

Teaching Impact Assessment for Wicked Problems: A Transdisciplinary Case



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Nuclear Waste Management as a Wicked Problem

Compared to “tame” problems “wicked” ones defy a problem definition and solution because of their unique characteristics, challenging their handling (Rittel & Weber 1973).

Ten characteristics of nuclear waste management as a wicked problem (Brunnengräber 2019):

1. national context
2. changing narratives
3. **socio-technical challenge**
4. double jeopardy situation
5. systemic risk
6. **vast time scales**
7. linked layers
8. landscape of conflicting actors
9. **boundaries of science**
10. challenged democracy

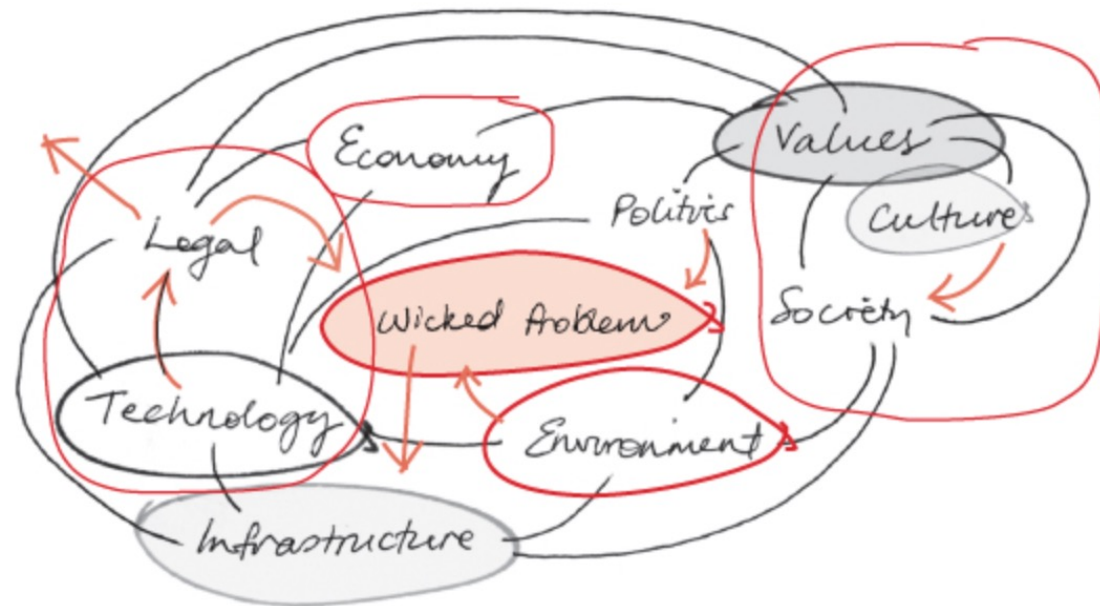


Figure 1: Embedment of wicked problems into complex systems (Conn & McLean 2024).

Dimensions of Interdisciplinary Understanding

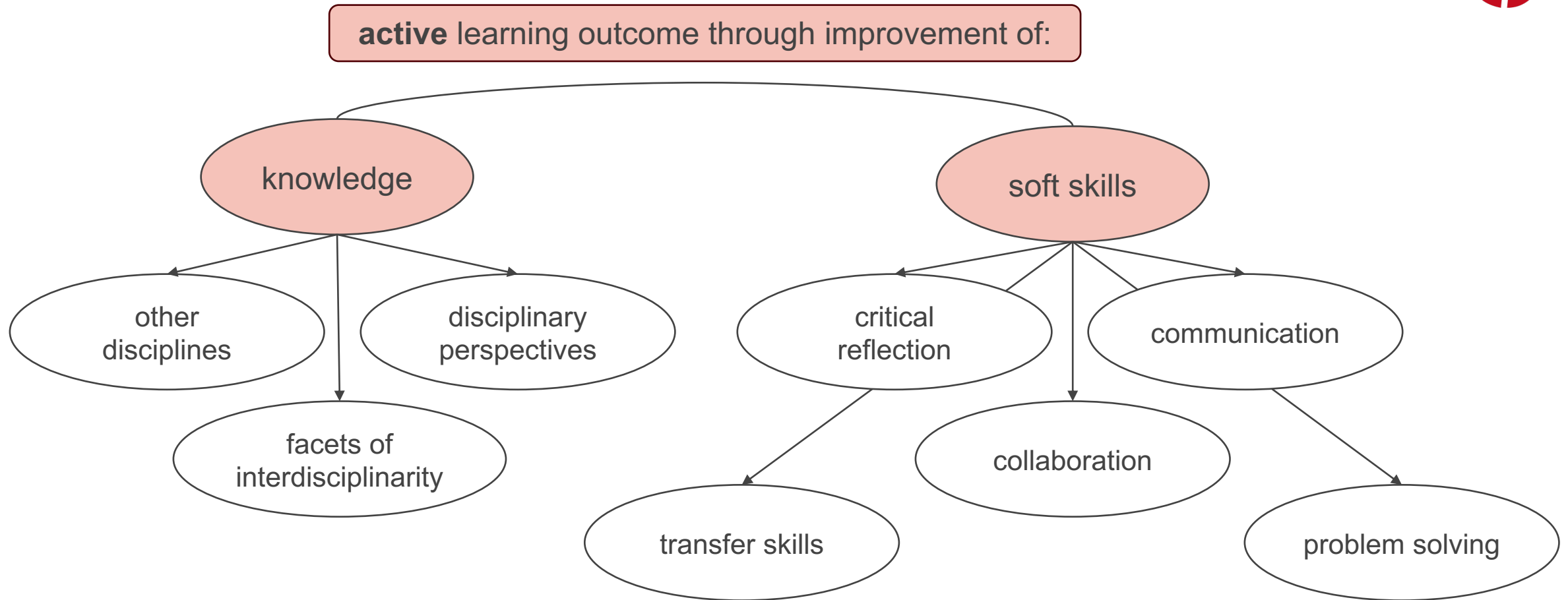


Figure 2: Dimensions of interdisciplinary thinking and understanding (adapted based on *Schijf et al. 2023, Spelt et al. 2017*).

Course Setting and Elements

Organisers & Lecturers



Week 1 – Knowledge Acquisition

- presentations, workshops, discussions, simulation games, and world cafes

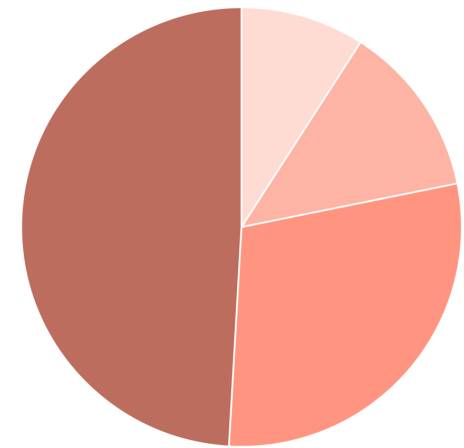
Week 2 – Transdisciplinary Exchange

- field trips to interim storage sites
- group presentations on event with the interested public

Participants

- 50 students from 14 different study programs (bachelor & master level)
- 12 employees of the practice partners

- social sciences
- natural sciences
- engineering
- planning sciences

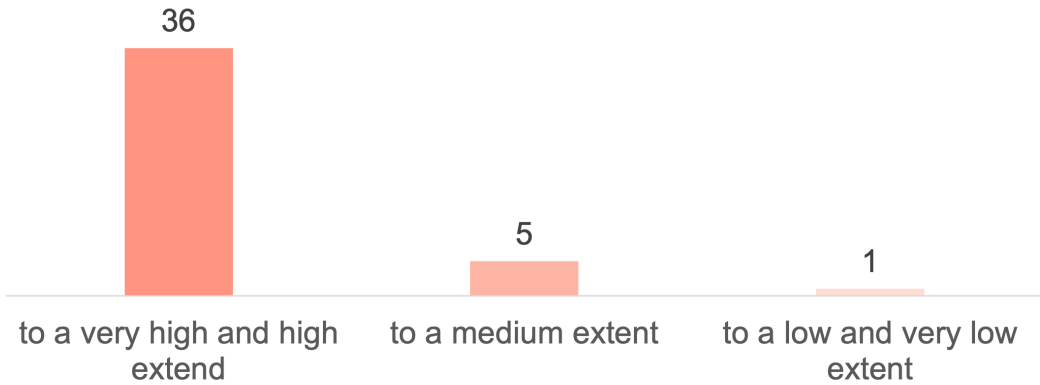


Survey Results: Development of Interdisciplinary Knowledge

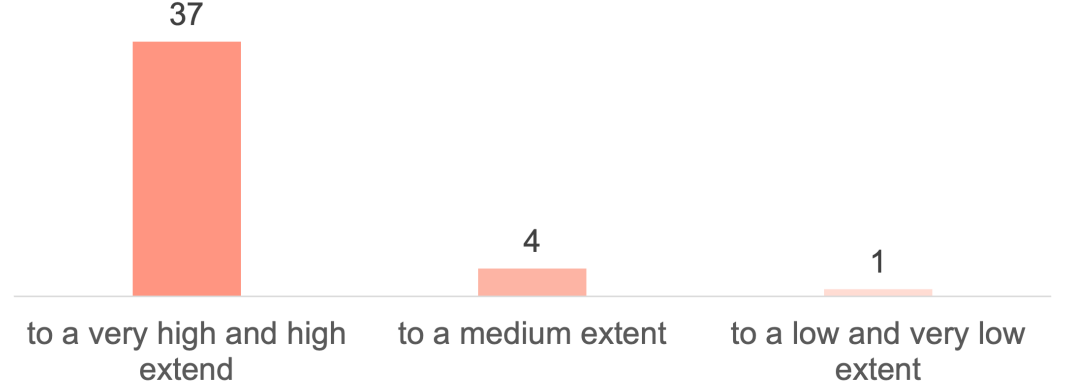


The course gave me the opportunity to improve my **knowledge** of (n = 42):

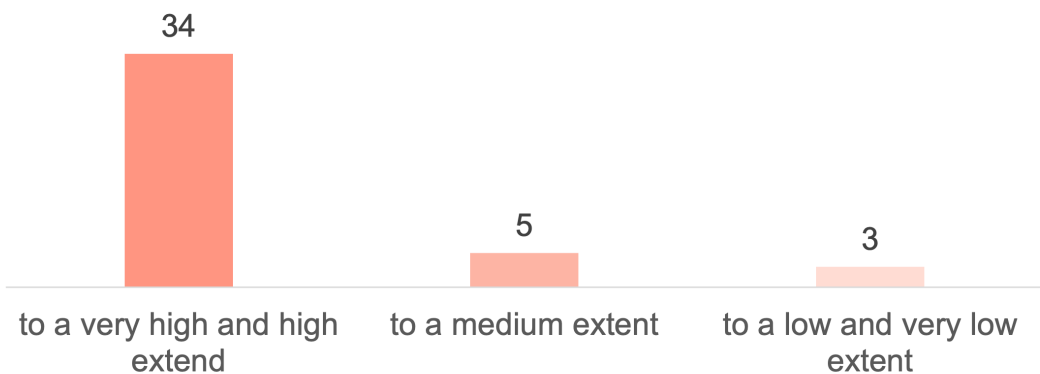
Other Disciplines



Different Disciplinary Perspectives



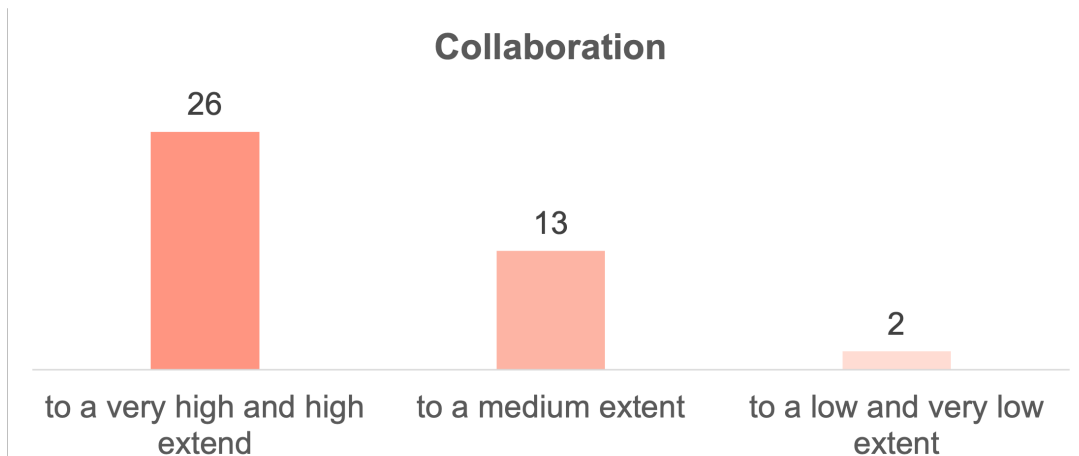
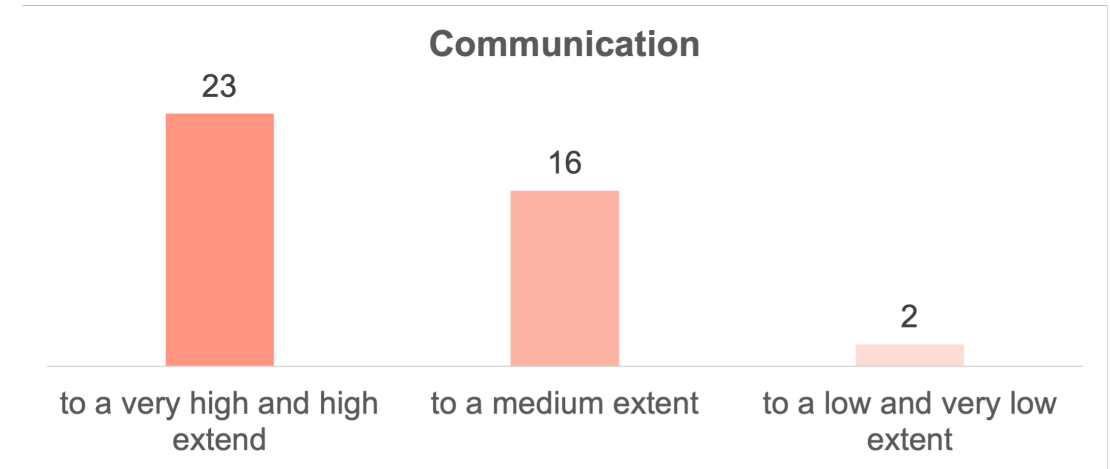
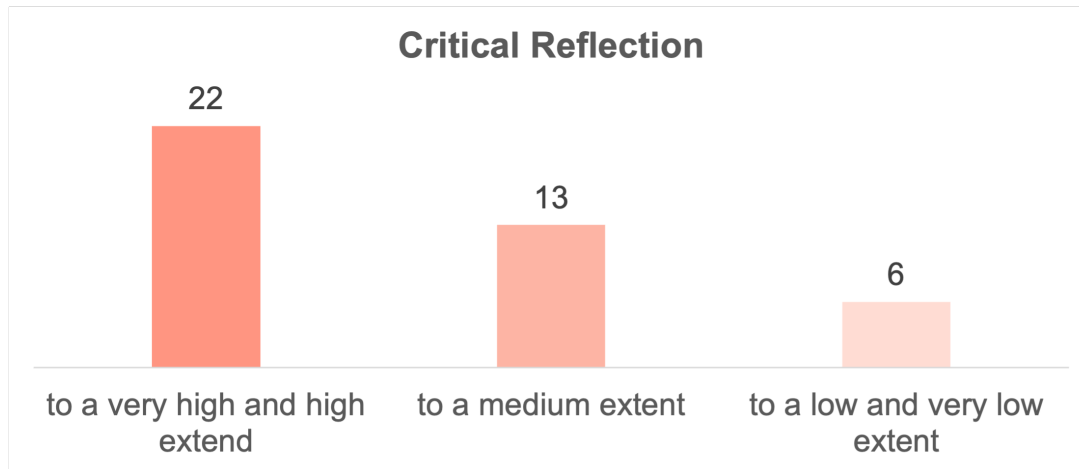
Facets of Interdisciplinarity



Survey Results: Development of Interdisciplinary Soft Skills



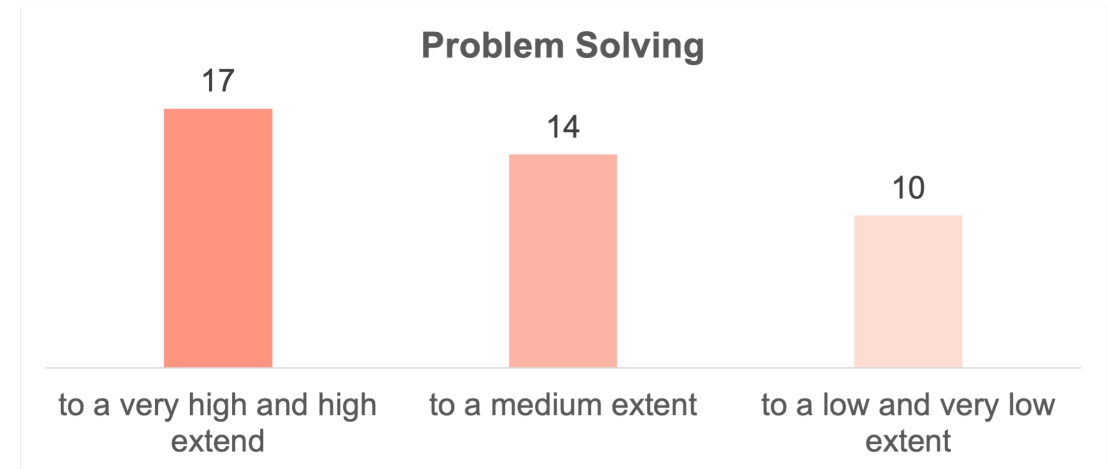
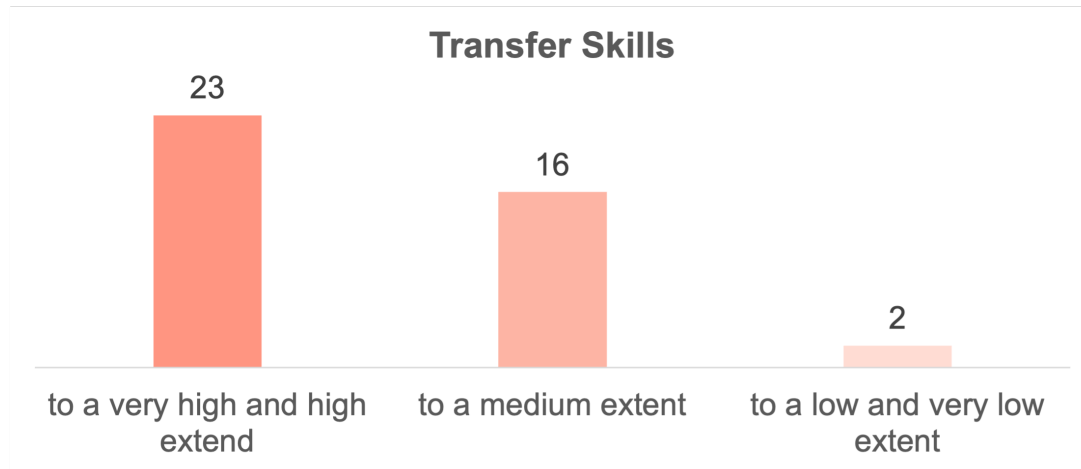
The course gave me the opportunity to improve the following **soft skills** (n = 41):



Survey Results: Development of Interdisciplinary Soft Skills



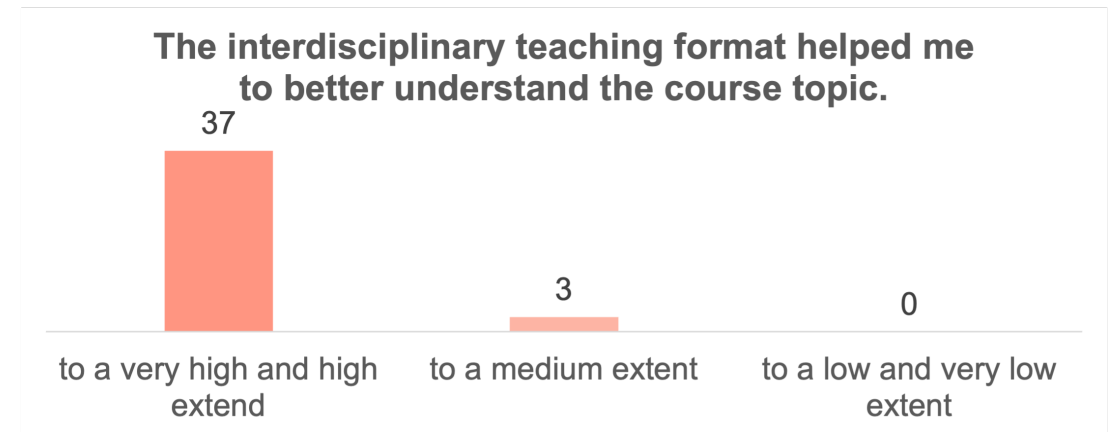
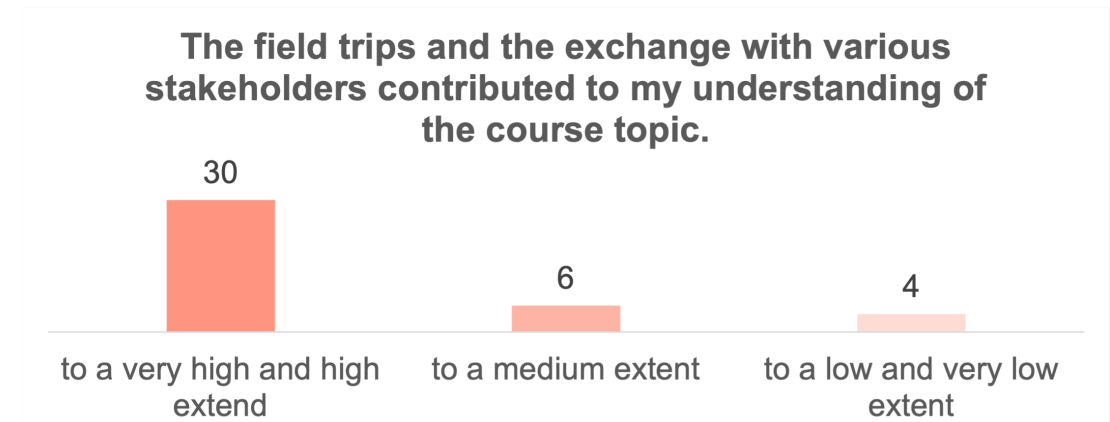
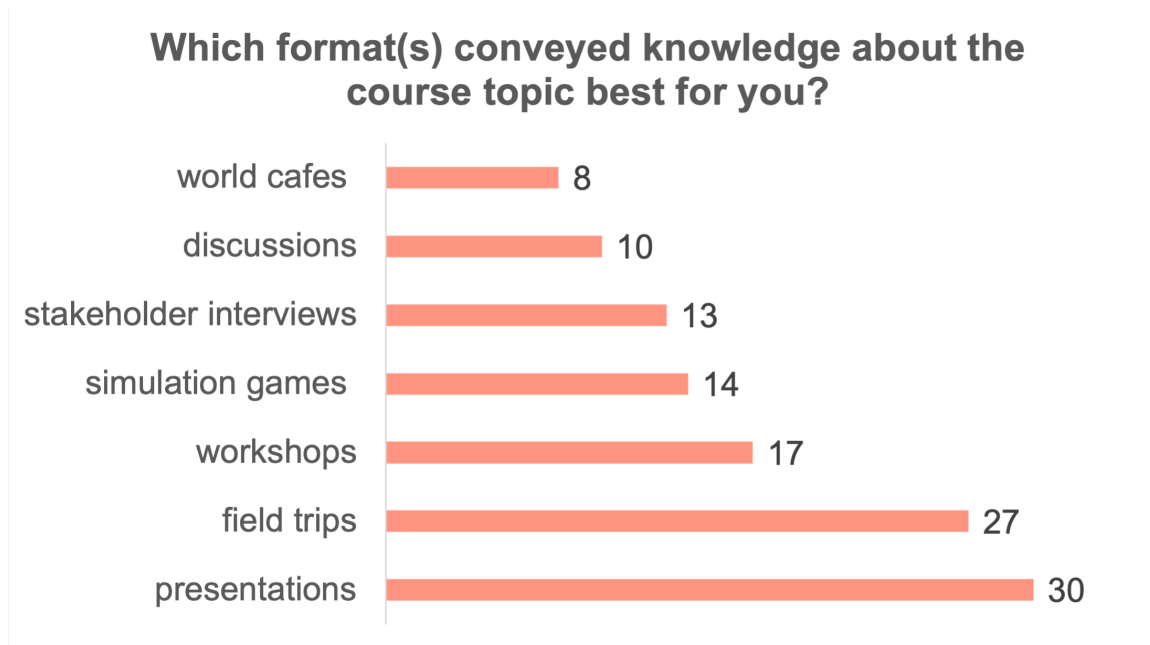
The course gave me the opportunity to improve the following **soft skills** (n = 41):



Survey Results: Reflection on Teaching Methods



How did the teaching methods support the learning outcome (n = 40):



Conclusions

- participants **improved** their **interdisciplinary understanding**
- **course format supported** participants in **gaining an understanding** of nuclear waste management as wicked problem
- **interdisciplinary education** may **benefit the taming** of wicked problems



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Let's continue the conversation!

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