Call for Papers

for a special issue of the *Journal of the Learning Sciences*

"Beyond disciplinary engagement: Researching the ecologies of interdisciplinary learning"

Guest editors

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Background

This special issue aims to elaborate *ecological perspectives* that encompass concepts and methodologies for studying complex heterogeneous learning practices in real-world settings, and to apply these perspectives to the research of *interdisciplinary learning*—of how people learn across and beyond disciplines.

The recent decade has brought a pressing need to engage students in schools and in higher education with contemporary societal challenges—climate change and justice, social equity, chronic and epidemic diseases, the disruptive proliferation of AI, etc. This need is driven by the recognition that education must prepare young people for addressing complex challenges that will dominate their lives. These challenges require not only deep disciplinary grounding but also work across disciplines and other established epistemic boundaries (Barry & Born, 2013; Markauskaite & Goodyear, 2017). They also call for collaboration of multiple people that represent different cultures, political agendas, and stakeholder perspectives. In short, complex societal challenges demand intertwining disciplinary knowledge with interdisciplinary practices, cognition with dialogue, and rigorous scientific understanding with civic responsibility and disposition to engage in joint action (Boix-Mansilla, 2017; Nikitina, 2005; Slakmon & Schwarz, 2019). This requires turning to the ecological conceptualizations of learning that acknowledge the heterogeneous, distributed, relational and multilayered nature of knowledge practices and human development (Damşa et al., 2020; Jornet & Damşa, 2021; Lee, 2010).

In response to the complex societal challenges, K-12 and Higher Education curricula are already seeing a significant shift in focus from individual disciplines to diverse interdisciplinary offerings (DeZure, 2017; Dolan, 2021; Takeuchi et al., 2020). However, there has been mounting concern that the majority of newly implemented interdisciplinary learning programs lack robust theoretical underpinning; and it is not clear if they result in the expected students' learning outcomes (Katz-Buonincontro, 2018; Lyall et al., 2016). In most of the publications on interdisciplinary programs, authors only speculate about the capabilities that students need to develop and pedagogical designs that could be effective, but the supporting conceptual foundation and empirical evidence are often limited. While there are some pioneering empirical studies (e.g., Kidron & Kali, 2015; Nikitina, 2005; Shen, Sung, & Zhang, 2015), research of interdisciplinary learning lags significantly behind institutional decisions that change practice. Well conceptualized and methodologically robust

research is needed about what kinds of knowledge, skills, dispositions and other personal resources enable people to work successfully across disciplinary boundaries, what types of pedagogical designs are effective for developing these capabilities, and how to make these designs scalable, equitable and sustainable.

In the learning sciences, research of interdisciplinary learning has occasionally appeared in different contexts, such as studies of heterogeneity in collaborative problem-solving (Smirnov, Easterday, & Gerber, 2018), disciplinary engagement in project-based learning (Van Horne & Bell, 2017), learning across contexts (Herrenkohl et al., 2018) and multivocality (Suthers et al., 2013). However, research in this area has been fragmented, making it hard to demonstrate its potential in addressing the critical issues of interdisciplinary learning. In recent years, however, there has been more attention given to the questions of interdisciplinarity in the learning sciences community. This includes several symposia and workshops on STEM and STEAM education and on learning beyond disciplinary boundaries (e.g., Castek, Hagerman, & Woodard, 2019; Herrenkohl et al., 2018; Markauskaite et al., 2020; Pea, Grover, & Brown, 2020). This work has emphasized the gap in the literature and the importance of bringing the topic of interdisciplinary learning to the forefront of the learning sciences. This initial work has also highlighted the fact that the field of the learning sciences is well-positioned to address some key theoretical and methodological challenges of interdisciplinary learning. These convergences between the issues of interdisciplinary learning and diverse lines of work that contribute to the ecological conceptualizations in the learning sciences are at the core of this special issue.

Aims and scope

The *overarching goal* of this special issue is to create a robust foundation for ecological conceptualizations and empirical research of interdisciplinary learning within the field of the learning sciences. It aims to bring together diverse theoretical and empirical research programs that contribute to the ecological understanding of interdisciplinary learning, present what has been done so far, identify existing synergies, and chart future research directions. The objective is to create an integrated theoretical, methodological and empirical platform for advancing interdisciplinary learning and highlight the main lines for future work so that researchers, designers, and practitioners can more rigorously and holistically address the issues of interdisciplinary learning.

We define the scope of interdisciplinary learning broadly. Interdisciplinary work often requires resourcefulness to interact productively and co-create knowledge together with people who have different expertise and who do not share the same disciplinary vocabularies, epistemic practices, and cultures. How people develop this resourcefulness and how to facilitate this process within and across different contexts are two broad questions that delineate the scope of interdisciplinary learning.

This special issue seeks to cover conceptual, methodological, design, and empirical aspects of interdisciplinary learning *within* and *across* four broad levels of learning ecologies:
- *Personal interdisciplinary resourcefulness*: What kinds of capabilities (knowledge, skills, dispositions, etc.) and other personal resources enable people to participate successfully in interdisciplinary knowledge work? How do these capabilities vary across individuals, problems and contexts? How could we assess these capabilities in just and equitable ways? What is the relationship between disciplinary and interdisciplinary capabilities?

- *Interdisciplinary learning in groups*: What is distinct to learning in interdisciplinary teams? What are the conditions that facilitate productive interdisciplinary engagement? How does the nature of interdisciplinary problems shape team learning? What kinds of methodologies and analytical tools do we use for studying interdisciplinary learning processes and outcomes? How can we study the dynamic between the resourcefulness of individual team members and group processes? What role do tools and artefacts play in interdisciplinary learning?
- *Curriculum activity systems*: What is distinct to interdisciplinary teaching and learning? What are the main design principles for designing interdisciplinary learning environments and courses? How can we ensure that these designs make epistemic fairness and hospitality possible? How can we study the impact and effectiveness of different designs?
- *Institutional arrangements and cultures*: What sorts of sociopolitical agendas, infrastructures, and other arrangements do underpin the current move towards interdisciplinary learning? How do the values, expectations, and roles of different stakeholders shape it? What enables and what hinders successful practices? What sorts of theories and methodologies could be used to study these practices?

We invite papers that investigate the questions of interdisciplinary learning across any of the above levels. They could draw on theories and methods from the learning sciences and other fields, such as anthropology, science and technology studies (STS), cognitive science, sociology, organizational science, linguistics, design, computer science and data science. Interdisciplinary contributions are particularly welcome.

We call for papers that report on empirical investigations of various aspects of interdisciplinary learning and contribute theoretical, design-based and methodological insights. Authors are initially invited to submit their extended abstracts outlining their contribution (approximately 1,000 words, including references). The guest editors will shortlist abstracts that have a clear potential to result in a high-quality original paper that makes a substantial contribution to this special issue and invite the authors to submit full manuscripts, which will be less than 10,000 words and follow JLS author instructions. All manuscripts then will undergo a full peer-review process similar to any other submission to the journal. Only accepted papers will be published in the special issue.

Timeline

Paper proposals (1000-word abstracts) due 1st July 2022
Decisions on proposals/invitations to contribute full papers 1st August 2022
Full manuscripts due 1st January 2023
The first round of reviews completed 1st April 2023
Revisions for further review rounds due 1st June 2023
Review of revisions returned to authors 1st July 2023
Second Revisions 1st September 2023
Final Manuscripts 15th November 2023
Special issue published in Spring 2024

Please send abstracts to the guest editors by July 1, 2022.
Email: jls.si2024@gmail.com

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