# Trajectories of Transfer Students Toward a Bachelor's Degree-Granting Institution

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*Phys. Teach.* 62, 370–373 (2024)
https://doi.org/10.1119/5.0108466

# Trajectories of Transfer Students Toward a Bachelor's Degree-Granting Institution

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As physics educators, we regularly teach students who have attended, are currently attending, or will attend community college. There is a significant portion of students in higher education who are transfer students who attended community college before pursuing their bach elor's degree at a university. In 2007, 9% of undergraduate physics seniors started at a two-year college.[1] While the term "transfer students" includes a wide range of experiences, we focus on students currently enrolled in a bachelor's de gree-granting institution who had previously enrolled in a community college. Despite the existence of a wide range of pathways connecting community college and a bachelor's de gree-granting institution, common discourse about transfer students can implicitly assume that transfer students spend two years at a community college and then two years at a uni versity to earn a bachelor's degree. The commonly used ter minology, "two-year college" and "four-year college," appears throughout conversations regarding higher education, which implies that the two- or four-year timeline is the normative pathway.[2,3] However, other data suggests that almost half of students who were enrolled in community colleges at some point in the previous 10 years spent longer than four semes ters at community college.[4] We sought to show and detail some of the pathways students take, focusing on their educa tional experiences, skill development, career goals, and per sistence. The purpose of this paper is to show (1) examples of transfer students' pathways that differ from the implicitly assumed track and (2) how these pathways reveal evidence of transfer students' persistence.

## Methods and context

The context of this study is a Physics and Astronomy Department in a large, public, bachelor's degree-granting minority-serving institution where a significant fraction of undergraduate physics majors are transfer students. We in vited most of the physics transfer students in the department to participate in an interview about their experiences and how the department can better support them. This study took place during the COVID-19 pandemic, which meant that we communicated with our respondents through email and conducted the interviews through Zoom. Of the 16 students invited to be interviewed, we received four responses and collected four interviews. From these four interviews, we decided to focus on two for this paper to highlight examples of narratives with a trajectory that counters the implicitly as sumed transfer student path.

For the first half of the interviews, the interviewer and interviewee collaboratively filled out a life grid (see Tables I and II). A life grid is a data collection tool that allows us to track student experiences through time. The columns of the grid represent what we refer to as "life segments"—periods of their life spent at different academic institutions or jobs. The rows represent dimensions of the interviewee's life. The word "dimensions" refers to the aspects in the interviewee's life that we wanted to understand.[5] We chose to implement the life grid methodology to help us understand how to better sup port transfer students and track how their career goals and experiences shifted over time. The life-grid methodology has previously been used to track student experiences through a multiweek-long lab project and to investigate how biology undergraduates' interests and career goals influenced how they pursued advanced degree paths. This interview tech nique also promoted collaboration between the interviewer and interviewee, which supports the interviewee's ownership over their narrative.[5,6] Similar to Rowland et al., we used the life grid to retroactively track students' career aspirations and



Table I. Ongoing progress toward career development: Chris's life grid. This interview was collected the year that Chris planned to graduate.

| | High School | Other Bachelor's Degree-Granting University (2 yr) | Two Other Locations (Not Enrolled in College) (5 yr) | Two Community Colleges (4 yr) | Current Bachelor's Degree-Granting University (3 yr) |
|---|---|---|---|---|---|
| What skills, ideas, experience did you gain? | Social experiences, started guitar | Not liking it/the whole college experience | Friends, hitchhiked places, lived life differently/lived life on the edge | Gained prerequisite math/physics skills, bad work experiences — restaurants | More math/physics skills, meeting people who were also interest ed in those topics as well, COVID |
| Career interests and goals | None | None/only goal I had was to figure that out (goals) | Trying to find a way back into school for something I wanted to do— specifically for science— probably physics or engineering | Getting a physics or engineering degree, become physicist or engineer | Get BS in physics, get into master's program—ideally [Other University], hopefully good job where I can make some money |



Table II. Skill development and ongoing progress toward goal achievement: Anthony's life grid. This life grid was collected roughly three years before Anthony intended to graduate.

| | High School | Community College #1 (2 yr) | Community College #2 (3 yr) | Current Bachelor's Degree Granting University (1 yr) |
|---|---|---|---|---|
| What skills, ideas, experience did you gain? | Understand self better, didn't learn much else like taxes | Working at Rite Aid, tutor; understand how people work/learn, how to be more independent, can't rely on people to do every thing for you | Working at Starbucks, math tutor at [Nearby Town]. All the jobs were difficult while going through school. Started coding—C++, learned what a program/languages are, learned limits of working (30 h/wk) and mostly part-time student | Started taking on loans—learned about them, started Python for physics. Helpful teacher [computational physics course]—entry level—did best on final project—didn't feel discouraged to stop trying. Learned how to make scientific paper—LaTeX, learned how to write cover letters/resume—from friends/family |

| | | | | |
|---|---|---|---|---|
| Career interests and goals | None, "nothing caught my eye" | Wanted to major in math— got to differential equations and linear algebra, couldn't remember what I learned from classes, wasn't exciting either | Wanted to go into computer engineering, was told good at math probably should do programming, computer engineering major for first two years, programming teacher C++— knowledgeable but can't teach well—too big a jump between classes, computer engineering teacher—one assignment— make anything but was too discouraging since there was no guidance—just ideas/lost most of time | Want to be an astrophysicist in future, also considering coding in physics after bachelor's degree to get solid job after [Current Bachelor's Degree-Granting University], no idea about grad programs, going for math minor, after math minor—might go for astronomy minor as well, find internship for coding or lab or research |



skill development through higher education.

Students were first asked to identify different "life segments," and the interviewer assigned each life segment a different column. Then, students were asked to recall information pertaining to the specific rows on the life grid. As they recalled the information, the interviewer filled in the boxes. The interviewer shared their screen to support collaboration with the interviewee and continually invited the interviewee to make corrections. The rows of the life grid were "What skills, ideas, experience did you gain?" "Life Events," "Activities, volunteering, clubs, research," and "Career interests and goals." These rows were chosen because we initially wanted to understand how coursework and advising could better meet transfer students' needs, and to understand aspects of their experiences and challenges so that we could look for commonalities.

The second half of the interview was semistructured and focused on their identity, community, transfer student experience, and future career goals. Two examples of these questions are "How would you describe the community college and university experiences?" and "How does your experience as a transfer student differ from students who are not transfer students? Are there any unique challenges that transfer students face?"

After conducting the interviews, we analyzed the recordings and transcripts to identify common themes. We found that persistence was a strong shared characteristic for transfer students. We define persistence to be when students articulate effort and progress toward the achievement of their own goals or to overcome challenges (similar to previous work on mindset[7]). Our student-centered definition of persistence differs from prior studies in higher education, where persistence is thought of as semester-to-semester continuation toward a degree.[8] To present our preliminary ideas and gain their feedback on the strength of our interpretations, we sought input from two physics education research (PER) group meetings, two practicing instructors, and a PER researcher in the field of transfer students.

At the time of their interviews, the four students had attended community college for more than two years and were on track to graduate at their bachelor's degree-granting institution more than two years after transferring. For the purposes of this paper, we will focus on two students who we refer to as Chris and Anthony. These students were selected because their trajectories highlight examples of narratives with a trajectory that counters the implicitly assumed transfer student path. Additionally, we only show the "Skills, ideas, and experience" and "Career interests and goals" rows.

Chris's life grid shows his path of starting college at a different bachelor's degree-granting institution, to working and living in two locations, to attending two different community colleges, and finally enrolling at his current bachelor's degree-granting institution. In the "skills, ideas, and experience" row, he describes "liv[ing] life differently," where he was referring to experiencing homelessness, "gaining prerequisite [math and physics] skills," and work experience. In the "Career interests and goals" row, Chris states that during his life segment at his first bachelor's degree-granting institution, his only goal was to "figure that out," meaning that his goal was to identify his career goals. While he was

not enrolled in college, his goal was to "find a way back into school" to pursue science, specifically physics or engineering. At his current bachelor's degree-granting institution, he describes several goals—completing his bachelor's degree, attending a master's program, and finding a "good job where I can make some money." Looking across the rows of Chris's life grid, we see that he has spent nine years in college, across four institu tions. We see Chris's willingness to pursue his degree across nine years of his life as evidence that he values his degree.

Anthony's life grid shows his path of attending two differ ent community colleges from high school for five years and then transferring to his current bachelor's degree-granting institution. In the "skills, ideas, and experience" row, Anthony described gaining many types of skills and knowledge. Some of these skills were concrete, such as learning particular cod ing languages and writing a resume. Other skills were more tied to his lifelong learning, such as "how to be more indepen dent," the "limits of working," and being a student. In the "Ca reer interests and goals" row, Anthony states that he wanted to major in math but later switched to computer engineering after stating that his math classes "weren't exciting." His goals at his current bachelor's degree-granting institution include pursuing an internship, completing his major and minor(s), and becoming an astrophysicist.

Using the life-grid methodology, we gain a window into how these students' career goals evolved over time. In Chris's life grid, there is a pattern of setting goals, achieving them, and moving onto the next life stage, where he decides on the next set of goals. In the last three life segments, he achieves his previous goal and sets a new goal based on the previous goal. While there may be other goals that are missing from this retrospective account, we find it interesting how connect ed each life segment is to the prior life segment's career goals.

In Anthony's life grid, there are different goals in most of the career row boxes, and they do not appear to be as con nected to each life segment. It appears that Anthony's shifting goals are primarily driven by doing what he enjoys. This is visible in his justification of different career interests, such as describing classes as not being "exciting," having no goals be cause nothing "caught his eye," and feeling discouraged from computer engineering because he was "lost most of the time." We see that both students connect their career goals to the prospects of stable finances and employment. Additionally, we see evidence of persistence in both of these students' life grids through their own methods of achieving their goals.

## Discussion

We have seen, using the life-grid methodology, that these students have complex pathways. This finding com plicates the notion that transfer students spend two years in community college followed by two years at a bachelor's degree-granting institution. Chris's trajectory through two community colleges, two bachelor's degree-granting insti tutions, and time spent outside of school involves ongoing skill development and progress toward career development.

Anthony's trajectory is through two community colleges and one bachelor's degree-granting institution, while maintaining multiple part-time jobs. Anthony's life grid illustrates how his career goals are informed by his evolving interests; his life grid additionally includes technical and personal skills that he values.

Looking across the life grids, we see evidence of per sistence in the two students' trajectories. Chris's trajectory, which includes nine years spent at four universities, also de scribes several struggles—experiencing homelessness, juggling work and school, and not enjoying college initially. Through these struggles and attending two different community col leges, he later described the path of a transfer student as "circu itous. It took longer and it involved more trial and error" than those who are not transfer students. In other parts of the inter view, Chris described having struggled to navigate academic advising and develop an education plan. Through navigating these challenges and having overcome them, we argue that Chris's life grid illustrates his persistence. In each of Anthony's life segments, he works toward his goal at that time. Overall, he consistently works toward his ultimate goal of finding some thing he enjoys, a process that involved approximately nine years in college. Through working part time in addition to this process, he gained various concrete and life skills.

Chris and Anthony's trajectories diverge from the com monly assumed transfer student pathway of spending two



years at community college plus two years at a bachelor's degree-granting institution. From our own experience, trans fer students can often feel that they are "behind" or "off track" if they do not follow this pathway. Even the phrases "two year college" and "four year" degree do not necessarily reflect the experiences of transfer students. The two trajectories in this study are examples of diverse pathways; however, they are not representative of all community college transfer students.

For high school and community college instructors, who mainly interact with transfer students before they enter a bachelor's degree-granting institution, it is valuable to see how their current interactions with students fit into their broader trajectory. These detailed accounts show how the goals and skills developed at community colleges are built upon at future institutions. For faculty and staff at bachelor's degree-granting institutions, because students in our study spent time at multiple community colleges and/or bachelor's degree-granting institutions, we think it is important to con sider how this may affect advising and degree path require ments. Finally, we

see in both life grids that Anthony and Chris have valuable perseverance and life experiences. Future work should consider how these experiences and qualities can be leveraged to improve the student experience. The life grid approach could be used to illustrate trajectories for other groups of students as well, which are likely also diverse and multifaceted. Additionally, future analyses can help research ers understand the range of different pathways students take and the number of students taking those pathways to gain a more comprehensive understanding of the transfer student experience.



Acknowledgments

This material is based on work supported by the National Sci ence Foundation under Grant No. 2224296.

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