

Abstract: Preliminary Student and Faculty Perceptions of Rotating Faculty Facilitators for Introductory Biomedical Engineering Problem-based Learning

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Background: Problem based learning (PBL) has been shown to be an effective teaching strategy, particularly for interdisciplinary fields such as biomedical engineering (BME) and medical education. Due to the broad range of problems and disciplines within the biomedical field, it is desirable to develop and enhance problem-solving and teamwork skills early in undergraduate education. However, PBL requires a broad range of expertise and significant time investment for facilitation and feedback. These are difficult criteria to meet with small instructional teams and large introductory student enrollments.

Methods: We used rotating faculty facilitators to address these challenges. For a Spring 2020 offering of an introductory BME course, 22 faculty and 3 graduate students from Biomedical Engineering, College of Veterinary Medicine, and School of Medicine were recruited to participate for at least two class periods. A week prior to their assigned facilitation day, facilitators were given a summary guide of The Tutorial Process [1] and the problem and deliverable description [2]. 86 students (39 BME major, 47 BME minor/non-minor) were organized into 20 teams and presented with two open-ended BME problems. Students and facilitators were recruited to participate in surveys on perceptions of the rotating facilitator model after the second problem. Ten of twenty-five (40%) facilitators and thirty-one of eighty-six (36%) students responded.

Results: Students (S) and facilitators (F) generally agreed that the amount (S: 2.7 ± 0.6 , F: 3.1 ± 0.3 ; 1 = Too Many, 5 = Not Enough) and length (S: 2.8 ± 0.7 , F: 3.3 ± 0.7 ; 1 = Very Long, 5 = Very Short) of facilitations were appropriate. Students tended to agree, and facilitators strongly agreed, that different facilitators was beneficial (S: 3.6 ± 1.0 , F: 4.5 ± 0.7 ; 1 = Strongly Disagree, 5 = Strongly Agree). Both students and facilitators cited diversity in viewpoints and experiences as a benefit, but also acknowledged the impact of facilitator style on student experience and student expectations on facilitator experience. Particularly, students identified facilitator preparedness as a pain point, and vice versa.

Conclusion/Discussion: The ability to recruit many facilitators across many fields is beneficial for BME courses due to the interdisciplinary nature and breadth of BME. Both students and facilitators perceive the rotating facilitator model as beneficial, particularly the wide range of expertise and perspectives, but future work will aim to address student and facilitator expectations of the experience, as well as facilitator training while maintaining positive facilitator perceptions of time investment.

References:

1. Barrows, H.S., The tutorial process. 1988: Southern Illinois Univ.
2. Arena, S.L., et al., Work in Progress: Student and faculty perceptions of rotating faculty facilitators for introductory biomedical engineering problem-based learning, in Annual Meeting of the American Society of Engineering Education. 2020: Virtual Conference June 21-24, 2020.