Active Learning Strategies that Transcend Physical Space: Lessons from Across Disciplines

In this panel, we shared several tips and techniques for active learning in the online educational space. The focus was on student engagement within three online teaching modalities: Face to Face, Online Synchronous, and Online Asynchronous. Each are presented using active learning.

A key motivation for active learning in classes is to encourage student participation across the entire gamut of intellectual facets of the course. One such model for this is based around cognitive apprenticeship[1], which builds activities towards problem solving with reinforcement by coaching. The goal is to introduce each new topic with the context surrounding it, instead of the topic itself. This can be achieved through the use of a blank slate approach, where the professor can begin by narrating their thought process as they think about a larger goal. Students may then be invited to join in exploring this context, simply by asking leading questions. All contributions must be welcomed and probed to see how they fit into the larger problem and if there are any additional considerations to be made. By the end of the exercise, the students have derived the topics we'll be studying in the new unit. Following the material from that unit, the professor can discuss how their ideas paralleled the actual designs of the experts, which brings about a greater understanding of the problem space, while allowing students to both observe and participate in a scaffolded design process.

Within the Face to Face modality, we engage students directly with activities that take advantage of the available space. Given adequate measure for distancing in these pandemic conditions, whiteboards may still be utilized to great extent if available in the space. One advantage to individual or group spaces on whiteboards is that students can see other approaches or solutions to the same problem, reinforcing a community of solutions. Think/Pair/Share style activities work very well even in environments wherein students may not be able to physically co-locate; students can discuss the salient points of a topic even at a safe distance in chairs. Problem solving techniques may also take place across the entire space, enabling the entire class to become involved.

With the Online Synchronous modality, one of the key factors is a well-structured process, framed by semester calendar, broken down by weekly topics for lectures, quizzes, recitations, and projects. This enables students to stay on track, even in the presence of life events that may take them out of the scheduled class sessions. As a sample of routine scheduling, we can publish material broken down into weekly folders, for easier tracking of the topics by students. Within these folders students can find the slides, documents or examples, worksheets, and other ancillary materials for that week. The lectures then are conducted live in an active learning style for the students. Following lectures, low-stakes, formative tasks can be given in the form of recitations, questions added to a living sample test, or quizzes, with each reinforcing the topics. Larger summative assessments would then follow.

The ultimate goal is to get students engaged in the learning process by thinking outside of the questions themselves and to become invested in the problem solving process around each topic. This brings about higher cognitive-order tasks, such as analysis and evaluation of the material and techniques. It is also critical, especially during this time of the pandemic, to recognize students are

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[1] Collins, A., Brown, J. S., & Newman, S. E. (1989). *Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics.* In L. B. Resnick (Ed.), *Knowing, learning, and instruction: Essays in honor of Robert Glaser* (p. 453–494). Lawrence Erlbaum Associates, Inc.

on-edge and do need more structure. Tools, such as a Professor's Task Board webpage, can be used as a way to reduce some of the omnipresent anxiety that this new normal brings.