WIP: Impact of Peer Mentor Program on First Year Engineering Students Success

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Abstract

A small private school in the Midwest began an engineering peer mentoring program to foster community and support networks among first-year students with goals of improving retention and student success. Engineering can be isolating in college, especially so in newer and smaller programs. Feelings of isolation are known to be detrimental to student success and mental health. To combat this impact on students, upperclassmen were paired with all first-year students based on common interests in order to meet outside of the classroom in social environments. Initial impact of this program was studied through university retention rate, program attendance, program continuation, and peer mentor performance. This program ran in the 2022-2023 academic year, and impact was monitored each semester. Initial results are promising, as semester I to semester II first-year student retention improved by over 20%, however, more analysis is needed to investigate all factors that may have contributed to this rise. Future work will continue to monitor these factors and look at ways to improve the program.

Introduction

The average retention rate of first year students in engineering nationwide in 2014 was about 80% [1]. Retention rates from Indiana universities reported by U.S. News & World report records an average of 69.75% from 2017 to 2020 [2]. At the University of Indianapolis, the first to second semester engineering retention rate in the 2021-2022 academic year was approximately 64%. One theory for this low retention rate is the impact of COVID-19 on student performance and community. The isolation necessary for COVID safety limited students forming connections with their peers and the broader campus community. To offset this, faculty designed a peer mentoring program that would pair incoming students with upperclassmen who shared some interests. The primary focus of this program was social, rather than academic, unlike many other programs studied in the past [3]. Mentees were required to join a peer group, but not required to attend, and no academic incentives or financial costs were attached, differing from some programs [4]. Peer mentors and mentees met on alternating weeks for activities such as lunch, school athletic events, gaming, laser tag, and others.

Methods

At the start of the semester, mentors were asked to write a brief bio segment introducing themselves and their interests. We had 80 first year students, and all were required to join a peer mentor group. Mentees were then grouped based on shared interests with mentors. Next, mentors were instructed to tabulate attendance, brief descriptions of their events, and any concerns they had. An element of mentor performance was evaluated using a metric called “anumerical score” which is the product of number of mentor events and the average attendance of that mentor’s events. For example, a mentor who held eight events and achieved an overall 25% attendance rate would score 200, the minimum value for which mentors could be considered high-ranking.

Mentoring events were later grouped into nine categories for analysis, based on the predominant activity- Video Games, Sporting Event, Community Event, Food, Hang Out, Sports, Board Games, Movies, Outing. Most names are self-evident, but for those which are less clear, Food is any event which centered around sharing a meal, Hang Outs were events which consisted primarily of talking and bonding, and Outing was an off-campus activity.

Results and Discussion

First semester retention rates for the 2022 to 2023 increased to 85.4%. This is a good indicator of success for the program so far, however there are many potential factors that could have contributed to this rise. COVID restrictions have loosened, allowing students to independently form connections with campus and their own support networks, the student body itself is different, and the first-year engineering courses have changed drastically. To verify the effectiveness of this program, we intend to compare student attendance of mentoring events to retention, and monitor this factor for some time as we improve upon the program. The first semester maintained an average of a 37.9% attendance rate, and, after some program optimization, this improved to 60.0% attendance in the second semester.

Mentoring event attendance rates decreased as semesters progressed, however, in addition to a linear downwards trend, campus events such as midterms, breaks, and exams caused a significant temporary decrease in attendance that would recover afterwards.

In the second semester, first year students could opt-out of the peer mentor program. A higher mentor anumerical score was correlated with an increase in the continuation of mentees into the second semester as part of the peer mentoring program (Figure 1). Once the program has collected more data, we intend to compare the retention rate of a mentee group with the anumerical score of the mentor. Given the trends of the anumerical score, we expect to see a correlation between anumerical score and retention rate.

Figure 2 shows the attendance for each event type. Mentoring events with the highest average attendance included Video Games, Sporting Events, Hang Out and Sports. However, when examining the average attendance of event types for high-ranking mentors, a new pattern emerged. The highest average attendance events were now Food, Sporting Events, Hang Out, and Board Games. All events increased in attendance, however, some particular types experienced significant increases in attendance. Food, despite an even split in events between high ranked and not, experienced an increase in attendance from 38% to 66%. More work remains to analyze and optimize the effectiveness of the peer mentoring program.

In the future of this program, we hope to continue to monitor these factors as well as additional ones not considered here. Many mentor programs monitor student GPA averages as a method of tracking mentoring success. With more time with the program, we hope to evaluate mentee academics as well as collect qualitative data on mentee satisfaction and other social aspects.

A key goal to our program was the fostering of communities and connections, and we believe that our measurements with anumerical score indicate some successes in this area. It indirectly measures the mentor's ability to inspire and connect with first year students, and motivate them

to attend events that have no direct impact on their grade whether they attend or not. We hope this novel social focus brings additional gain to our students and program, beyond a purely academic focus.

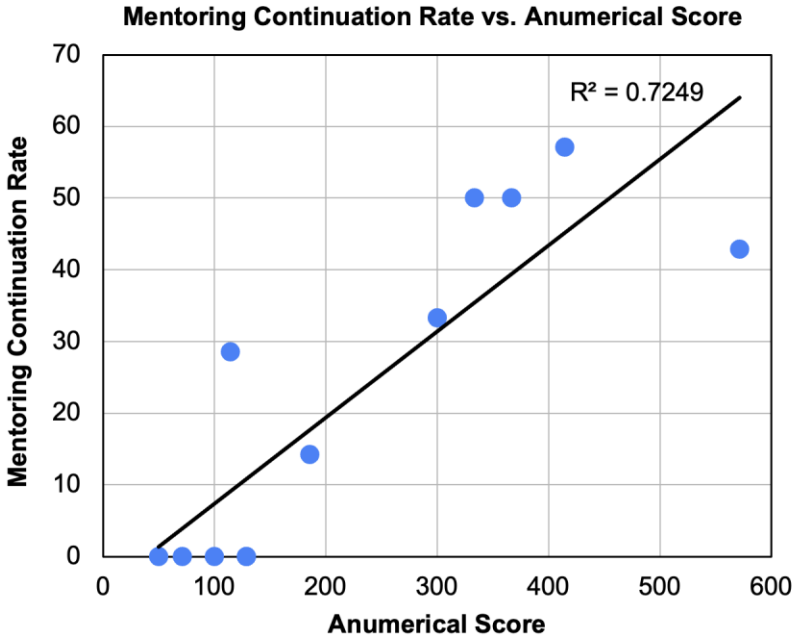

Figure 1. Mentor Evaluation Graph: Likelihood of mentees to continue with the peer mentor program vs. Anumerical Score (average attendance * number of events planned.)

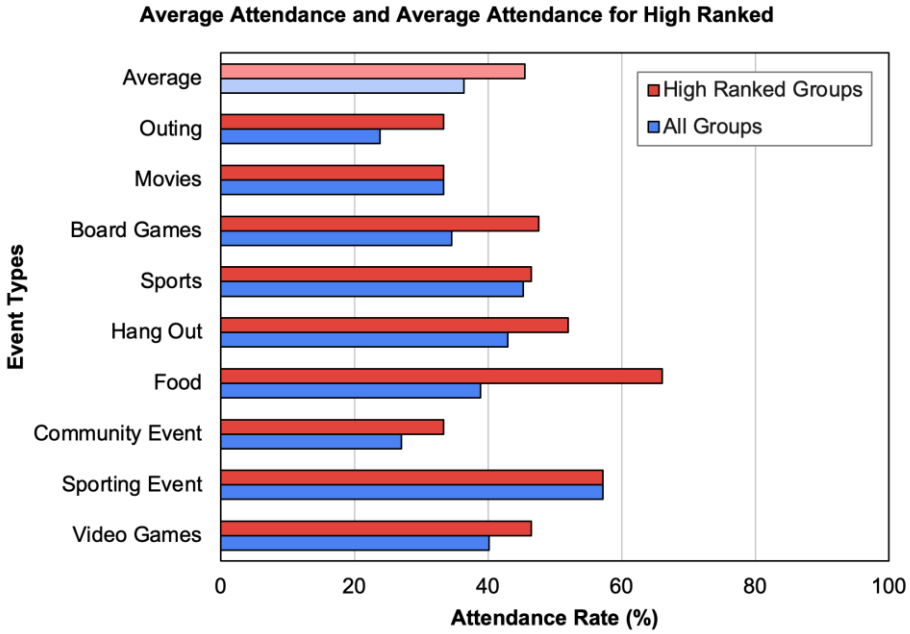

Figure 2. Event Analysis: Average attendance for each event type for all groups and high ranked groups (those with more events and higher attendance than average)

References

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