# Implementation of writing-to-learn pedagogies in large-enrollment gateway courses in LSA and Engineering

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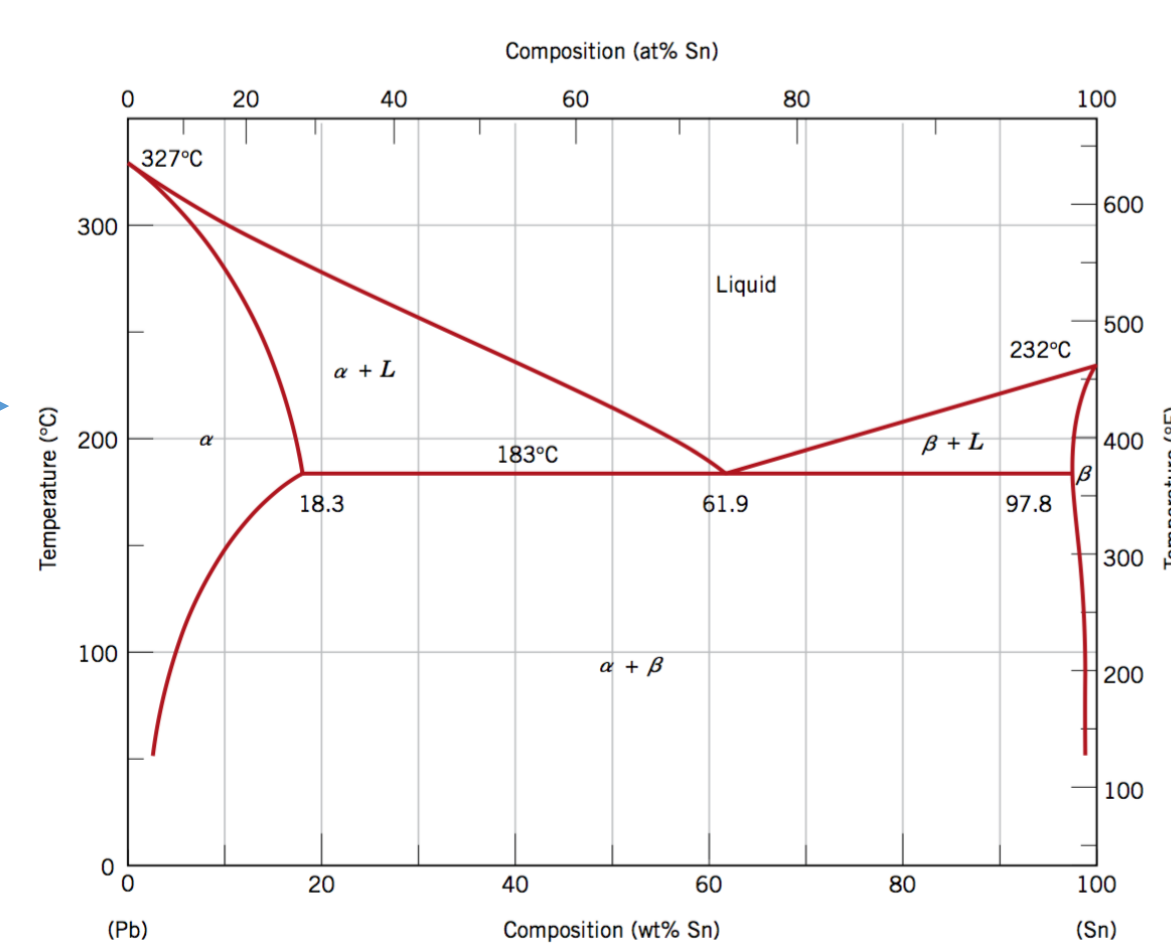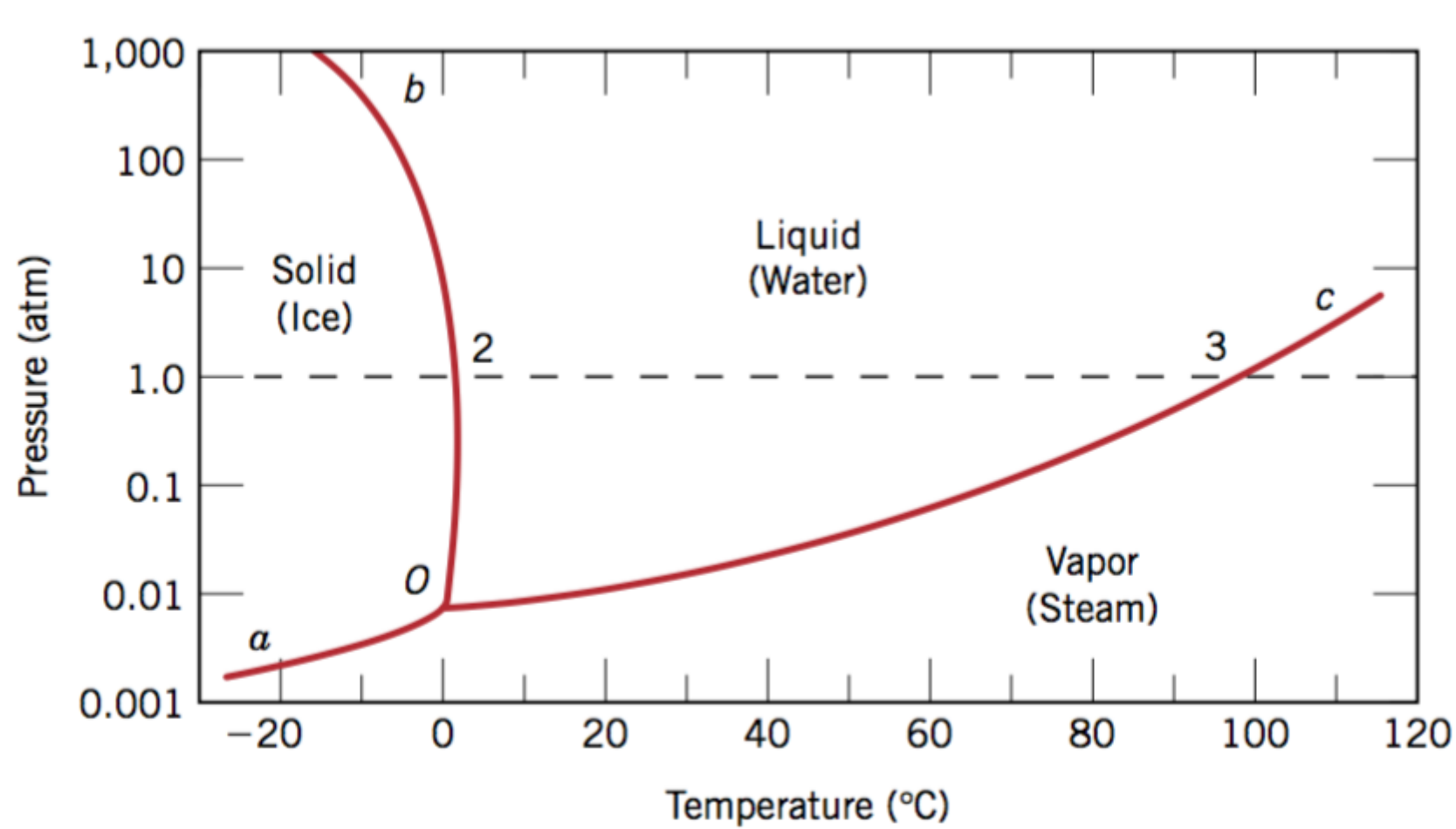
## Writing To Learn (WTL)

- Different aim from Learning to Write
- Enhances content learning
- Fosters engagement with peers and instructors
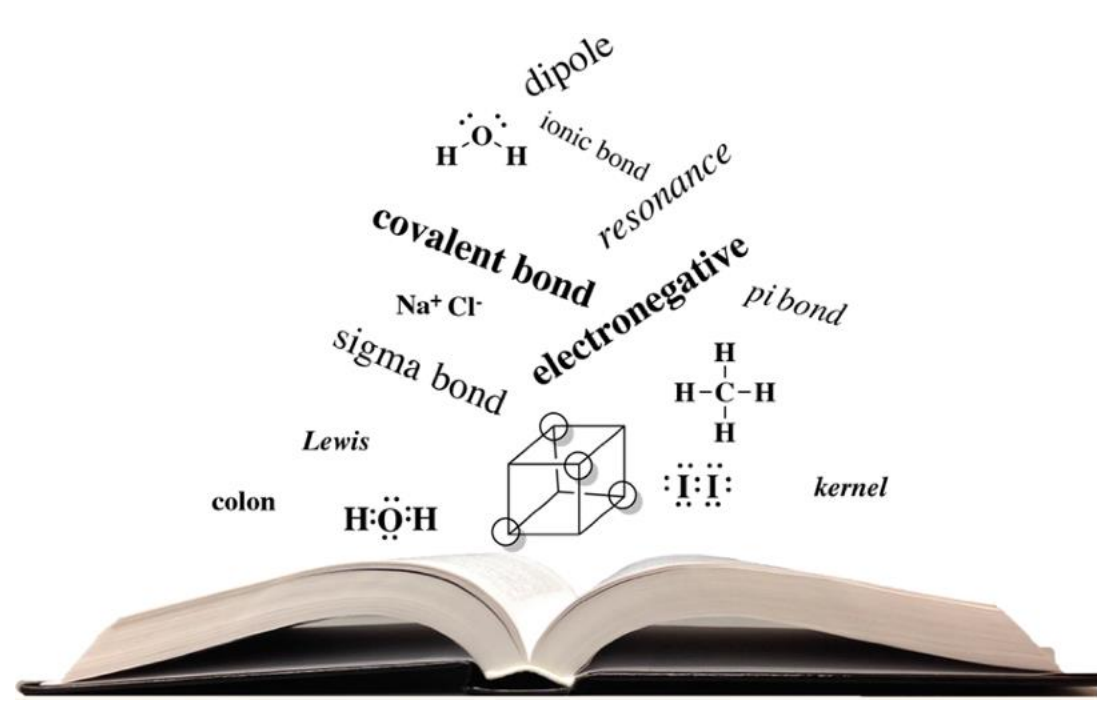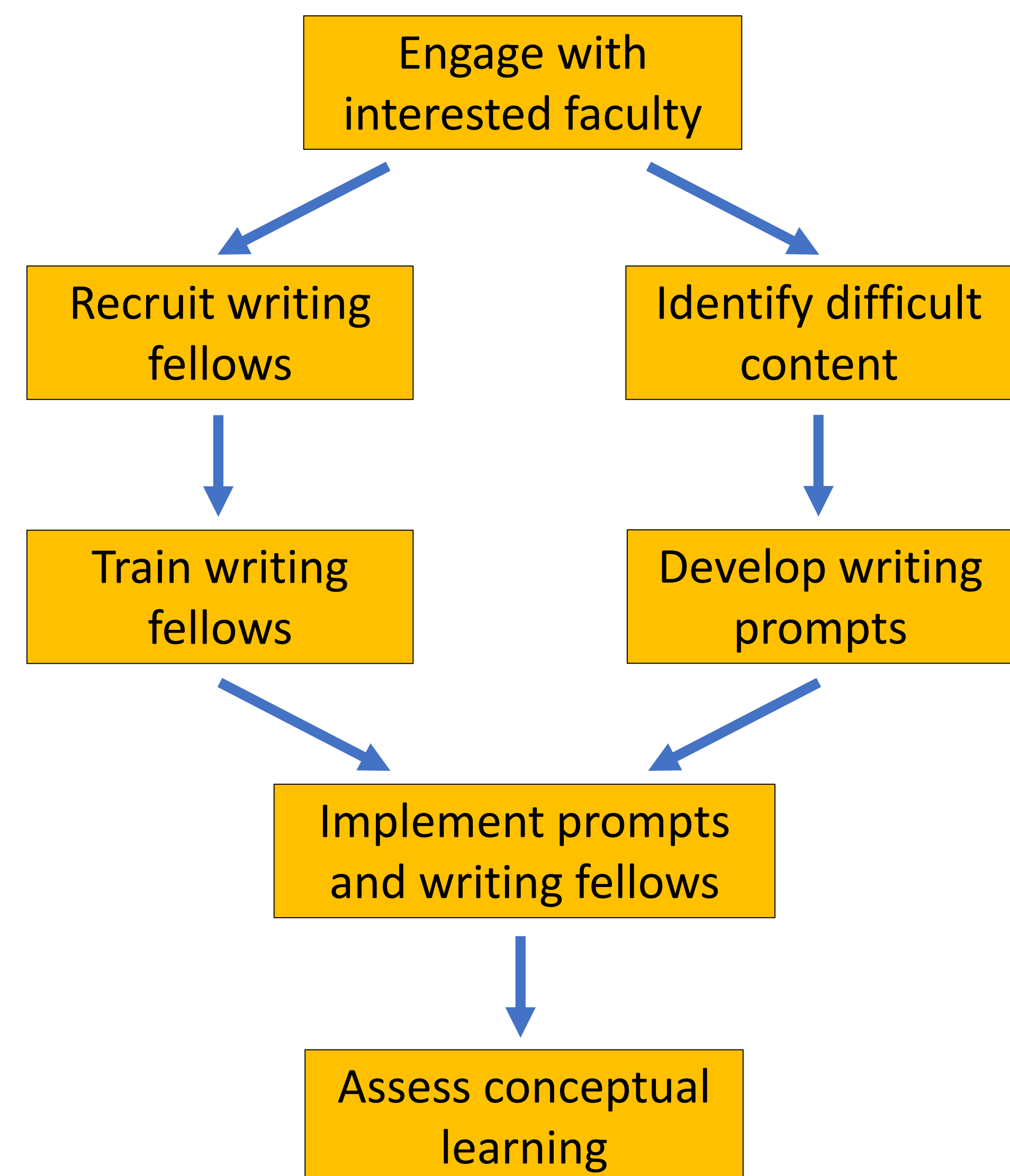
## Piloting WTL in MSE 250

- Approximately 30 students
- Reflective writing
- Conceptual-based writing
- Peer review
  - Evaluate peers' writing using a rubric
  - Revise writing in response to critique
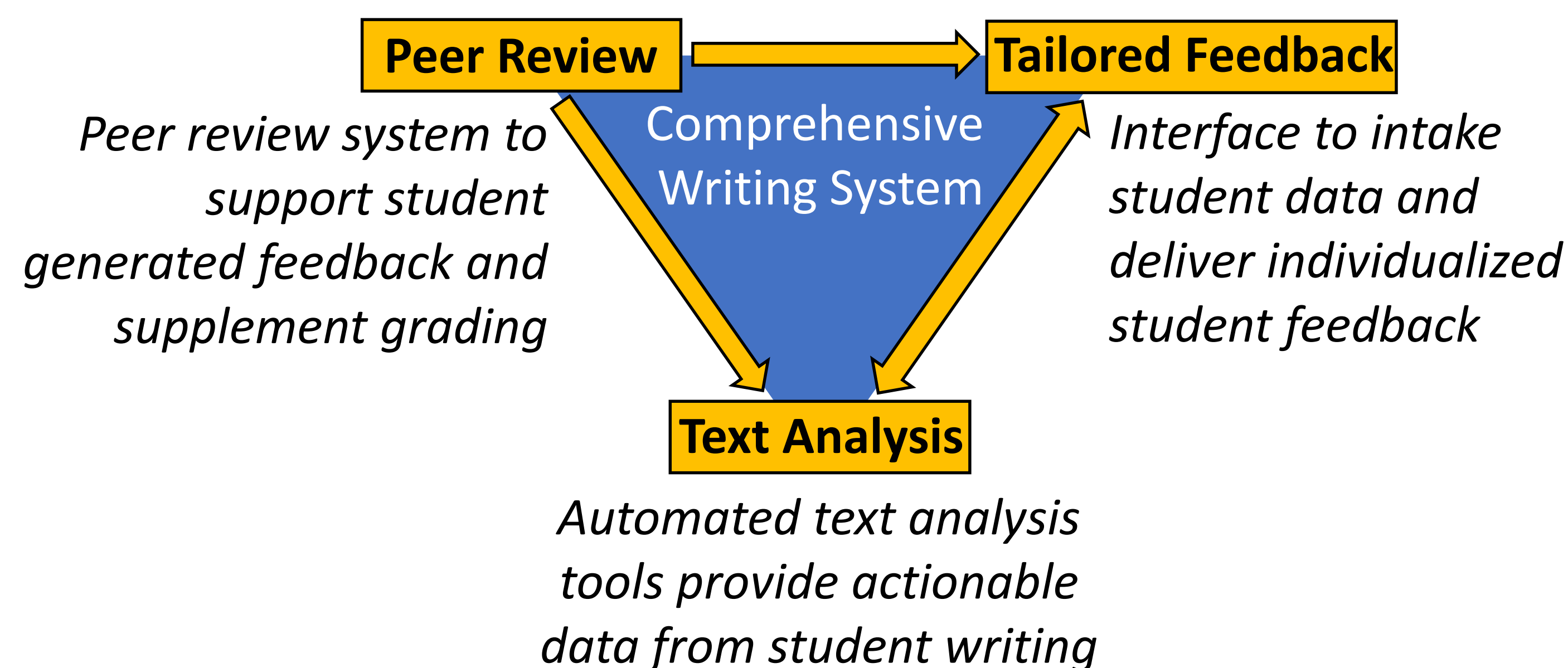
### WTL Phase Diagrams



Callister Jr., W. D.; Rethwisch, D. G. *Materials Science and Engineering: An Introduction*, 9th Ed.; John Wiley & Sons, Inc.: Hoboken, NJ 2014; pgs 302, 315.

## Implementation Scheme



Engage with interested faculty → Recruit writing fellows / Identify difficult content → Train writing fellows / Develop writing prompts → Implement prompts and writing fellows → Assess conceptual learning

## Technology to Support Writing

**Peer Review** — *Peer review system to support student generated feedback and supplement grading*

Comprehensive Writing System

**Tailored Feedback** — *Interface to intake student data and deliver individualized student feedback*

**Text Analysis** — *Automated text analysis tools provide actionable data from student writing*

## National Implementation



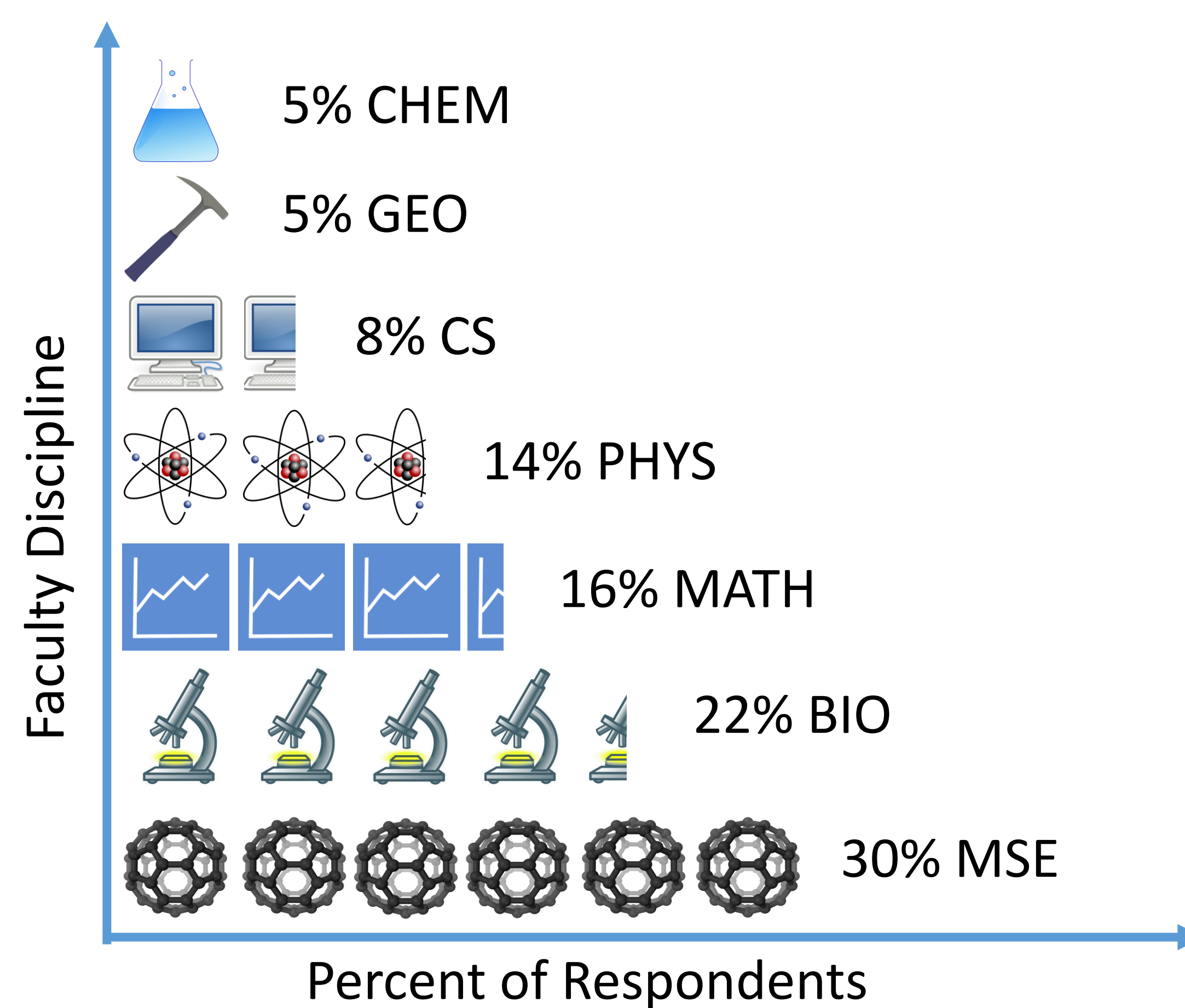Funding Agencies: NSF, Third Century Initiative, W.M. Keck Foundation

Academic Partners: Duke, UMN, UMich, USC

## National STEM Faculty Writing Survey

- A pilot survey was administered to 200 faculty with a response rate of 18.5%
- A full-scale of over 28,000 STEM faculty is ongoing

### Faculty Response by Discipline



- 5% CHEM
- 5% GEO
- 8% CS
- 14% PHYS
- 16% MATH
- 22% BIO
- 30% MSE

*STEM faculty view WTL as effective for:*
- Learning content knowledge
- Promoting critical thinking/scientific reasoning
- Training disciplinary thinking

*Despite the favorable views of WTL only:*
- 62.5% use writing in undergraduate classes
- 67% use technical writing
- 27% use concept-focused writing

*So why aren't they using it?*
- Practical constraints
- Lack of confidence
- Failure of previous attempts

## Acknowledgements