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Creating Collaborative Infrastructures in Interdisciplinary Higher Education Study Programs – Challenges and Potentials

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Research Domains

Learning, teaching and assessment (LTA)

Abstract

This paper examines the creation of collaborative infrastructures in interdisciplinary programs through a case study of the Interdisciplinary Consortium for Applied Research in Ecology and Evolution (ICARE) program at the University of Maryland, Baltimore County (UMBC).

Collaborative infrastructures, including negotiated systems, processes and cultural norms, are essential for facilitating effective interactions among diverse groups. While traditional monodisciplinary programs have well-established, tacit infrastructures, interdisciplinary programs face unique challenges due to varying backgrounds and expectations of students and faculty.

The study employs a mixed methods approach to explore how ICARE participants navigate the program's collaborative infrastructure. Findings reveal significant challenges, such as misalignment with existing courses and lack of institutional support, leading to tensions and difficulties for students and faculty. Despite these issues, the study highlights the rewards of establishing robust collaborative infrastructures. The insights gained emphasize the need for proactive infrastructure planning to support interdisciplinary teaching and learning effectively.

Full paper

Collaborative infrastructures encompass the systems, processes, and cultural norms that enable seamless collaboration. In higher education, collaborative infrastructures can be understood as frameworks that facilitate effective interaction between students, teachers and faculty.

In most educational institutions, didactical contracts (1) between teachers and students are tacitly negotiated and sustained within the disciplinary traditions, and ways of teaching, learning and collaborating that make up the collaborative infrastructures have developed over decades or even centuries and passed down from one generation to another. Collaborative infrastructure is supported by the physical structures such as faculty buildings, lecture halls, collaborative spaces on campus (2) and confirmed by digital learning platforms, intranet, and management systems.

While the collaborative infrastructures in traditional, monodisciplinary settings remain tacit and intuitive for most students (3), this is not possible in interdisciplinary programs, where students, faculty and staff

come from various bachelor's programs, with diverse national, cultural and disciplinary backgrounds, and with diverse expectations and assumptions of teaching, learning and collaboration. All these prior experiences have to meet, greet and merge on top of existing, often monodisciplinary, structures. Whereas a missing, malfunctioning or unnegotiated infrastructure is problematic in any collaborative endeavor, the consequences are amplified in teaching and learning at the intersections of disciplines, diversity, culture, and expertise (4,5). This is the background of this paper.

The paper explores the importance of collaborative infrastructure in interdisciplinary education, using the ongoing master's program by the Interdisciplinary Consortium for Applied Research in Ecology and Evolution (ICARE) at the University of Maryland, Baltimore County (UMBC) as case (6). Employing a mixed methods approach (survey, observations and interviews), our study focus on the project organization and practices of the ICARE program, particularly how the students, faculty and staff navigated through the type of collaborative infrastructure developed by and from the design and structure of the program. Following the program since the launch in 2021, we have explored how the interdisciplinary training teams—each consisting of a master's student, supervisors, and mentors—have organised and developed their collaborations within the context of existing taught master's programs at UMBC.

So far, the study has provided ample insight into the challenges of creating a collaborative infrastructure in a new interdisciplinary program. As the ICARE program was externally funded by the NSF and added as a project component to the existing taught master's programs at UMBC, there was a lack of alignment between existing courses and the courses offered as part of the ICARE program. The lack of alignment was also apparent in the lack of ownership and recognition by the university leadership. Whereas the ICARE program is gaining reach, and the first cohorts of graduates are well known and respected in the local community due to the many collaborations with external stakeholders and mentors, the UMBC management has shown little support for the program and no inclination to embed or extend the program after the funding period. As a result, the connections between the ICARE program and the existing institutional structures are weak, which means that the staff and faculty involved in ICARE navigate their research and teaching obligations across two different systems, causing tension and frustration for them and the students.

The lack of an aligned collaborative infrastructure also shows up in the teaching and learning activities and the courses. In the absence of an overall, clear structure of the program, the students grapple with a curriculum that incorporates a range of different teaching styles and signature pedagogies (7). Although the ICARE program include mentorship programs, interdisciplinary seminars, and even a physical tool for interdisciplinary collaboration, the first cohorts of students (mainly consisting of first-generation students from underserved communities), struggled to find their roles in the training teams and build up a sense of agency.

Meanwhile, despite all the challenges and hardship, the study also highlights the benefit of consciously creating a visible collaborative infrastructure from the outset and shows that, while establishing robust support for interdisciplinary collaboration in structures that were not originally built for it, is difficult, bordering impossible, it is extremely rewarding when it works (8).

Finally, whereas the study focuses on a single case and the findings thus derive from a small sample, the challenges mentioned mirror those of many higher education institutions, where interdisciplinary activities are not sustained unless they are fully embedded in the visible and physical structures of the institution (9). The study, therefore, offers potentially valuable insights for future interdisciplinary higher

education programs, while emphasising the need for proactive infrastructure planning to support effective (interdisciplinary) teaching and learning practices.

References

1. Brousseau, G., & Warfield, V. (2021). Didactical Contract and the Teaching and Learning of Science. In R. Gunstone (Ed.), Encyclopedia of Science Education (pp. 1–7). Springer Netherlands. https://doi.org/10.1007/978-94-007-6165-0_93-2

2. Lindvig, K., Lyall, C., & Meagher, L. (2019). Creating interdisciplinary education within monodisciplinary structures: The art of managing interstitiality. Studies in Higher Education, 44(2), 347–360. https://doi.org/10.1080/03075079.2017.1365358

3. Ulriksen, L. (2009). The implied student. Studies in Higher Education, 34(5), 517–532. https://doi.org/10.1080/03075070802597135

4. Winchester-Seeto, T., Homewood, J., Thogersen, J., Jacenyik-Trawoger, C., Manathunga, C., Reid, A., & Holbrook, A. (2014). Doctoral supervision in a cross-cultural context: Issues affecting supervisors and candidates. Higher Education Research & Development, 33(3), 610–626. https://doi.org/10.1080/07294360.2013.841648

5. Vienni-Baptista, B., van Goch, M., von Lambalgen, R. Ellemose Lindvig, K. (2024) *Interdisciplinary practices in higher education: Teaching, learning and collaborating across borders*, Routledge. (Chapter 2)

6. Interdisciplinary Consortium for Applied Research in Ecology and Evolution (ICARE). (n.d.). Retrieved from https://icare.umbc.edu/

7. Shulman, L. S. (2005). *Signature pedagogies in the professions*. Daedalus, 134(3), 52–59. https://doi.org/10.1162/0011526054622015

8. Lindvig, K., & Hillersdal, L. (2019). Strategically Unclear? Organising Interdisciplinarity in an Excellence Programme of Interdisciplinary Research in Denmark. Minerva, 57(1), 23–46. https://doi.org/10.1007/s11024-018-9361-5

9. Lindvig, K. (2022). Loud and soft voices of interdisciplinarity in higher education. In Configurations of Interdisciplinarity Within Education. Routledge