**Getting the Sage off the Stage: A New Interactive Course in Radiative Transfer**

**BACKGROUND**

**Missed Opportunity:**
Despite coveted small class sizes, my graduate courses follow the “sage on the stage” model, with moderate in-class interaction.

**Old Instructional Model:**
- Lecture
- Worked Examples
- Discussion
- Passive
- Active

Learning outcomes drive:
- Content (not the text)
- Activities (in and out of class)
- Assessment

**New Instructional Model:**
- Lecture
- Worked Examples
- Discussion
- Group Work
- Individual Work
- Lab Work
- Passive
- Active
- Constructive
- Interactive

**WHAT IS CHANGING**

**New Instructional Model:**
- Lecture
- Worked Examples
- Discussion
- Group Work
- Individual Work
- Lab Work
- Passive
- Active
- Constructive
- Interactive

**INTENDED OUTCOMES**

**Improved retention of information** through more in-class interaction.

Application of in-class instruction in **labs and student projects**

Motivating content through **real-world examples**

Peer-to-peer interaction in **small group projects/discussions**

**Learning outcomes drive:**
- Content (not the text)
- Activities (in and out of class)
- Assessment

**Example in-class activity:**

**Modeling Global Warming**

- Activity type: group work & discussion

**Learning outcome:**
- Demonstrate absorption, emission, scattering, and wavelength dependence of radiation

**Within the group:**
- Diagram how global warming works

**Group share:**
- Identify major factors in global warming

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**Jason Porter** is an associate professor of mechanical engineering and has been teaching at Mines since 2010. Jason teaches undergraduate heat transfer and has developed two new courses at the graduate level: Advanced Heat Transfer and Radiative Transfer. Jason’s research interests are in developing optical diagnostics for fundamental study and efficient control of energy systems.