for interdisciplinary research can be seen in the four significant features that Kettl (2006) finds characterize wicked problems: one, the problems cross political jurisdictions; two, the high cost of failure; three, immediate and pressing need; and four, depleted intellectual capital for generating new solutions. Interdisciplinary research offers the potential to generate new intellectual capital and is not bound by any political jurisdictional. In essence, Kettl calls for research that crosses boundaries and transfers across cases, which are the inherent characteristic of interdisciplinary research (Adler *et al.*, 2018).

Moving Forward with Interdisciplinary Approaches

Interdisciplinary research offers a significant set of advantages. First, the approach helps break through the "path dependence" characteristic of current social problems and institutional design (North, 1990). Moreover, interdisciplinary research provides a range of tools to compare institutions across nations, for example to research the "...cultural and historical conditions and social and political practices of societies, democratic practices, principles, and institutions emerged, evolved, and developed." (Jalata, 2018;20). Second, interdisciplinary approaches can more readily navigate the complexities of multi-layered societies, simultaneously researching the individual, team, organizational, community, and institutional dynamics. Third, interdisciplinary research can draw on various quantitative and qualitative methodologies, avoiding attachment to study available only available data sets in what has been described as the "bright streetlights effect." In this metaphor, researchers are similar to the man searching for lost car keys only under a street light because that is where the light shines (Hill and Lynn, 2005, 188). Four, interdisciplinary research can develop teams researching similar problems but across different regions and nations (Ostrom, 1990 and 2010).

Interdisciplinary approaches that access various methodologies offer a greater likelihood of developing systems that provide analytical leverage for understanding complex problems. The interdisciplinary perspective generates knowledge that addresses the challenges described as "failure of imagination" and "wicked problems." Metaphorically, interdisciplinary research embraces the description to think outside the box and think that there is no box to create new possibilities (Zander and Zander, 2002). Practically, connecting researchers across different locations, from other fields, aligns with Johannsson's finding that "When you step into an intersection of fields, disciplines, and cultures, you can combine existing concepts into a large number of extraordinary ideas" (2004, 1), named the Medici effect for the explosive growth of knowledge and commerce in 15th century Florence, Italy. Interdisciplinary approaches can connect theory and practice, offering the potential to understand the conflict inherent in organizations due to the varied "...ideology, values, morals, emotions, perceptions..." that individuals bring to discussions and decision-making (Rajbhandari, (2018;4).

Ostrom's interdisciplinary research approach has been applied to research explaining successes and failures in building large-scale public transportation projects (Callahan, 2007), to the study of fiscal sustainability in a region of 20 million residents (Tang, Callahan, and Pisano, 2014). Moreover, a range of specific challenges in explaining effective collective action to understand



the role of human dignity and the rule of law as driving forces in governance (Newland, 2012), the challenges of the transition to legitimacy in fragile or conflict-affected states (McLoughlin, 2015) or addressing migration (Geuijen *et al.*, 2017)

Conclusion

The worldwide tragedies of the COVID-19 pandemic call for the capacities of interdisciplinary research. Four mechanisms of interdisciplinary collaboration specifically address responding to COVID-19, as well as to other complex social challenges: one, the capacity to investigate from multiple lenses, with various frames; two, a wide range of research methodologies; three, the flexibility to design research at multiple societal levels; and four, the capacity to generate new findings and solutions to replenish intellectual capital to address wicked social problems. Models of successfully interdisciplinary research such as Ostrom's offer a roadmap for designing research collaborations, convening workshops, finding shared methodology, and connecting across regions and nations. The future of interdisciplinary research becomes increasingly important with the increasing fragmentation of disciplines and the growing complexity of societal problems.

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