

Renee Michelle Goertzen
Rachel E. Scherr

New Faculty Workshop
June 23, 2015



Periscope

Looking into learning
in best-practices physics classrooms



Engaging the culture, changing the world®
Seattle Pacific
UNIVERSITY



PhysPort.org



Supported in part by
NSF Grant No. 1323699

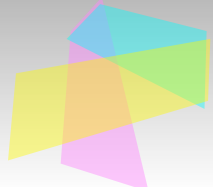


Periscope: Looking into learning

Lessons centered on **video episodes** from best-practices physics classrooms, to help instructors:

- ✦ enrich their experience with **noticing and interpreting student behavior** and
- ✦ practice **applying lessons learned about teaching to actual teaching situations**

Primary aim: To help instructors **see** authentic teaching events the way an expert educator does – to develop their “professional vision” (Goodwin, 1994).



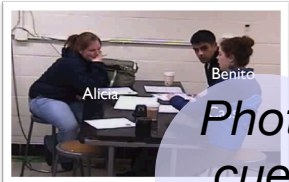
One-page handout

Topic for all of us

How can I facilitate students working well in groups?

Group work is an important part of many physics classes. As instructors we may be hoping that during group work students will validate each other's correct ideas, refute each other's incorrect ideas, raise important questions, and generally provide each other with a safe and productive mini-environment for learning. However, it's hard to know whether groups are really accomplishing these things, especially when we're not there. How can we facilitate students working well in groups?

This episode shows a group of students in tutorial who are discussing the distribution of a force over a surface. The questions below are about what they are doing in this discussion, what supports them in having a good discussion, and what instructors can do to promote productive group work.



Episode: "Soft bed"

Photo cues video

Task reproduced from exemplary materials

(from Open Source Tutorials in Physics Sense-Making)

- A. A bed of nails is not especially comfortable. However, it's a lot more comfortable than draping your body over a bed of pins. Explain why this is, especially since the force involved (your weight) is the same.
- B. Lying on the floor is even more comfortable than lying on a bed of nails. Why? Draw a diagram to explain your answer.
- C. Lying on a soft bed is the most comfortable of all. Why is it more comfortable than the floor? Again, draw a diagram to explain this phenomenon.

1. (Task design) The instructional format for the class represented in the episode depends on students engaging productively with one another. What features of the task help them to do so?
2. (Group dynamics) Does the discussion in this episode appear to be generative, in the sense that new ideas emerge? Or does it seem to be more of a case of one student teaching something to another? What does your observation imply about how best to organize students into groups?
3. (Group dynamics) Do you get the sense that one student knows more physics than the others? If so, does this hinder the discussion, help the discussion, or neither? Does your answer have implications for organizing students into groups?

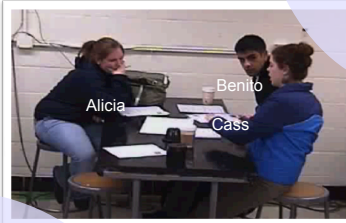
Discussion questions highlight theme

Collaborative learning, nonverbal communication, task design, forces, tutorials



Episode: "Soft bed"

- 1 Benito: Why, because of the springs? I don't know.
- 2 Alicia: Because there's a nice cushiony softness. Or in the case of my bed, there's memory foam. I guess there is-
- 3 Cass: Maybe it's cause of the force.
- 4 Alicia: There's force, cause the cushion of the bed is less force than the, or is it?
- 5 Cass: Cause, yeah, cause it sinks in so the force is less?
- 6 Alicia: Yeah, yeah...the exerting force.
- 7 Cass: I guess you, there's more of the bed
- 8 Alicia: Well it has to do with density
- 9 Cass: Well, it's greater area, cause more of the bed, more of the, your surface is on the bed, you know what I mean?
- 10 Alicia: Well not necessarily, I mean if you lay on the
- 11 Cass: Because if you are like on top of it, or if you're like sunken into it
- 12 Alicia: Well I'm thinking like density, like the density of the bed is a lot less than the floor.
- 13 Cass: But this doesn't have anything to do with density
- 14 Benito: No, like even when you're laying on the floor, not every single part of your body touching the
- 15 Cass: Right, but if you have a mattress that like
- 16 Alicia: So more of your body surface area is in contact with the bed than the floor?
- 17 Cass: Yeah.

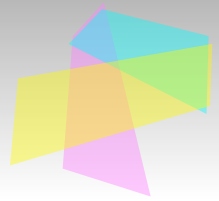


Filmed at University of Maryland - College Park

Line-numbered transcript supports detailed discussion

Editable: users may change anything they want



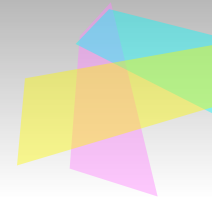


Context: Tutorials in an introductory course

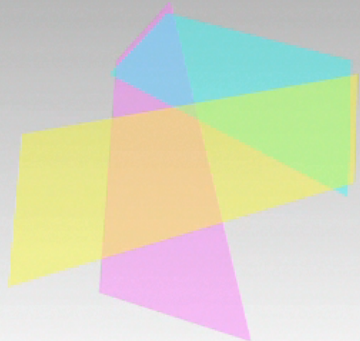
Video removed from slides.

The videos are all available at:

[https://www.physport.org/
periscope/](https://www.physport.org/periscope/)



What instructor behaviors facilitate student learning?



Periscope

Looking into learning

in best-practices physics classrooms

physport.org/periscope

Episode 101: “Depth”

*Filmed at the University of Maryland
using Open Source Tutorials*



Supported in part by
NSF Grant No. 1323699

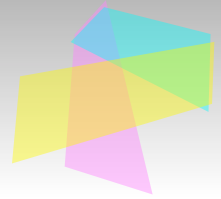


Periscope has many uses

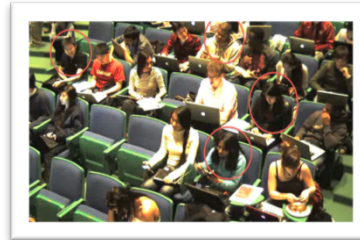
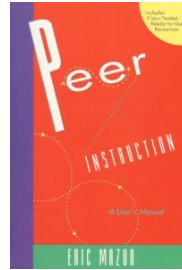
Use Periscope if you want to:

- Lead a weekly seminar on physics teaching and learning for TAs/LAs
- Share best practices in physics instruction with other faculty
- Prepare other faculty to train TAs/LAs
- Teach TAs/LAs what ideas students have about a particular physics topic
- ...

Videos of exemplary instruction



 UNIVERSITY OF MARYLAND

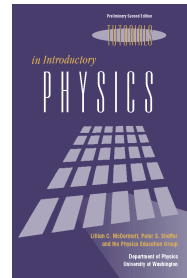


 HARVARD UNIVERSITY

 FLORIDA INTERNATIONAL UNIVERSITY

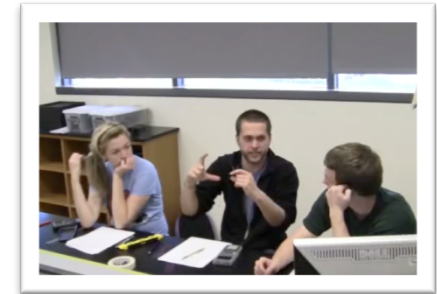


CHICAGO STATE UNIVERSITY



 Engaging the culture, changing the world®
Seattle Pacific UNIVERSITY

 WESTERN WASHINGTON UNIVERSITY



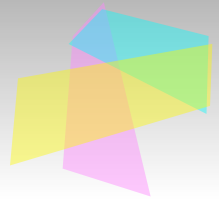
 University of Colorado **Boulder**



Lesson topics

- ▶ What ideas do students have about (energy, forces, circuits, etc) and how do I address them?
- ▶ How can I best facilitate a student discussion?
- ▶ How do I bring out students' physics ideas?
- ▶ When is it okay to leave students with the wrong answer?
- ▶ Does it matter if students are unhappy in my class?
- ▶ How can I assess students in a class emphasizing group work?
- ▶ What instructor behaviors facilitate student learning?
- ▶ How can I support underrepresented groups in succeeding in my class?
- ▶ How can I arrange my classroom physically to facilitate student learning?
- ▶ What kinds of tasks help students work together constructively?
- ▶ What is there to learn from students who don't talk much?

Seeing like an expert educator

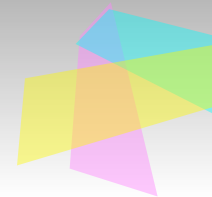


All university and college instructors need opportunities to **observe, discuss, and reflect on** teaching situations similar to the ones they themselves face

in order to learn to **see** students' ideas, questions, expectations, gestures, engagement, progress, and so on



Particularly critical in an interactive classroom, in which instructors are expected to respond to students' ideas and interactions as they unfold moment to moment.



Benefits of video

- ✦ **Feeling like you are really there** gives insight into what happened and why
- ✦ **Watching with others** reveals both unique and universal interpretations of the *same* events
- ✦ **Watching repeatedly** supports testing intuitions against evidence
- ✦ Discussion reveals the **principles and values** that motivate instructor and student behavior
- ✦ **Diverse, intimate examples** of what reform teaching really looks like

Workshops » Periscope

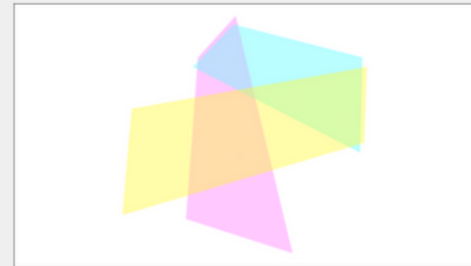
Periscope: Looking into Learning

What is Periscope?

A collection of lessons for faculty and LAs/TAs to:

- watch and discuss videos of best-practices physics classrooms
- apply lessons learned to actual teaching situations
- practice interpreting student behavior
- become more effective teachers

For details on how to implement Periscope lessons, see the [Periscope Facilitator's Guide](#).



1



Watch classroom
video

2



Discuss in
small groups

3



Discuss with
whole class

What do you want to do?

I want to lead a weekly
seminar on physics
teaching and learning
for TAs/LAs

I want to lead a half-
day workshop for
physics TAs/LAs

I want to share best
practices in physics
instruction with other
faculty



Questions?

Want to beta test Periscope's new website?

(Open to people running workshops for LAs, TAs, or faculty, or those browsing for their own curiosity.)

Contact Stephanie@sciencegeekgirl.com. All interviews last one hour, and will take place the week of July 13.