

Building Transfer Readiness: Cross-Institutional Support for Community College Engineering Students

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Abstract

This study examined how low-income community college engineering students develop transfer readiness and how their perceptions of support align with those of transfer students who have already transitioned to a four-year university. Conducted within a multi-institutional NSF-funded S-STEM program, the research compared experiences of students at two partner community colleges with those of program scholars at a large public research university. Guided by Schlossberg's Transition Theory, the study aimed to identify which academic, social, and institutional supports most effectively prepare students for successful transfer and persistence in engineering programs.

Surveys incorporated validated measures of self-efficacy, social support, and transfer student capital. Additional program-specific items captured students' awareness, utilization, and perceived usefulness of campus and program resources. Data were collected from community college participants and transfer students at the four-year institution.

The scholars in the EMPOWER program reported strong mentoring and peer support networks but noted ongoing challenges in navigating institutional systems and balancing academic rigor after transferring. This paper presents an analysis of the self-reported academic confidence among the EMPOWER program scholars at the partnering community colleges. It also explores the correlation between pre-transfer students' confidence in seeking support and the actual engagement of post-transfer students with mentoring and resource centers.

Our research emphasizes the importance of coordinated programming across institutions, structured mentoring, and early introduction to university-level resources. It shows that these activities, supported by cross-campus visits within this program, enhance community college students' readiness and smooth their transition into four-year engineering programs. Findings demonstrate that sustained collaboration between community colleges and universities can bridge preparation gaps and strengthen social and academic confidence among transfer engineering students.

Introduction

Transfer engineering students, who enter in, through, and out of community college then in, through, and out of a university, reveal an exemplary case of students in transition. Schlossberg [1] has written extensively on the topic of coping through transition in a variety of applied settings. Her work sets a particularly strong foundation for investigating and understanding the transfer engineering students' pathway. 1) Situation, 2) Self, 3) Support, and 4) Strategies are known as the 4 S's and key factors for how someone might perceive and adapt to their transition. It is important to observe how these influence the perception and adaptation of the transfer engineering student.

A lot has changed since “transfer shock” was described and studied by Hills [2] in 1965. Community colleges are further reaching and supportive of their transfer students, leading into the transition to a 4-year university. Additionally, transfer students’ backgrounds are especially wide-ranging. More recently, Laanan et al. [3] investigated through an online questionnaire “transfer capital” and how students' motivation and support, for example, can help them persevere. Ogilvie et al. [4] reviewed many works specific to understanding the transfer engineering pathway and, following up with their colleagues Davis and Knight [5], they shared transfer engineering student advice to future transfer students. For example, quotes from students discussed how institutions could share more information on how to be involved in organizations early on in college, student services could be more accessible to them, and it would be helpful to have the course-related workload differences between the two institutions highlighted before transfer. It is notable from their qualitative review how student perception before transfer can be different from their post-transfer reality.

The EMPOWER program initially described in [6] is supported by the National Science Foundation (S-STEM) to directly support Pell-eligible transfer engineering students at the University of California, San Diego, Southwestern College, and Imperial Valley College through scholarships and high-impact practices. Through financial aid, mentorship, and cohort-building activities, students are well-positioned to graduate and obtain an engineering career. To better support transfer engineering students, it is important to understand their pathway, including their barriers and the most influential factors on their perseverance. An initial investigation was developed by the EMPOWER program leadership team [7,8] to better understand the influential factors on students' transition, post-transition, and how the 4-year university supported them. It was found that surveyed students valued the EMPOWER program, addressing Schlossberg’s 4S factors. In addition, these students valued other institutional existing supports as well as their peer networks while navigating their transitions. EMPOWER’s partnership with the university’s existing transfer resource center, engineering resource center, undergraduate research center, and financial aid office was revealed to be beneficial, as perceived by the students.

In this paper, we examine influential factors on student transitions as they are perceived and compared between current community college engineering students seeking transfer and 4-year university students after transfer. A survey questionnaire is designed and administered to gauge the influential factors through Likert scale and free response questions. Results are summarized and discussed.

Methods and Participation

A questionnaire survey was developed to understand how transfer-track engineering students experience their major transition between 2-year and 4-year programs, as perceived pre- and post-transfer. Eight categories of surveyed information were collected across more than 40 short answer, Likert-scale, and free response questions.

Beyond general information and consent, the questionnaire’s eight categories included:

Student Profile/Demographics: Standard background information of participants.

Self-efficacy & Motivation: Self-efficacy was measured using the New General Self-Efficacy Questionnaire [9]. Motivation, including self-determination, intrinsic

motivation, career motivation, and goal motivation, was measured using the Motivation Questionnaire II (SMQ-II) [10].

Transfer Student Capital: Questions regarding student knowledge about transfer before their transition and how to navigate resources once at the university.

Institutional Engagement: Questions about participation in academic, social, and professional development activities.

Perceived Social Support: Questions regarding support from friends and family.

Sense of Belonging: Questions described in [6] and [7], which measure student-institution relationship and feelings of acceptance/belonging.

Transitioning to a 4-year university: Free response questions regarding student transition between the 2-year and 4-year institutions.

EMPOWER Program Support: Free response questions regarding student support from the EMPOWER program.

Quantitative results appear primarily from responses to Likert scale questions. The answer options were on a scale from 1 ("not at all true of me") to 7 ("very true of me"). Average scores of each factor from categories 5), 6), and 7) were calculated for each participant for use in subsequent analyses. Free response and open-ended question responses were analyzed through identifying representative themes and quantifying occurrences. Quotations from responses are used for context. A more detailed breakdown of the survey questions is provided in Appendix A.

The questionnaire for the survey was developed using Google Forms and distributed through email to the scholars at each institution. Survey participation was voluntary, and informed consent was obtained in accordance with the institutional review board. A total of 31 consenting responses were obtained from the 4-year institution, and a total of 23 consenting responses were obtained from the 2-year institutions.

Results & Discussion

Selected questions alongside aggregated, averaged, or summarized responses will be revealed and discussed in the following subsections:

Student Participant Profile [Schlossberg's Situation]:

An EMPOWER scholar is a community college student or university transfer student who is pursuing an engineering degree, Pell grant eligible, and a U.S. citizen or permanent resident. EMPOWER scholars apply and are accepted into a program at one of the three institutions. As shown in Figure X, the surveyed population has a wide distribution of experience, pre- and post- transfer, and of time active in the EMPOWER program. The GPAs across institutions for the survey participants are very similar. The gender distributions in both community college and university lean more male, however the university student participants' gender difference is less discernible.

Community College

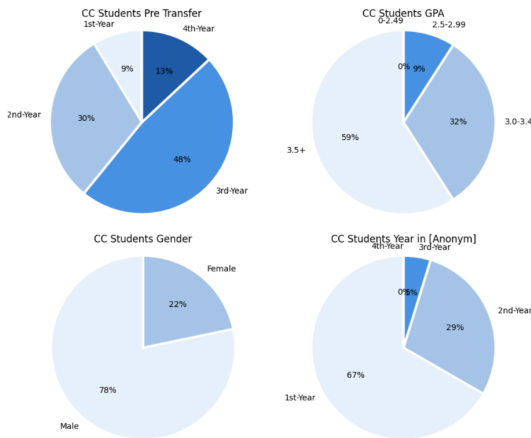


Fig. 1: Community college (CC) demographics, including year after entrance, gender, GPA, and years in EMPOWER.

University

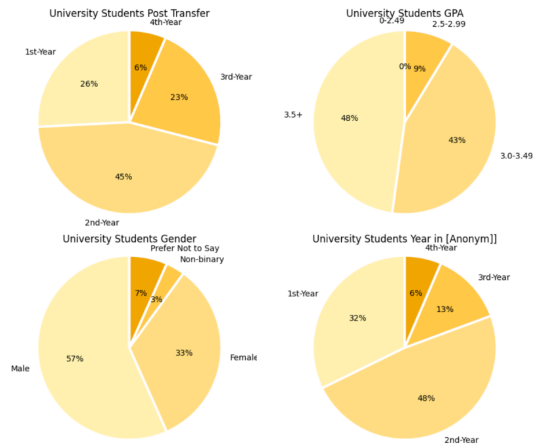


Fig. 2: University demographics, including year after entrance, gender, GPA, and years in EMPOWER.

Self-Efficacy & Motivation [Schlossberg's Self]:

Self-efficacy and motivation are high (average above 5 on a 1-7 scale) among both groups, community college transfer engineering students and university transfer engineering students. Self-efficacy trends downward post-transfer for students. At the university, it is possible that students begin to doubt themselves, for example, their academic abilities, when placed into a challenging situation. Motivation remains just as high or is higher post-transfer.

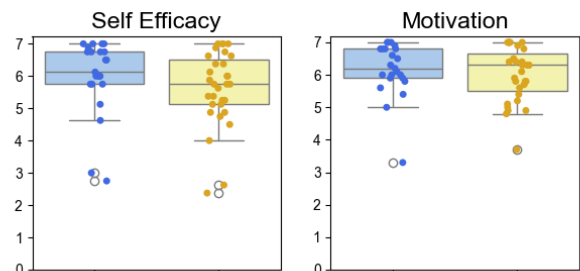


Fig. 3: Self efficacy & motivation averaged data for each student, comparing community college (left) and university (right).

Transfer Student Capital [Schlossberg's Self & Strategies]:

Transfer student capital, specifically with questions related to transition preparedness and navigating through the transfer process, relies on Schlossberg's factors, self & strategies. There is no significant difference in the mean, however figure 4 illustrates a more widely varying perspective of students post transfer. It is possible that the specific students in the community college pool, coming from the EMPOWER program, reduced the variance. Whereas students at the university transferring from a wider array of community colleges likely had different experiences, thus showing a wider variance of transfer capital.

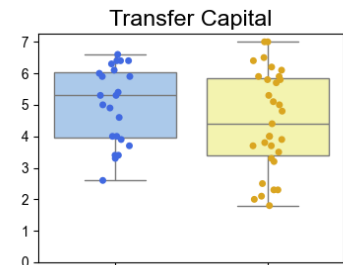


Fig. 4: Transfer capital averaged data for each student, comparing community college (left) and university (right).

Institutional Engagement [Schlossberg's Support]:

At both community colleges and the university, there are many opportunities to engage with academic support, social events, and professional development activities. It is interesting to note that, at a university, there are a significantly larger number of opportunities to engage in such ways, most students at a university responded that they do not frequently attend events. Looking across all three categories, students are more inclined to use academic support.

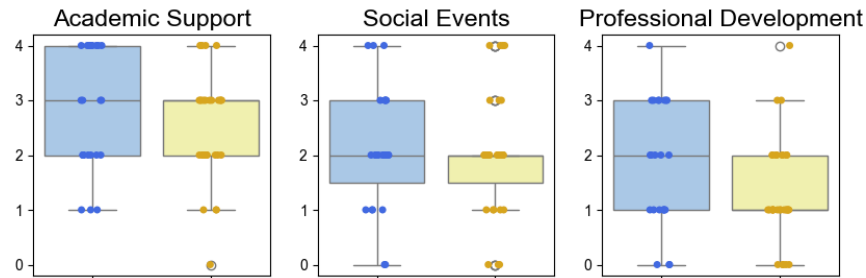


Fig. 5: Institutional engagement frequency, including academic support, social events, and professional development frequency data for each student, comparing community college (left) and university (right).

Perceived Social Support [Schlossberg's Support]:

The perceived social support measured shows a fairly consistent trend across community college and university participants. Looking more closely at the responses regarding family and friends, it was observed that after students transitioned to the university, they relied more heavily on friends than their families. It is important for a university program to identify transfer students who have lost their previous social support network (family and/or friends) and have yet to find social support in the new environment.

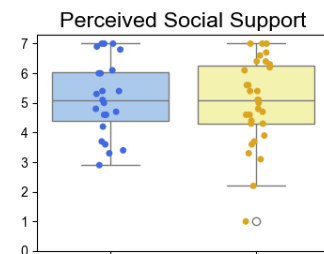


Fig. 6: Perceived social support averaged data for each student, comparing community college (left) and university (right).

Sense of Belonging [Multidimensional: Schlossberg's Situation, Self, and Support]:

Community colleges enroll students with a wide variety of backgrounds at often non-traditional points in their lives. It can be difficult to enhance a sense of belonging when students are commuting and possibly have increased attention on family and work. At UC San Diego, transfer students make up approximately one-third of each graduating class. Even with such a critical mass, the delayed entrance and shorter duration at a traditionally 4-year program can lead to a lower sense of belonging. Despite all of this, both community college EMPOWER students and university EMPOWER students have reported a high sense of belonging. The most positive response of all questions was to "People at my institution accept me."

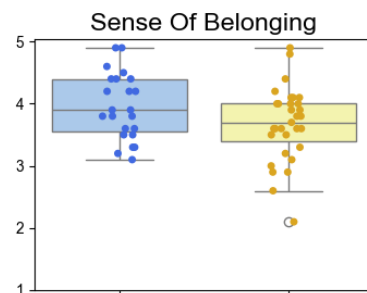


Fig. 7: Sense of belonging averaged data for each student, comparing community college (left) and university (right).

Transitioning to a 4-year University [Open-Ended Questions, Multidimensional: Schlossberg's Support and Strategies]:

To perform thematic analysis of students' responses to the survey questions related to transition, we reviewed all responses from the 4-year university and the partnering 2-year colleges. We then created a set of high-level themes based on the provided responses and the recurring mentions. Several students cited multiple themes in their responses (e.g., a student might mention both an institutional program and peer support as sources of support during their transition). Therefore, the sum of the counts exceeds the total number of respondents for certain themes. Tables 1 and 2 outline the themes identified in students' responses to questions about what has helped them transition or prepare for a transition to a 4-year university, as well as the strategies they developed to achieve their academic goals. The percentages of university and community college students whose responses mapped to a theme are also included in these tables.

Table 1. The thematic analysis and comparison of responses from university and community college students regarding the support they received for their transition or preparation for transition.

Community College students Question: What, if at all, has been the support you have had in your transition preparation thus far? Can you share an example of why or how they have been supportive in preparing for the transition?			
University students Question: What, if at all, has been the support you have had in your transition thus far? Can you share an example as to why or how they have been supportive in your transition?			
Theme	Description	Percentage of Community College Respondents (N = 21)	Percentage of University Respondents (N = 24)
Institutional and Program Support	Transfer-oriented programs, scholarships, EMPOWER cohorts, and formal advising offices.	48% (10/21)	54% (13/24)
Peer and Community Support	Friends, study partners, fellow-transfer networks, and student-org	52% (11/21)	79% (19/24)
Faculty and Mentor Guidance	Direct help from professors, TAs, research mentors, and counselors who give academic or planning advice.	52% (11/21)	21% (5/24)
Financial Support	Money-related aid (scholarships, emergency funds, and stipends).	5% (1/21)	8% (2/24)
Research and Academic Opportunity	Visiting research labs, access to conference presentations, robotics, or other discipline-specific experiences.	5% (1/21)	8% (2/24)
Confidence and Personal Growth	Statements of self-efficacy, resilience, "learning how to learn", mindset, and feeling ready.	33% (7/21)	13% (3/24)
Health and Wellness Support	References to mental-health counseling and health-related services that helped the transition.	0% (0/26)	4% (1/24)

Responses to the question about transition support indicate that both university transfer students and community college students experienced a combination of academic and social support, though the types of support emphasized differed somewhat between the two groups. University transfer students most often pointed to peer and community support, such as friends, student organizations, and other transfer students, with one student explaining that “student organizations and fellow transfer students have been my support during transition, as I felt a sense of belonging and familiarity with transfer students, and student organizations let me explore cool engineering topics.” Many university students also described institutional or program support as influential, particularly transfer focused programs and advising, noting that “attending transfer prep and being an EMPOWER scholar have definitely helped me as they allowed me to learn about resources for transfers on campus as well as make some connections with other transfer engineering students. It helps to have some familiar faces in the classes you take.” Fewer university students mentioned faculty guidance, financial help, or health related services, though some highlighted specific mentorship opportunities, such as one student who shared that “the EMPOWER Group Faculty Mentorship Lunch has been incredibly supportive during my transition” and helped them gain their first clear understanding of academic research and faculty work. Community college students also reported strong peer support, but they were more likely than university students to emphasize guidance from faculty and mentors and to highlight increased confidence and readiness gained through program participation, advising, or conversations with family members. One student described the collective role of academic relationships, stating, “my counselors, professors, and classmates offer me aid with the process.” Another student emphasized the impact of the EMPOWER program participation on their academic goals, explaining that “this program has really pushed me to excel because the trips to UC San Diego’s engineering school really allowed me to visualize myself at UC San Diego,” and that this visualization motivated them to continue pursuing long-term academic goals. Overall, the findings suggest that relationships with peers and access to structured programs play an important role for both groups, while community college students rely more heavily on faculty guidance and confidence-building experiences as they prepare for transfer.

Table 2. The thematic analysis and comparison of responses from university and community college students regarding the strategies they developed to reach their goals.

Community College students Question: What strategies have you developed thus far to reach your mentioned goals? Any resources used, etc.?			
University students Question: What strategies have you developed thus far to reach your mentioned goals? Any resources used, etc.?			
Theme	Description	Percentage of Community College Respondents (N = 22)	Percentage of University Respondents (N = 22)
Study Habit and Time Management	Establishing daily/weekly habits or using planning tools.	59% (13/22)	32% (7/22)
Academic-Resource Utilization	Using campus academic supports such as office hours, tutoring/TA sessions, workshops, and discussion sections.	50% (11/22)	50% (11/22)
Networking and Relationship Building	Actively forming connections with peers, clubs, and societies.	50% (11/22)	41% (9/22)
Mentorship and Guided Advice	Reference to a specific mentor, counselor, professor, or advisor who provides career or academic advice.	14% (3/22)	14% (3/22)
Research & Career Development	Participation in research labs, looking for UG research projects, or applying for internships.	23% (5/22)	14% (3/22)
Self-Reflection & Personal-Growth	Learning from mistakes and stepping out of the comfort zone	14% (3/22)	23% (5/22)

Responses to the question about strategies used to reach academic and career goals indicate that both university transfer students and community college students relied on a range of structured, proactive approaches, though the emphasis on specific strategies varied between the two groups. University transfer students most frequently described the use of academic resources, such as office hours, tutoring, and workshops, as central to their progress, with students noting practices like “starting homeworks well before the deadline, go to office hours, attend discussions, textbook examples,” and “I study a lot, make study groups, ask for help, go to TA and office hours, and try my best to stay on top of the material.” Many university students also emphasized intentional networking and relationship building through peers, student organizations, and academic communities, explaining that they had “worked extensively to utilize my network of people and personnel to help me push further into my journey.” Several university students referenced developing study habits and time management strategies, including the use of schedules or planning tools, with one student sharing that “Google Calendar has been very helpful to keep track of important assignments and events.” Community college students similarly emphasized academic resource use and networking, but they more frequently highlighted the importance of consistent study habits and time management, as one student explained, “I have just managed to figure out a good schedule and having good time

management because a lot of things demand time from you, so definitely removing a lot of the distractions that are not contributing to your growth or getting closer to your goals.” Some community college students also described engagement in research and career development activities or reliance on mentorship and guided advice, noting the use of resources such as “Handshake, LinkedIn, Triton Center, and academic tutoring,” while others reflected on personal growth strategies, including “being consistent, responsible, and start getting out of my comfort zone talking to people so I can learn about other experiences.” Overall, the findings suggest that both groups draw heavily on academic resources, networking, and structured study practices to advance their goals, with community college students reporting strong engagement across all three areas, while university transfer students more often emphasized navigating academic systems and leveraging existing networks as part of their strategies.

Table 3. The thematic analysis and comparison of responses from university and community college students regarding the contribution of the EMPOWER program components to students' transitions.

Community College students Question: How, if at all, have the EMPOWER program components you engaged with contributed to your transition preparation?			
University students Question: How, if at all, have the EMPOWER program components you engaged with contributed to your transition preparation?			
Theme	Description	Percentage of Community College Respondents (N = 14)	Percentage of University Respondents (N = 25)
Financial Support	Scholarships, stipends, or any monetary aid that make studying possible.	0% (0/14)	16% (4/25)
Peer and Community Support	Connecting with other transfer students, EMPOWER program scholars, clubs, and study groups	7% (1/14)	52% (13/25)
Mentorship and Guided Advice	Meeting with a mentor, advisor, or structured mentorship activity (e.g., Faculty Mentorship Lunch).	21% (3/14)	16% (4/25)
Personal Growth & Structured Support	Improving confidence and motivation, or utilizing the organized and structured help from the EMPOWER program	7% (1/14)	44% (11/25)
Academic & Career Guidance	Access to faculty/research or academic guidance, or career-oriented support	79% (11/14)	52% (13/25)

Responses to the question about the contribution of the EMPOWER program to students' transitions indicate that program components supported university transfer students and community college students in distinct but overlapping ways during transition and transition preparation. University transfer students most frequently highlighted peer and community support and academic and career guidance as key contributions of the program, describing how connecting with other scholars and accessing academic or career-related resources helped them

navigate their transition. For example, one student shared that “it’s allowed me the opportunity to meet with faculty and professors alike to get more comfortable taking risks or being bold asking to join their labs that eventually landed me a position with an incredible faculty member,” while another noted that “I got to meet a lot of other engineering majors and networked with professors I wouldn’t have had the opportunity of meeting otherwise.” Several university students also emphasized personal growth and structured support, explaining that organized program components increased their confidence and sense of belonging, as one student reflected, “I found people who experienced the same as me, and felt more belonging through these people and professors who make effort to guide us.” Fewer university students referenced financial support or mentorship and guided advice, though some described these elements as critical in reducing stress and enabling continued enrollment, with one student stating that “this program provides me much needed financial support and an opportunity to do research during the summer... I would not be able to attend school without financial support like this.” Community college students, in contrast, most strongly emphasized academic and career guidance, with nearly all references centering on the cross-campus program events that exposed them to university spaces, faculty, and transfer resources. Students described how campus visits, lab tours, and interactions with university staff and transfer students helped clarify academic pathways and transfer expectations, noting that “they really helped me get an idea of how a four year university is going to look like,” that the visit “opened my eyes to the opportunities and resources available on campus such as the makerspace and labs,” and that “exploring labs and connecting with UC staff helped me be prepared for what comes next.” Overall, the findings suggest that while university transfer students experienced the program as a source of community building, confidence development, and academic access, community college students primarily engaged with program components as a way to visualize the university environment and better understand the academic and career pathways ahead.

Summary & Conclusion

EMPOWER students from UC San Diego, SWC, and IVC participated in a survey that covered student profile/demographics, self-efficacy and motivation, transfer student capital, institutional engagement, perceived social support, sense of belonging, transitioning to a 4-year university, and, finally, EMPOWER program support. Quantitative and qualitative data were revealed and discussed. Comparisons were made between the community college and university responses.

EMPOWER students, across all institutions, showed strong self-efficacy and motivation. Reported transfer capital, i.e., knowledge of the transfer process and how to navigate university resources post-transition, varied widely across students, most especially for current university students. Engagement in institutional activities, i.e., academic support, social events, and professional development activities, varied widely, however it was noted that for both community college and university EMPOWER students, there was an increased engagement with academic support. Perceived social support was high across both groups, however, when looking more closely at the responses, support was more commonly found with friends as opposed to family after transfer to a university. A highly positive response at all institutions was shown for the sense of belonging, with students strongly agreeing to “People at my institution accept me.” Considering free responses regarding the support students received for their transition or preparation for transition, the most common themes included: 1) Institutional and Program Support, 2) Peer and Community Support, and 3) Faculty and Mentor Guidance.

Considering free responses regarding the strategies they developed to reach their goals, most common themes included: 1) Study Habit and Time Management, 2) Academic-Resource Utilization, and 3) Networking and Relationship Building. And finally, considering free responses regarding the contribution of the EMPOWER program components to students' transitions, the most common themes included: 1) Peer and Community Support, 2) Personal Growth & Structured Support, and 3) Academic & Career Guidance. Through the lens of Schlossberg's transition theory, there is a strong mix of support around each transition factor: situation, self, support, and strategies.

Key Lessons Learned:

- The transition from community college to university for transfer engineering students is challenging, and they should be supported through a variety of mechanisms, for example, mentorship, pre- and post-transition cohort building, cross-campus visits, and academic support.
- Peer networks play an especially important role in preparation for transfer, as well as post-transfer when navigating a large campus.
- Existing institutional resources are important to leverage. It is important to connect students with resource centers, timely to their transition. For a large S-STEM program, building faculty and staff relationships across institutional resources can reduce barriers for transfer students.

Researcher Positionality Statement

As researchers, we acknowledge our positionality in this study and recognize how our backgrounds, experiences, and perspectives might influence the research process. Our team comprises three professors in electrical and computer engineering who do not have first-hand experience as transfer students but have extensive experience in student advising, mentorship, and institutional support programs for both transfer and non-transfer students. Our engagement with transfer students through mentoring and program development has provided insights into the challenges they face and the support programs that might help them during their transition.

We recognize that our perspectives influenced the survey design, data collection, and analysis. To strengthen the relevance and clarity of the survey, we incorporated insights from student responses to a similar survey conducted the previous year. By analyzing themes and patterns from prior responses, we refined survey items to better capture students' experiences with academic and social support systems. This approach allowed us to align the survey questions with student-identified challenges and concerns.

Furthermore, we acknowledge that the findings of this study are influenced by the distinct environment and institutional structure of a large public research university, and they may not directly apply to all engineering education contexts. Nevertheless, we hope that these insights encourage educators to design and implement programs that better support the success of transfer students in engineering programs.

As human participants in the research process, we also recognize the ethical responsibility involved in collecting and analyzing both quantitative and qualitative data from students. Beyond

compliance with IRB approval, we took deliberate steps to protect participant confidentiality, ensure voluntary participation, and accurately represent student experiences. Given that open-ended responses often contained personal reflections on academic struggles, transitions, and institutional barriers, we de-identified responses before engaging in the data analysis to maintain participant anonymity.

Acknowledgment

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Appendix A - EMPOWER Year 4 Survey Questionnaire

- 1) Student Profile/Demographics
- 2) Academic Support Services
 - a) How often do you use the Academic Support Services, such as Professor/TA/Tutor Office Hours, the Tutoring Center, or other Tutoring offers at your current institution?
- 3) Institution Event Participation
 - a) How often do you attend the social events held at the Jacobs School of Engineering?
 - b) How often do you attend the professional development or technical events (seminars, workshops, etc.) held at the Jacobs School of Engineering?
 - c) How often do you meet with a mentor at [Institution] in an INFORMAL setting?
 - d) The mentor can be a professor, an academic advisor, or an alumnus with whom you meet at least once a quarter.
- 4) Self Efficacy
 - a) For each of the following statements, please indicate how true it is for you using the following scale: 1 (not at all true of me) to 7 (very true of me)
 - I will be able to achieve most of the goals that I have set for myself.
 - When facing difficult tasks, I am certain that I will accomplish them.
 - In general, I think that I can obtain outcomes that are important to me.
 - I believe I can succeed at most any endeavor to which I set my mind.
 - I will be able to successfully overcome many challenges.
 - I am confident that I can perform effectively on many different tasks.
 - Compared to other people, I can do most tasks very well.
 - Even when things are tough, I can perform quite well.
- 5) Perceived Social Support
 - a) For each of the following statements, please indicate your level of agreement using the scale from 1 (strongly disagree) to 7 (strongly agree).
 - My family really tries to help me.
 - I get the emotional help and support I need from my family.
 - My friends really try to help me.
 - There is a special person who is around when I am in need.
 - I can count on my friends when things go wrong.
 - I can talk about my problems with my family.
 - I have friends with whom I can share my joys and sorrows.
 - My family is willing to help me make decisions.
 - I can talk about my problems with my friends.
- 6) Transfer Student Capital
 - a) For each of the following statements, please indicate your level of agreement using the scale from 1 (strongly disagree) to 7 (strongly agree).
 - I knew the steps required to transfer to a four-year engineering program before transfer.
 - I knew what academic expectations looked like at a four-year institution before transfer.
 - I knew how university advising at a four-year institution worked before transfer.

- Looking back, I understood what to expect during the overall transition from community college to [Institution].
- Looking back, I felt academically prepared for my transition to [Institution].
- Looking back, I understood what academic changes to expect when I transferred to [Institution].
- Looking back, I felt ready to adjust to the non-academic aspects of the transition to [Institution] (for example, the campus environment, quarter system, commuting, or student life).

b) For each of the following statements, please indicate your level of agreement using the scale from 1 (strongly disagree) to 7 (strongly agree).

- I know how to find information about research opportunities at a university.
- I know how to find internships related to my major.
- I know how to get involved in engineering organizations.

7) Motivation

a) For each of the following statements, please indicate how true it is for you using the following scale: 1 (not at all true of me) to 7 (very true of me)

- I put enough effort into learning engineering topics
- I use different strategies to learn engineering topics
- I spend a lot of time learning engineering topics
- I study hard to learn engineering topics
- I prepare well for the exams in engineering courses
- The engineering topics I learn are relevant to my life
- Learning engineering topics is interesting
- I am curious about discoveries in engineering fields
- I enjoy learning engineering topics
- Learning engineering topics will help me get a good job
- Understanding engineering topics will benefit me in my career
- My career will involve engineering
- I like to do better than other students on engineering course exams
- Getting a good grade on engineering course exams is important to me
- I think about the grades I will get in engineering courses
- Scoring high on engineering tests and laboratory work matters to me a lot

8) Sense of Belonging

a) For each of the following statements, please indicate your level of agreement using the scale from 1 (strongly disagree) to 5 (strongly agree).

- People at [Institution] accept me.
- I feel like an outsider at [Institution].
- Other people understand more than I do about what is going on at [Institution].
- I think in the same way as do people who do well at [Institution].
- It is a mystery to me how [Institution] works.
- I feel alienated from [Institution].
- I fit in well at [Institution].
- I am similar to the kind of people who succeed at [Institution].
- I know what kind of people [Institution] professors are.

- I get along well with people at [Institution].
- I belong at [Institution].
- I know how to do well at [Institution].
- I do not know what I would need to do to make a [Institution] professor like me.
- I feel comfortable at [Institution].
- People at [Institution] like me.
- If I wanted to, I could potentially do very well at [Institution].
- People at [Institution] are a lot like me.

9) Transitioning to a 4-year university

- a) Please describe your transition from college to university. How has it been so far?
- b) What, if at all, has been the support you have had in your transition thus far? Can you share an example as to why or how they have been supportive in your transition?
- c) What are one or two ways your background, upbringing, or identity have contributed to (or hindered) your transition? Please share why or how.
- d) Why did you decide to go the community college route? What goals do you have for transfer (if any)?
- e) What strategies have you developed thus far to reach your mentioned goals? Any resources used, etc.?

10) EMPOWER Program Support

- a) In what year did you first become an EMPOWER Scholar?
- b) How often have you participated in the EMPOWER program activities?
- c) What are some of the ways you have engaged with the EMPOWER Scholars Program thus far?
- d) How, if at all, have the EMPOWER program components you engaged with contributed to your transition? Please provide an example.
- e) How, if at all, have they contributed to any feelings of being welcomed at the Jacobs School of Engineering at [Institution]? Please provide an example.
- f) What have you gained from your EMPOWER program experience?
- g) Have you received a scholarship from the EMPOWER program this quarter?
- h) If you have received a scholarship from the EMPOWER program, in what ways has it helped you?
- i) Have you ever participated in EMPOWER's "Meet with a Mentor" program? This means, have you ever requested a \$15 "Meet with a Mentor" Triton card?
- j) How can we improve the EMPOWER's "Meet with a Mentor" program to facilitate your participation?