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**A Deliberate Practice Instructional Approach for Upper Division Physics Courses**[1]

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In upper division physics courses, an overarching educational goal is to have students think about and use the material much as a practicing physicist in the field does. Specifically, this would include knowledge (such as concepts, formalism, and instruments), approaches, and metacognitive skills that physicists use in solving "typical" (research context) problems to both understand and predict physical observations and accompanying models. Using an interactive instructional approach known as deliberate practice (described earlier in this session) we will discuss our work on how to provide students with the necessary practice and feedback to achieve these skills in a core DAMOP course of modern optics. We present the results of a direct and explicit comparison between this approach and traditional lecture-based instruction revealing evidence that a significant improvement of the students' mastery of these skills occurs when deliberate practice is employed.

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