

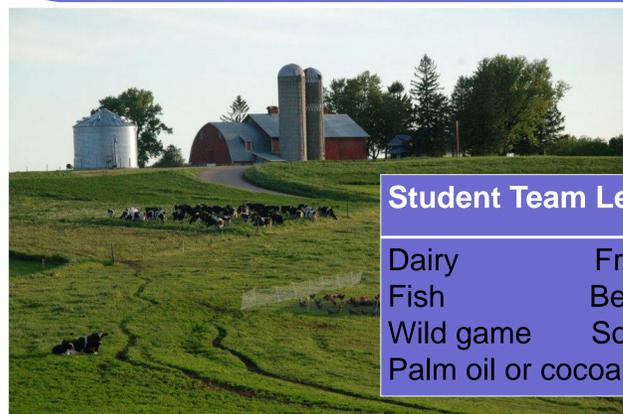
# Student Learning Gains from Peer Lectures versus Instructor Lectures

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## Teaching & Learning Questions

1. How much do students learn when their peers present interactive lectures in comparison to when an instructor presents interactive lectures?
2. What forms of teaching do students prefer and find most effective?
3. How do interactive activities affect student learning?
4. How does student interest in topics change as a result of the lessons?



Student Team Lectures		Instructor Lectures
Dairy	Fruit	Vegetables
Fish	Beverages	Shellfish
Wild game	Soy/ tofu	Nuts
Palm oil or cocoa		Rice or grains

## Course & Assignment Context

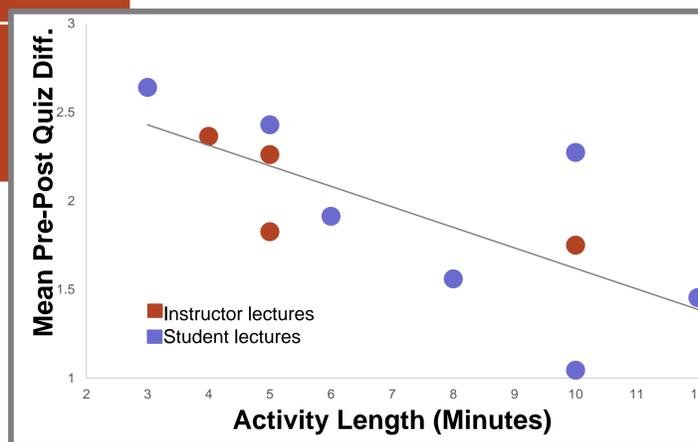
- A junior-level Environmental Studies topics course: "The Environment and Food Systems": 25 students
- A learning goal was "Describe key effects of obtaining a variety of foods on wild populations, soils, climate, water quality, water quantity, and social justice."
- Groups of 3-4 students assigned a topic based on preferences
- Team presentations: 25-35 minutes, including an activity for class involvement and optional video
- Structure of the assignment included:
  - ✓ Detailed scoring rubric and activity suggestions
  - ✓ Annotated bibliography
  - ✓ Presentation outline
  - ✓ Instructor meeting during class work time
  - ✓ Sample presentations from the instructor
  - ✓ Peer evaluation through CATME.org



## Pre- & Post- Instruction Quizzes

Learning gains for each student were compared using the same scoring rubric for the pre- and post-tests. The same short-answer question was asked for each topic presentation: "Briefly describe environmental effects of producing and obtaining this type of food."

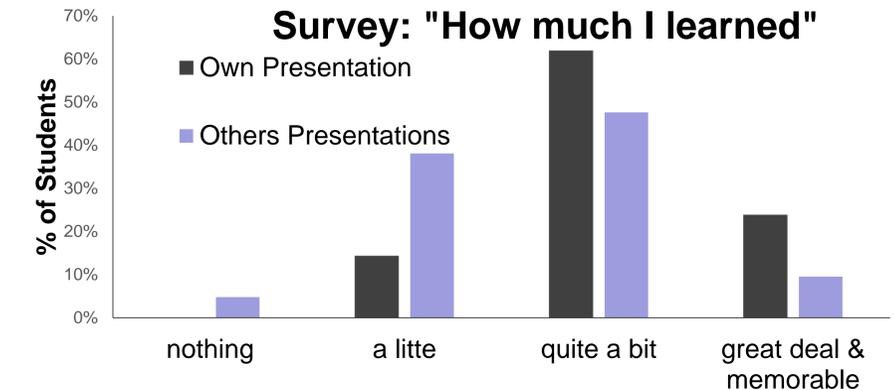
- Average scores were 1.96 points higher on the post-instruction quiz than the pre-instruction quiz (5- point scale; SD = 1.23, n = 248).
- There was **no difference in mean learning gains when students presented versus the instructor** (two-way ANOVA  $p > 0.05$ ), and also no significant effect of the interaction term (presenter x student).



- A simple linear regression was calculated to predict quiz gains based on length of activity within the presentations. A significant negative relationship was found ( $F(1,9)=9.66$ ,  $p=0.01$ ), with an  $R^2$  of 0.52.
- Total presentation length, sequence, and score did not significantly affect mean quiz gains.

## Acknowledgements

The Wisconsin Teaching Scholars program through the UW System Office of Professional and Instructional Development (OPID) made this work possible.



## Pre- and Post-Instruction Surveys

- "How often have you thought about the effects of producing and obtaining [each food type] outside of your work for this class?" Using a Likert scale of 0-4, the average difference was  $> 1$  for half of the food topics, suggesting increased application of the class content. This was not affected by student vs. instructor presentations.
- For all topics combined, the average Likert score increased from 1.5 to 2.5 over the semester.

Learning format	Preferred	Most effective
Tour or lecture by guest	1	1
Interactive lecture by instructor	2	1
Watching documentary film	3	3
Interactive lecture by students	4	6
Discussion	5	5
Reading	6	4

## Conclusions

- Students preferred instructor lectures to peer lectures and reported instructor lectures to be more effective. However, quiz scores showed equal learning and interest between these formats.
- Learning gains declined as class activity length increased, possibly due to less content coverage and distraction from main ideas.