

HOW ARE THE GEOSCIENCES DOING?

Teaching in the discipline

ON THE CUTTING EDGE PD PROGRAM

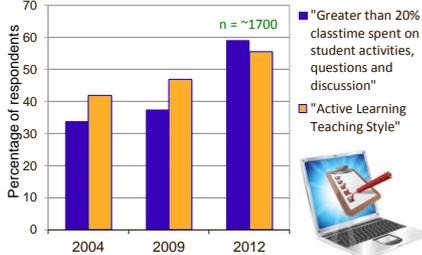


<http://serc.carleton.edu/NAGTWorkshops/index.html>

- 12+ year professional development program
- 118 workshops/events
- Attended by 1800 geoscience faculty, 600 graduate students/post-docs
- Three national surveys (2004, 2009, 2012)

ON THE CUTTING EDGE PD PROGRAM

- Active learning becoming more common in geoscience classrooms



■ "Greater than 20% classtime spent on student activities, questions and discussion"
■ "Active Learning Teaching Style"

MEASURING TEACHING PRACTICES

Reformed Teaching Observation Protocol¹

- Describes teaching process on five subscales
 - Lesson Design by instructor
 - Propositional knowledge of instructor
 - Procedural Knowledge (what students do)
 - Student-Student Interactions
 - Student-Teacher Interactions
- Five statements per subscale

18) There was a high proportion of student talk and a significant amount of it occurred between and among students (quantity of interactions)

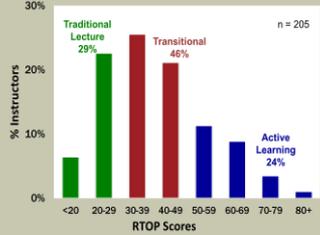
No student-student talk 0	Students talk to each other at least once (about lesson content) 1	Student-student talk occurs at least 10% of the time during the course of the class 2	Student-student talk occurs more than 25% of the time during the course of the class 3	In any given moment during the lesson, students are more likely to be talking to each other than the teacher (>50% student to student) 4
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¹Sawada et al., 2002; MacIsaac and Falconer, 2002; Budd et al., 2013

MEASURING TEACHING PRACTICES

Reformed Teaching Observation Protocol

- Describes teaching process on five subscales
- Maximum score = 100 (25 x 4)
- Typical scores range from 20-80
- Reformed classrooms featuring more active learning practices have higher RTOP scores¹



n = 205

¹Sawada et al., 2002; MacIsaac and Falconer, 2002; Budd et al., 2013

OBSERVED TEACHING PRACTICES

	Most Traditional Lecture n=10	Mean Traditional Lecture n=10	Mean Transitional Lecture n=22	Mean Active Learning n=12	Most Active Learning n=11
No/few questions asked by instructor	50%	27%	0%	0%	0%
No/few questions from students	60%	36%	9%	0%	0%
Students are passive/not asked to do anything	70%	36%	4%	0%	0%
No student-student interaction/conversation	70%	80%	32%	0%	0%
Student-student interactions or group work	0%	9%	59%	100%	91%
Students read graphs, maps, use data	20%	27%	27%	67%	45%
Students answer open-ended questions	0%	0%	4%	17%	45%
Instructor assesses students (new or prior knowledge)	10%	18%	18%	33%	45%
Lesson adjustments based on student work or prior knowledge	0%	0%	9%	33%	54%

From Teasdale, R., presentation

Predict Variations in Teaching Practices

We have been using the Reformed Teaching Observation Protocol (RTOP) to measure teaching practices of more than 200 instructors in a variety of undergraduate geoscience classes at a range of US colleges and universities.

Complete the survey that follows to make some predictions about what you think we might have discovered.

NC STATE UNIVERSITY

Predict Variations in Teaching Practices

1. RTOP scores varied with the class size **True** **False**
2. RTOP scores varied between introductory and majors courses. **True** **False**
3. RTOP scores varied among different types of academic institutions **True** **False**
4. RTOP scores for full professors were higher than those for assistant professors **True** **False**
5. RTOP scores were higher for instructors who had participated in significant professional development. **True** **False**

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OTCE PARTICIPATION VS. RTOP SCORES

How did participation in On the Cutting Edge events and use of web resources impact teaching practice?

Cutting Edge Participation: Total RTOP Scores

