Engineering Educators Bringing the World Together
2025 ASEE Annual Conference & Exposition
Palais des congrès de Montréal, Montréal, QC • June 22–25, 2025 ASEE
Paper ID #47106

Guides on the transfer journey: A qualitative study exploring the academic and social supports of community college transfer students

Ms. Jan Edwards, College of Lake County

Jan L. Edwards is a Professor of Engineering at the College of Lake County in Illinois. She received her Bachelor's and Master's degree in Materials Science and Engineering at Michigan Technological University. She completed her Ed.D. at Northern Illinois University with an emphasis in College Teaching. Dr. Edwards teaches general engineering courses, manages outreach initiatives and the CLC Baxter Innovation Lab at the community college. She is also serving as the Principal Investigator on the college's NSF S-STEM grant, Building an Academic Community of Engineering Scholars.

Carrie Kortegast, Northern Illinois University

Guides on the transfer journey: A qualitative study exploring the academic and social supports of community college transfer students

Introduction

This research brief explores the community college student's transfer journey guided by the transfer student capital and engineering identity frameworks. Academic supports, social relationships, and experiential learning are common programmatic approaches to fostering a sense of belonging and engineering identity within first-year experience programs [1]-[5]. The goal is to actively engage students as they transition into an engineering degree program with the intention of improving persistence and graduation rates [6]-[8].

Some students enter the engineering pathway as juniors after completing two or more years at a community college. However, nationally only 16% of students who start at community college with the intention of earning any bachelor's degree complete that goal within 6 years of starting college [9]. Students who then successfully transfer have about a 50% chance of completing their bachelor's degree within four years. The odds become even better - rising to 67% - for those who first complete their associate's degree, surpassing the graduation rate of students who start directly at the university [9]. By helping more students successfully transfer, we could significantly expand the pipeline of new engineers entering the profession.

The success of transfer students has often been analyzed at the point of transfer or from the perspective of the receiving institution [10]-[14]. This research study aims to understand the community college experiences of engineering students that provided the foundation and momentum for successful transfer and continued persistence with the following questions: 1) How did the community college experience influence the decision to continue studying engineering at a university; and 2) How did transfer student capital inform students' transfer experience?

Theoretical Frameworks

The transfer student capital (TSC) framework identifies the knowledge and skills community college students accrue to successfully manage the transfer process to a four-year university. It provides a holistic understanding of the education pathway, including social and academic adjustment [15] and social relationships developed. These social relationships and collection of community college experiences provide students opportunities to increase their transfer capital and thereby increase the probability of successful transition experience and degree completion [16], [17].

The engineering identity framework by Godwin [18] assists in understanding how students develop an engineering identity. The framework consists of three interrelated dimensions: interest, performance, and recognition (of self and by others). Relationships with peers, faculty, and engineering professionals are most prominent in the description of recognition: how a student perceives others see them in the context of engineering [18].

Methods

This research brief is part of a larger qualitative case study [19] examining the vertical transfer process and engineering identity development. The case study research focuses on an "in-depth description and analysis of a bounded system" [19, p. 37] within a real-life context. The bound system for this case was the engineering degree program at a large suburban Hispanic Serving Institution (HSI) community college, Midwest Community College (pseudonym - MWC). The degree program, Associate in Engineering Science (A.E.S.), is based on the state articulation requirements which mirror the freshman and sophomore portion of a bachelor's degree in engineering.

Data Sources

The two primary data sources were: 1) semi-structured interviews with individual students; and 2) education journey reflection maps. Purposeful sampling was used to recruit participants who had completed at least 36 credits at MWC prior to transfer, completed at least one semester after transfer, and continued to be enrolled in an engineering degree program or were a recent engineering graduate. Twelve individuals agreed to participate who successfully transferred to one of six different institutions (See Table 1). At the time of the interview, the participants' upcoming graduation date ranged from within the next 3 months to the next two years. Three of the participants had graduated recently.

Table 1: Participant demographics

Pseudonym	Gender	Ethnicity	First generation	Age	AES earned from MWC	Transfer Institution
Jake	Man	White	Yes	32	Yes	Large Public R2
Emilia	Woman	White	No	22	Yes	Large Public R1
Alan	Man	White	No	21	Yes	Large Public R2
Bruno	Man	Latinx	Yes	22	Yes	Large Public R1
Abe	Man	White	No	45	Yes	Small Private R
Mia	Woman	White	No	21	No	Large Public R1
Gabe	Man	White, Latinx	Yes	23	Yes	Large Public R1
Cedric	Man	White	No	21	Yes	Med. Private
Kyle	Man	White	Yes	22	Yes	Small Private R
Jessica	Woman	Latinx	Yes	23	Yes	Small Private R
Wyatt	Man	White	No	23	Yes	Large Public R1
Zane	Man	White	No	25	No	Large Public R2

Prior to the semi-structured interview, students completed an education journey reflection which mapped critical incidents. The critical incident technique required individuals to create a retrospective report of incidents that were of personal importance [20]. Participants were asked to plot critical incidents on the timeline related to becoming an engineer and their educational journey from high school to community college to a four-year institution with particular focus on the transfer process.

Participants were interviewed via Zoom by Dr. Edwards with each interview lasting between 30 to 90 minutes. The semi-structured interview focused on opportunities to build transfer student capital and develop their engineering identity. Questions included "Why did you choose to start at community college" and "Describe your relationships with faculty, advisors or other

community college contacts and how they influenced the development of your engineering identity." Critical incidents from education journey reflection maps were also discussed.

Data Analysis

Interviews were transcribed then reviewed for correctness. Data were analyzed with a focus on how students made meaning of their experiences during the transfer process and how their community college experiences shaped their expectations. Open coding was initially applied, using the participants own words to create the coding list. This was consolidated based on emerging themes and patterns [21]. Codes were then compared against the processes for successful transfer and engineering identity concepts in the frameworks to interpret what the phenomenon meant to the participants [22, p. 213].

Trustworthiness

Dr. Edwards served as the lead investigator and was responsible for interviews and data analysis. Her background as a community college faculty member framed the research study with a practitioner mindset. Dr. Kortegast, an associate professor in higher education, was employed for peer review [19, p. 249] to verify interpretation and for manuscript revision. In addition, member checks [19] were conducted to confirm the first author's interpretations aligned with participants' perceptions.

Results

The following summarizes the findings related to interactions at the community college that assisted participants' engineering identity development and critical incidents related to the transfer process.

The participants arrived at community college at various life stages. Approximately three-fourths were recent high school graduates, while the others had pursued careers that did not require a formal degree such as military service or construction. Those older students were more uncertain about starting a STEM degree program which would require considerable math.

About half of the participants identified as first-generation college students and had limited exposure to the engineering profession beyond related high school coursework. They may have completed technical courses such as CAD or a pre-engineering program such as Project Lead the Way in high school. Other participants had strong role models who were practicing engineers or older siblings or cousins pursuing an engineering degree. They spoke more clearly of their childhood interests in inventing, robotics, programming, and other related activities. Their role models had encouraged or inspired them to pursue a degree in engineering or a related field.

Once the participants started at community college, a common theme was the ease with which relationships could be established. The smaller classrooms facilitated opportunities for students to compare notes, form study groups, and simply find familiar faces. Participants felt that the low student to faculty ratio allowed faculty to learn their names and educational goals, creating a more personalized setting. Being a relatively small program, students had the same professor for two or three of their technical courses, increasing the level of familiarity.

Fork in the road

Reflecting on memorable and critical moments led to narratives of successes but also moments of personal struggle and growth, including thoughts of switching majors. Several students spoke of courses that they failed and then later repeated successfully. These students experienced a mental shift, realizing that they were capable of more than they had originally thought. They also came to understand that it was ok to fail. Cedric described learning to fail as a critical incident in the development of his engineering identity sharing,

> That's the entire thing of being an engineer - if you don't know how to do it, figure it out. It's not the end of the world if you mess up. And so, learning from the mistakes is what my professors taught me … they were tremendously helpful in establishing my mind as an engineer.

In each case, it was the feedback from a faculty member that supported the students' momentum forward. They internalized that support as recognition of their potential to be successful. Indeed, the power in the faculty role was described by Jake when he shared, "I was still kind of like one foot out, one foot in, in terms of engineering. For a little while, one bad experience in a class could make or break my decision to go for engineering." It was the positive relationships with faculty that helped him continue pursuing engineering.

Using the buddy system

The shared experience of completing lab reports and homework assignments fostered meaningful connections between students. Jake shared, "So you start to meet people that were like minded and wanted to learn. And maybe they're struggling with some of the similar things that I was struggling with, and sort of bonding on that." Peer relationships provided participants with new insights, alternate perspectives, and a better understanding of collaboration. Students highlighted group design projects as moments when they took time to understand their peers' perspectives and reasoning. Students revealed that these relationships made the classes more enjoyable and also motivated them.

However, several students commented on their own issues with anxiety and tendency to be more introverted. Zane shared that he realized the importance of these social connections over time. Zane's "aha moment" on the importance of developing relationships with others was tied to his future aspirations. Zane shared,

> But it's obviously extremely important as an engineer, to be able to not just be an engineer, but be a person, right? There's something behind the blank face…. I just learned to talk and network with people in professional ways and in just casual ways.

For many participants, it took time to get comfortable and learn how to interact with people.

Solitary journey

Outside of the classroom it could be more difficult to form social relationships. While there were many student clubs on campus, most of the students found limited time to engage with them. As a commuter campus, not everyone was necessarily looking to engage with others. Kyle observed "A lot of times the people that are like in the lobbies, or anything outside of classroom, they're in

their own zone. You know what I mean. Headphones in. They're going to their car. They're coming into class."

Wyatt commented on intentionally keeping to himself and thinking that was okay since this "isn't real college." There was the perception that he would engage more later when he was further along in the program and taking the courses that were specific to his major after he transferred. While he was in the minority, a few other participants clearly prioritized balancing academics and working part-time over creating any meaningful campus relationships as a time management strategy.

Planning next steps

Informal support and self-advising were the two most common approaches to learning more about the transfer process. Students sought out insight from their parents, parents of friends who had attended college, and community members. Jessica revealed that her pastor was the one who had insisted she tour the college that she later transferred to. She was not alone in looking for support in her faith community. Cedric also commented on the strong ties he had to his church and the support he had received on his education journey.

The strong ties to their community were what made starting at a community college the logical choice for many participants but also made taking that next step more daunting for some students. Several participants commented on just being comfortable in their current routine and not really giving much thought to the transfer process. Gabe, whose advancement was slowed during the pandemic, reflected on his own progress as "I'm happy. I'm doing what I need to do, kind of ticking the boxes as I go along with the classes." But then he was pulled aside by a professor, "And he's like, 'Yeah, you're done. You got to get out of here and you have to get moving on this.' And it just kind of woke me up." There was considerable variation in the timeline for when students started their transfer research. Some participants had decided on their transfer institution prior to starting community college, while others were starting their transfer research in earnest only a month before submitting a transfer application.

Students identified community college academic advisors as the individuals least sought out for details about the articulation process and transfer institution choice. While they may ask advisors for advice on the general transfer process, students expressed a lack of confidence in the advisor understanding the field of engineering or the requirements of the specific transfer school that they were interested in. They relied on the engineering faculty to aid them in selecting the right technical courses and narrowing down their transfer options.

Limitations

There are several limitations to consider related to these findings. Only students who had successfully transferred and continued to complete a degree in an engineering field were interviewed. This was an intentional aspect of the design to focus on the participants experiences as they related to engineering identity development during the institutional transition. Thus, the results of this study should cautiously be transferred to other types of engineering students.

Discussion and Implications

Within the TSC framework, community college students gain knowledge and skills through a composite of coursework completed and the associated course learning [15] that assists them with navigating the transfer process. Participants identified their academic peers as providing both increased understanding of technical content and increased motivation that influenced their decision to continue studying engineering. The opportunities to form these peer connections were predominately occurring within the classroom, which is not uncommon at community colleges [23]. Consistent with previous studies, these observations emphasize the value of active learning pedagogy in providing opportunities for students to engage both with the content and each other [24]-[26].

It was evident that beyond the academic gains in knowledge, participants felt supported by faculty in their pursuit of an engineering degree. Many of the critical incidents identified by participants included overcoming obstacles and gaining confidence in becoming an engineer. While in community college, most participants stated they did not yet identify as an engineer. However, they felt that faculty recognized their potential to become an engineer even when they were struggling. Wang [27, p. 37] described these interactions as compassion enhanced pedagogy when reflecting on changes in the classroom during the pandemic. She further observed that faculty were more aware of student perseverance driven by their hopes for themselves.

The above outcomes of increased technical understanding and improved confidence align with previous research that building a student's self-efficacy prior to transfer is essential [28]-[30]. Acknowledging that several of the students repeated a critical math course prior to successfully transferring, it also highlights the importance of resiliency from failure.

At the decision phase of transfer, the participants were focused on navigating the process. For these participants, the source of navigational capital aligned with previous research for first-generation transfer students who find their communities instrumental in navigating the transfer process [10], [11]. In general, the participants were observed to rely on parents and community members who had completed college to build their navigational capital rather than MWC. However, the importance of conversations with community college faculty members was apparent for understanding the discipline options and technical details of the transfer process.

Conclusions

This study explored community college experiences from the perspective of students who had already successfully transferred from a single community college to different universities. As they reflected on the critical incidents along their path that contributed to their persistence, there were common academic relationships that superseded their specific engineering discipline or choice of transfer institution. While these relationships may not be unique in comparison to university experiences, they are more concentrated within the confines of the classroom.

A future study will provide more details on how the relationships discussed in this brief and expectations of an academic network impacted the students' transition into the university culture.

References

1. K. Doran and J. Swenson, "'Do I belong here?': Persistence and retention implications of engineering belongingness and identity in academically at-risk populations," *IEEE Frontiers in Education Conference (FIE), Oct. 2022.* pp. 1-9., 2022.
2. M. L. Espino, S. L. Rodriguez, and B. D. Le, "A systematic review of literature: Engineering identity and students with financial need in community colleges," *Community College Journal of Research and Practice*, vol. *46, no.* 5, pp. 352-363, 2022.
3. A. Godwin and A. Kirn, "Identity-based motivation: Connections between first-year students' engineering role identities and future-time perspectives," *Journal of Engineering Education*, vol. 109, no. 3, pp. 362-383, 2020.
4. B. E. Hughes, W. J. Schell, B. Tallman, T. Sybesma, M. B. Kwapisz, E. Annand, E., ... and D. Kotys-Schwartz, "Entering the community of practice: changes in engineering students' engineering identities and perceptions of the field," *European Journal of Engineering Education,* vol. 46, no. 6, pp. 968-986, 2021.
5. A. D. Patrick and A. N. Prybutok, "Predicting persistence in engineering through an engineering identity scale," *International Journal of Engineering Education*, vol. 34, no 2a, pp. 351-363, 2018.
6. A. Clark, R. Desing, C. Wallwey, R. L. Kajfez, J. Mohammadi-Aragh, and S. Sassi, "Tracking first-year engineering students' identity metrics," *IJEE International Journal of Engineering Education,* vol. 36, no. 5, pp. 1625-1639, 2020.
7. X. Chen, C. E. Brawner, M. W. Ohland and M. K. Orr, "A Taxonomy of Engineering Matriculation Practices," in *Proc. 120th ASEE Annual Conference, Atlanta, GA, USA, June 2013.*
8. O. Pierrakos, T. K. Beam, J. Constantz, A. Johri and R. Anderson, "On the development of a professional identity: Engineering persisters vs engineering switchers," *Proceedings – Frontiers in Education Conference, FIE, Oct. 18-21, 2009*.
9. T. Velasco, J. Fink, M. Bedoya, D. Jenkins, and T. LaViolet, "Tracking transfer: Four-year institutional effectiveness in broadening bachelor's degree attainment.," Community College Research Center, Teachers College, Columbia University, 2024.
10. K. A. Davis, A. M. Ogilvie, and D. B. Knight, "Easing engineering transfer students' transitions: Recommendations from students who successfully navigated the transfer pathway," in *Proc. ASEE Annual Conference & Exposition, Columbus, OH, USA, June 2017.*
11. R. Cepeda, M. T. Buelow, S. S. Jaggars, and M. D. Rivera, "Like a freshman who didn't get a freshman orientation: How transfer student capital, social support, and self-efficacy intertwine in the transfer student experience," *Front. Psychol.* vol. 12, 767395, 2021. doi: 10.3389/fpsyg.2021.767395
12. N. L. Smith, J. R. Grohs, and E. M. Van Aken, "Comparison of transfer shock and graduation rates across engineering transfer student populations," *Journal of Engineering Education,* vol. 111, no. 1, pp. 65-81, 2022.
13. C. Hartman and J. Mayo, "It's Like Trying to Merge into Traffic: Relationships Between Transfer Student Experiences and Identity," *Journal of College Student Development*, vol. 63, no. 5, pp. 475-490, 2022.
14. A. M. Ogilvie and D. B. Knight, "Post-transfer transition experiences for engineering transfer students," *Journal of College Student Retention: Research, Theory & Practice*, vol. 23, no. 2, pp. 292-321, 2021.

15. F. S. Laanan, S. S. Starobin, and L. E. Eggleston, ”Adjustment of community college students at a four-year university: Role and relevance of transfer student capital for student retention,” *Journal of College Student Retention: Research, Theory & Practice,* vol. 12, no. 2, pp. 175-209, 2011.
16. F. Laanan, “Studying transfer students: Part II: Dimensions of transfer students’ adjustment,” *Community College Journal of Research and Practice*, vol. 31, no. 1, pp. 37–59, 2007. https://doi.org/10.1080/10668920600859947
17. C. Lukszo and S. Hayes, “Comparing the college choice decision process among two-and four-year transfer students,” *College and University*, vol. 94, no. 3, pp. 2-13, 2019.
18. A. Godwin, “The development of a measure of engineering identity,” in *Proc ASEE 123rd Conference & Exposition, New Orleans, LA, United States*, *June 2016.*
19. S. B. Merriam and E. J. Tisdell, *Qualitative research: A guide to design and implementation*, 4th ed. San Francisco, CA: Jossey-Bass, 2016.
20. L. D. Butterfield, W. A. Borgen, N. E. Amundson, and A. S. T. Maglio, “Fifty years of the critical incident technique: 1954-2004 and beyond,” *Qualitative research*, vol. 5, no. 4, pp. 475-497, 2005.
21. M. B. Miles, A. M. Huberman, and J. Saldana, *Qualitative data analysis. A methods sourcebook*, 4th ed, Thousand Oaks, CA: Sage, 2020.
22. S. R. Jones, V. Torres, and J. Arminio, *Negotiating the complexities of qualitative research in higher education: Essential elements and issues*, 3rd ed, Routledge, 2021. https://doi.org/10.4324/9781003090694
23. L. Schuddle, “Short- and long-term impacts of engagement experiences with faculty and peers at community colleges,” *Review of Higher Education*, vol. 42, no.2, 2019.
24. J. Louten, “Fostering persistence in science, technology, engineering, and mathematics (STEM): Creating an equitable environment that addresses the needs of undergraduate students,” *Journal of College Student Retention: Research, Theory & Practice*, vol. 26, no. 1, pp. 283-302, 2022.
25. H. M. Matusovich, R. A. Streveler, and R. L. Miller, “Why do students choose engineering? A qualitative, longitudinal investigation of students' motivational values,” *Journal of Engineering Education*, vol. 99, no. 4, pp. 289-303, 2010.
26. X. Wang, N. Sun, S. Y. Lee, and B. Wagner, “Does active learning contribute to transfer intent among 2-year college students beginning in STEM?,” *The Journal of Higher Education*, vol. 88, no. 4, pp. 593-618, 2017.
27. X. Wang, *Delivering Promise: Equity-Driven Educational Change and Innovation in Community and Technical Colleges*, Harvard Education Press, 2024.
28. A. Bandura, *Self-efficacy: The exercise of control,* New York: W H Freeman, 1997.
29. S. L. Britner and F. Pajares, “Sources of science self-efficacy beliefs of middle school students,” *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, vol. 43, no. 5, pp. 485-499, 2006.
30. C. Maliszewski Lukszo and S. Hayes, “Facilitating transfer student success: Exploring sources of transfer student capital,” *Community College Review*, vol. 48, no. 1, pp. 31-54, 2020.