

GIFTS: Developing a Community of Learners with Incoming Engineering Students that Initially Were Not Calculus Ready

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Introduction

Matriculating engineering students who are not calculus-ready encounter many barriers in their academic development as compared with their calculus-ready peers [1], [2]. Typically, these students must take a longer path to graduate, are not able to take classes with their incoming peers, and often experience added barriers as students from underrepresented backgrounds. Some schools attempt to prepare students for calculus in the summer before they matriculate with a summer math bridge program [3-12]. These bridge programs focus on math instruction, and some include engineering activities. Some of the current research on such programming does discuss the value and importance of community that that can be built and maintained through a summer bridge program [1], [13], but they do not discuss how to maintain this community once summer ends. Additionally, many of these programs do not include any support for students beyond August.

Project Approach

AT UW Madison, we have developed a summer bridge program for incoming engineering students designed to foster community and prepare them for retaking their placement exam. Every part of the in-person experience was designed to promote community building: collaborating on group math assignments, taking part in engineering activities, and attending a kick-off dinner with parents and families.

Throughout the semester students are encouraged to attend study tables for math, chemistry and statics. Tutors are provided to facilitate instruction, but students are encouraged to work together on their homework also.

Results and Discussion

At the end of the program twenty-two of the thirty-three students increased their placement score. At the end of the summer the students were asked about what was most beneficial about the program. They shared that the events outside of instruction, such as meeting people and getting to know the campus and classes, were more beneficial than their exam preparation.

In addition to students preparing academically, we have found they have also developed a community of learners to rely on for the rest of their college career. Students have formed their own study groups and are regularly studying on their own. There are at least four groups of students that are living together in the fall in off-campus housing. There are other groups that are playing intermural sports together.

Overall, this program developed a community of learners. The students were able to find others who started in a similar place to what they did, so they understood they were not alone in their struggles.

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