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Faculty Perceptions of the Implementation of Flipped Teaching in Undergraduate STEM Courses Across Two Institutions

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Abstract

The flipped classroom is an active learning and teaching environment that has been shown to improve student engagement and thus student performance. In order to expand the use of flipped teaching (FT) in STEM classrooms, we recruited faculty members from two institutions, six faculty from a local community college and an additional six from a regional state university. We were particularly interested in how faculty perceived the implementation of FT, barriers in the implementation of FT, and the differences in FT implementation at a four-year university and a two-year community college. All 12 faculty members participated in six faculty development FT workshops, that were spread over an entire semester. While undergoing training, the participants were expected to be preparing for their implementation of FT during the following semester. Pre-implementation survey data from both institutions showed that 6 out of 12 faculty had a strongly favorable attitude toward FT and 4 out of 12 strongly agreed that they possessed the knowledge to use FT. When implementation of FT was considered, 4 out of 6 community college faculty and 2 out of 6 university faculty strongly agreed that they could successfully implement FT. One common barrier contributing to the resistance in the implementation of FT as identified by the participants at both institutions in the pre-implementation survey was the lack of time to implement. Additional barriers identified specifically by the university faculty included lacking the knowledge to implement FT as well as anticipating potential resistance from students. Post-implementation survey data showed that university faculty attitudes toward FT increased from 3 out of 6 to 5 out of 6 while community college faculty's attitudes remained at 3 out of 6. There was an increase in knowledge of using FT from 2 out of 6 to 6 out of 6 by university faculty and from 2 out of 6 to 5 out of 6 by community college faculty. Additionally, faculty perceptions of successful implementation increased from 2 out of 6 to 5 out of 6 by university faculty and remained unchanged at 4 out of 6 among community college faculty. Multiple barriers were identified through post-implementation survey by faculty from both institutions which included lacking the time to implement, limited knowledge related to implementation, grading, and class sizes. An additional barrier identified specifically by the university faculty was anticipating potential resistance from students. Addressing these barriers is critical in allowing the use of active learning methodologies such as FT.

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