

The Value of Video Homework Solutions vs. Recitation Sessions

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Many universities use recitation sessions to augment lectures in math, science, and engineering disciplines. Recitation sessions are typically small group sessions where a teaching assistant solves additional problems and can answer students' questions. There are several issues surrounding recitation sessions particularly at a large comprehensive public university. First, the costs of running multiple recitation sessions can be prohibitive. Second, space-constraints on campus may limit the number of sessions that can be offered and/or limit the times that recitation sessions can be held. Third, on a primarily non-residential campus attendance may be low, especially if the recitation session is not required. Fourth, traditional recitation sessions (as opposed to supplemental instruction-like sessions) are delivered lecture style, although generally with more instructor-student interaction than a typical lecture. While students often like to have recitation sessions that cover many problems that help them understand how to solve their homework, the sessions are typically not very effective in helping students improve their own problem-solving skills.

Video-homework solutions can help address many of these issues. Instructors, perhaps with the assistance of a teaching assistant, can identify a sub-set of homework problems that cover the various course concepts and learning outcomes and provide video solutions for these problems. Note, these can be actual homework solutions that are provided to students after homework is due; in this case students will benefit from gaining a deeper understanding to a problem they have already attempted to solve. On the other hand, it can also be beneficial to provide video solutions to problems that are similar to the homework problems to assist students as they are solving their homework problems. A combination of both types of video solutions can be provided, as is typically done in most recitation sessions. There are several benefits to using video homework solutions. They are more cost effective as compared to recitation sessions since the same video solution can be used for the entire class and possibly multiple offerings of the course. Furthermore, they do not impose the space and scheduling conflicts that recitation sessions have. Rather, students can watch them on campus or at home and can watch them at any time during the day or night. In addition, students can watch them multiple times, rewinding and replaying as needed.

Statics is a foundational course in mechanical engineering programs. At Cal State LA, a large comprehensive public university, this course is one of the highest ranking courses for predicting student success, as well as one of the courses with the highest DFW rates. For this reason, the department has offered optional recitation sessions in Spring and Fall 2018. In Fall 2018, video homework solutions were also provided. We will present some preliminary results including recitation session attendance, video viewing analytics, and impact on student success. In addition, we will present some insights from the instructor and teaching assistant regarding implementation logistics, problem selection for recitation and video solutions, and tips for creating effective video solutions.