

Guide to Inclusion Awareness in the Organization of Knowledge

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This guide proposes an inclusive approach to the organization or categorization of existing theories and knowledge, as well as the development of new knowledge and theory. This guide is intended to help researchers and scholars maintain awareness of their decisions to include and/or exclude certain scholarship, and to report and reduce the limitations of their theory or categorization of existing theories. These efforts will make audiences aware of the decisions made in the development process, and promote transparency related to decisions that have impacted which perspectives, voices, bodies of knowledge, and ideas have been included and excluded.

Origins of this Work

Breaking Down Silos was a working meeting, sponsored by the National Science Foundation (DUE: 1830897/1830860), that brought together 25 scholars whose work relates to change in undergraduate STEM education. These scholars, from a variety of disciplines, met to discuss various theories of change and had the original intention of organizing and categorizing existing theories to support interdisciplinary work and improve communication of scholarship across projects and traditions. During this meeting, participants discussed the benefits and limitations of typologies (i.e., categorizations of existing theories), including what such a framework might offer to the work of researchers and practitioners and what it might obscure or prevent. Part of this conversation illuminated a variety of areas in which caution should be exercised at the working meeting and by those doing similar work. Some of the concerns and cautionary notes which arose at the meeting included:

- As scholarly work continues to expand and change over time, a categorization scheme often remains stagnant
- Categorization schemes privilege some sources of knowledge (e.g., people, ideas, perspectives) over others, which hides and/or marginalizes certain works and/or people
- A categorization scheme that is most relevant and useful for one audience may not be transferable to other contexts
- The presentation of a categorization scheme can suggest a false sense of coverage, mastery, and completeness

Building on these concerns, we developed a guide for researchers and scholars to use as they embark upon processes intended to provide an organizational scheme to existing scholarly work, and more generally to the development of new theory.

About the Authors

The four authors of this document met at the *Breaking Down Silos* working meeting in February 2019, contributed in equal measure to this document, and are listed alphabetically. Dr. Apkarian and Dr. Quardokus Fisher have previously worked together on postsecondary STEM education change using social network analysis. Dr. Bonds and Dr. Burt come from a higher education and student affairs background, and each research issues of diversity and inclusion in STEM education. At the time this guide was developed, Dr. Apkarian was a postdoctoral research associate, Dr. Burt and Dr. Quardokus Fisher were Assistant Professors, and Dr. Bonds was an independent researcher. Dr. Apkarian identifies as an Armenian-American woman who presents primarily as white, and she researches mathematics education and change processes in postsecondary STEM education. Dr. Bonds identifies as an African-American woman, researching organizational change and efficiency in higher education. Her previous work has focused heavily on emergency management in higher education, but she currently contributes this knowledge as a researcher on a NSF-funded RED Project intended to increase inclusion in a biomedical engineering department. Dr. Burt identifies as a Black man, and researches the achievement, learning, and experiences of historically underrepresented students of color in STEM fields. Dr. Quardokus Fisher identifies as a white woman and has a background in research on change in higher education and atmospheric science education. Her contributions to this work were influenced by previous work on an NSF-funded project for developing champions of diversity in the geosciences¹ and the diversity, inclusion, and social justice professional development that accompanied this work.

Why is this Guide Needed?

Theory development, and any subsequent categorization of such theories, is a process embedded with decisions that ultimately determine the quality and utility of the resultant theory or categorization. The creation of a categorization scheme for existing theories is a form of gatekeeping knowledge. The process we offer in this guide is thus intended to move towards inclusion in the resulting scholarly work; it questions which people and what knowledge are being highlighted through the development of a theory or categorization. The inclusion of some but not all perspectives is often hidden, which perpetuates an incomplete view of the scholarly ecosystem. By making explicit the decision processes and boundaries, the resulting work can acknowledge and reduce these constraints.

¹ Quardokus Fisher, K., Dixon, P. G., Kaufman, E., Calagna, O., Simmons, D. R., Brinkworth, C., and Myles, L. (2018). *Preparing Geoscientists to Lead Diversity, Equity, and Inclusion Cultural Changes in the Geological Sciences: Hearts of GOLD*. The Geological Society of America (GSA).

Using this Guide

We designed this guide with the intention of supporting inclusivity and diversity when categorizing existing scholarly work and theories, as inspired by the *Breaking Down Silos* working meeting. Throughout its creation, we realized that the guidelines presented here are relevant also to the creation of a literature review, typology, categorization of existing work, and/or development of new theory. We refer to these aspects of scholarship collectively throughout the rest of this document.

Throughout the development of any scholarly work, researchers are forced to make decisions that set the boundaries and scope of their work, and the guidelines in this document are intended to help make this decision-making process explicit. Presented in the form of questions which should be asked and addressed at various stages of scholarly work, this guide is organized by the stages of a project. Answers to the questions should be made explicit to readers or consumers of the resulting product. While attention to broadening perspectives and an awareness of the boundary-building that occurs through delimiting decisions should be a part of every stage of scholarship, this guide asks questions that are relevant at the beginning, middle, and end of the scholarly process. As this process is iterative, scholars may benefit from revisiting questions multiple times.

If at the conclusion of your work you have answered many of these questions with “no” or “I don’t know,” your final product may be too narrow and contain hidden decisions that undermine the inclusiveness, and therefore utility, of the work.

Early Stages

Regardless of the project, initial planning and idea conception set the direction of work. The following questions are aimed at explicating your positionality as the person (or people) undertaking a project and to the audience which will consume this work. Critically, these questions guide you to consider your position in relation to the broader field(s) and your audience. Your product is likely to be more inclusive and relevant if your project team (and/or advisory panel) is more diverse. Regardless of the compositional diversity of your team, these questions can help you to begin your work from a place of self-awareness and recognition of which perspectives are present and absent from your working group and process.

- Who are you? Who are you *not*?
 - Consider your demographics and personal identities
 - Consider your professional roles, ranks, disciplines, and identities
- How will your positionalities inform and limit your product?
- How has your previous work in this scholarly area influenced your approach and process?
- Who is your audience?
 - How might you include this audience in your development process?

Middle Stage(s) and Throughout

After identifying your positionality, goals and audience, the work of collecting literature and engaging with it begins in earnest. Already an iterative and expansive process, we offer reflection questions to support broadening the base of your scholarship or review of existing scholarship. These questions are intended to clarify the decision-making process and highlight what your work includes and excludes. We acknowledge that not everything can be included but suggest care and caution in making delimiting decisions – and understanding the impact of those decisions. Many of these questions refer to the decision of “what counts” as valid, relevant knowledge and/or literature– and understanding that these decisions inherently, and sometimes unintentionally, impact whether certain knowledge registers as worthy of consideration to others. These questions should be revisited cyclically as the work evolves, to continually monitor representation and inclusivity.

- What perspectives are represented in the works that you have chosen to categorize? Have you considered what is missing? Are any over- or under-represented, in terms of...
 - ... disciplinary traditions?
 - ... demographics of authors/researchers?
 - ... contexts in which that knowledge was developed²?
- In what ways did you consider the supporting evidence or robustness of the scholarship that guided or formed your work?
 - What bias might these decisions bring into your scholarship³?
- Have you included representatives of communities not directly participating in this work in some way? For example, by getting feedback on your process or early versions of your product from people outside your project team...
 - ... with different professional or disciplinary backgrounds?
 - ... with different personal or demographic backgrounds?
 - ... who are representatives of your target audience?
 - How are you incorporating that feedback into your product?
- What are the examples or prototypes that you are using to represent the categories or themes that you have developed?
 - How diverse are those examples in terms of their origin, authorship, and disciplinary tradition or heritage?
 - What is missing, and why? Can that be addressed?

² For example, was the majority of this knowledge base developed in business-related settings? K-12 institutions? Predominantly white institutions of higher education? For consultation and improvement purposes or exploratory ones? These matter for both inclusion and transferability.

³ For example, the decision to consider work exclusively from peer-reviewed journals inherits the potential bias of those journals and their editors.

Ending Stage(s)

As a scholarly project draws to a close, authorial decisions start to focus on the information you will be communicate to others through the final product. Once a product is released, the impact of previous decision-making ripples beyond you and your project team into the outside world. The questions at this step are aimed at supporting intentionality in decisions of previous work your product will highlight. One aspect we feature is that of choosing examples. Selected works which are used as illustrative examples or exemplary works are thrust into the spotlight, with other knowledge or scholarship in the background. The authors, works, ideas, and perspectives which are most clearly described or foregrounded are likely to receive a promotional boost – we urge awareness and intentionality in that kind of decision-making.

- How have you incorporated feedback into your final product from people outside your project team...
 - ... with different professional or disciplinary backgrounds?
 - ... with different personal or demographic backgrounds?
 - ... who are representatives of your target audience?
- What are the examples or prototypes that you are using to illustrate your ideas?
 - How diverse are those examples in terms of their origin, authorship, and disciplinary tradition or heritage?
 - What is missing, and why?
- In what ways could new knowledge be incorporated into your existing framework or categorization scheme?
 - Is there a mechanism for dynamically updating this categorization?
 - Is there a plan or the potential to expand and edit this organization as new ideas emerge?

Polishing and Dissemination Stage

The “final” stages of development involve polishing and disseminating your work. At this stage, it is valuable to make explicit the decisions that have been made along the way, including the questions this guide asked you to answer at earlier stages. Depending on the format of the final product and avenues for dissemination, consider preparing supplemental information which tracks the decision process and outlines specifics of the reviewed work (e.g., journals, years, author demographics).

- Are the following explicitly and transparently clear in your shareable product:
 - Who you are, and how that might bias your position in relation to the work?
 - What criteria were used to include and exclude particular works and knowledge?
 - The boundaries of the works/knowledge reviewed and not reviewed?
 - The feedback and member-checking processes used to support validity and inclusion?
- Is there discussion (or at least mention) of:
 - The values inherent in your decision-making?
 - Where the spotlight is (and why)?
 - The limitation that this was done at a particular time and place, while knowledge continues to grow and change?

Coda

Organizing, categorizing, typing, reviewing, and synthesizing knowledge is a daunting task. An emphasis on inclusivity of perspectives, ideas, and voices serves to make that work stronger and more complete as well as to redress longstanding imbalances of power in academia, scholarship, and knowledge creation. This guide should draw attention to the ways in which this might occur in your work, and help you to identify inaugural steps toward reducing the use of minimizing or marginalizing practices. Not all work can be reviewed at once, and knowledge grows and changes quickly. By taking steps toward inclusivity, and candidly naming those choices, we hope that: (a) your work will be stronger; (b) those who have different knowledge will be able to clearly see what might be missing and support the inclusion of that work and; (c) your work will help normalize the process of inclusivity in knowledge organization.

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