Title: Bridging disciplines for a sustainable future: Innovative pedagogies to facilitate engagements with wicked problems in sustainability education

Conference abstract Presented Friday 10 October 9:00-10:30 at ENLIGHT Teaching & Learning Conference 2025 - Playfulness for the Future of Higher Education - Uppsala, Sweden, October 8-10, 2025

Authors: Martin Mickelsson[a*, b] and Emma Oljans[b, c]

[a]*Department of Earth Sciences, University of Gothenburg, Gothenburg, Sweden*
[b]*Department of Women´s and Children´s Health, Uppsala University, Uppsala University Hospital SE-751 85 Uppsala, Sweden*
[c]*The Department of Movement, Culture and Society, The Swedish School of Sport and Health Sciences, Sweden*

**Corresponding author.*

Keywords
Antimicrobial resistance; transdisciplinarity; sustainability education; ethical reasoning; systems thinking

Short abstract

This presentation demonstrates how case vignettes, real-world narratives, enable interdisciplinary collaboration to address antimicrobial resistance (AMR) in Zimbabwe. Workshops with 60 stakeholders from medicine, agriculture, and environmental science revealed three key benefits: shared knowledge-building, ethical/systems thinking, and practical solutions like surveillance systems and policy reforms.

Extended abstract

Antimicrobial resistance (AMR) is a pressing global challenge that intersects medicine, veterinary science, agriculture, and environmental health. As a wicked problem characterized by uncertainty, competing interests, and systemic interdependencies, AMR demands collaborative, transdisciplinary solutions. This oral presentation explores how case vignettes, short, narrative-based scenarios, can foster deep learning, ethical reflection, and team-based problem-solving among diverse stakeholders. By engaging educators, students, and external partners, we demonstrate how participatory workshops can generate stronger, more inclusive solutions than any single discipline could achieve alone.

Designed as an interactive oral presentation, this session will invite audience participation through live polls and breakout discussions, ensuring relevance for both in-person and virtual attendees. We welcome a hybrid format to maximize engagement, allowing remote and on-site participants to collaborate in real time. Our approach aligns with transdisciplinarity, bringing together students and faculty from medicine, veterinary science, agriculture, sustainability, and environmental science. Additionally, we engaged external stakeholders, including farmers and policymakers, to ground discussions in real-world challenges.

Two one-day workshops were held at Midlands State University in Gweru and the University of Zimbabwe in Harare, involving 60 participants—20 students and 10 educators from each university—representing multiple disciplines such as medicine, veterinary science, agriculture, dietetics, and environmental science. External perspectives from farmers, health practitioners, and sustainability advocates further enriched the discussions. The case vignettes used in these workshops were co-developed with researchers and practitioners, focusing on Zimbabwe's specific challenges, particularly antibiotic misuse in livestock production driven by economic pressures and food security concerns.

The workshops followed a structured collaborative process. First, participants examined the vignettes through guided questions, revealing divergent perspectives: veterinarians emphasized animal health, agricultural scientists prioritized food security, and medical professionals highlighted human health risks. This interdisciplinary analysis underscored how differently stakeholders perceive AMR, laying the groundwork for deeper collaboration.

Next, the discussions shifted to ethical and systems thinking, exploring tensions between short-term economic needs, such as farmers using antibiotics for growth promotion, and long-term communal risks, including ecosystem contamination and treatment-resistant infections. Participants mapped systemic connections, such as how antibiotic residues in animal waste pollute water supplies, affecting both ecosystems and human health. These conversations highlighted the shared responsibility among farmers, policymakers, and consumers in addressing AMR.

The collaborative approach yielded three key contributions. First, it fostered interdisciplinary engagement, enabling participants to co-create knowledge by linking antibiotic use to environmental, medical, and economic consequences. Second, it promoted ethical and systems thinking, encouraging critical reflection on transparency, accountability, and the interconnected nature of AMR. Third, it drove collaborative problem-solving, generating practical solutions such as integrated surveillance systems for antibiotic residues, community education programs, and policy reforms to restrict non-therapeutic antibiotic use.

In conclusion, this presentation highlights the methodological innovation of using case vignettes as a tool for tackling wicked problems through team-based learning. It also provides empirical insights into the need for context-specific, transdisciplinary strategies to combat AMR. Most importantly, it demonstrates the transformative potential of collaborative learning, bridging analysis and action to foster equitable, systemic responses to sustainability challenges. We invite participants to join a hybrid discussion on scaling these approaches across disciplines and borders, reinforcing the power of collective action in addressing global challenges like AMR.