For almost 1,000 years, lecture has been the predominant form of teaching. There has been increasing pressure to abandon lecturing and instead use more active learning strategies. An unfortunate outcome is that didactic lecture remains the dominant form of teaching in undergraduate STEM courses. This situation has critically impeded the adoption of active learning strategies that would likely have promoted student learning beyond where it is today. The primary position of this point of view article is to discuss a structure for dissecting the teaching reform into incremental pathways that can be applied to instructional decisions. 

Accepting that faculty are comfortable in lectures, it may be impractical to abandon lecture and embrace fully student-centered active learning. We should move beyond the dichotomy classification of lecture and active learning, and advance the teaching reform by taking incremental pathways. Undemanding changes in the lecture can initiate the process of developing a more active learning environment by constructing “interactive lecture”: lecturing plays as the primary mode, supplemented by active learning, such as occasional interactive quizzes or conceptual questions (Stains et al., 2018). When we see that interactive lecture becomes more prevalent in STEM classrooms, strategies for engendering a more active approach to existing didactic sessions can be incorporated in “active lecture” such as increased instructor–student interactions, group collaborations, engagement in discussions, and reflection on learning. The first two incremental pathways maintain the lecture’s role of prominence, but both effectively create moments where students are actively engaged. 

The next incremental stage is “quasi-student-centered active learning,” where active learning serves as the primary role and supplemented by lectures: didactic lecture sessions are used as an effective tool to contextualize content and explain difficult concepts, followed by student-centered active learning strategies with time devoted to discussion, group work,
and problem-solving. Future pedagogical work will include exploring different styles of active learning, as well as different frameworks for how knowledge is constructed by the new generation of students.

As faculty begin the work of transforming passive lecturing into active learning experiences, the incremental pathways may facilitate the teaching reform to promote active learning in college STEM classrooms. While not a panacea, these paths could be a beginning for faculty to explore the idea of active learning in their classrooms and create a caring environment to enhance student engagement.

Given the national calls to implement more active learning in college STEM classrooms, this point of view article discusses a structure for dissecting the teaching reform into incremental pathways that can be applied to instructional decisions. It provides a framework for future research on what faculty do to incrementally promote active learning in college STEM classrooms and increase awareness and use of active learning pedagogical practices amongst multi-disciplinary groups of STEM faculty, contributing an overall improvement in teaching reform for better educational outcomes.

References

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