Researching ourselves: How are we helping faculty to change their teaching?

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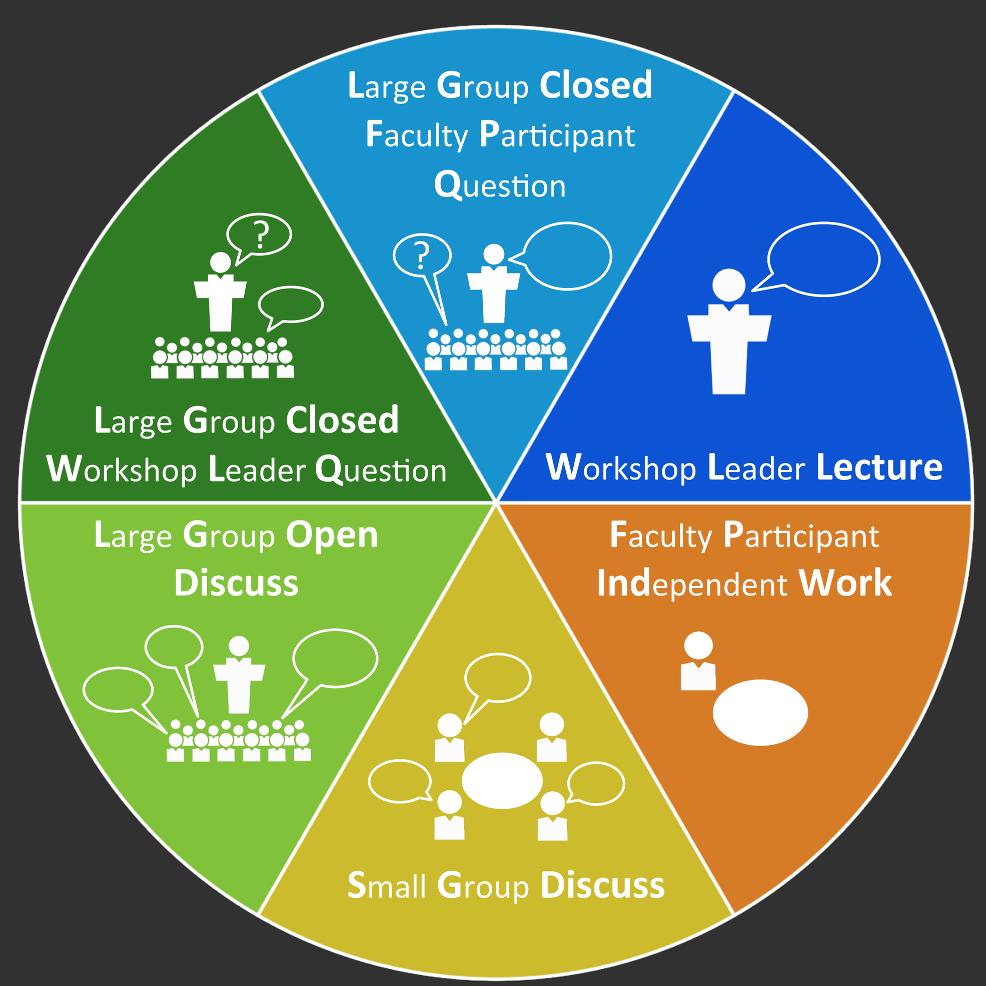
Abstract

Professional development workshops like the the Physics and Astronomy New Faculty Workshop (NFW) serve a critical role within our community and are commonly used to promote the adoption and adaption of research-based instructional strategies. After attending the NFW, faculty are often motivated to modify and adapt these strategies within their classrooms, but may be underprepared to do so in ways likely to achieve the positive student outcomes the designers were able to foster [1]. We study the NFW using a real-time professional development observation tool and case study analysis. We show how the tool allows workshop leaders to assess the prevalence of lecture and what goals could plausibly be met through their workshop design. We also analyze faculty engaging in a task as physics students, and find that their interactions poorly represent what we would like them to foster in their own classrooms. This suggests that if faculty are to learn to better facilitate group work based on these experiences, which we consider a worthwhile goal, guided reflection may be necessary.

How are faculty engaged?

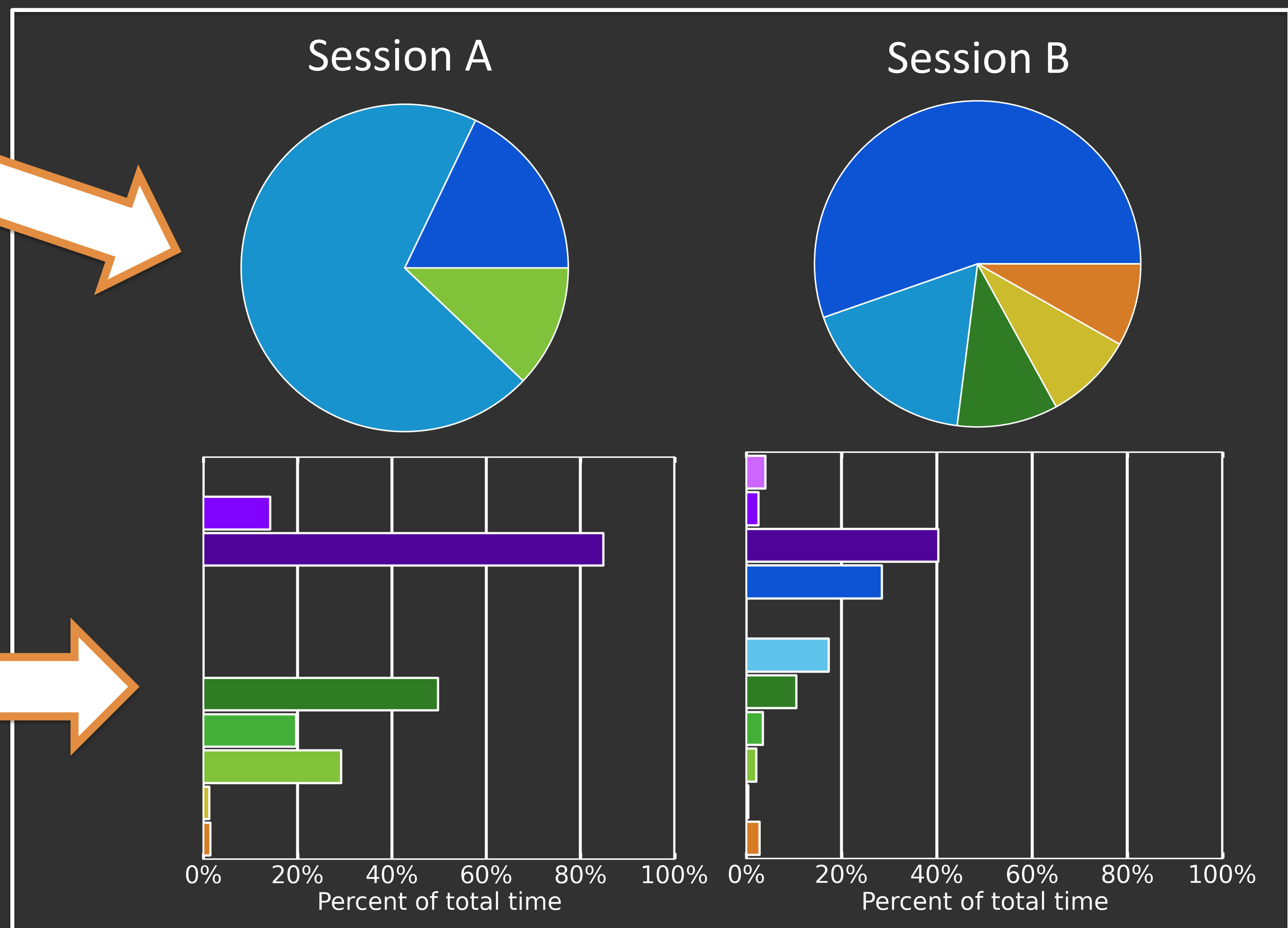


What's the focus?

- Workshop Leader Instructions
- Understanding Discipline-Based Education Research
- Awareness of Instructional Strategies
- Workshop Leader Simulating Instructional Strategy
- Faculty Participant Simulating Instructional Strategy
- Critiquing Simulated Instructional Strategy
- Workshop Leader Pre-Workshop Experiences
- Faculty Participant Pre-Workshop Experiences
- Student Experiences
- Understanding Science
- Critiquing Student Tasks

The Real-time Professional Development Observation Tool (R-PDOT)

The Real-time Professional Development Observation Tool (R-PDOT) will allow an observer to collect non-evaluative, quantitative data about what faculty participants experience during these workshops. Its purpose is to support critical reflection on workshop design and implementation. An observer can simultaneously record two aspects of workshop sessions—the ways in which faculty participants are engaged (top) and the focus of their engagement (bottom)—using two sets of codes. The first set is modeled after existing classroom observation tools [2-3]; the second draws from promising professional development practices reported in the K-12 literature [4] and our prior observations.

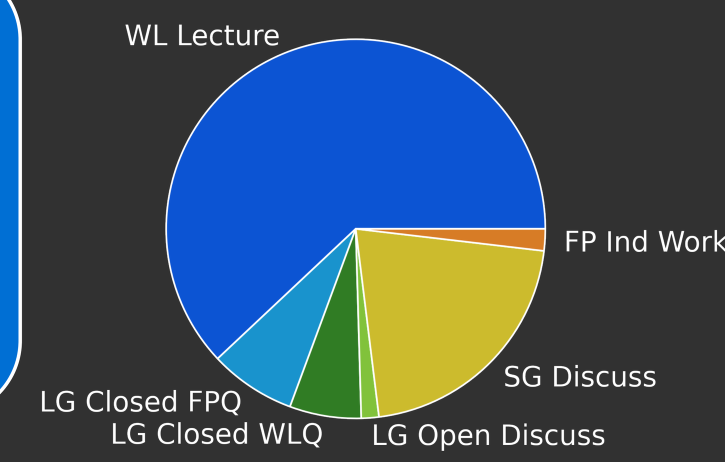


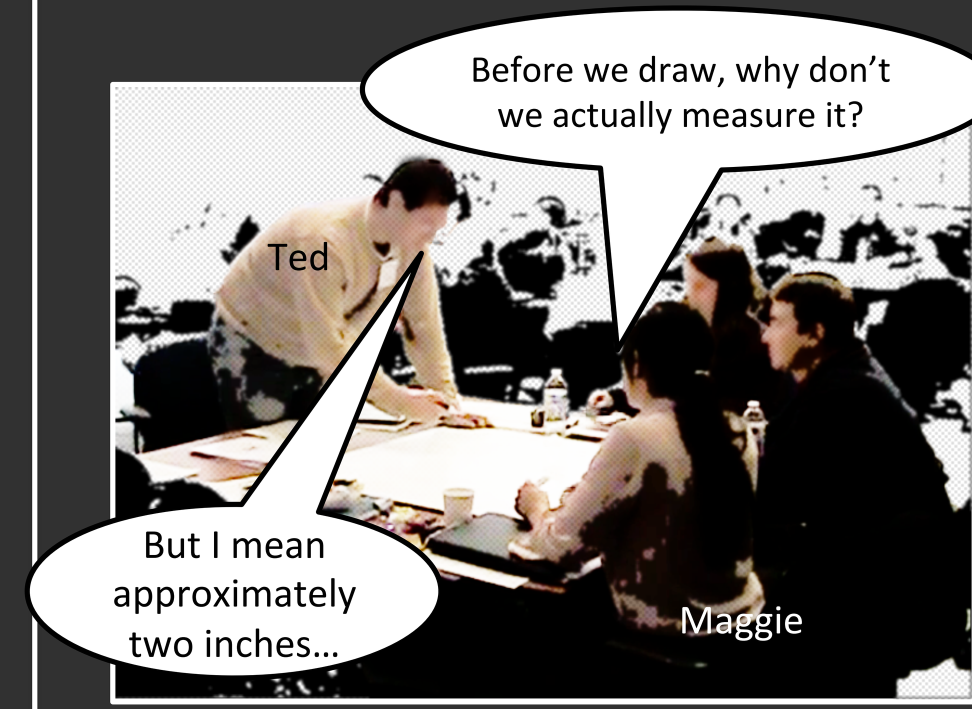
R-PDOT implications

While Session A is primarily driven by faculty's questions and Session B is more planned, a workshop leader disseminates ideas for the majority of both. Session A is focused on awareness of instructional strategies and past experiences, particularly those of the workshop leader. This session might motivate faculty to try new teaching strategies if the workshop leader's message aligns well with faculty's prior experiences and concerns. In Session B, about half the time is spent with the workshop leader modeling and critiquing the implementation of instructional strategies. This session may help faculty to reflect on their own instruction and envision strategy implementation in more concrete ways.

A case study of faculty doing school

We use R-PDOT data to select a 9-minute period of small group discussion, during which time faculty act as physics students (*WL simulating IS*), to analyze in detail. As the episode begins, faculty are instructed to quickly draw a 7 x 7 grid of points on the whiteboard, spaced approximately 2 inches apart.





Maggie and Ted take up competing aspects of the instructions, accuracy versus speed. They do not offer any justification for their arguments and treat the whiteboard as a contested territory, both of which are markers of low coordination in group work [5].

As faculty debate between accuracy and speed, the workshop leader walks over and effectively discards Maggie's approach, quickly drawing dots on their whiteboard. Ted vies for the workshop leader's approval, claiming "That's what I was gonna do until... (pointing towards his group)", but gets no response.

Later on, Ted writes equations as others watch.

Ted's above behaviors towards the workshop leader suggest he is "doing school": trying to appease an authority and to set himself apart from his peers [6]. At left, Ted pursues his own ideas as the task becomes more challenging.

Case study implications

Pseudo-student experiences could act as a mechanism by which faculty improve their understanding of how to facilitate group work, a central component of active learning. Our data reveal that this is not guaranteed: these faculty struggle to collaborate and would likely need additional guidance to learn to guide students well through similar activities. While more work is still needed to understand how this and other professional development practices contribute to faculty's learning about teaching, this kind of analysis paired with R-PDOT data lends actionable insight into how to improve the design of professional development workshops.

References

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