Asking the Right Questions in Community College Pathways Research

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Asking the Right Questions in Community College

Pathways Research

This work-in-progress considers the question: *How do we measure success for a community college transfer program?* This paper provides background information on the current state of student-related data collection for community colleges, focusing on community colleges in California, and poses questions regarding next steps in data collection and analysis.

Motivation

We need more engineers and community colleges provide a pathway for additional engineering students [1, 2]. Currently, there are seven million students in community colleges nationally and over two million students in public California community colleges [3, 4]. Understanding and improving pathways to engineering via the community college route has the potential to contribute currently untapped engineering talent to help fill the projected engineer deficit. Metrics should be established in order to assess the current rate of success and identify areas of improvement in community college transfer programs.

Background on transfer program goals

Success of engineering transfer programs can be defined by how well it meets its objectives. The authors' experience in teaching transfer student populations has led to the development of four main objectives for engineering transfer programs. These four main objectives are the following: 1) provide students with an entry point into an engineering pathway, 2) help students achieve their goal of being accepted into an engineering bachelor's program at a degree-granting institution, 3) establish foundational knowledge and skills for students to achieve their goal of obtaining a bachelor's degree in engineering, and 4) help students develop career expectations to achieve their goal of being employed in an engineering-related career.

Background on community college characteristics

Although engineering transfer programs may vary across community colleges, there are some common, defining features of these programs that are important to recognize if we are to create generalizable metrics for success. First, many, if not all, public community colleges have open enrollment policies, meaning that there are no minimum academic qualifications that a student must meet before being admitted at the college. Therefore, students do not have to go through the same application and acceptance process that occurs for four-year institutions. Community college students do not need to obtain a high school diploma, take a standardized test such as the SAT, nor meet any minimum academic requirements such as math or reading proficiencies before being accepted. The application process for community college students is not designed to help select students for admittance but rather to obtain personal information for reporting

purposes. The exact questions and length of the application vary by state. In California, for example, the application is a set of online questions that takes, based on the lead author's experience, about 20 minutes to complete. Students may register for any course for which they meet the prerequisites, as soon as they complete the online application. An advantage of an open enrollment policy is that students have the opportunity to try out courses in different fields before committing to a program of study.

Second, there is no single sequence of courses that community college students take when pursuing an engineering bachelor's degree. There are no set "first-year courses" that all students would take when first enrolling in the college; some students may begin with developmental math courses while others may place into higher level math courses. Additionally, students leave at different points as well. The number of required units varies by transfer institution ranging from one year of courses up to three years of completed courses. Combined with the ease at which students may switch between full-time and part-time status, it is difficult to identify a single pathway for students getting in, through, and out of community college. Complicating pathways further, students are often "swirlers" who take courses at multiple colleges depending on which college is offering the needed courses and at times that work best for the student's work and study schedule [5].

Third, the transfer application process begins when the student first enrolls in courses. Before enrolling in courses, a student should pick a major and a school to transfer to – commonly students pick several schools – followed by the student investigating the required and recommended courses for transferring into that program at that school. Many students consider multiple schools and the requirements may be different for each of them. Students must then plan out their own course sequence based on meeting the requirements for transfer to each of the desired schools. It may be difficult to identify students on a particular engineering pathway from their course enrollment patterns, due to the multiple sets of requirements that the students are balancing.

A fourth characteristic is the very high rate at which students do not complete their courses. While it is beyond the scope of this current work, it should be noted that the ease with which students can apply and then begin taking courses, and the ease with which students can leave their courses, may have some implications for perceived value of the courses and experiences. Additionally, without a preset sequence of courses, community college students may not gain the sense of community that students in other programs might have. This may be important for the development of interventions in community college transfer programs that can address the high drop-out rate. Some work is being done to establish Learning Communities with several colleges starting cohort programs in Fall 2016. The hope is that the Learning Community cohorts may help reduce the drop-out rate from key science, technology, engineering, and math courses.

Currently available data: bachelor's-granting institutions

The task of identifying students on the engineering pathway is more easily done at institutions that grant bachelor's degrees, where students may be identified as engineering students through their applications and acceptances into an engineering program. Measured outcomes at four-year schools include persistence along the pathway for their major and being granted a bachelor's degree in engineering [6]. Because a single institution both offers courses along the pathway and grants the degree, it has the information available to determine the rate at which students complete the engineering program.

Currently available data: community colleges

The task of identifying students on an engineering pathway can be much harder at community colleges. While some community colleges have an option for students to indicate a bachelor's degree in engineering as their transfer major on their application, California community colleges do not. Both identifying students on an engineering pathway and tracking their progress is difficult. It is well documented that the data that are available to determine success of community college transfer programs are severely lacking [1, 7-9], and the availability of data is getting worse with the closure of the California Postsecondary Education Commission [10]. This Commission had provided detailed data in a variety of areas including transfer pathways from each of the California community colleges to each of the universities in either of the two public California university systems [11]. The commission made it possible to conduct a search by year and institution and filter this data by major [11]. They had pulled together data from historical records up through approximately 2011, and all of the data is still available through their website [11].

The authors are not aware of any published papers on the application process to attend community colleges in California, for example, papers that might describe how the process compares between colleges or how the process in California compares to the process in other states. The following paragraphs include information based on informal conversations with people familiar with the California community college system. In 2012, the Student Success Taskforce made recommendations for improving education in California. Based on these recommendations, changes are being implemented over several years. First, there is now a single application that each student completes to enroll in any of the 112 California community colleges [4]; however, that basic application does not include questions about transfer major. While each community college has the option to add a small number of questions to that application, the authors are not aware of any college in the state including a question on intended transfer major. Students are asked if they intend to transfer, but when asked about their desired major, the only options available are for the associate degrees granted by that specific community college. If the community college does not offer an engineering associate degree, engineering would not show up on the list of majors at all. Second, students are required to declare a major and create an educational plan outlining the courses taken each term in order to get priority registration. Unfortunately, the list of majors that students may choose from is limited to the degrees and

certificates that the specific college offers. While the educational plan that the student creates will have the degree offered by the community college attached to it, it would be up to the counselor and student to put together an appropriate educational plan based on all of the student's goals. Additionally, many students do not take advantage of priority registration and may not either see the advantage of registering early or be ready to enroll at that time.

California community colleges do get some information about students who have transferred to the two public university systems in California, the California State University (CSU) system and the University of California (UC) system. The data are limited to counts of students from that community college who have been accepted into each of the universities. The counts are broken down by major for students entering the universities in the CSU system. Information regarding transferring from a given community college to an out-of-state or private university can be requested through the National Student Clearinghouse (www.studentclearinghouse.org). The data provided from the National Student Clearinghouse are limited as schools must provide information to the National Student Clearinghouse only for students receiving federal financial aid and are not required to provide information for students not receiving aid although they are allowed to do so. Additionally, the National Student Clearinghouse data does not include major. Thus the limited currently available data identifies an important void.

Additionally, many students "swirl" or enroll in courses at different community colleges as they attempt to patchwork together their required courses for transfer [5]. There is no current communication between community colleges about who is enrolled at multiple schools. Although, based on the Student Success Taskforce, students have recently been given a single identification number that they use when enrolling at any California community college, those identification numbers have not yet been incorporated into resources to facilitate tracking students between community colleges [12].

Next steps in data collection and analysis

The next steps in answering our question - *How do we measure success for a community college transfer program?* – include identifying the desired data and forming a plan for data collection and analysis. As a first measure of the success of the transfer program, the authors would like to identify engineering students early in their academic pathway and track those students through the community college and bachelor's degree-granting institution that they transfer to in order to determine a rate at which students are staying on the engineering pathway. The authors would like to get feedback from researchers who have collected transfer major information about the advantages and disadvantages of the different methods that institutions use to collect this data, i.e. either local online surveys or through a state-wide application, from an open response item or a pull down menu on the application, and if and when the information is updated by the student.

Request for Feedback

The authors would like input and feedback from the Educational Research and Methods Division members in addition to others familiar with this type of work on the methods of data collection and analysis. Which methods for data collection and analysis would best provide a measure of success for a community college transfer program? Can methods be developed that would scale and easily be implemented at other community colleges? The proposed work could include surveys, questionnaires, interviews, registration information, and data from state or national databases. Having an established measure of success will identify room for improvement in the community college engineering transfer pathways. This will provide a baseline for assessment of the effectiveness of future improvements to transfer programs. Understanding and improving the rate of success for community college transfer programs would increase the number of engineering graduates and address the demand for engineers.

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