

The value of peer discussions in teaching and learning physics

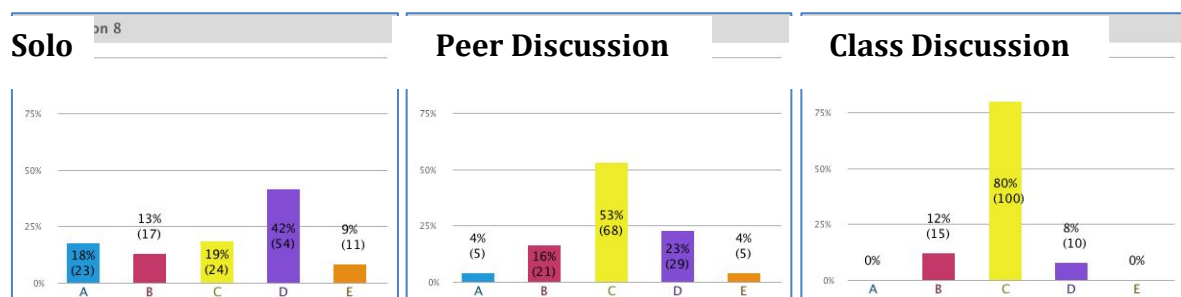
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We, as physicists, exchange ideas, discuss our experimental set ups, and challenge ourselves to put together new information to improve our own research. Yet as instructors of university level physics, we often hold a frontal monologue. Why do we not discuss our teaching practices, share our best materials, or challenge ourselves to teach using evidence-based methods?

Indeed, there is plenty of evidence from research in physics education and cognitive science describing how active methods have been shown to increase university student learning (1). Such active learning requires not only students to do different things during (synchronous) class time, but it also challenges instructors to change their role from less of a ‘sage on stage’ and to more of a ‘guide at the side’.

To facilitate this shift, I initiated a series of Open Dialogue meetings aimed at getting students and instructors together to discuss their own teaching and learning experiences within the department. These discussions led to a re-structuring of the tutorial sessions. The new format creates a learning space for students to work in small groups, discuss conceptual issues with each other and work together on strategies to solve presence tasks and homework; the analysis of the opportunities and challenges of the new tutorial structure were presented in a masters’ thesis (2).

In the first part of the colloquium, I will describe some examples of active learning techniques and research findings about the value of peer discussions - from both abroad and within the department – in learning physics. Then in the second part of the colloquium, similar to how students learn through discussion, I invite you to join in peer-to-peer discussions about your own teaching and learning.



(1) Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, 111(23), 8410-8415.

(2) Rogge, I. (2020) Chancen und Risiken der Einführung von Übungen mit dreiphasigem Ablauf einschließlich Gruppenarbeitsphasen in der Anfangsphase des Monobachelors Physik an der Freien Universität Berlin (Masterarbeit)