

Board 143: Challenges Faced by Students Transitioning from High School to College

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Challenges Faced by First Generation Students Enrolled in Engineering – Transitioning from High School to College

Abstract:

The COVID-19 pandemic has caused significant disruptions in the educational system at both the K-12 and university levels. At the university level, students are struggling with deficiencies in math knowledge and with the lack of skills needed to succeed in college. According to the 2022 report from the American College Testing (ACT), only one in five students graduating from high school are prepared to take university level courses in math and science. In 2022, the ACT composite results fell to the lowest values since 1991. This generation of students is more distressed, disengaged, digitally distracted, and discouraged when compared with previous cohorts.

The purpose of this project is to identify the challenges faced by students transitioning from high school to college after the COVID-19 pandemic. For this study, we are focused on the transition of first-generation students as they experience their first semester in college. We believe that the COVID-19 pandemic has caused significant shifts in the struggles and needs of incoming students. For the analysis, first semester students enrolled in an engineering program in the Mid-Atlantic region were tasked to write a reflective essay explaining the challenges faced in their first four weeks in college. A thematic analysis of the qualitative data was used to analyze the reflective essays.

This “work in progress” paper will summarize the main results of the study. Based on the analysis, we propose interventions to assist these students in their transition from high school to college. This project is relevant to institutions seeking to improve the retention of students in their engineering programs.

Background:

First generation college students are defined as students whose parents completed only a high school diploma or equivalent. Some researchers include in this classification those students whose parents completed a two-year degree but not a four-year degree [1]. This parental limitation in higher education poses a major disadvantage to these students compared with students whose parents completed a higher education degree. This study adopted the definition of first-generation college students as college students whose parents did not graduate from a four-year institution [1].

Across colleges and universities in the United States, first generation students comprise 30-50% of the undergraduate students. First generation students are more predominant in two-year colleges and in general, they tend to have a high dropout rate [2].

Research indicates that first generation students are less likely to be engaged in academic and social experiences such as studying in groups, interacting with faculty and peers, participating in extracurricular activities, and attending support services [3]. This low level of academic and social engagement has been linked in part to their finances and financial aid, with first generation students being more likely to live and work-off campus, and more likely to take classes part time while working full-time [3].

Several studies have identified barriers to higher education access and persistence in college. These barriers include lacking knowledge of admissions, financial concerns, challenging engineering curriculum, few if any role models, balancing college with personal commitments, and lack of parental knowledge [4].

To increase the retention of first-generation students in engineering, studies recommend that institutions reach out to these students and engage them as early as possible during the first year in college. Strategies such as summer bridge courses and programs between high school and college, orientation courses before and during the first year, faculty mentoring programs, and peer mentoring programs have led to increases in confidence, belongingness, and engagement in first generation students. These interventions can ease the transition to college by getting these students integrated into the social and academic of college and helping them acquire the knowledge and skills necessary to succeed in college. Unfortunately, these interventions cannot be made mandatory and often be cost or time prohibitive unless funding for participation is available for all who wish to participate. Therefore, it would be beneficial to identify and address challenges of these students through the pre-existing course curriculum.

This study seeks to understand the challenges faced by first-generation students when they transition from high school to college. Specifically, the goal was to determine a) what are the challenges faced by first generation students during the transition from high school to college?, and b) are there differences in the challenges experienced by calculus-ready versus non-calculus ready first generation students enrolled in engineering? Most studies focus on the overall experience of first-generation students in college. Our study focuses on the first four weeks, and the challenges faced during the initial transition to college.

Participants:

This study was conducted in a land grant institution in the mid-Atlantic region and included data from sixty-eight (68) males and fourteen (14) females, all first-generation students enrolled in a first-year engineering program. Of those students, 51.2% of the students were calculus ready (48.8% non-calculus ready). All students completed a reflective essay administered in their fourth week in college. The essay asked students to reflect on their experience during their first four weeks in college and to discuss challenges faced.

Reflective Essays:

As part of a first-year seminar course, students were asked to reflect on their college experience during the first four weeks of classes. Reflective essays were collected in week four (4) to capture students' experiences as they transitioned from high school to the College. For those essays, students were asked to write a reflection about the challenges faced as they transition from high school to college. Eighty-two (82) reflective essays were analyzed in this study using thematic analysis.

Results:

The reflective essays were coded, and the content was analyzed. Eight emergent themes were identified describing major barriers: 1) time management, 2) adjustment to college life, 3) academic difficulty, 4) mental and physical health, 5) social component, 6) study skills, 7)

organizational skills, and 8) juggling multiple responsibilities. Table 1 summarizes the concerns expressed and the percentage of the students that indicated the concern. For the most part, time management issues were the predominant concern among first generation students.

Table 1. Concerns expressed by students in the reflective essays (overall results)

Concerns Expressed	Percentage of students
Time Management	65.9%
Adjustment to being away from home (home sickness and independence)	48.8%
Academic Difficulty	47.6%
Health (mental and physical health)	34.1%
Social (making friends, sexism)	32.9%
Study Skills (not knowing how to study)	23.2%
Organizational skills (keeping track of homework, complaints about using ecampus or homework programs, finding what they need to complete work)	15.9%
Juggling other responsibilities (job, sports team, fraternities, etc.)	15.9%
Extenuating family circumstances	1.2%

Other challenges expressed include adjustment to being away from home, academic difficulty with specific classes or topics, health related problems, and social concerns.

In terms of differences among calculus-ready and non-calculus ready students, the data indicate that time management remained the predominant problem for both groups of first-generation students. The two largest differences in response were in Academic and Social Difficulties. Calculus-ready students reported a higher level of academic difficulty, however, explanations for this were not discernible from the data. Non-Calculus ready students reported higher levels of social difficulties. While previous research indicates that first generation students are generally less involved in social activities, there could be additional differences in the non-Calculus ready cohort that exacerbates this issue further.

Table 2. Calculus-ready versus non calculus ready first-generation students

Concern	Calculus - Ready	Non-Calculus Ready
Time Management	62%	68%
Adjustment to being away from home (home sickness and independence)	45%	50%
Academic Difficulty	55%	40%
Health (mental and physical health; ADHD, ADD)	36%	30%
Social (making friends, sexism)	26%	40%
Study Skills (not knowing how to study)	29%	15%
Organizational skills (keeping track of homework, complaints about using ecampus, all different programs they need to use, finding what they need to complete work)	17%	15%

Juggling other responsibilities (job, sports, team, fraternities, etc.)	10%	23%
Extenuating family circumstances	0	3%

Example excerpts from each topic analyzed in the reflective essays are provided below:

TIME MANAGEMENT: “I have honestly struggled with time management throughout my whole school career. It’s just hard to find time to hang out with my newly made friends and complete all my school work with time to spare. Don’t get me wrong I have been completing my school work but lately it seems like I have been finishing my assignments right before its due. Procrastination is also one of my worst habits. I always seem to tell myself “Oh I have time to do this later”.

OTHER RESPONSIBILITIES: “Things were not looking good for my money at all. I had a restricted amount of money, I was unemployed, and I had no other means to make my first payment. On top of that, I was required to attend class on a consistent basis, and I was scrambling to find time to study while I was looking for work, which left me feeling quite mentally fatigued. As soon as I learned I would not be able to afford school, I sent out applications for jobs right away. This makes it more difficult for me to maintain a healthy balance in my time management.”

SOCIAL: “As well academically I have felt as though I am not smart enough or meant to be in the program I am in because I feel like I am behind my peers and am constantly surrounded by men which can feel a little isolating as a woman.”

ORGANIZATION: “The challenge that has proven to be the most threatening and difficult to overcome is keeping up with all of my different courses and schoolwork. Even if we may be working on almost the same thing in most of them, the different classes all use different apps/programs to communicate or do/turn-in work. I have to search all over eCampus, AktivChemistry, Cengage, MasteringBiology, as well as GoogleClassroom. Having to go through these apps for each individual class takes nearly an hour for me to be able to gauge what needs done first or what is more/less important.”

ADJUSTMENT: “I have experienced a very rough transition from high school to college. One of the large things is simply the size of the area. I lived significantly away from town at my home, so I’m not used to all of the walking done here. I also get lost very easily, which was very rough my first few weeks here.... Moving out of my home has been somewhat rough, but it also has noticeable benefits. I certainly miss my family and my dog. It’s also sad not being able to see some of my friends.”

ACADEMIC: “During this semester, I would say my biggest challenge is test taking strategies. I tend to do very well on classwork and discussions but I get lots of anxiety and stress when taking tests. I tense up and seem to “forget” everything I have learned. I know I am capable of completing these problems, but I freeze up and lose track of everything.”

STUDY SKILLS: “Whenever I study, I have a habit of doing all my studying at once, and this leads me to burnout. When I burn out, I cannot retain information as easily and I get distracted, causing me to waste an hour at times.”

EXTENUATING FAMILY CIRCUMSTANCES: “I am not a traditional student. After having a career and family established, I made the decision to invest in my human capital and seek a higher education. I do not face the same challenges as my peers, and I find it difficult to reach a connection with them.”

HEALTH: “Lately, I have been getting much sicker than I am used to including cold symptoms, fevers, and most of all allergies... Another problem I have been slightly struggling with has been including damage to my mental health. I have been slightly missing home more and more as time goes on, along with continuously stressing over exams, homework, quizzes, and just college overall.”

Discussion:

The most common challenge reported by first generation students was issues with time management and adjustment to being away from home. Since it is not clear the level of commitment outside class (including hours of work) for these students, we are not sure if the time management issue was more associated with course work, other daily life activities, or inefficient use of time.

No major difference in the challenges faced was observed among calculus ready and non-calculus ready students. Time management was the number one reported concern among both populations of first-generation students.

Many of the challenges that were frequently mentioned, including time management, identifying effective learning strategies, and some organizational skills fall under the umbrella of self-regulated learning. In terms of interventions, the first-year seminar is a good place to start promoting self-regulated learning skills among first generation students, though these skills should continue to be fostered through a first-year program to build proficiency and improve overall retention. Since adjustment to university life and social life concerns were also expressed, programs that help integrate first-generation students to the campus and community will ease this transition and help in the adjustment to college. Student mentoring programs and networking activities should be promoted at the first-year level to create a sense of community and to ease the adjustment to college. These programs should be provided at low or no cost so that financial factors don't dissuade participation.

Conclusion:

The transition from high school to college is challenging to most students, especially to first-generation students. First-generation students for the most part don't experience the level of parental support that other students experience and lack the knowledge of college. They also face issues with academic and social integration. Time management, social adaptation, and academic difficulty are major issues faced by this student population that limit retention of these students. Implementing programs that help integrate first generation students to college life in combination with fostering self-regulated learning skills in the classroom throughout first-year course work has the potential to benefit students as well as their institutions.

References:

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