Peer Mentor Program Strategy for Improvement in First-Year Student Retention

Ms. Joan Matutes, University of Indianapolis

Joan Matutes is currently an undergraduate mechanical engineering major at the University of Indianapolis. Joan enjoys research, and intends to continue research in graduate school and beyond.

Miss Shelby Hacker, University of Indianapolis

Shelby Hacker is currently an undergraduate general engineering major with a focus in computer engineering and mathematics at the University of Indianapolis.

Dr. Patricia Snell Herzog, Indiana University Indianapolis

Patricia Snell Herzog, PhD is a sociologist, associate professor in the Indiana University Lilly Family School of Philanthropy, and affiliated faculty in the Department of Human-Computer Interaction within the Luddy School of Informatics, Computing, and Engineering in Indianapolis.

Dr. Stephen J. Spicklemire, University of Indianapolis

Has been teaching physics at UIndy for more than 35 years. From the implementation of ”flipped” physics class to the modernization of scientific computing and laboratory instrumentation courses, Steve has brought the strengths of his background in physics, engineering and computer science into the classroom. Steve also does IT and engineering consulting.

Dr. Kenneth Reid, University of Indianapolis

Kenneth Reid is the Associate Dean and Director of Engineering at the R. B. Annis School of Engineering at the University of Indianapolis. He and his coauthors were awarded the Wickenden award (Journal of Engineering Education, 2014) and Best Paper award, Educational Research and Methods Division (ASEE, 2014). He was awarded an IEEE-USA Professional Achievement Award (2013) for designing the B.S. degree in Engineering Education. He is a co-PI on the ”Engineering for Us All” (e4usa) project to develop a high school engineering course ”for all”. He is active in engineering within K-12, (Technology Student Association Board of Directors) and has written multiple texts in Engineering, Mathematics and Digital Electronics. He earned a PhD in Engineering Education from Purdue University, is a Senior Member of IEEE, on the Board of Governors of the IEEE Education Society, and a Member of Tau Beta Pi.

Dr. Joan Martinez, University of Indianapolis

Joan Martinez is an assistant professor in the R.B. Annis School of Engineering at the University of Indianapolis. He received his Ph.D. in Industrial Engineering from Western Michigan University. His research interest lies in developing data-driven models within the fields of production systems, financial systems, decision sciences, and engineering education.

Brett Leonard, University of Indianapolis
Dr. Joseph B. Herzog, University of Indianapolis

Joseph B. Herzog is an Associate professor in the R.B. Annis School of Engineering at the University of Indianapolis. He chose to come to the University of Indianapolis because he is passionate about teaching, is excited about the direction of the new R.B. Annis School of Engineering, is glad to return to his engineering roots, and is happy to be close to his extended family. Previously he was an Assistant Professor in the Department of Physics at the University of Arkansas. He is truly grateful for his time at the University of Arkansas, and enjoyed his department, students, and the campus. While in Fayetteville, he also served as a faculty in the Microelectronics-Photonics Program and the Institute for Nanoscience and Engineering. He received his PhD from the University of Notre Dame working in the Nano-Optics Research Lab with J. Merz and A. Mintairov. After this he was a Welch Postdoctoral Research Associate, researching plasmonic nanostructures at Rice University with Douglas Natelson in the Department of

Physics & Astronomy. In the summer of 2017 he was a Fellow at the U.S. Naval Research Laboratory (NRL) in Washington, DC working with Jake Fontana on tunable subnanometer gap plasmonic metasurfaces as part of the Office of Naval Research Summer Faculty Research Program. At the NRL he worked in the Center for Biomolecular Science and Engineering, which is a division of the Materials Directorate at the NRL. His experience also includes working for Intel Corporation both in Hillsboro, OR and Santa Clara, CA; and he worked at the Berliner Elektronenspeicherring-Gesellschaft für Synchrotronstrahlung m.b.H. (BESSY - Berlin electron storage ring company for synchrotron radiation) in Berlin, Germany, researching ultra thick high-aspect-ratio microfabrication. His research focuses on experimental nano-optics, including plasmonics, nanofabrication, computational modeling, photonic crystals, and engineering education.

Peer Mentor Program Strategy for Improvement in First Year Student Retention

Abstract

This work is a *Complete Evidence-based Practice Paper* studying students in a small, private school in the Midwest that recently developed a peer mentoring program. The goal of the program is to improve retention among first-year engineering students by forming a strong sense of community within the school. The first year in college can be challenging, especially in engineering programs. Feelings of isolation are common and can negatively affect student success and mental health. To combat this impact on students, experienced college students (sophomores, juniors, and seniors) were paired with first-year students based on common interests in order to meet outside of the classroom in social environments.

Each individual peer mentoring group was composed of a single peer mentor guiding a small cohort of students. At the start of each fall semester, mentors were asked to write a brief bio segment introducing themselves and their interests. Each first-year student was required to join a peer mentor group. Mentees were then grouped based on shared interests with mentors. Once paired with a mentor, the mentees were strongly encouraged to engage in weekly interactions, either through attendance at a one-hour event or by maintaining regular communication with their mentor. With the goal of improving community bonds amongst first-year students, these events were typically fun, social events: meals together, game nights, sporting events, and so on. This arrangement provided first-year students with the opportunity to develop strong connections with peers and upper-class students, enabling them to ask questions they might not feel as comfortable posing to professors. Mentors were instructed to tabulate attendance, write brief descriptions of their events, and note any concerns they had.

In the academic year immediately following the initiation of the peer mentor program (Fall 2021 - Fall 2022), this program saw 14.5% points increase in overall first-year to second-year retention. This paper investigates changes in retention numbers at various points in time to better understand the success of this program and excavate its relevance for other programs seeking to implement peer mentoring. In addition to quantitative data, we gathered qualitative, open-ended survey data from mentees on how they feel the program helped them. This helps to understand experiences from the students' perspectives. Additionally, metrics were analyzed to help optimize mentee attendance and participation in the peer mentor events.

Between the academic years, the peer mentoring program underwent significant enhancements. Program information was distributed to incoming students prior to the start of classes, and peer mentors were incorporated into 'welcome to campus' type events. These changes improved incoming engagement with the program. Next steps are to implement a similar peer mentoring program in other academic units across the university. If the success is realized in other disciplines, then the model presented here could be successful at other institutions.

Introduction

As a part of improving student retention rates at a small, private institution in the Midwest, faculty in engineering launched a new peer mentoring program focused on supporting first-year students. With a young engineering program and the isolating effects of the COVID-19 pandemic, students often were not well-connected to their peers. In our previous publication [1], semester-to-semester retention rates were reported.

Our work builds upon and contributes to existing research on peer mentoring [2-4]. Prior studies find that peer mentoring is an effective approach to supporting college student success for a number of reasons [4-15]. In peer mentoring students share valuable information and expertise with their peers, and peers serve as positive role models for social comparison [5]. Additionally, peer mentoring encourages self-reflection and enhances collaboration with others [6]. Reciprocal learning is engendered through improving comprehension and fostering social interactions [7]. In a study of first-generation college students, peer mentoring was found to contribute to building five practices of exemplary leaders: enabling others to act by strengthening confidence and competence, modeling the way by facilitating discussions and sharing experiences, challenging the process by adapting as pitfalls are encountered, encouraging the heart by recognizing and appreciating personal contributions of peers, and inspiring a shared visions by identifying mutually engaging values that motivate action [8].

These interventions are particularly important during the early years of college, which can be stressful [9]. Peer mentoring addresses the need for social integration, which contributes to higher academic performance, better grade point averages, and successfully passing more courses [4]. Despite the academic and social support that can be gained from peer mentoring, there can be challenges, such as clarifying roles and time management [10]. Quality control issues can depend on the competence and effectiveness of peers in supporting other students [11]. Plus, it is important to recognize that peer mentoring involves emotional labor, yet this is found to be mediated by fostering a collaborative partnership culture among students [12]. Indeed, most peer mentors experience benefits from supporting other students, such as feeling a stronger sense of belonging [13]. Indeed, in a systematic review of more than 2,000 existing studies, there are consistently found academic and social benefits, namely academically: a deeper understanding of course content, clarification of assignment requirements, and completion of course assignments [14]. Social benefits include overcoming isolation, increasing collaboration among other students, moral support, reassurance, confidence building, and community [14].

Many mentoring programs in the past have focused on providing academic support and mentoring [15]. However, this program focused solely on social support and mentoring, similar to other programs [16, 17]. While mentors were allowed to offer academic support, this was not the main focus, and mentors were instead encouraged to host social events - activities such as hanging out, lunch, gaming, and school athletic events, among others. A primary focus of the program was fostering community and interpersonal connections. Additionally, while mentees were required to join a peer group, there was no attendance requirement or incentive during the first year. The peer mentors also gave first-year students someone they could go to if they had any questions regarding college. Instead of giving direct academic support and tutoring the first-year students, peer mentors instead shared study tips and made sure the first-year students were aware of all the available resources on campus, such as free tutoring.

After the first year of this program showed potentially promising signs of success, work was engaged to evaluate and improve this program.

Methods

Each year, a call-out to upperclass students went out to sign up to be peer mentors. The peer mentors were required to register for a one-credit Engineering Leadership independent study course with the faculty lead of the peer mentor program. All students who had the initiative to volunteer and sign up for the course were selected for the program. Incentives for peer

mentors to participate in the program include earning course credit in the Engineering Leadership course and gaining leadership experience. Also, peer mentors thought it was a fun thing to do. Some wanted to give back and signed up because they cared about the success of their peers and younger students, and it was a good way to meet other people.

Once selected, the peer mentors created a one-paragraph bio that included interests outside of class. The bios of all the peer mentors were then shared with all of the incoming first-year students. Next, a preference survey was sent out to all the first-year students to indicate which peer mentor(s) they were interested in being paired with. In the survey, it was noted that these groups were not intended to be groups of majors (i.e., all mechanical engineers), but rather students were encouraged to select peer mentors based on shared interests: watching sports, playing sports, playing video games, baking, music, reading, etc. During the first year of implementation, 60% of the incoming students completed the interested survey. Those who did not complete the survey were randomly assigned to peer mentors.

The design, much like a matching service, was to facilitate student agency in being matched with others with whom they perceived mutual interests. Using the preference survey results, the lead faculty distributed the first-year students evenly among the peer mentors to create the mentor groups. Each peer mentor was paired with 6 - 7 first-year students during the semester we implemented the program. Almost all of the first-year students who completed the preference survey were paired with one of their top two choices of mentors.

Before the semester started, the peer mentors participated in an orientation session where the guidelines, policies, and expectations of the program were explained to them. The expectation was that peer mentors held a weekly social event with their peer mentors for the first half of the semester. After midterms, these activities were hosted once every two weeks. During the semester, peer mentors kept attendance records during the events they hosted, mainly for this research study. The attendance records had no bearing on first-year student academic records.

Example activities that peer mentors hosted included participating in school events as a group, video game nights, going out to dinner as a group, playing sports together on the main lawn, and so on. The peer mentors were around in the building and available to answer questions the first-year students had. The main challenges that peer mentors experienced during the first semester of implementation included non-responsive first-year students and lack of participation in the events among first-year students.

After the first semester of the program (Fall 2021), both peer mentors and mentees were given the option to participate again in the second semester of their first year (Spring 2022). Similar to the first semester, peer mentor groups were formed in a similar fashion.

Some changes were made for the second year of the peer-mentor program (Fall 2022): the peer mentor program was integrated more with the Orientation to Engineering course, the one class that all first-year engineering students have to take in the first Semester. The survey was sent out earlier and advertised more during the Orientation to Engineering course (the class that all first-year students take), this helped increase the response rate of the pairing preference survey to 84%. Peer mentors who were available were invited to in-class activities for the Orientation to Engineering class. Peer mentors also participated in pre-semester math prep courses. Across the School, a service requirement was established for all students, which allowed for additional activities with peer mentors. As an Orientation to Engineering class requirement, mentees were required to provide evidence that they met with their mentor at least once for a required class assignment. At the end of the semester, both mentors and mentees were surveyed qualitatively to provide feedback and at the end of the first semester.

Finally, in the second Semester of Year 3 (2023 - 2024 academic year), a few new changes were made. First, with the new School-wide service requirement for all students each semester, peer mentors are now required to host a service event. This will foster leadership development and will provide an opportunity for first-year students to connect with mentors. Since service is a requirement for all students, it will help motivate participation. Additionally, mentees were asked how they wanted to participate in the program. Asking them how frequently they would like to meet, in what means (in person, virtually, chat messages). Mentors were encouraged to connect with their mentees 1-on-1, as this can help establish a relationship with first-year students who do not like to get together in group settings.

Figure 1 below summarizes the timeline of the peer mentor program implementation; it also serves as a legend for the various statistics in this paper. *Mid-Year* retention rates represent the percentage of students who continue with our engineering program going from the first semester of college to their second semester of college. *Full-Year* retention rates represent the percentage of students who continue with engineering beyond the first year of enrollment (Semester I to Semester I of the following year), this is the first-year to second-year retention rate. These statistics only count retained students as students who are continuously enrolled in the engineering program, so if a student switches majors out of the school of engineering but stays enrolled at the university, this student is not counted as being retained for the numbers in the paper. A student who does not continuously enroll in engineering for any reason is considered not retained, even if they reenter the engineering program later.

During the 2021 - 2022 academic year, there was no peer mentoring program. The peer mentor program started in Semester I of the 2022 - 2023 academic year. After the start of the program, first-year students are given the option to participate during the second semester of their first year (Semester II) as peer mentees. Retention rates from Semester II (2022 - 2023) to Semester I (2023 - 2024) are reported in order to compare the effect for those who opted in or not in the Sem II peer mentor program.

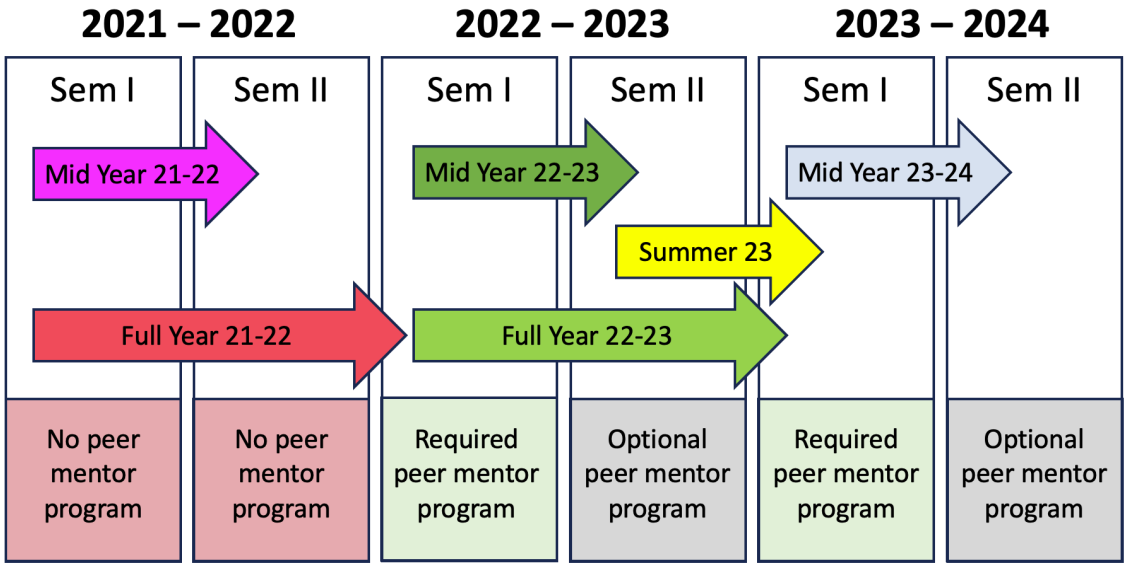

Figure 1. Timeline of peer mentor program implementation: In 2021 - 2022 the peer mentor program did not exist. The peer mentor program started in the first semester (Sem I) of the 2022 - 2023 academic year. In Semester II (Sem II) of each academic year when the peer mentor

program was implemented, students had the option to opt-in for Sem II. Arrows represent each retention statistic. Statistics which were observed included Mid-Year retention (from Sem I to Sem II), Full-Year retention (Sem I to Sem I of the following year), Summer retention (Sem II to Sem I of the following year).

Results and Discussion

Figure 2, shown below, demonstrates the change in Mid-Year retention rates for freshmen between the year before the introduction of the peer mentoring program and the first year of the program. Mid-Year retention improved by nearly 22% points in the first year of the peer mentoring program.

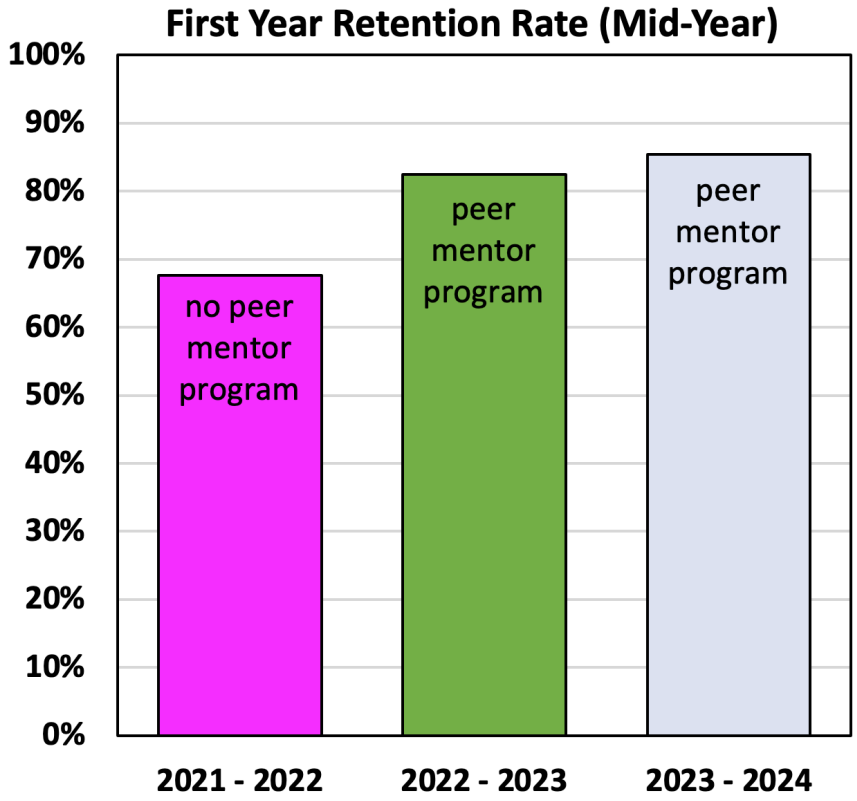

Figure 2. First Mid-Year Retention Results: Student retention rates between Semester I and Semester II, for the year before the peer mentor program started, and the first year of the program.

In Semester II of the 2022 - 2023 academic year, first-year students had the option to participate in the peer mentoring program, the second semester of their first year. Of the 70 first-year students enrolled during this semester, 18 elected to continue participation in the peer mentor program, while 52 students elected to not continue in the program. Of the 18 who chose to continue in the peer mentor program during the second semester of their first year, 15 of them (83.3%) were retained the following academic year. Of the 52 first-year students who did not elect to participate in the peer mentoring program during the second semester of their first year, only 28 continued as students the following academic year. This shows that beyond the program

benefits, willingness to participate in the program is itself a predictor of first-year student retention. There is a symmetry here with broader findings regarding the prosocial characteristics of survey volunteers, in that even volunteering to answer a survey reflects a willingness to engage in social activities that is not representative of those who are nonrespondents [17]. Plus, engagement on campus is connected to retention because students expressing a willingness to get involved serves as an oath, a commitment to an attentive agent of change in campus life [18]. The over-the-summer retention rate for those who participated was ~30% points greater as compared to those who did not choose to participate in the Sem II program.

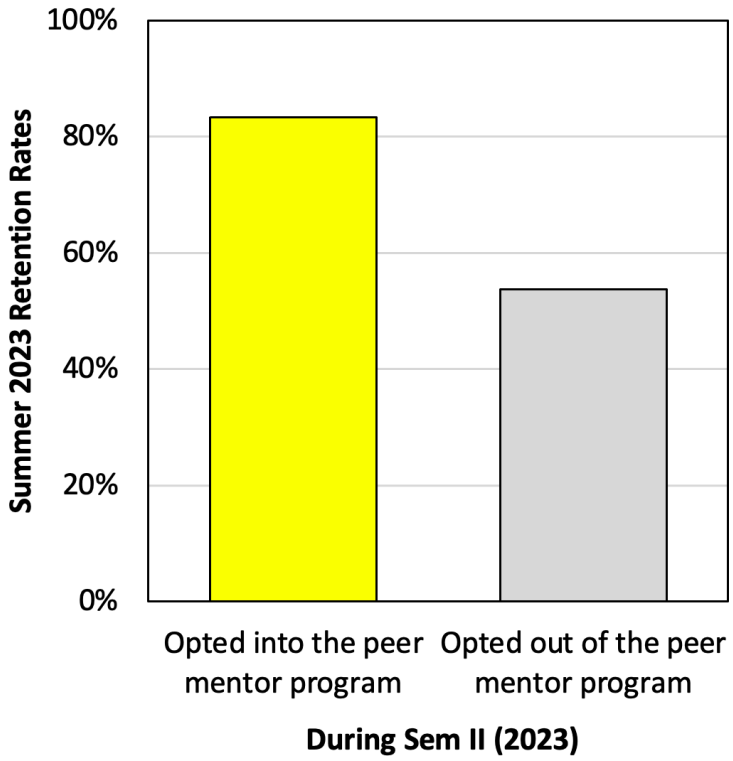

Figure 3. Semester II Participation Retention Rates: Comparing the summer (Sem II to Sem I) retention rates of students who participated in the peer mentoring program during the optional second semester, and those who did not.

The Full-Year Fall 2022 - 2023 retention rate was 14.5% points greater than the Full-Year Fall 2021 - Fall 2022 retention rate. This shows a significant improvement between the first-year students who had no peer mentoring program as compared to the first cohort with a peer mentoring program. This improvement is impressive, however, could be affected by other factors and improvements made across the School as well. This is described more in below discussion.

The mentoring program used multiple metrics to analyze the performance of mentors in fulfilling the goals of the program. *Mentor Score* was calculated as a multiple of the mentor's group average attendance rate, the number of events they held, and the number of mentees they had. *Anumerical Score*, was similar to the *mentor score*, however, it did not multiply by the number of mentees [1]. So therefore, *Anumerical Score* = *Mentor Score* / (number of Mentees). Initial data from Mid-Year retention showed a stronger correlation between a mentor's *Anumerical Score* and the retention rate of their mentees than between mentor score and the

retention rate. Our results confirmed this, as shown in Figure 4 below, where there is a stronger difference between average mentor *Anumerical Scores* for retained and non-retained students compared to the difference between *Mentor Scores* for retained and non-retained students.

In every area of evaluation, the mentors of retained students were ranked higher. The average number of events hosted by mentors for retained students was 6.1, while the average number of events hosted by mentors for non-retained students was 5.6 (see Figure 4c). Many of the other areas of evaluation marked here in Figure 4 could be influenced by the students themselves being studied. A student who attends more events and is more involved may be more likely to be retained even without the program.

Mentor Scores were created to account for the impact organizing a larger group of students may have on the ability of a mentor to get higher attendance rates or run as many events. Interestingly enough, this score was found to be less strongly associated with retention than the *Anumerical Score*, as seen below in Figures 4b and d.

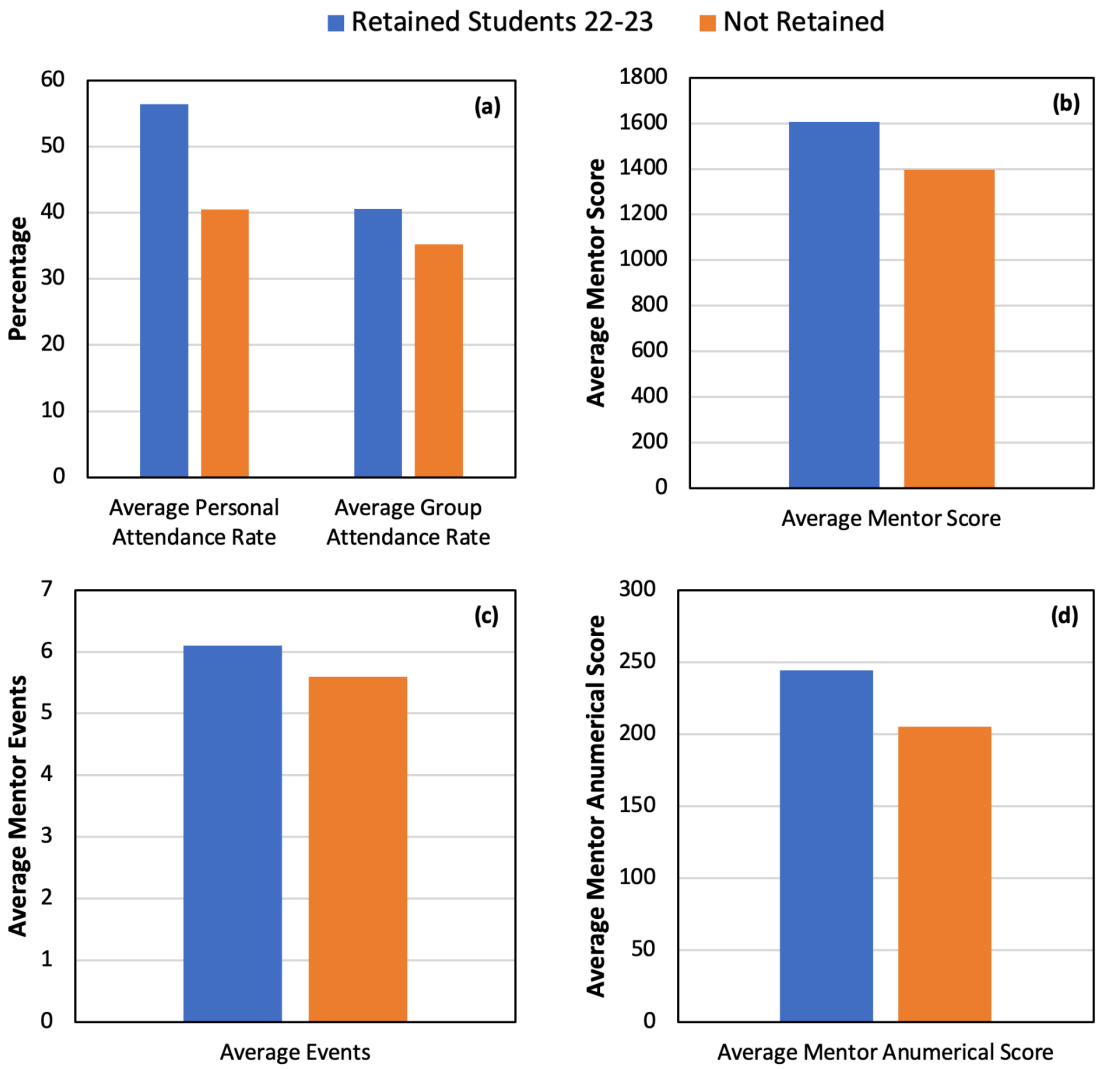

Figure 4. Mentoring Effectiveness: Four graphs comparing the methodologies used to evaluate the effectiveness of the program against student Full Year 2022 - 2023 retention rates. (a) Compares the average of personal and group attendance rates at mentoring events of retained

students against that of those who were not. (b) Average mentor score of the students' mentor, (c) average number of events hosted by the students' mentor, and (d) average numerical score for the students' mentor for those retained and not retained.

Analyzing the retention data in Figure 4, a relationship between involvement in the mentoring program and student retention is found. The individual attendance for students who were retained past the first year averaged 15.8% points higher than students who did not participate (see Figure 4a). The average mentor *Anumerical Score* for retained mentees was 39 points higher than those who were not, representing an approximately 19% increase in anumerical score for retained mentees (see Figure 4d). This indicates that the program likely had a positive effect on student retention.

As the peer mentor program wrapped up at the end of Semester I 2023 - 2024, a survey was sent out to all mentored first-year students and all the mentors.

The response rate of the peer mentor survey was 90% (10/11). Of those who completed the survey, 100% either *agreed* or *slightly agreed* (the highest two options) when asked if the peer mentor program contributed to their leadership development. In an open-ended response, the mentors included developing new friends and enjoyed giving advice to first-year students as positive aspects of the program. The peer mentors suggested that there may be ways to improve the program for the first-year students. Some suggestions include having larger groups with multiple mentors and incentivizing communication for the mentees.

The response rate of the mentored first-year students was 32% (31/97), which is better than the attendance of first-year students at mentored-hosted events. 51.6% of surveyed mentees *agreed* or *slightly agreed* that the program encouraged them to join a community, and 58.1% *agreed* or *slightly agreed* that the program contributed to their freshman experience. Students who responded to the survey also shared positive aspects of the program in an open-ended question; they stated that fun events allowed some time to destress, provided a way to meet new people, and taught more information about the university and clubs on campus.

For suggestions to improve the program, the first-year students suggested the mentor and mentees have similar schedules, host more large community events, and include the mentors in the mentee's first week on campus (orientation week), the week before classes start. The first-year students were also asked if they wanted to continue the program in the following semester and listed the reasons. Those who chose not to participate in the program listed reasons such as having too much homework, do not think mentoring is needed, and no longer seeing a benefit from the program. Those who signed up for the program for the following semester stated they had an interest in continuing to participate in fun events, look forward to building more friendships, and have the mentor as an engineering resource. These comments, along with the retention data shown above, highlight some of the successes we have had with the program.

Discussion

Since the peer mentor program started, retention rates have improved, which is promising. Comments from survey results also highlight the value of the program. A particular ongoing event that has been successful is the weekly game night which includes both video games and card games. This event is hosted by peer mentors, and even faculty show up every once in a while. Another success is a weekly barbeque hosted by faculty and staff in the School. All students are invited to come to eat, relax, play games, build things, race go-karts, or work on

projects and/or school work. This event is one that peer mentors encourage their mentees to participate in. Finally, many of the peer mentors were also leaders of engineering student organizations (SWE, IEEE, ASME, ACM, etc.). So when these peer mentors hosted these events, they would invite and encourage their mentees to attend these as well.

The main challenges of the program include (1) getting mentees to respond to peer mentors, (2) trying to schedule meet-ups or events that work for everyone's schedule, (3) first-year student attendance and active participation in peer mentor-hosted events. Since the first-year students were still getting acclimated to the expectations of college and how to use all of the campus resources, there were times when there were no responses or communication with the peer mentors.

Having an assignment in the first-year Orientation to Engineering course associated with peer mentor participation helped a little with communication for one week. Free food also incentivized participation, as was gathering a peer mentor group to attend and spectate at a University varsity sporting event. Another aspect that helped build community with first-year students and peer mentors was that service event participation was required for all students in the School of Engineering. So when the peer mentors gathered around a service event, this helped with first-year participation since they also needed to complete the service event for their class requirement.

While retention rate significantly improved since the implementation of the peer mentor program, it is important to note that other changes across the School of Engineering also occurred during this time frame. So it is difficult to exactly isolate the particular effect of the peer mentor program. Other things that may have contributed to the improved retention rates include changes to the Introduction to Engineering and Orientation to Engineering courses, as well as the introduction of a "STEM Accelerator" course prior to the start of the academic year, to help students who did not test into an adequate math course on the first attempt. However, during the first year of the peer mentor program, less than five students participated in the STEM Accelerator course. The Orientation to Engineering course is a mandatory course for all freshman engineering majors that is taught during Semester I each year. It focuses on preparing students for the transition from high school to college. Finally, the effect that the COVID pandemic has on high school students could have affected each cohort differently as they matriculate as first-year students; however, preliminary national data [19] does not show a significant decrease for the 2021 cohort, so it seems like this was not a major factor.

Future Work

A number of updates and improvements to the program are planned for future iterations. First, peer mentors will be asked to reach out and meet with each mentee one-on-one during the first three weeks of the semester. Next, since service events are required in our School, we will also require each peer mentor to host and plan a service event, inviting all students and especially their peer mentors to participate.

Finally, we realize there are some introverted first-year students who might prefer the one-on-one events listed above instead of large group events. Therefore, before the semester starts, we can survey mentees during the pairing survey, and ask about how they would like to participate in the program. Whether it is via chat, large group, one-on-one, smaller groups, etc. – allowing engagement in a style suited to each student, but maintaining a goal of each student at least knowing one senior student they can go to.

With the success of the peer mentoring program in Engineering, we plan to try and implement a similar program in the Department of Music across campus. The somewhat disparate nature of students in varied departments such as engineering and music will allow exploration of the mentorship program's efficacy across a wider population. The program pilot in another department will likewise provide an environment to examine mentorship's interaction with other variables such as grouping amongst differing programs with limited interaction within a department. Also with this effort, internal funding has supported this work, which will provide the peer mentors with a small, hundred-dollar, budget for food or other game supplies as they host events for first-year students.

References

[1] K. Reid, J. B. Herzog, J. Matutes, S. Hacker, S. Spicklemire, "Impact of Peer Mentor Program on First Year Engineering Students Success," American Society for Engineering Education (ASEE), First-Year Engineering Experience Conference (FYEE) 2023.

[2] J. Johnson, A. D. Niemi, M. G. Green, and L. E. Gentry, "Management and assessment of a successful peer mentor program for increasing freshmen retention," presented at the Paper presented at 2014 ASEE Annual Conference & Exposition, Indianapolis, Indiana, June. 2014. doi: 10.18260/1-2--22815.

[3] M. DeMarinis, J. Beaulieu, I. Cull, and A. Abd-El-Aziz, "A Mixed-Methods Approach to Understanding the Impact of a First-Year Peer Mentor Program," *Journal of The First-Year Experience & Students in Transition*, vol. 29, no. 2, pp. 93–107, 2017.

[4] B. Leidenfrost, B. Strassnig, M. Schütz, C.-C. Carbon, and A. Schabmann, "The Impact of Peer Mentoring on Mentee Academic Performance: Is Any Mentoring Style Better than No Mentoring at All?," *International Journal of Teaching and Learning in Higher Education*, vol. 26, no. 1, pp. 102–111, 2014.

[5] P. Collier, "Why peer mentoring is an effective approach for promoting college student success," *MUJ*, vol. 28, no. 3, Aug. 2017, doi: 10.18060/21539

[6] S. Gamlath, "Peer learning and the undergraduate journey: a framework for student success," *Higher Education Research & Development*, vol. 41, no. 3, pp. 699–713, Apr. 2022, doi: 10.1080/07294360.2021.1877625

[7] B.-A. Hamilton-Hinch, C. Stilwell, C. Manuel, S. Hutchinson, K. Woodford, and A. Ellis, "Peer Assisted Learning: What Can Students Teach Us and Each Other?," *SCHOLE: A Journal of Leisure Studies and Recreation Education*, vol. 38, no. 3, pp. 161–174, Sep. 2023, doi: 10.1080/1937156X.2021.1969527

[8] K. Hirsch, S. F. Odom, and L. L. Moore, "An Examination of the Impact of Peer Mentoring on First-Generation College Student Peer Mentors' Development of the Five Practices of Exemplary Leaders," *Journal of Leadership Education*, vol. 20, no. 4, 2021, doi: 10.12806/V20/I4/R11

[9] S. R. Lane, “Addressing the Stressful First Year in College: Could Peer Mentoring Be a Critical Strategy?,” *Journal of College Student Retention: Research, Theory & Practice*, vol. 22, no. 3, pp. 481–496, Nov. 2020, doi: 10.1177/1521025118773319

[10] M. Marshall, J. Dobbs-Oates, T. Kunberger, and J. Greene, “The peer mentor experience: benefits and challenges in undergraduate programs,” *Mentoring & Tutoring: Partnership in Learning*, vol. 29, no. 1, pp. 89–109, Jan. 2021, doi: 10.1080/13611267.2021.1899587

[11] K. L. McMaster, D. Fuchs, and L. S. Fuchs, “Research on Peer-Assisted Learning Strategies: The Promise and Limitations of Peer-Mediated Instruction,” *Reading & Writing Quarterly*, vol. 22, no. 1, pp. 5–25, Jan. 2006, doi: 10.1080/10573560500203491

[12] C. Seery, A. Andres, N. Moore-Cherry, and S. O’Sullivan, “Students as Partners in Peer Mentoring: Expectations, Experiences and Emotions,” *Innov High Educ*, vol. 46, no. 6, pp. 663–681, Dec. 2021, doi: 10.1007/s10755-021-09556-8

[13] M. Sullivan, G. Franulovich, S. Matthews, and A. Kelly, “Just in time, just for you: Growing a peer learning program,” *JANZSSA*, Dec. 2023, doi: 10.30688/janzssa.2024-1-01

[14] B. Tibingana-Ahimbisibwe, S. Willis, S. Catherall, F. Butler, and R. Harrison, “A systematic review of peer-assisted learning in fully online higher education distance learning programmes,” *Open Learning: The Journal of Open, Distance and e-Learning*, vol. 37, no. 3, pp. 251–272, Jul. 2022, doi: 10.1080/02680513.2020.1758651

[15] D. Budny, C. Paul, and B. B. Newborg, “Impact Of Peer Mentoring On Freshmen Engineering Students,” Journal of STEM Education: Innovations and Research, vol. 11, no. 5, Oct. 2010.

[16] K. Reid, “Creating a Sense of Community: Mentoring First-Year Engineering Students,” *QED News*, vol. XVII, no. 2, pp. 4–6, Fall 2012.

[17] K. G. Abraham, S. Helms, and S. Presser, “How Social Processes Distort Measurement: The Impact of Survey Nonresponse on Estimates of Volunteer Work in the United States,” *American Journal of Sociology*, vol. 114, no. 4, pp. 1129–1165, Jan. 2009, doi: 10.1086/595945

[18] G. D. Caruth, “Student Engagement, Retention, and Motivation: Assessing Academic Success in Today’s College Students,” *PER*, vol. 5, no. 1, pp. 17–30, Dec. 2018, doi: 10.17275/per.18.4.5.1

[19] National Student Clearinghouse Research Center, “Persistence and Retention Report: Fall 2021 Beginning Postsecondary Student Cohort,” Herndon, VA, Jul. 2023. Accessed: Mar. 29, 2024. [Online]. Available: https://nscresearchcenter.org/persistence-retention/