Bridging the Gap:
Communicating to Increase the Visibility and Impact of Your Academic Work

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ABSTRACT

This paper focuses on how best to communicate your scholarly work to wider audiences. Topics covered include inter-, multi-, and trans-disciplinarity in academia: what are the differences between them, what are the benefits to your academic work, and how to learn from and leverage cross-disciplinary partnerships to boost your messaging. Using the communication theories of Systems Theory and Symbolic Interactionism as a framework, I discuss how best to approach communicating about your research to other disciplines and non-academic audiences. Examples include writing opinion/editorial pieces for mainstream media, networking with science communicators, and connecting with your university's strategic communications officers.

Keywords: Interdisciplinary, multidisciplinary, trans-disciplinary, communication theory, science communication, non-academic audience

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1. INTRODUCTION

Meta-communication, or communication about communication, allows scholars to convey messages through sound, imagery, and the written word to give context to their messages [1, 2]. As researchers, we want to avoid having our scholarship published solely in academic journals or books, which are deemed largely inaccessible to publics outside of our narrow academic discipline.

When we present at conferences, we have the benefit of non-verbal communication (i.e., audience members nodding, changing facial expressions, changing posture, and even silence) to help enhance mutual understanding of the subject [3]. We can ask for a show of hands, use metacommentary such as "I don't know if I'm explaining this well, but…" or summarize our main points to ensure that the content of our messaging is reinforced. Social Constructivism and Speech Act Theory suggest that we use language to establish a shared understanding, and not just to convey literal messages [4]. When we rely solely on the written word – often only communicated to our small inner circle – however, we miss out on the opportunity to manage expectations and develop shared meanings. This paper, therefore, was designed to aid in meta-communication about your academic work, allowing you to reach broader audiences and give greater context to your scholarship.

2. TRANSDISCIPLINARITY IN ACADEMIA

When academics write a master's thesis or doctoral dissertation, most focus on a very specialized topic area. George Mason University's Institute for Humane Studies (IHS) reminds us, however, not to let that hyper-specialization put you in the habit of failing to look at the bigger picture [5]. Whereas you become a specialist in a particular field of study, part of truly understanding your discipline involves asking questions about how it relates to other disciplines. Each field has its own lens through which it interprets the world, and exposing your work to other audiences can help provide perspectives not emphasized in your field. Those audiences can, in turn, benefit from learning about your insights. As the IHS noted, a "philosopher who can think like an economist is more likely to produce work that economists want to read… and an economist who can think like a philosopher is more likely to appeal to philosophers" (n.p.). Sharing your work more widely can lead to better explanatory and predictive scholarship, helping to test the limits of your data or methodology. Perhaps you will be inspired to confront questions that might not have otherwise occurred to you.

Interdisciplinary vs. multidisciplinary vs. transdisciplinary
When a scholar seeks to work in tandem with other disciplines to amplify their research, they can choose to build that team in various ways. The literature can conflate the terms inter-, multi-, and trans-disciplinarity; however, it is important to distinguish them from one other so you can locate yourself on that continuum and determine which approach is most effective for your specific goals.

Choi and Pak [6] noted that interdisciplinarity "analyzes, synthesizes, and harmonizes links between disciplines into a coordinated and coherent whole" (p. 351) whereas multidisciplinarity draws on knowledge from different disciplines but stays within its own boundaries. The interdisciplinary team works jointly to synthesize two disciplines and could graphically be represented by two partially overlapping circles; conversely, the members of a multidisciplinary team work in parallel from their own disciplinary bases to address a common problem and would be graphically represented by two side-by-side but totally separate circles. Transdisciplinarity, however, transcends disciplinary boundaries altogether and can even include non-academic stakeholders. Everyone on the transdisciplinary team works together using a shared conceptual framework. This team is collaborative, integrative, and holistic and could be represented graphically as a third circle covering two partially overlapping circles [6].

Jensenius [7] frames the journey from intradisciplinary (i.e., working with team members from your field) to transdisciplinary

as a spectrum. Borrowing from Stember's 1990 work [8], he summarized each step on the continuum:

1) Intradisciplinary: working within a single discipline
2) Multidisciplinary: people from different disciplines working together, each drawing on their disciplinary knowledge
3) Crossdisciplinary: viewing one discipline from the perspective of another
4) Interdisciplinary: integrating knowledge and methods from different disciplines, using a real synthesis of approaches
5) Transdisciplinary: creating a unity of intellectual frameworks beyond the disciplinary perspectives

Viewed in this way, a scholar can move from one end of the continuum to the other: first working within the frame of a single discipline (intradisciplinary); to then looking at a problem by adding multiple perspectives while maintaining their distinctiveness (multidisciplinary); then collaborating with the goal of transferring knowledge from one discipline to another (crossdisciplinary); then working to integrate knowledge from contrasting disciplines to create new applications, analyses, or even entirely new disciplines (interdisciplinary); to finally combining interdisciplinarity with a more participatory approach (transdisciplinary) [9].

As Ramchandani noted, whereas interdisciplinary collaborations "create new knowledge synthesized from existing disciplines, a transdisciplinary team relates all disciplines into a coherent whole" (n.p.). For example, my academic college participates in 365 Days of Learning and Service and brings together 11 academic departments and schools under one theme each year (e.g., housing insecurity, sustainability, etc.,). This theme brings together academics and non-academics alike in pursuit of a common goal; the whole becomes greater than the sum of its parts.

Benefits of working on a transdisciplinary team

Putting together a transdisciplinary team to problem-solve and amplify your area of research can be a big undertaking; in most academic departments, there is no real incentive to do so. But the benefits of working with others outside of your "silo" cannot be understated. If you are working on a solution to a problem that affects society at large, approaching that research holistically, considering the interdependence between disciplines, seems like a no-brainer. Scholars can both specialize *and* have the holistic picture [9]. And during the process, you connect with others interested in solving the same types of complex, interconnected challenges you are tackling.

Spina highlighted three benefits from such a collaboration: community engagement, innovation, and intercultural engagement [10]. He noted that, rather than creating new academic units, the creation of "loose-knit, cross-university 'transdisciplinary faculties'" helps maintain the integrity of departments while providing leadership in those three areas. These faculties serve to break down silos and engage in collective efforts to find unique solutions. This could result in new methodologies, new curriculum development, new technologies, and new research agendas.

The Institute for Applied Creativity for Transformation at the University of Dayton published a tip sheet "What Does Interdisciplinary Mean?" and noted that:

- Transdisciplinary collaboration occurs when people bring different disciplinary expertise to the table and strive to develop innovative, holistic, and shared conceptual frameworks, thereby de-emphasizing the contributing disciplines
- In transdisciplinary work, representatives of the different disciplines are encouraged to transcend their separate conceptual, theoretical, and methodological orientations in order to develop a shared approach to research, building on a common conceptual framework that can be used to understand a problem holistically and, thereby, can *develop novel approaches* to address it
- A transdisciplinary approach is problem-focused, holistic, and requires scholars from at least two disciplines to collaboratively develop innovative conceptual models that integrate the theories and methods of multiple disciplines for the purpose of *developing new solutions* to specific, common, real-world problems
- Transdisciplinary work surpasses interdisciplinary work in that it seeks to develop holistic perspectives by integrating different disciplinary perspectives, thereby *creating new frameworks* to understand problems *for the purposes of developing solutions* (emphasis added)

Beyond merely expanding your academic network, transdisciplinarity invites innovation and encourages creative, solutions-oriented, impactful research.

Utrecht University developed a Transdisciplinary Field Guide [11], noting that "Ecological crises, social injustice, political polarization and other pressing challenges are all complex problems that don't fit into disciplinary boxes. They are better understood by engaging directly with societal stakeholders. Transdisciplinary research enables integration of scientific and non-scientific knowledge to address these challenges" (n.p.). This free resource is available online to anyone who wants to "do science with society" and can help you determine if the transdisciplinary approach is right for you (see Figure 1).

> **Are you interested in transdisciplinary approaches? Take this quick self-assessment.**
>
> - Are you addressing a societal issue(s) with your research?
> - Are you interested in having an impact on how society understands or takes action on your societal issue(s)?
> - Do external stakeholders hold useful knowledge, capacities and opportunities for action on the issue you are interested in?
> - Are you curious and open to explore an issue together with others?
> - What type of research questions are you addressing? Does the knowledge you seek aim to guide understanding of an issue or to provide direction or recommendations for action?
> - Are you interested in developing outputs beyond academic articles that support understanding among societal actors and action?
>
> **If you answered yes to most of these questions, then a transdisciplinary approach is for you!** To do transdisciplinary research you have to be driven by a desire to address societal problems through research and to engage with stakeholders in order to address these problems.
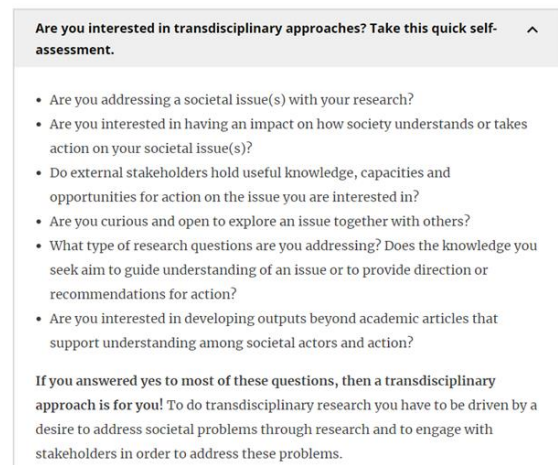
Figure 1: Self-assessment © Utrecht University

As long as you have an open, curious, and adaptive approach to research; the ability to reflect on your personal assumptions, biases, and triggers (and the capacity to navigate them); and see the value in diverse forms of knowledge across disciplines and

stakeholders, transdisciplinary research is right for you. If you are still unsure, Torrens et al. [11] do a nice job of summarizing the academic benefits of working in a transdisciplinary team (see Figure 2).

Academic benefits ⌃

- **Engagement**- Researchers connect and contribute to real-world issues that society is grappling with
- **Societal impact** - The outcomes are more applicable and salient for stakeholders, contributing directly to challenges they face.
- **New partnerships**- Researchers and external partners create valuable partnerships that open new avenues for research and practice, funding and resource-sharing.
- **Fresh ideas** - External partners bring perspectives, knowledge and capacity to act that enhance research.
- **Reality check** - Testing and experimenting theories in practice lead to unique insights and surprises.
- **New capacities** - Researchers learn new skills and sensibilities such as effective stakeholder engagement.
- **New career possibilities** - Researchers can discover new avenues for their development

Figure 2: Academic Benefits © Utrecht University

3. COMMUNICATION THEORY AND BEST PRACTICES TO FRAME RESEARCH FOR NONSPECIALIST AUDIENCES

In addition to potentially forming new research teams to amplify your scholarship, various communication theories weigh in to assist with non-academic "signal boosting" of your work. Historically, academic scholarship has been almost completely inaccessible to the general public. However, getting your academic work in front of the public as part of your dissemination strategy has many advantages: attracting the attention of the media, encouraging local community engagement, advocating for policy change, encouraging younger audiences to consider a career in science/academia, raising new research questions, finding new collaborators, and protecting against the spread of misinformation in the public sphere [12].

So, what is the best way to communicate your scholarship to "lay" audiences? Be self-aware and audience-aware. Dynamic Human-Centered Communication Systems Theory (i.e., *who said what, to whom, where, through what medium?*) notes that experts require fewer resources to process content than a novice [13]. Put another way, a nonspecialist will need to devote more brain power to understanding your message. The challenge to scholars, then, is to communicate with clarity and focus. Know your audience; try to take the viewpoint of the potential reader or audience member. The theory of Symbolic Interactionism reminds us that social participants are constantly negotiating a shared definition of social situations – taking one another's viewpoints into account – and interpreting each other's behaviors prior to implementing an action [14]. Thus, we need to be audience-aware and use "accessible communication" strategies: "writing or speech that is specifically designed for a nonspecialist or general audience. This may include people with little to no professional or academic knowledge of the specific field, and/or of science in general" [12, p. 2].

Improving Readability
Most academics have been trained to write in a very specific style for academic publications, but there are many ways to adjust your writing to make it more accessible. First, write informally and

conscientiously. Be simple and direct; the average reading age of the general public is 8-10 years [15]. If you want to compare your writing to other texts written for that age group, you can consult a "readability measure" such as those outlined in Kincaid, et al. [16]. Also note that if your writing offends or patronizes your audience, you are not achieving your goal; make things clear, but there is no need to repeat yourself unnecessarily.

Brevity is best. Aim for a sentence length of ten words or less to succinctly clarify your message [12]; short sentences are easier for nonspecialists to digest because less information has to be retained in the brain [13]. Also be mindful of how you structure your writing. The traditional structure of academic scholarship is not a good model for a general audience. Instead, improve readability with some format adjustments, for example:
- Use parentheses to clarify or define anything too complicated; this allows you to use academic language while making the message accessible
- Consider using larger font sizes
- In presentations, ensure adequate color contrast (e.g., black text on a white background)
- Incorporate relevant images where possible; pictures or images can reduce the ambiguity of message meaning [17] and enhance processing fluency [18]
- Break up text with subheadings
- Use bullets in place of long, wordy lists
- Keep text aligned to the left [12]

When you can, avoid jargon and complex words. The general rule is that words containing four or more syllables are needlessly complex [12]. Replace or explain technical terms [19] and use simple variants of academic language; for example, no meaning is lost by using "goal" instead of "objective" [12]. Acronyms can be used where appropriate as long as they are noted in brackets the first time they are used (i.e., The National Science Foundation [NSF]) [19]. As you walk the reader through your methodology, use active voice ("the cat sat on the mat") rather than passive voice ("the mat was sat on by the cat") [12]. Results should be presented in a logical sequence [20]. Choose strong, direct, engaging verbs to make your sentences more straightforward. For example, instead of "We provided an analysis of the data that led to the conclusion that the treatment was effective," try "We analyzed the data and concluded the treatment was effective" [19].

Communicating Takeaways, Relevance, and Impact
Before you even begin writing for the nonspecialist audience, craft your take-home messages. Think about the main ideas you want them to take away from your work. Introduce these ideas early and then summarize them at the end [19]. It might feel awkward, but *start* with your conclusions. In academic work, the take-home message is typically buried, introduced only after the subject and methods have been described. For the lay audience, however, it is important to keep them engaged by stating the purpose of your research early [21], begin with the take-home message, and then follow up with key background information and context [12]. Information is more likely to be retained when you can repeat key messages.

Highlighting the relevance of your work is another important aspect of engagement. Discuss the novelty or relevancy of your research. Are you improving on existing technology or developing something new [21]? What do your results tell us that we did not know before [19]? Make your work feel timely by associating your key messages with a current issue. For example,

perhaps your research touches on the COVID-19 pandemic. And be clear about the impact of your work. As Hua notes, "scholarly research is valuable in many facets of everyday life – whether it involves creating new vaccines to reduce illness severity or public policy research that leads to enhancements in regulatory practices, it is critical to convey how your work will improve society" [21, np].

Engaging the Audience
Being self- and audience-aware by improving readability and clearly communicating takeaways will engage your audience. Remember that most people reading your work will be doing so for the first time; if you do not take the time to break it down into digestible chunks, they can easily become lost [21]. It might be helpful to present your work to different audiences to see if they understand your logic and flow; get feedback from a non-expert or imagine reading your text out loud to someone who is directly affected by your topic. Focus your revisions on areas they find confusing or do not understand [19].

Orritt and Powell note that it is good practice to be mindful of how your text will affect readers, and to consider ways in which you can make your overall tone more positive. In medicine, for example, talk about *survival* rates rather than *mortality* rates, or explain what can be done in the future to improve the situation rather than dwell on the negative [12]. They explain, "the conclusion of an accessible text can be made more memorable or poignant by relating the topic back to the reader. This could take the form of a call to action, a signpost on to other helpful information or resources, or information about how the key message could change their circumstances [12, p. 5]. As you engage your audience, you might also aim to encourage readers to take a particular point of view, raise awareness of an issue, or encourage them to change their behavior in some way. So, by practicing writing clearly, conscientiously, and in an engaging manner for nonspecialists, scholars can open up the world of science and empower people to become more involved and interested in traditionally-academic topics.

4. GETTING YOUR WORK "OUT THERE"

As noted above, historically, science has been almost completely inaccessible to the general public. Inequalities in education, Latinized language, invitation-only academic societies, and journals behind paywalls have fostered this divide. Most basic science is funded by the public, but the public communication of this science is stuck in academia. A first step towards getting your work in front of a wider audience is to register with Open Researcher and Contributor ID (ORCID), a non-profit organization supported by a global community of members like research institutions and publishers. Register for free on their website to get a persistent digital identifier (or ORCID iD) that you own and control, and then use that iD in systems/platforms including grant applications and manuscript submissions. This iD links all of your research together, distinguishes you from other researchers, and allows you to get recognition for your work by connecting it with your professional affiliations and publications. You can set your visibility to "public" to increase your discoverability online.

Next, prioritize publishing in open-access journals and depositing your papers at places like PubMed Central or Creative Commons. These sites are essential to the open flow of information and will communicate your research to a wide audience who can find your work after a quick Google search [20]. Open-access publications not only make science more accessible, but they also empower the public to understand more complex information. However, the free flow of information does have one major drawback: misinterpretation. Proactively and clearly communicating your work to the public is key to safeguarding against misinformation and helps scholars control the narrative of their findings in the public sphere [12].

Though not an exhaustive list, below are a number of ways to get your scholarship "out there" in front of the public. First, you might consider writing an opinion/editorial (op-ed) piece for mainstream media. If popular-style writing is not your forte, reach out to the writing center at your university or consult a writing coach for guidance. One option in the USA is to connect with The OpEd Project, a non-profit organization that works with universities, think tanks, foundations, nonprofits, corporations, and community organizations to train under-represented experts to take thought leadership positions in their fields. They connect participants with an international network of high-level media mentors and promote their ideas directly to media gatekeepers. Their focus is: What do you know, why does it matter, and how can you use it to change the world? [22] Previous participants in the OpEd Project published stories that went viral and ultimately ended up in media outlets such as the *New York Times* and the *Washington Post*.

Perhaps your scholarship lends itself to a book-length manuscript. Consider pitching your book idea to an academic publisher. There are resources available to assist you with a pitch. For example, Portwood-Stacer's [23] guide *The Book Proposal Book: A Guide for Scholarly Authors* provides "best practices for packaging your research to meet the needs of scholarly book publishers and readers, so that you have the greatest chance of reaching them with your message" (p. 2). Landing a book contract can be unfamiliar territory for academic researchers, but by learning about the process, you will position yourself to be seriously considered by the kinds of publishing professionals with whom you want to collaborate.

Step one is to connect with an acquiring editor – maybe at a conference, on social media, or an email/phone call. You will want to be prepared with a concise summary of the book, the names of any series at the press that you think would be a good home for your project, and an introduction of yourself as a researcher that helps the editor situate you as a scholar. They will decide if your book is a good fit for their press; if it is, the editor will want to talk through the concept with you and encourage you to submit a full proposal. A text like *The Book Proposal Book* can walk you through drafting your proposal package, a discussion of similar books, a description of your target audience, crafting an effective overview of your project and its thesis, and compelling chapter summaries [23]. One piece of advice: start with a proposal and then shop it around. Avoid writing the book first, with hopes of finding a publisher after the fact.

Another way to grow your audience: connect with science communicators. Examples of science communicators with large social media followings include Neil deGrasse Tyson, Richard Dawkins, David Attenborough, and Marcus du Sautoy. They host social media channels, blogs, podcasts, and TED talks. Other leaders in science communication include the American Association for the Advancement of Science (AAAS), the Public Library of Science (PLOS), and NASA. Follow them online! Not only will they provide a model for clear, concise communication

to the public, but they will also provide a network of other science-minded users hungry for content. Effective science communicators place their research in a larger narrative context: they tell a compelling, immersive story using visuals like videos, high-resolution photographs, illustrations, infographics, and visual effects. Some illustrative examples of excellent science communication storytelling include "Out of Africa" from the University of Queensland, "Mission to the Sun" from the Imperial College of London, "Root & Branch" from New Zealand media company Stuff, "They Emerged Transformed" from the University of Utah, "A Wilderness of Water" from the United Nations Development Programme, and "Indonesia's Secret Forests" from *Forests News* [links to all six examples can be found at reference 24 below].

You can search online for your geographical area (e.g., "Five Science Communicators to Follow in the Arab World," or "Australian Science Communicators") or your area of interest. For example, in my own area of research I focus on children and media, so I follow MIT-engineer turned Emmy-nominated science TV host of *Emily's Wonder Lab* Emily Calandrelli on social media to better understand how she teaches science to children. Books like *The Hands-On Guide for Science Communicators: A Step-By-Step Approach to Public Outreach* can also serve as a resource to help you "do" science communication by providing shortcuts, checklists, and hands-on exercises [25]. Professional development programs like those at the Alan Alda Center for Communicating Science at Stony Brook University in the USA will also help you cultivate effective and compelling science communication strategies.

You can also leverage social media and blogs to communicate about your research. Create social media accounts and follow other academics in your field. Connect with them, tag them in posts, and share your scholarship in a space that is completely accessible to anyone with an internet connection. Build your online authority and credibility in your area of expertise. Find ways to optimize your content by learning to write about your work in a non-traditional way. Blogging and posting to social media can help you refine this skill. There are plenty of resources online to help you get started. For example, the "The SciComm Toolkit with Soph Talks Science" podcast is a wealth of information about determining your audience, how to get them to care about your research, easy ways to optimize your science communication content, tips for sharing science on Instagram, and common mistakes to avoid when doing science communication. Maybe pitch a TED talk where you condense your scholarship into a compelling 18-minute talk that communicates your best ideas; a carefully prepared TED or TEDx presentation can have an astonishing impact, especially when it goes viral online.

Lastly, do not underestimate your own university or company's office of strategic communication. Advocate for your scholarship by connecting with the people at your institution who craft messaging to external audiences. Prepare a succinct "elevator pitch" (an overview of your project so concise it can be communicated in the time it takes to ride an elevator/lift) about your latest project; be sure your name is on the media list (i.e., when the news media contacts your organization for a quote about your topic, you are the point of contact); and make it known that you are the subject matter expert. Your stratcomm team will be even more likely to feature your work on their website, social media, or magazine if there is a compelling visual element to accompany your story.

5. SUMMARY

Communicating to the broader public about academic research can feel daunting, but there are several ways to bridge that gap to increase the visibility and impact of your scholarship. Consider joining or forming a transdisciplinary research team; connect with other scholars and stakeholders to problem-solve and amplify your area of expertise. Search for ways to reach new audiences with your research, such as publishing in open-access journals. Empathize with your nonspecialist audience by limiting jargon, improving readability, and clearly communicating the relevance and impact of your work. Consider writing op-eds or proposing a new book idea. Search for new outlets online, such as blogs and social media, and connect with science communicators who specialize in accessible messaging. There are many ways to develop your writing for "lay" audiences to advance the flow of scientific information.

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