Modern Marvels® series to illustrate various mechanics concepts that would otherwise not be practical to demonstrate in the classroom.

The time spent demonstrating mechanics often comes at the expense of solving more example problems during the lecture. Based on the author’s interactions with several hundred students, there is anecdotal evidence to suggest that student performance would improve if students could (a) view each lecture multiple times and on-demand, (b) follow the lecture at their own pace, and (c) watch the instructor solve additional problems. To explore this possibility, the authors embraced movie/film technology made available by the UM Academic Technologies department.

UM Academic Technologies constructed a Faculty Exploratory center that includes an assortment of learning resources developed as a means of helping faculty integrate technology into their teaching and learning activities. One such resource is the One Button Studio, which is an automated video/film recording studio that allows faculty to record videos without any prior knowledge of film- or movie-making; only the “touch of one button” is needed. The studio includes a video camcorder, professional lighting, ceiling-mounted microphones for sound recording, and most notably, a clear lightboard.

In the author’s opinion, the clear lightboard (Figure 1) is the most useful and novel technology that enabled the production of instructional mini-lecture videos for their Statics course. An instructor writes lecture notes in the usual manner (left to right) on a transparent glass board, which allows the instructor to simultaneously maintain face-to-face contact with the student audience. Since the instructor’s back is no longer to the students, this arrangement allows better eye contact and creates a more natural viewing experience. A camcorder on the opposite side of the glass records audio and video, then flips the recorded images such that the edited video can be viewed correctly through a smartphone or computer monitor. When the lecture is complete, the video is saved on a USB flash drive. There is also ample space in the studio to accommodate a live student audience, thus, allowing student’s questions and the instructor’s responses to be captured on the video. The video is then posted online for students to download, allowing them to watch the mini-lecture on-demand. Media controls such as rewind, fast forward, and pause enable students to tailor the speed and progression of the movie to match their own learning pace. In addition, image extraction applications allow students to extract still images, which can be pasted into their electronic or handwritten notes.

The authors are passionate about teaching Statics, and plan to continue to explore this technology as part of their ongoing effort to provide students with flexible and effective learning resources. Although formal assessment and evaluation has not yet been conducted, the authors believe that this technology may have a significant positive effect on student learning in Statics and other engineering courses.

Acknowledgements

The authors wish to thank Nathalie Molina (Sr. Instructional Designer, UM Academic Technologies) for her continued assistance, support, and access to the Faculty Exploratory and One Button Studio at the University of Miami.

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