Training Mechanical Engineering GTAs to Effectively Evaluate Writing

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International Writing Across the Curriculum Conference
June 13, 2014

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Session Outline

- Recognizing the Problem (and then doing something about it)
- Theoretical Framework
  - Standpoint Theory (remember that crazy idea from the '90s that the subject being studied just might have something useful to say?)
  - Self-efficacy (Social Cognitive Theory)
  - WAC
- Program Structure
- Results Thus Far
- Where do we go from here?

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Recognizing the Problem

An Uphill Battle

- Three required lab classes (MEEM 2500, 3220, 3000) where students wrote more than two dozen lab reports over three semesters, however:
  - Students often complained about inconsistency in the GTA grading and felt the reports were a "waste of time" for lack of feedback and real learning
  - Faculty often complained that some seniors still didn't know how to write professional prose when they graduated
- Some faculty not initially supportive of doing anything to fix the problem though
  - Non-native English Speaking GTAs not "trainable"
    - Stuck in mindset that teaching writing meant grammar and punctuation

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And doing something about it

Proposing a Solution

- Rather than inject new writing into the curriculum, fix what's there first
- Determine what the GTA's needed to be successful
- Define "successful"
    - More, and more relevant, feedback that helps the students improve technical writing
    - Increased level of confidence in their abilities so the grades they assign are more accurate
- Build a coalition of department administrators, faculty, and experienced GTAs

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Theoretical Framework to Address Issues

Standpoint Theory

- Nancy Hartsock broached the concept of standpoint theory in 1983, arguing that women have different perspectives on economic issues than men because of their unique experiences.
- Sandra Harding extended the theory beyond women and economics to include all those considered "other" in a culture and argued that incorporating perspectives beyond the dominant one strengthens science and, I argue, the academy.
- Applying standpoint theory with GTAs
  - Seek input from experienced GTAs of diverse backgrounds to determine what they believe they need to do their jobs well (training, mentorship, respect!)
  - Continue to solicit their input throughout the semester
  - Implement their suggestions whenever possible

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Self-Efficacy (Social Cognitive Theory)

- Definition
  - "Perceived self-efficacy is concerned with judgments of personal capability ..." (A. Bandura, *Self-Efficacy: The Exercise of Control*, 1997, p. 11)
- Applying it with GTAs ("Self-Efficacy and Work-Related Performance: A Meta Analysis," A. Stijkovic & F. Luthans, 1998, pp. 255-256)
  - Accurately describe the task to be performed
  - Provide training in the technology necessary to perform effectively
  - Eliminate as many distractions as possible
  - Provide support by showing confidence in their ability to perform
  - Provide training in coping strategies for when things get difficult
  - Time training so that it coincides with the task (not too far in advance)
  - Provide clear and objective standards of performance measures

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WAC Theory

- No WAC program at Michigan Tech currently, but the department is committed to the concept that incorporating writing into disciplinary courses is effective at improving retention of course material, not just improving communication ability
- Training sessions modeled on faculty workshops pioneered by Toby Fulwiler and company at Michigan Tech in the late 1970s
  - Discussions about how they feel about writing and what they value in a piece of writing
  - Some discussion about role of writing instruction in a mechanical engineering program (rhetorical, not instrumental approach)
  - Practice evaluating student writing and receive by feedback on their efforts

Program Structure
Keep It Short and Simple

- Key components
  - "A TA's Guide to Teaching Writing in All Disciplines" by Beth Hedengren
  - Developed a set of lab report guidelines (applied to all labs) that explains each section in depth
    - Interesting by-product of this activity was that faculty had to really think about what they wanted their students to learn and do
  - Developed a rubric that corresponded with the guidelines and was customizable to each course
  - Developed a three-session, six-hour intensive training course that all lab GTAs would be required to complete during the first two weeks of class

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Showing GTAs What They Already Know

- Again I use standpoint theory in the sense that I ask the GTAs to put themselves in the shoes of their students. What do they wish their instructors had done when grading their own papers?
- I ask a whole series of questions about technical writing, write their answers on the whiteboard, and watch their amazement grow as they realize just how much they already know about writing.
- This little exercise dramatically boosts their confidence in their ability to evaluate writing.

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Bringing Faculty and GTAs Together

- In about week 5, the lab faculty and GTAs from each course grade the same two mediocre reports (chosen by faculty or lead TA) applicable to their course and we meet to compare results.
  - This "grade-norming" exercise is especially helpful because GTAs see what faculty are looking for from the reports (most faculty grade much more rigorously)
- In about week 10, all of the GTAs and most of the lab faculty meet as one group to discuss issues, share insights, and plan for the future.

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Results Thus Far

GTAs Face Challenges Beyond Language & Experience

- Improved consistency from TA to TA
- Amount and quality of feedback has risen
- Some now "excited" about teaching
- BUT …
- Some still too lax assigning grades below a B because they feel "bad"
- Some GTAs struggle with time management due to uncompromising advisors

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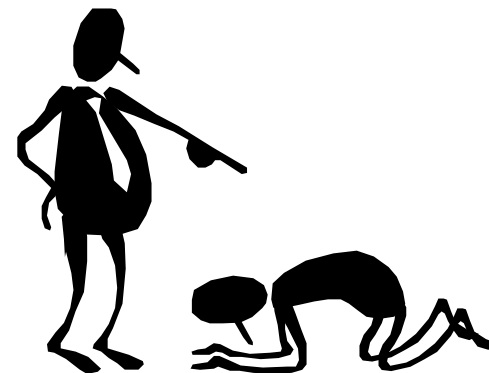
Where do we go from here?

Assessment and Evaluation

- Surveys (7 open-ended questions) of the students in two of the labs show they like the guidelines and rubrics and that they feel most of the GTAs are making an effort to provide effective feedback that helps them improve their writing.
- Assessment of student writing scheduled following the spring 2015 semester, using an empirical approach (Lauer & Asher, 1988)
- Transitioning to new curriculum where lab courses and one design course will be replaced with ME Practice four-course sequence
  - Faculty on board with requiring the GTAs to complete the training!

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Testing the Model Elsewhere

- This model is not resource intensive.
  - Developing the guidelines and rubrics took about 10 hours for the administrator and 4-5 hours for each faculty member and the two lead GTAs.
  - Actually administering the training sessions and follow-up takes about 15 hours each semester
  - 12 used copies of Hedengren's book cost about $35
    - Faculty bought their own copies

What would I like you to remember from this session and share with disciplinary faculty?

Engineering graduate students for whom English is not their first language ARE quite capable of evaluating student writing! Like everyone else, they simply need training and mentorship to be effective.

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