

Threshold concepts workshop: Decoding and activating the “Aha!” moments of disciplinary learning

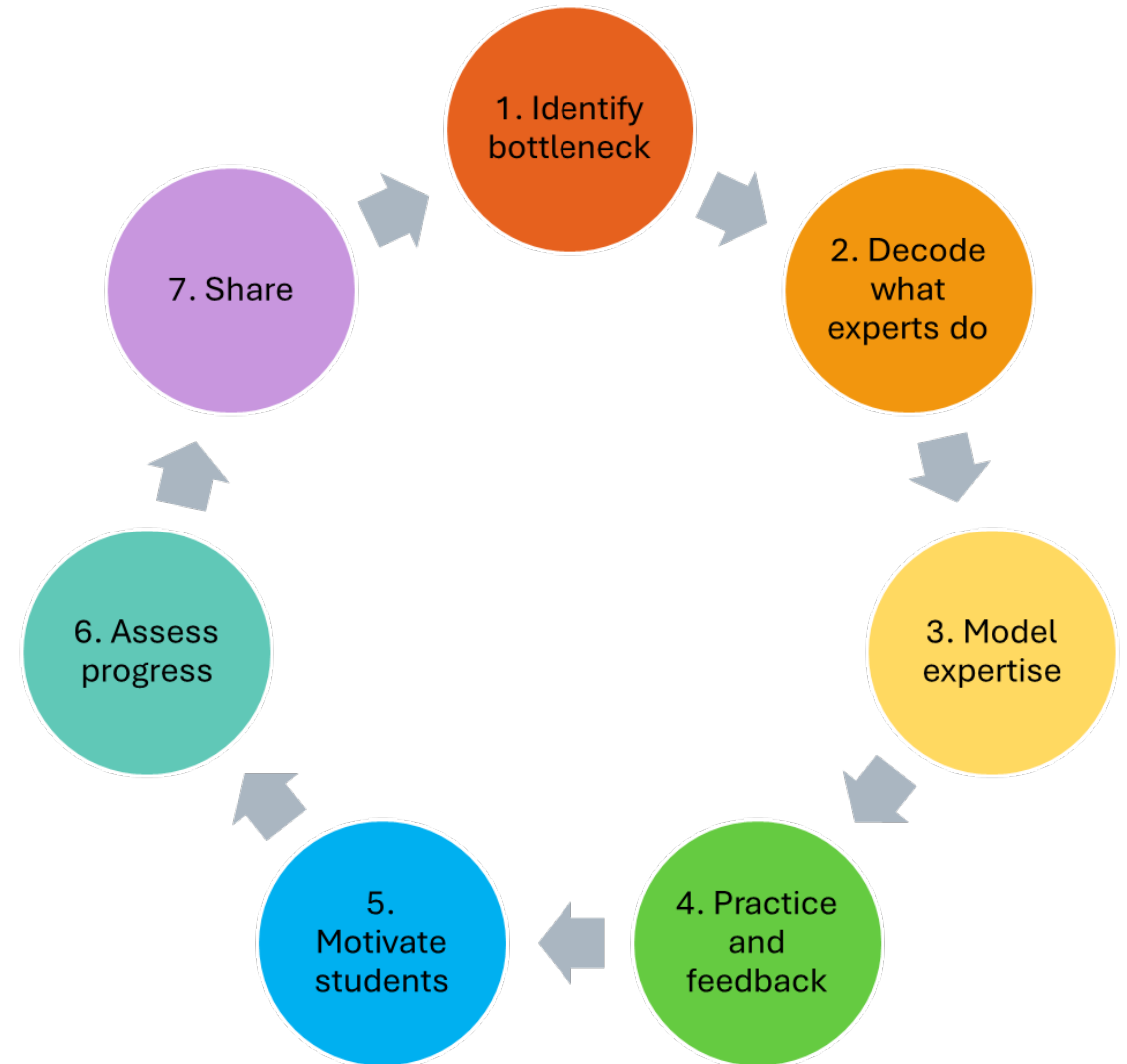


The UTM Working Group on Threshold Concepts in Pedagogy

Mark Blaauw-Hara, Adriana Grimaldi, Kathleen Scheaffer,
Joanna Szurmak, & Lingzi Zhuang

Agenda

- Welcome and Introductions
- Background:
 - The expert-novice gap
 - Decoding the disciplines in a nut-shell
 - Demonstration
- Your turn:
 - Identifying a bottleneck in your teaching
 - Interview
- Together:
 - Debriefing

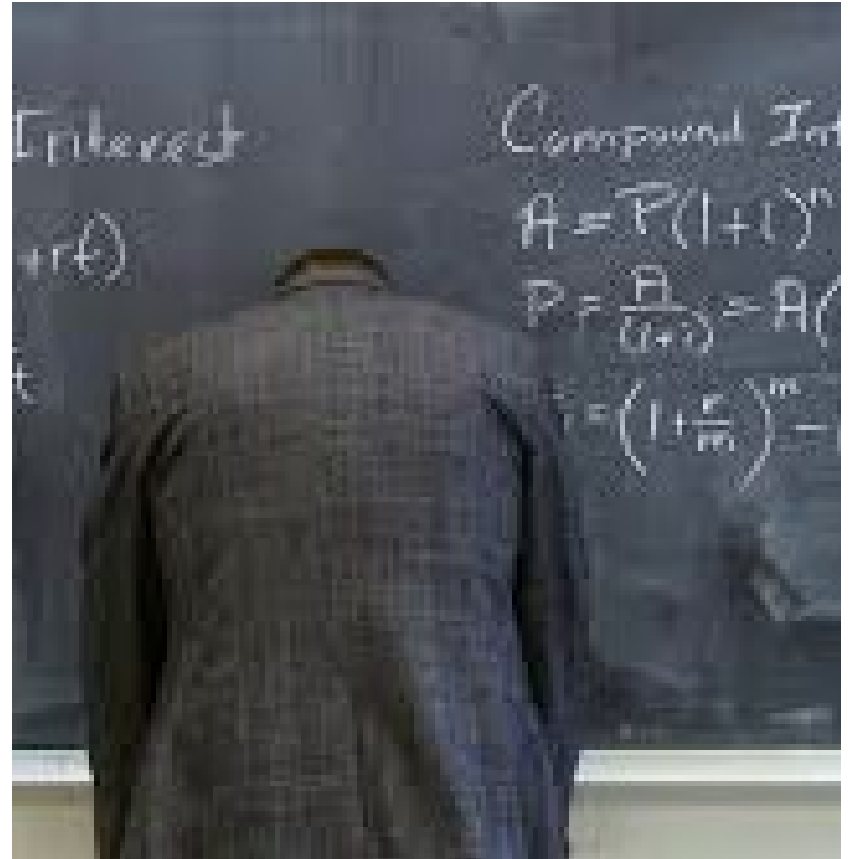


“Why don’t my students understand what I am trying to teach?”

"It seems so obvious and natural to me."

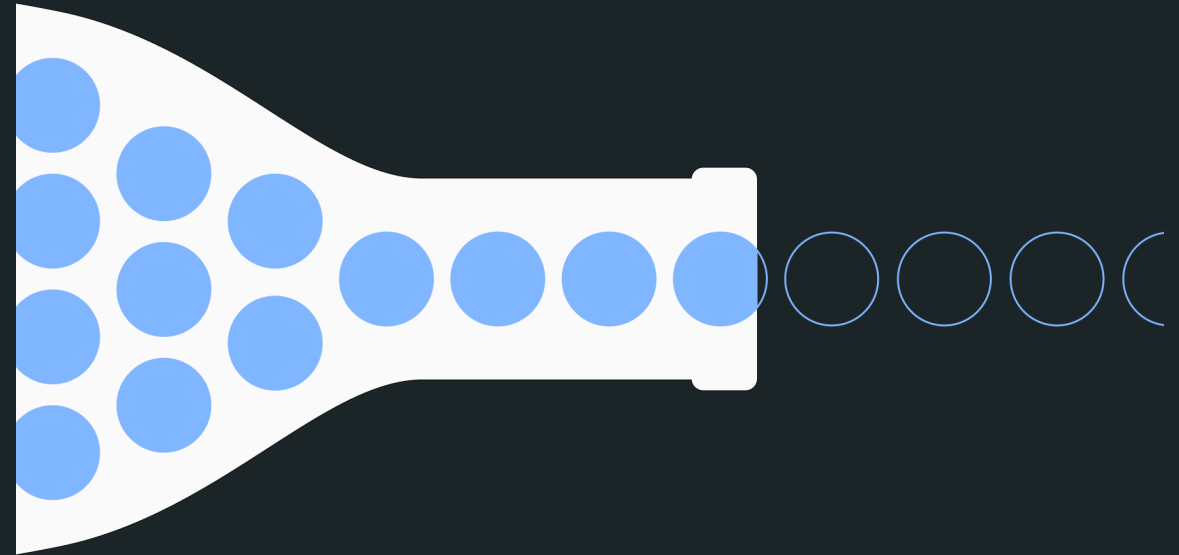
"They just don't get it."

"When I teach this, some students get it naturally and others will never understand!"



The expert – novice gap

- Experts have **tacit knowledge** about their discipline.
- Often, their way of knowing and doing is **never made explicit**, informally or in textbooks, etc.
- Novice knowledge gaps create "**bottlenecks**", where students get stuck and can't fully progress in their learning

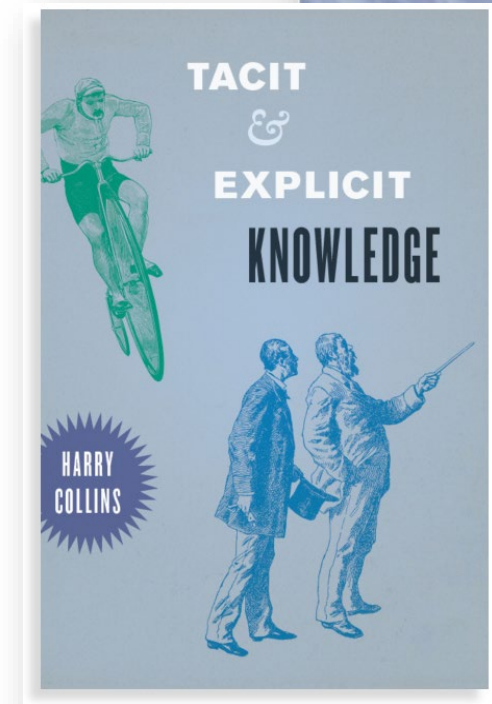


<https://www.statsig.com/perspectives/performance-bottlenecks-in-app-development>

The curse of expertise

The “**curse of expertise**” arises when teachers have
“automated important discipline-specific thought patterns to such an extent that they cannot explicate them”
(Riegler 2020a, 5; Riegler 2020c).

The Decoding the Disciplines interview emerged as a means of overcoming this curse.



Polanyi, M., & Sen, A. (2009). *The tacit dimension*. The University of Chicago Press.

Collins, H. M. (2010). *Tacit and explicit knowledge*. The University of Chicago Press.

Decoding the Disciplines

The *Freshman Learning Project* at Indiana University (1998-2010).

- Participants: instructors **from different disciplines**
- Visited each other's first-year classes, observed each other teach
- All noticed that instructors taught about things that visibly came very naturally to them.
 - **The instructors had tacit knowledge that the learners did not have.**
 - Learners responded with confusion and gap manifestation.

A focus on bottlenecks connects with the study of liminality and threshold concepts

Connecting to Threshold Concepts

- Learning processes are a “**black box**” (Geiger,2024; Koopmans, 2014).
- Students dwell in a **liminal state** of confusion and uncertainty before making it across the **threshold** of a troublesome disciplinary knowledge.

“[...] we need to unpack the mysteries of liminality, both in terms of how it is experienced by learners and the kinds of pedagogical tools or approaches that might support passage through it”

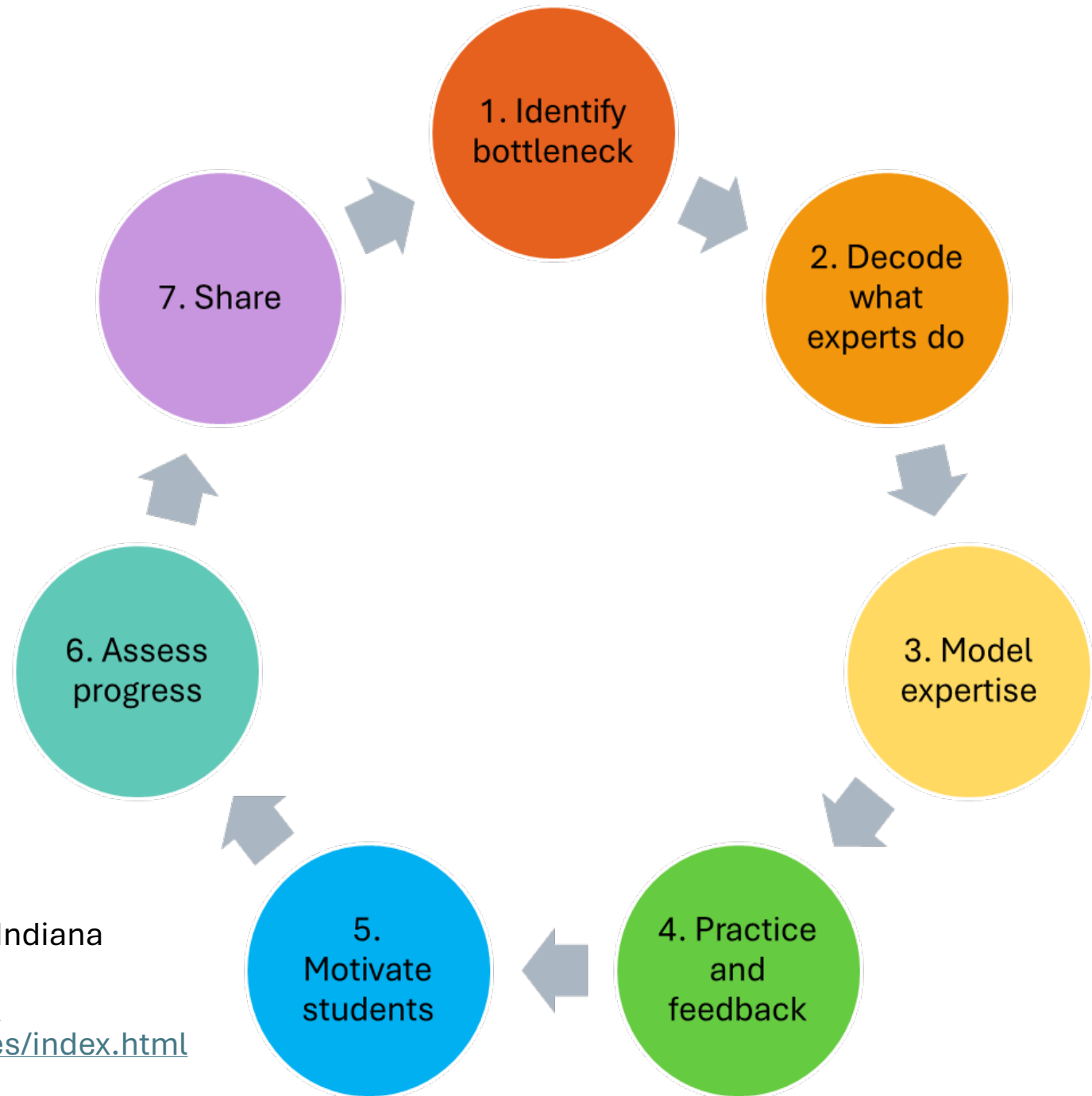
(Rattray & Ravenstahl, 2024)

***Decoding the Disciplines* puts expert teachers into the position of the novice learners is an attempt to make pedagogy visible**

(Land et al., 2014).



Decoding the Disciplines



Center for Innovative Teaching and Learning, Indiana University Bloomington. (2026). *Decoding the disciplines*. <https://citl.indiana.edu/teaching-resources/course-design/decoding-disciplines/index.html>



Identify and decode
a bottleneck

The interview

The decoding interview has become a powerful and versatile tool for understanding what we need to teach to students.

The process requires a willingness to publicly explore areas of pedagogical ignorance on the part of the interviewee and the presence of at least two other people.

Preferably these people are not disciplinary experts. Non-experts can ask insightful questions to get to the core of the bottleneck

Interview demonstration

Interviewee: Lingzi Zhuang

Beginner and intermediate linguistics

Students learn a scientific way of understanding human language as a *system of meaningful symbols*.

- **Bottleneck:** Any human language is a system of meaningful symbols
- Most students are habituated into only thinking scientifically about standardized, sociolinguistically dominant, or well-resourced & commonly-studied lgs
 - —even though many students are – wittingly or unwittingly - speakers of non-standardized/minoritized/unscripted/understudied lgs themselves

A common observation showing inadequate understanding of the bottleneck

- Performing well on all multiple-choice questions on instructed concepts such as "prescriptivism"/"descriptivism," while continuing to espouse ideas such as
 - "my English is not good"
 - "the Zhengzhou dialect is not a full language"
 - "English grammar is more complex than Chinese grammar"
 - "Arabic grammar is more complex/beautiful/perfect than English/the Palestinian dialect/..."
- **Interviewers:** "inquisitive non-expert" (Timmermans et al. 2018)



Wolf (Humility – Dbaadendiziwin)

In yellow, Wolf teaches humility through connection and cooperation. Overlapping, flowing lines represent unity, shared leadership, and the strength found in moving together rather than alone

Bottleneck Reflection (2 minutes)

—
What is your
bottleneck?

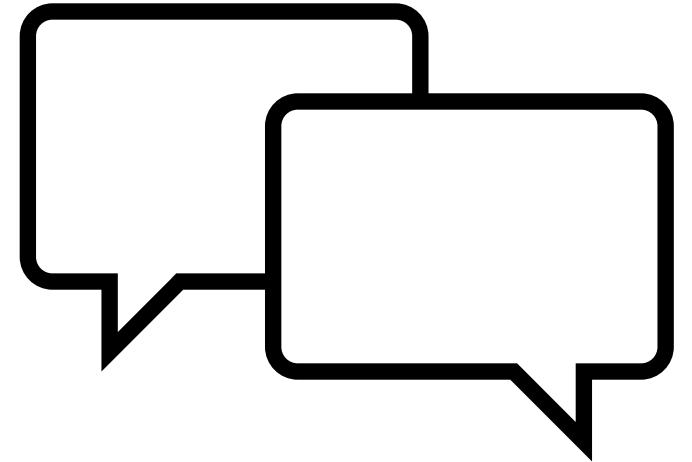
14



Practice

In groups of 2, please:

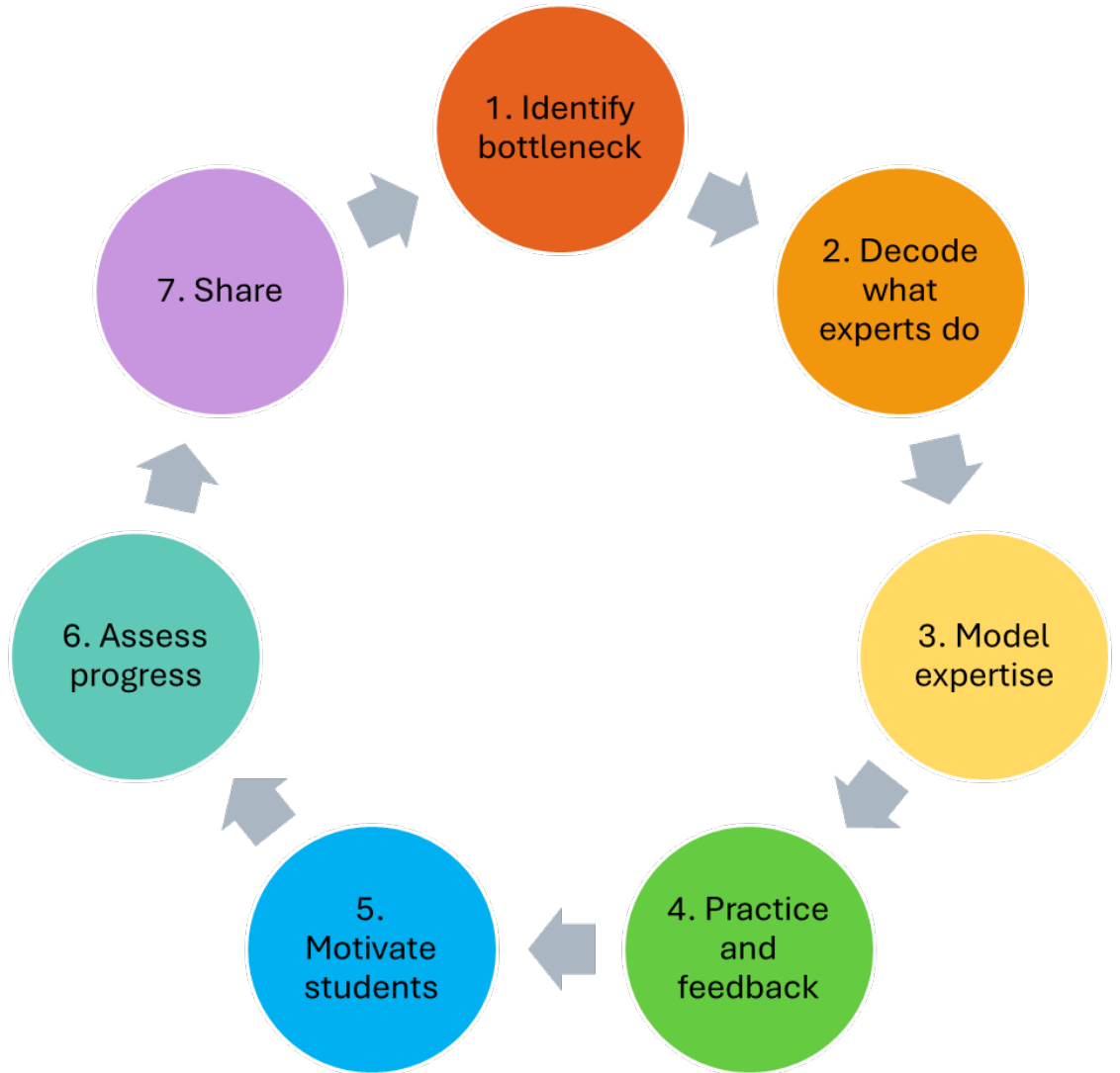
- Introduce yourself to each other **(2 mins)**
 - Name (pronouns optional) and discipline/department
 - Select who will be the first to be the interviewer and the interviewee.
- Start the first round of the decoding/interviewing process, as well as record the insights using the sheet provided **(9 min.)**
 - We will keep a timer and alert you when there are two mins left of the first round
 - Please record your group's insights
- Switch roles and start the process over **(9 mins)**
- After a total of 20 minutes, we will come back to debrief as a large group



Debrief (10 minutes)

When called on, please state your name (pronouns optional) and your discipline or department.

- **What did you learn about your bottleneck(s) through this process?**
- **How might decoding the disciplines (interview approach) facilitate your pedagogy?**



Connect with UTM Threshold Working Group

Working Group Website

<https://uoft.me/Threshold>



Research Study

Feedback on this Workshop

<https://tinyurl.com/surveyTWG>



References

- Ardizzone, T., Breithaupt, F., & Gutjahr, P. C. (2004). Decoding humanities. In D. Pace, & J. Middendorf (Eds.), *Decoding the disciplines: Helping students learn disciplinary ways of thinking*, 45-46. *New Directions in Teaching and Learning* 98. doi:10.1002/tl.146.
- Geiger, J.-M. (2024). Assessment of student learning in threshold concepts-oriented teaching and learning. In J. P. Davies, E. Gironacci, S. McGowan, A. Nyamapfene, J. Rattray, A. M. Tierney, & A. S. Webb (Eds.), *Threshold concepts in the moment*, 15-28. Brill.
- Koopmans, M. (2014). Change, self-organization and the search for causality in educational research and practice. *Complicity: An International Journal of Complexity and Education*, 11(1): 20–39. <https://doi.org/10.29173/cmplt19523>
- Land, R., Rattray, J., Vivian, P. (2014). Learning in the liminal space: A semiotic approach to threshold concepts. *Higher Education*, 67, 199-217. <https://doi.org/10.1007/s10734-013-9705-x>
- Middendorf, J., & Pace, D. (2004). Decoding the disciplines: A model for helping students learn disciplinary ways of thinking. *New Directions for Teaching and Learning*, 98(Special Issue: Decoding the Disciplines: Helping Students Learn Disciplinary Ways of Thinking), 1–12. <https://doi.org/10.1002/tl.142>
- Palfreyman, N. (2020). Bottlenecks: From static words to slippery concepts. *Didaktiknachrichten*, 29–45. https://diz-bayern.de/DiNa/07_2020.
- Pace, D. (2021). Beyond Decoding the Disciplines 1.0: New directions for the paradigm. *Teaching & Learning Inquiry*, 9(2). <http://dx.doi.org/10.20343/teachlearninqu.9.2.3> Available Open Access through the Creative Commons CC-BY-NC License 4.0

Rattray, J., & Ravenstahl, M.J. (2024). Mediating liminality: Artefacts as a means of supporting threshold transformations. In J. P. Davies, E. Gironacci, S. McGowan, A. Nyamapfene, J. Rattray, A. M. Tierney, & A. S. Webb (Eds.), *Threshold concepts in the moment*, 89-104. Brill.

Riegler, Peter. (2020a). Decoding the Disciplines—A Roundtable from Novice to Expert Back to Novice. *DidaktikNachrichten*, 3–8. https://diz-bayern.de/DiNa/07_2020. Originally published as Riegler, Peter. 2019. “Decoding the Disciplines—Yom Laien zum Experten und noch einmal zu den Anfängen zurück.” *Didaktiknachrichten*, 3–7. https://diz-bayern.de/DiNa/11_2019.

Riegler, Peter. (2020b). The Decoding Interview—an Exemplary Insight. *Didaktiknachrichten*, 11–18. https://diz-bayern.de/DiNa/07_2020. Originally published as Riegler, Peter. 2019. “Das Decoding Interview – ein exemplarischer Einblick.” *Didaktiknachrichten*, 10–17. https://diz-bayern.de/DiNa/11_2019.

Riegler, Peter. (2020c). The Decoding Alphabet. *Didaktik-Nachrichten*, 50–51. https://diz-bayern.de/images/cwattachments/506_549cb112bb9684e079d3fb2f5ca21787.pdfso.

Timmermans, Julie A., Carmen Bruni, Rob Gorbett, Barbara Moffatt, Gordon Stubbley, Diane Williams, and Trevor Holmes. (2018). “The Flourishing of Care in a Multidisciplinary Faculty Learning Community.” *International Journal for Academic Development*. 23, no. 4: 367–73. <https://doi.org/10.1080/1360144X.2018.1521335>.

Zolan, M., Strome, S., & Innes, R. (2004). Decoding genetics and molecular biology. In D. Pace, & J. Middendorf (Eds.), *Decoding the disciplines: Helping students learn disciplinary ways of thinking*, 23- 32. *New Directions in Teaching and Learning*, 98 . doi:10.1002/tl.144.