

A Preliminary Analysis of Student Characteristics and Program Satisfaction in Technician Education Programs

Abstract

This research is a study of student satisfaction in two-year technician education programs, with a focus on under-represented groups in STEM fields, and includes 3,216 students from 96 schools. The survey data collected for this study included questions about student satisfaction and student background, as part of a larger study about pathways in technician education. Descriptive, multi-level, and qualitative analyses reveal a diverse student body, relatively high levels of student satisfaction across gender, race-ethnicity, family status, and sexuality, as well as areas of concern. Total student satisfaction was measured based on satisfaction with courses, instruction, advising, students, and general satisfaction with the program. These findings are relevant to a variety of stakeholders involved with technician education at two-year colleges.

Research Objectives

1. Who are technician students with respect to their demographic backgrounds?
2. How satisfied are technician students with their programs at two-year colleges?
3. What is the relationship between demographic characteristics and satisfaction factors for technician students within two-year colleges?
4. How do community college students think their personal characteristics affect their student experiences?

Review of Literature

Today's community college students are a diverse and complex group. According to the National Center for Education Statistics (2014) and The American Association of Community Colleges (2014) as of the 2012–2013 academic year there were 12.8 million students enrolled in community colleges in the U.S. Seventy-one percent of community college students are over 22 years old, and the number of students over the age of 25 will continue to increase during the next five years (AACC 2014). Two-thirds of all community college students attend part-time— often due to other responsibilities including childcare and family, and most students work in addition to their studies. Community colleges are also an important educational pathway for minorities, both historically and in contemporary times (Flores & Hagan, 2008). Community college students experience a variety of socioeconomic and cultural factors that complicate their college experience, and two-year institutions serve a particularly key role in preparing under-represented, under-prepared, and less affluent students for the workforce and further schooling (Bensimon & Santiago, 2013).

Increasingly, community colleges are offering programs and degree options within Science, Technology, Engineering, and Mathematics (STEM) fields. Georgetown University's Center on Education and the Workforce estimates that 92 percent of STEM workers need postsecondary education and 35 percent of STEM job openings require a certificate or associate degree. According to the National Academies, nearly half of Americans with bachelor's degrees in science and engineering attended community colleges at some point, and almost a third of those with master's degrees did so as well. Yet degree completion rates in STEM programs at community colleges remains low. Cook and King (2007) and Orozco and Cauthen (2009) noted that students' work schedules, and particularly those working more than 20 hours a week, make it less likely that these students will be able to finish their course work (Mullin 2012a). Other factors that interfere with community college student retention and achievement include delaying enrollment, supporting dependents, and not having a high school diploma (Mullin 2012b).

One theory about ways to increase retention and completion rates in higher education is through improving student's academic experiences and program satisfaction. Tinto (2009) identifies four primary conditions for student success including high and clear expectations, academic and social support, consistent feedback, and engagement in the classroom. Today's two-year technician programs enroll a highly diverse student body, by age, race-ethnicity, gender, sexuality, and family status, where students are often juggling multiple responsibilities outside of their classes as well. The objective of this analysis is to develop an understanding for the relationship between technician students' background characteristics and their level of satisfaction with their programs. Theoretically speaking, high levels of academic satisfaction would be a positive sign for increased retention and completion in technician programs.

Data & Methods

We used a survey research design to respond to our research questions. We used descriptive statistics to describe the demographic and participation factors of respondents. In addition, we also analyzed an open-ended survey question about students' satisfaction and ways they perceived their demographic background impacting their experience in the program. For the open-ended survey question, responses were thematically coded and analyzed.

We constructed the questionnaire online (using Qualtrics) and asked questions about students' sociodemographic background, enrollment status, program satisfaction, campus resource knowledge and utilization, motivation to enroll, career and educational aspirations, employment status, and school-work-life balance issues.

The survey was administered to 3,216 students from 96 two-year colleges, and includes a diverse group based on age, race-ethnicity, gender, sexuality, as well as work and family status.

To determine program satisfaction, students were asked "Generally speaking, how satisfied are you with your program at [insert name of college]?" The survey included five responses ranging from "Not satisfied at all" to "Extremely satisfied." Student responses were coded 1 through 5. Follow-up questions asked about student satisfaction with courses, instruction, advising, and interaction using the same five item scale. Factor analyses indicated that the responses to each of the five questions could be

summed to form a measure of total satisfaction that ranged from 5 to 25. The dependent variable for this analysis is total satisfaction with respect to age, gender, race, family status, and sexuality.

Findings

In response to our first research question, “Who are technician students with respect to their demographic backgrounds?” the sample shows that technician students are a diverse group, and includes about 20% women, 30% racial-ethnic minorities, 10% reporting disabilities, 5% LGBT students, and an age range of 18 to 65+. Technician students are also “non-traditional” in higher education settings by way of their life experiences, with the majority simultaneously juggling school, work, and family. The program composition of students broke down this way: 53% Engineering Technology, 19% Energy/Environment, 19% Advanced Manufacturing, 2% Micro/Nano, 19% Other. Further details are provided in Table 1.

In response to our second research question, “How satisfied are technician students with their programs at two-year colleges?” we find that the majority of students report being “extremely satisfied” and “very satisfied” with their programs overall, and in particular with their instructors, advising, and in their interactions with other students. Additionally, the majority of students also report that their programs fit their schedules and lifestyles “extremely well” and “very well.”

Our third research question, “What is the relationship between demographic characteristics and satisfaction factors for technician students within two-year colleges?” shows some variation between groups and with respect to different aspects of program satisfaction.

Table 2 reveals the results of multilevel analyses of satisfaction controlling for college. Overall students were generally satisfied with their programs as indicated by the intercept of 19.9, comparable to a 4 of 5 or “very satisfied” response. Analyses reveal no significant differences in satisfaction with respect to age or family status. Black students had significantly higher satisfaction compared to White students.

Initial analyses included gender, based on responses of male, female, and non-gender conforming. Students responded to the question “Do you identify as gay, lesbian, bisexual, or transgender?” with yes, no, or prefer not to say. Table 2 includes interaction terms for gender*LGBT to determine if LGBT identity was related to satisfaction differently for people who describe themselves as male, female, or non-gender conforming.

Table 2 shows that non-LGBT women had higher satisfaction compared to non-LGBT men, the comparison group. However, LGBT men had significantly lower satisfaction than non-LGBT men. In addition, non-gender conforming students who identified as LGBT, or preferred to not give a response, had the lowest satisfaction among students.

We performed an ordinal regression of all five measures of satisfaction with respect to demographic factors and the results are provided in Table 3. Older students reported higher satisfaction overall and with respect to courses and instruction. Women had higher satisfaction as men in those areas as well as with advising. Students who identified as non-gender conforming (< 1%) expressed lower satisfaction with instruction and advising compared to men. In terms of race, Black students had the highest satisfaction among all groups in every area except instruction. By contrast, Asian had significantly lower

satisfaction in every category except advising compared to students who only identified as White. Pacific Islander and Other race students had the lowest general satisfaction.

Students who preferred not to state their sexuality also had lower satisfaction with courses and advising. Students with disabilities had lower general satisfaction and lower satisfaction with student interaction. Students who preferred not to list a disability had lower satisfaction with advising.

With respect to our fourth and final research question, “How do community college students think their personal characteristics affect their student experiences?” we see several areas for concern. While students provided some positive comments, they also shared negative experiences.

Age –

Non-traditionally aged students share both positive and negative comments:

“I had more life experience, which made me more focused on what was important in class and in life. I took on more roles that involved leadership, including team-building exercises, and being a teacher's assistant.”

“Being an older student who had never been successful in the academic environment, it was extremely stressful as well as difficult for the first year and a half when I originally enrolled in classes.”

“I was rudely told one day I was too old to be in college.”

Gender –

While some women in the program felt positively, most who provided comments shared troubling experiences:

“I think my gender has been a positive thing, since there are so few women in the program, I tend to stand out, which is usually a good thing in college.”

“Unfortunately, in one class I was the only girl. Not only that but I was also the youngest in the class. I had some comments from a few guys that made me angry. However, I stayed in the course and still got an A. In my engineering class during labs, I was always given tasks like write because you have nice handwriting or something simple. I was never allowed to actually work on our project. It wasn't until a guy was stuck on how to get an answer that I was included. I was sad to see how shocked they were that I knew how to do simple calculus problems. It didn't stop me I am excited to prove them all wrong.”

“Instructors sometimes do the work for me rather than watch me go slowly or rather than explain it.”

“I am very often the only female, the only person of color, or both in many of my classes and it is incredibly isolating sometimes. It makes classes that require group work that much more difficult because of the added stress of trying to find someone who wants to break their social groups to let me work with them.”

“Being a straight female in the automotive program has led to a lot of male classmates saying or doing sexually inappropriate things to me, to the point that I considered filing a police report on one of my classmates. This has been distressing and distracting when I'm trying to participate in class or a lab.”

Family –

Students discussed their families in different ways – as motivators, difficulties with child care issues, not being home, and praised their support as well:

“My children are a big reason why I will never quit and enable me to stay motivated and continue to be a role model.”

“My kids are in 3rd and 5th grade and aren’t allowed in the math lab with me. Even when I bring them with their own schoolwork to do. As a single parent I had to learn the hard way that I can’t get help at school in the evenings.”

“My daughter asks about me and why I’m never home”

“Being married has been positive to me being a student because my wife has been very supportive of me going to school.”

School-Work-Life Balance –

Finding a way to balance all the demands on their time was a true challenge for most students:

“There’s a lot of time that you need to balance. Like family time and he time. It’s stressful with a kid and sometimes I lose my mind but I’m still determined”

“Just an added strain on my marriage due to time constraints”

“Since I have kids at home and must work full time to provide for my family it is hard to also be away from them at night while taking college courses”

Significance

Findings provide two-year colleges with a better understanding of the students they serve in terms of their unique lived experiences and challenges. Results of our study may help institutions identify ways to provide supports for their diverse student population and to assist with their persistence in completing their programs.

		Never enrolled	Enrolled in CC	Earned Assoc degree	Enrolled in 4 Year	Earned Bach degree	Total
	N	1860	546	256	325	229	3216
FutureHighestDeg (does not include current degree)	None	11%	12%	12%	10%	22%	12%
	Associates	29%	33%	21%	21%	27%	28%
	Bachelors	33%	36%	42%	43%	15%	34%
	Masters	20%	13%	17%	21%	30%	19%
	PhD	7%	5%	9%	5%	6%	6%
AspirHighestDeg (includes current degree)	None	11%	12%	0%	10%	0%	10%
	Associates	29%	33%	33%	21%	0%	27%
	Bachelors	33%	36%	42%	43%	64%	38%
	Masters	20%	13%	17%	21%	30%	19%
	PhD	7%	5%	9%	5%	6%	6%
Age Quintiles	18-19	35%	7%	3%	3%	2%	22%
	20-21	23%	12%	7%	14%	2%	17%
	22-26	17%	24%	25%	33%	21%	21%
	27-33	12%	27%	27%	26%	36%	19%
	34+	13%	30%	38%	24%	40%	21%
Gender	Male	81%	81%	75%	78%	72%	80%
	Female	18%	18%	24%	21%	28%	20%
	Non-gender conforming	1%	1%	1%	1%	0%	1%
Race/Ethnicity	White	66%	71%	62%	74%	71%	68%
	Hispanic/Latino	18%	15%	16%	13%	9%	16%
	Black/African American	10%	12%	11%	8%	6%	10%
	Asian	10%	7%	11%	7%	13%	9%
	Native American or American Indian	3%	4%	3%	2%	3%	3%
	Middle Eastern or North African	2%	1%	3%	2%	2%	2%
	Native Hawaiian or Pacific Islander	3%	1%	4%	2%	1%	3%
	Something else, please specify	3%	4%	2%	4%	2%	3%
Disability	Yes	9%	11%	14%	16%	6%	10%
	No	88%	83%	80%	79%	90%	85%
	Prefer not to say	3%	7%	5%	5%	5%	4%
Mother's educational attainment	Less than high school	10%	10%	12%	4%	6%	10%
	High school or GED	29%	31%	30%	24%	24%	29%
	Some college	17%	20%	16%	16%	10%	17%
	Associate's degree/certificate	13%	12%	14%	14%	13%	13%
	Bachelor's degree	17%	13%	15%	23%	27%	18%
	Master's degree	7%	8%	8%	13%	14%	8%
	Professional degree (e.g., JD or MD)	1%	1%	0%	2%	3%	1%
	Doctoral degree	1%	1%	1%	1%	2%	1%
	Don't know	5%	3%	4%	3%	2%	4%
Father's educational attainment	Less than high school	13%	10%	14%	6%	8%	11%
	High school or GED	29%	34%	35%	21%	22%	29%
	Some college	15%	17%	13%	17%	11%	15%
	Associate's degree/certificate	11%	8%	12%	10%	13%	10%
	Bachelor's degree	16%	14%	13%	26%	26%	17%
	Master's degree	6%	8%	4%	10%	11%	7%
	Professional degree (e.g., JD or MD)	2%	1%	1%	2%	4%	2%
	Doctoral degree	1%	1%	1%	3%	3%	1%
	Don't know	8%	6%	7%	6%	2%	7%
Family Status	Parent	56%	51%	50%	42%	33%	52%
	Single	74%	54%	48%	64%	50%	66%
	Widowed	0%	0%	1%	0%	0%	0%
	Divorced	2%	5%	4%	2%	4%	3%
	Separated	1%	1%	2%	1%	1%	1%
	Living with a partner	9%	11%	9%	12%	10%	10%
	Married	14%	28%	37%	20%	34%	20%
Employment	Not currently employed, not actively looking	12%	12%	11%	12%	11%	12%
	Not currently employed, actively looking	15%	11%	8%	11%	12%	13%
	In the military	0%	1%	0%	0%	0%	0%
	Employed seasonally	4%	3%	2%	4%	3%	4%
	Employed part-time in job unrelated to studies	30%	21%	22%	24%	20%	26%
	Employed part-time in job related to studies	12%	11%	9%	12%	11%	12%
	Employed full-time in job unrelated to studies	12%	15%	18%	17%	21%	14%
	Employed full-time in job related to studies	15%	25%	29%	20%	21%	19%

Table 2:

		General satisfaction		Satisfaction with courses		Satisfaction with instruction		Satisfaction with advising		Satisfaction with student interaction		Total Satisfaction	
		Mean		Mean		Mean		Mean		Mean			Count
Gender	Male		4.1		4		4		3.8		3.9	19.8	2557
	Female		4.1		4.1		4.1		3.8		3.9	20	629
	Non-gender conforming		3.6		3.6		3.6		3.1		3.4	17.3	30
Race/Ethnicity	White		4.1		4		4.1		3.7		3.9	19.8	2180
	Hispanic/Latino		4.1		4		4		3.8		3.9	19.8	515
	Black/African American		4.2		4.1		4.1		4		4	20.4	311
	Asian		3.9		3.9		3.9		3.7		3.7	19.1	298
	Native American or American Indian		3.9		3.9		4		3.7		3.7	19.2	103
	Middle Eastern or North African		4		4		4		4		3.8	19.8	55
	Native Hawaiian or Pacific Islander		3.8		3.8		3.9		3.8		3.7	19	90
	Something else, please specify		3.8		3.8		3.9		3.8		3.9	19.2	92
	Family	Parent		4.1		4		4		3.8		3.9	19.8
Single			4.1		4		4		3.8		3.9	19.8	2118
Widowed			4		3.8		3.8		4		3.3	18.9	6
Divorced			4.2		4		4.1		3.8		4	20.1	101
Separated			4.1		4.2		4.1		3.8		3.8	20	32
Living with a partner			4.2		4.1		4.1		3.8		3.9	20.1	313
Married			4.2		4.1		4.1		3.8		3.9	20.1	646
Identify as LGBT		No		4.1		4		4		3.8		3.9	19.9
	Prefer not to say		3.8		3.9		4		3.7		3.7	19.1	111
	Yes		3.9		3.9		3.9		3.5		3.7	18.9	159
Total		4.1		4		4		3.8		3.9	19.8	3216	

Table 3

Demographic	General Satisfaction		Courses		Instruction		Advising		Student Interaction		
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	
Age	.009	.003 **	.013	.003 ***	.009	.003 **	.002	.003	-.006	.003	
Female	.232	.086 **	.291	.086 ***	.169	.085 *	.183	.083 *	.078	.084	
Non-gender conforming	-.530	.360	-.661	.362	-.724	.355 *	-.820	.349 *	-.607	.354	
White Multiracial	-.062	.140	.001	.141	.113	.138	-.034	.136	-.315	.137 *	
Hispanic	-.002	.095	.097	.095	-.033	.093	.078	.091	.080	.093	
Black	.298	.115 **	.239	.115 *	.212	.113	.468	.112 ***	.330	.113 **	
Asian	-.320	.118 **	-.387	.119 ***	-.435	.116 ***	-.081	.114	-.369	.115 ***	
Native American	-.334	.205	-.211	.207	-.120	.202	-.156	.199	-.159	.201	
Middle Eastern/North African	.109	.261	.248	.263	.105	.258	.429	.255	.081	.256	
Pacific Islanders	-.563	.206 **	-.403	.208	-.177	.203	.053	.200	-.151	.202	
Other Race	-.434	.200 *	-.391	.202	-.255	.197	.079	.194	.187	.197	
Identify as LGBT	-.500	.187 **	-.165	.189	-.029	.185	-.004	.181	-.172	.184	
Prefer not to say if LGBT	-.388	.161 *	-.356	.162 *	-.269	.158	-.321	.156 *	-.268	.158	
Disability	-.351	.164 *	-.272	.165	-.187	.162	-.282	.159	-.451	.161 **	
Prefer not to list a Disability	-.195	.111	-.077	.112	-.158	.110	-.214	.107 *	-.010	.109	
Threshold	Not satisfied at all	-5.120	.263 ***	-5.080	.278 ***	-4.745	.228 ***	-3.493	.144 ***	-4.668	.194 ***
	Not too satisfied	-3.497	.150 ***	-3.308	.148 ***	-3.059	.135 ***	-2.117	.114 ***	-3.002	.126 ***
	Somewhat satisfied	-1.193	.110 ***	-.943	.109 ***	-.938	.107 ***	-.468	.104 ***	-.992	.107 ***
	Very satisfied	.898	.109 ***	1.311	.111 ***	.838	.107 ***	1.022	.106 ***	.789	.106 ***

References

- American Association of Community Colleges. 2014. Community College Trends and Statistics. Retrieved from American Association of Community Colleges: <http://www.aacc.nche.edu/AboutCC/Trends/Pages/studentsatcommunitycolleges.aspx>.
- Bensimon, E. & Santiago, C. (2013). Foreword. In R. Palmer & J. Wood (Eds.), *Community colleges and STEM: Examining underrepresented racial and ethnic minorities* (pp. ix-xi). New York, NY: Routledge.
- Cook, B. J., and J. E. King. 2007. 2007 Status report on the Pell grant program. Washington, DC: American Council on Education, Center for Policy Analysis
- Digest of Educational Statistics. (2009). U.S. Department of Education Institute of Education Sciences, National Center for Educational Statistics. Authors. Accessed October 15, 2010 at <http://nces.ed.gov/programs/digest/d09/>
- It's About Access. By: Flores, Roy, Hagan, Beth, *Diverse: Issues in Higher Education*, 15575411, 6/26/2008, Vol. 25, Issue 10
- Mullin, C. M. 2012a. It's a matter of time: Low-income students and community colleges (Policy Brief 2012-02PBL). Washington, DC: American Association of Community Colleges.
- Mullin, C. M. 2012b. Why access matters: The community college student body (Policy Brief 2012-01PBL). Washington, DC: American Association of Community Colleges
- National Center for Education Statistics. 2014. Nontraditional Undergraduates: Definitions & Data. Retrieved from Institute of Education Sciences: <http://nces.ed.gov/pubs/web/97578e.asp>.
- Orozco, V., and N. K. Cauthen. 2009. Work less, study more, and succeed: How financial supports can improve postsecondary success. New York: Demos.
- Tinto, Vincent. How to Help Students Stay and Succeed. *Chronicle of Higher Education*. 2/6/2009, Vol. 55 Issue 22, pA33-A33. 1/4p.
- Wang, X. (2013). Community colleges and underrepresented racial and ethnic minorities in STEM education: A national picture. In R. Palmer & J. Wood (Eds.), *Community colleges and STEM: Examining underrepresented racial and ethnic minorities* (pp. 3-16). New York, NY: Routledge.