

WANT TO IMPROVE UNDERGRADUATE THESIS WRITING?

ENGAGE STUDENTS AND FACULTY IN SCIENTIFIC PEER REVIEW

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Two models for mentoring writers

- One-on-one
 - Pros
 - Personalized attention
 - Light load for faculty
 - Cons
 - Overzealous faculty
 - Overextended faculty
- Course
 - Pros
 - Conventions of sci. writing
 - Course structure
 - Reader expectation theory
 - Cons
 - Difficult to fit in schedules
 - (Difficult to staff)



WHICH APPROACH PROMOTES BETTER WRITING AND CRITICAL THINKING SKILLS?

Literature review

- Undergraduate Research Experiences
- Writing-to-learn

Writing-To-Learn in Undergraduate Science, Technology, Engineering, and Mathematics (STEM) Education: A “bottom-up” approach to developing and adopting effective practices

Julie Reynolds, Chris Thaiss, Robert Thompson & Wendy Katkin
(in review)

	Biology/ Life Sciences	Chemistry	Engineering	Math/Computer Science/ Statistics	Physics/ Earth Sciences
Content knowledge					
Conceptual understanding					
Scientific method					
Critical thinking					
Effective communication					
Metacognition					
Professionalization					

	Biology/ Life Sciences	Chemistry	Engineering	Math/Computer Science/ Statistics	Physics/ Earth Sciences
Content knowledge	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone
Conceptual understanding	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone
Scientific method	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone
Critical thinking	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone
Effective communication	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone
Metacognition	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone
Professionalization	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone	Intro Advanced Capstone

Two models for mentoring writers



Methods: Discourse analysis

- Trained raters
- BioTAP rubric
- course = 47, no course = 143
- IRR = moderate to strong

Reynolds et al, 2009. BioTAP: A Systematic Approach to Teaching Scientific Writing and Evaluating Undergraduate Theses *BioScience* 59(10): 896-903

Comparison groups

- Self-selected groups
 - H1: no difference between the two groups based on gender or ethnicity
 - Hispanics were significantly more likely to enroll in the course than non-Hispanics (2x2 Chi-squared tests, $p=0.01$)
 - H2: no difference between students' writing scores based on ethnicity
 - Distribution of Hispanic students' writing scores was not significantly different from the rest of the student population ($p = 0.11$).
- IRB approval

