



Impactful interdisciplinarity

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Abstract

In this editorial, we reflect on the trade-offs associated with interdisciplinarity. We discuss several benefits, as well as various costs and risks. We elaborate on three scopes of interdisciplinarity: (1) interdisciplinary teaching, (2) interdisciplinary research collaborations and teams, and (3) interdisciplinary profiles and careers. We conclude with recommendations for (early-career) scholars, university management, research funders, as well as authors of articles in *Public Management and Governance Review*.

Key words

Interdisciplinarity, Trade-offs, Interdisciplinary collaboration, Interdisciplinary teaching, Interdisciplinary careers.

Extra information

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Introduction

Interdisciplinarity is a term frequently used in scientific communication, particularly in discussions among academics and policymakers. The underlying message of interdisciplinarity discourses is often that the knowledge, paradigms, and methods of different scientific disciplines must be combined to address large and multifaceted problems—also referred to as *wicked problems* or *grand challenges* [1], [2], [3]. These challenges include climate change, political instability, pandemics, migration, aging populations, and large-scale societal digital transformation. The argument for increasingly interdisciplinary research is closely related to scholars' awareness that researchers must demonstrate the practical relevance of their research output for decision-makers with public impact. Given that practical relevance is at the heart of this journal's mission statement, we believe it is timely to share reflections and recommendations on interdisciplinarity.

In this editorial, we present ideas and critical reflections on commonly used arguments in favor of interdisciplinarity, and we use these insights to formulate recommendations regarding



interdisciplinarity as a means—rather than an end in itself—toward truly impactful research and teaching.

What is interdisciplinarity?

Several scholars agree that interdisciplinary research utilizes and connects knowledge, worldviews, and epistemologies from various disciplines through teams or individual professionals [4], [5], [6]. Yang (2009)[7] expands this definition by focusing not only on research teams but also on subjects, programs, and broader collaborations. Indeed, interdisciplinarity encompasses not only research but also nearly all core processes of the academic enterprise. Van Noorden (2015)[8] discusses the interdisciplinary nature of various research areas by examining cross-disciplinary citations. Such studies provide a concrete and measurable operationalization of interdisciplinarity, which may help compare research areas, subjects, courses, programs, and teams, and even individual scholars. For example, Van Noorden (2015)[8] demonstrates that public administration as a research field appears less interdisciplinary than other fields—at least in terms of citations to and from other research fields—despite its focus on major societal issues requiring multiple disciplinary perspectives [6], [9], [10].

Interdisciplinarity is not a win-win; it is a trade-off

Interdisciplinarity offers many benefits, but it also incurs costs. Moreover, both the benefits and the costs may not be equally distributed among all stakeholders involved. While such imbalance is not necessarily a major issue, it becomes problematic when both the advantages and the costs are vaguely defined, hidden, or misrepresented. In such cases, arguments supporting interdisciplinary research and teaching may become biased and insufficiently reflective, turning interdisciplinary requirements (e.g., for research funding, teaching, and academic job advancement) into burdensome bureaucratic conditions rather than catalysts for more impactful knowledge development (research) and knowledge transfer (teaching).

To clarify the elements that constitute the concrete content of interdisciplinarity trade-offs, as well as the stakeholders for whom these elements are particularly relevant, we discuss several scopes of interdisciplinarity in the next section. In doing so, we aim to elucidate specific benefits and costs of interdisciplinarity and how they are traded off against one another. With these trade-offs in mind, we also provide recommendations for the respective stakeholders involved.

Scopes of interdisciplinarity

Interdisciplinarity is often used as an all-encompassing term for many aspects of academic life. Consequently, it is rarely clarified which dimensions of academic processes, objectives, and stakeholders the concept is intended to address. Nevertheless, distinguishing between various scopes of interdisciplinarity is important for better addressing the different stakeholders involved and for providing greater detail regarding the considerations each stakeholder should take into account when making decisions regarding interdisciplinarity. To clarify this, we discuss a selection of interdisciplinarity scopes:

Interdisciplinary teaching

Interdisciplinary teaching involves actively combining different disciplinary paradigms and methods within a single teaching program, course, or lecture [11]. Most courses and lectures remains mono-disciplinary. In many cases, mono-disciplinary teaching is appropriate because



a consistent set of topics, paradigms, and methods must be taught. This approach is often efficient for transferring large amounts of relatively standardized knowledge, which aligns with the structure of the job market and many organizations.

In contrast, teaching may become more interdisciplinary by adopting a problem- and/or phenomenon-focused approach [5], [9], [11]. In this approach, course subjects are defined not by traditional disciplinary foci but by concrete problems, challenges, and phenomena [12]. Consequently, these courses can also bring students from different disciplinary backgrounds together, which in turns also enables mutual interdisciplinary learning among students. Consequently, course content draws upon different disciplines and, therefore, on different—and often conflicting—paradigms, theories, and methods. It is crucial to acknowledge this explicitly, as it represents the central trade-off of interdisciplinary teaching. Interdisciplinary teaching offers the advantage of training students to apply their knowledge in a more practical way, enabling them to focus on problem-solving and understanding complex phenomena throughout their education.

Moreover, interdisciplinary teaching provides the additional benefit of enabling students to develop meta-knowledge about disciplines (directly from lecturers, as well as from interactions with students with other disciplinary backgrounds). In other words, students gain opportunities to reflect more explicitly on the underlying assumptions within different disciplines [13]. However, this is also where the (hidden) costs often emerge. Such an approach requires a highly specific and carefully adjusted two-layered method of teaching [14]. On the fundamental layer, students engage with the problem, challenge, or phenomenon itself. On the meta-layer, they critically reflect on the assumptions, methods, strengths, limitations, and disciplinary cultures that different fields bring to the analysis of that problem [15], [16]. This process requires substantial time and mental effort from both teachers and students [12]. When sufficient time and effort are unavailable—for example, within formalized learning settings characterized by fixed and traditional teaching requirements—interdisciplinary teaching may become superficial, confusing, and inconclusive [7]. Therefore, teachers and curriculum developers must carefully account for this multi-layered structure of interdisciplinary teaching. Claiming that a course or program is interdisciplinary without adequately investing in the meta-layer leaves learners confronted with eclectic facts and examples rather than a profound understanding of both the complexity of a phenomenon and the underlying assumptions and strengths of each disciplinary perspective.

Interdisciplinary research collaborations and teams

Interdisciplinary research collaborations and teams are often advocated as necessary for large-scale, problem- or phenomenon-defined funding calls. In this context, interdisciplinary collaborators are brought together, with each collaborator explicitly positioned within a disciplinary domain, thereby indirectly signaling specific forms of knowledge, mindsets, scientific networks, and academic communities [17], [18]. As previously mentioned, the underlying assumption is that combining a broader range of theories, methods, and paradigms should enable true breakthroughs in problem-solving. This further implies that focal problems or challenges cannot be comprehensively addressed through the paradigms and methods commonly applied within individual disciplines.

In contrast, an often-underestimated drawback of interdisciplinary collaborations is the significant increase in transaction costs compared with mono-disciplinary collaborations [13], [16], [19], [20]. Collaborators from different disciplinary backgrounds not only possess (1) different professional vocabularies but are also (2) socialized into different collaborative and



operational practices. For example, they may rely on different analytical software, editing tools, and reporting styles. Moreover, collaborators may have (3) significantly different career incentives. Although all scientific collaborators may value publication, the actual outlets that provide formal and informal recognition may differ significantly across disciplines [18], [19], [21].

Transaction costs in interdisciplinary research are also driven by the inherent mutual opaqueness among researchers regarding the actual assumptions, strengths, and limitations of other disciplines [22]. Disciplines may therefore be understood as distinct academic cultures with specific norms and requirements concerning methods, reasoning, and knowledge development. Consequently, conversations within interdisciplinary collaborations—although intended to reduce transaction costs—are not solely focused on learning from one another to create additional gains. They may also involve setting additional restrictions on the overall collaboration, which may reduce rather than increase the novelty of the collaboration’s output. In other words, interdisciplinary collaborations often operate within the limited intersection of disciplinary commonalities rather than within the full combination of both shared and unique disciplinary features. Below are a few generic examples that many scholars involved in interdisciplinary collaboration may recognize:

1. Acceptable samples and sample sizes [23], [24], [25], [26]: In some disciplines, small laboratory samples of students are commonly used to study basic economic and psychological behavior and reasoning. In many other disciplines, however, such approaches may be viewed as lacking face validity and generalizability.
2. Framing of experiments [27], [28], [29], [30], [31]: In some disciplines—particularly economics—it is entirely unacceptable to provide respondents with hypothetical information, while other common assumptions often remain unquestioned. For example, the assumption that real-life behavior is primarily driven by utility maximization that can be fully operationalized through monetary incentives in abstracted laboratory settings is frequently accepted.
3. Differences in epistemological stance can make it difficult to collaborate across disciplines [32], [33], [34], [35], [36]: O very common example is the acceptance of inductive versus deductive paradigms. This distinction is conceptually related to the acceptance of prior knowledge or informed assumptions in theory development and testing. Some disciplines embrace more open and exploratory approaches, often associated with qualitative research methods, while in other fields, a predominantly positivist approach—often linked to quantitative research—remains the default approach. Nevertheless, developments such as supervised machine learning increasingly enable quantitative approaches to explore large databases.

As a result of these transaction costs, as well as operational and cultural boundaries within large-scale interdisciplinary collaborations, it often becomes tempting to divide the overall problem-oriented collaborations into smaller work packages, each focused on mono-disciplinary efficiency [37], [38]. Similarly, fragmented findings of such collaborations often occur with mono-disciplinary framings and in mono-disciplinary outlets [39].

The trade-offs associated with interdisciplinary collaboration involve assessing whether the likelihood of achieving actual knowledge breakthrough justifies the substantially higher transaction costs associated with interdisciplinary collaborations. This assessment can be difficult because of the opaqueness surrounding each collaborating researcher’s understanding of the underlying assumptions, minimal standards, and actual strengths of other disciplines.



Moreover, when disciplinary commonalities are too limited and/or discipline-specific norms become excessively rigid or judgmental regarding practices in other disciplines, any meaningful knowledge development through interdisciplinary collaboration becomes less likely.

For the stakeholders involved, fostering interdisciplinarity primarily requires moving beyond the limited commonalities between disciplines. In particular, when evaluating interdisciplinary research proposals and publications, it is essential to accept different research cultures. In turn, this requires researchers to explain openly the disciplinary perspective adopted in their work. Consequently, greater attention should often be devoted to explicitly articulating the underlying assumptions that shape reasoning and argumentation.

Interdisciplinary profiles and careers

Interdisciplinary profiles and careers develop when scholars broaden their skills and knowledge portfolios through multidisciplinary and interdisciplinary teaching and research. This can yield substantial advantages in terms of scholars' individual ability to internalize fundamental patterns across disciplines, as well as recognize the unique strengths of individual disciplines [40]. With sufficient scientific creativity and intellectual curiosity, interesting opportunities arise when identifying how shortcomings in addressing particular problems within one discipline can be compensated for by strengths derived from another discipline.

Building an interdisciplinary profile also enables scholars to function as effective brokers who identify opportunities for and establish interdisciplinary collaborations [20]. Although such scholars may not be regarded as discipline-specific specialists, they possess the ability to connect specialists together, thereby reducing transaction costs and increasing the likelihood of impactful knowledge creation [41].

The trade-off associated with this scope involves adopting an entrepreneurial mindset when selecting and pursuing new learning opportunities throughout one's academic career. Compared with a specialist career path confined to a single discipline, the interdisciplinary broker career path is likely to involve greater risks but may also offer higher intrinsic and extrinsic rewards when those risks are successfully managed [20], [41]. In other words, exploring new methods and paradigms beyond one's disciplinary background may not yield measurable outputs—such as publications—which are often essential for the career advancement of early-career scholars [42], [43]. Furthermore, even when interdisciplinary work results in strong research outputs, an interdisciplinary scholar's professional profile may still be perceived as eclectic and unfocused when evaluated by mono-disciplinary selection committees.

An entrepreneurial mindset may be highly personal and potentially difficult to cultivate. Nevertheless, some academic contexts may be better suited to allow early-career scholars to experience such an entrepreneurial mindset in practice. To truly benefit from an interdisciplinary profile, emphasis should be placed on openness and intellectual breadth. Scholars should be given opportunities to familiarize themselves with diverse paradigms, methods, and disciplinary cultures, experiment with new approaches, abandon unproductive directions, and critically question underlying assumptions. For early-career scholars in particular, such opportunities are essential for consolidating entrepreneurial mindsets that may ultimately foster interdisciplinary profiles.

Although early-career scholars must navigate these trade-offs themselves, supervisors and coordinators of PhD and postdoctoral career programs also play a crucial role [44]. They should provide at least some degree of flexibility, opportunities for learning by doing, and room for trial-and-error experiences [45]. However, current trends in academia may not strongly support



such approaches, particularly as PhD programs, postdoctoral qualifications, and tenure-track requirements become increasingly formalized, predefined, and burdened with numerous micro-requirements regarding publication numbers and publication types—often within specific mono-disciplinary journals—as well as conference participation, various administrative responsibilities, and predefined teaching approaches.

Some concluding recommendations

1. For **early-career scholars**, we recommend maintaining awareness of the trade-offs associated with interdisciplinary research, teaching, and profile development. In addition to personal preferences, it is essential to consider risks related to career opportunities, transaction costs, and the potential benefits of breakthrough knowledge creation.
2. For **university management**, we recommend a genuine commitment to the principles of interdisciplinarity. Merely using the term without substantive meaning or implementation is insufficient. Supporting interdisciplinarity requires adjusting evaluation criteria for research projects, teaching activities, and career advancement. Moreover, it necessitates fostering an academic culture in which early-career scholars are encouraged to explore and engage in self-learning and development.
3. For **research funders**, we advise against promoting—or standardly requiring—interdisciplinarity as an abstract objective in itself. Instead, interdisciplinarity should be understood as a means toward meaningful knowledge development. Adopting such a realistic perspective on interdisciplinarity allows greater consideration of the costs associated with *interdisciplinarity as a means*. Interdisciplinarity should therefore be pursued only when the additional transaction costs are outweighed by the greater likelihood of true knowledge advancement.
4. For our **authors**, we encourage the submission of practice-oriented articles to *Public Management and Governance Review* that can inspire decision-makers to make more informed and impactful decisions. Although an interdisciplinary perspective may be beneficial, it is not necessarily essential (or: not all problems require an interdisciplinary approach). Nevertheless, authors are encouraged to explain their underlying assumptions, as not all academic conventions readily translate into practical real-world contexts.

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