

## Monitor levels of interdisciplinary research

### Report

As part of a broader initiative to measure and understand the University of Manchester's interdisciplinary research activities, we have been exploring the potential of bibliometric indicators to monitor levels of interdisciplinary research over time. In news which we are sure will not surprise us, this is proving to be a very difficult task! Over the past year, various approaches have been experimented with and assessed, each offering distinct perspectives and encountering specific limitations.

**1. Citation based:** Using a set of publications from one of our Research Institutes, we focused on the diversity of subject categories cited within these articles as a proxy for interdisciplinarity. This employed three specific bibliometric indicators (Variety: Count of different subject categories cited / Balance: Evenness in the distribution of cited categories, quantified using an adjusted Gini coefficient / Disparity: Cognitive distance between cited subject categories, determined by their relative positions on a cognitive map of academic disciplines).

**2. Analysis based on organisational affiliations:** This approach assessed the interdisciplinary nature of research outputs by counting the distinct organisational units in the author lists of papers from the past year. The number of different units was used as a potential proxy for interdisciplinary activity.

**3. Distinct Subject Area Count and Expert Review Comparison:** The Library analyzed papers associated with research publications from 2018 to 2023 for two of our Research Institutes. The process involved systematically collecting publication data, mapping each paper's All Science Journal Classification (ASJC) codes to broader subject areas, thus calculating a distinct subject area count per paper. Domain experts then reviewed and scored these same papers based on their perceived interdisciplinarity. The final stage involved a comparative analysis of the distinct subject areas count and expert scores to evaluate the method's effectiveness in accurately identifying interdisciplinary research.

### **All of the approaches above encountered significant limitations:**

1. Despite the robust analysis, no clear correlation was found consistently linking high scores on these indicators with interdisciplinary research. The complex methodology also created challenges regarding the scalability of this approach.

2. The working group found that the diversity of organisational affiliations did not reliably indicate interdisciplinary research. It was noted that disciplinary research is often conducted across various units, not confined to a single department or school. As a result, collaboration between authors from different units did not necessarily equate to interdisciplinary research, making this proxy too simplistic and unreliable for accurately identifying interdisciplinary work.

3. Expert reviews did not support The assumption that a higher Distinct Subject Areas Count correlates with increased interdisciplinarity, indicating variability in how interdisciplinarity is perceived and assessed. Moreover, the use of broad subject areas for categorisation may not capture the nuanced, specific intersections in interdisciplinary work, potentially leading to over- or underestimation.

As a result of the above, we are very interested in the development work currently undertaken by [THE / Schmidt](#) relating to the ISF.

While we have noted some of the [concerns](#) around the methodologies employed, we are very interested in understanding more about how the bibliometric indicators (based on Open Alex data) were generated for these rankings. Not least, how papers were identified as interdisciplinary in the first place!

Does anybody have any insight at all on the methodology that has been used by THE/ Schmidt in their development work, which they would be willing to share? We are hoping it might provide us with some more avenues for experimentation. Failing that, if anybody has any success stories to share - related to mapping interdisciplinary research across their own institution.

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