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Peer Coaching Program Development: A Framework of First-Year Latina/o Student Persistence Pursuing STEM Pathways at a Hispanic Serving Institution

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Abstract

This study developed and examined the implementation of an intrusive peer-to-peer coaching program model at a private 4-year master's degree granting Hispanic Serving Institution (HSI) located in South Texas. The coaching program provided support and promoted increased persistence among Latina/o students entering first-year science, technology, engineering, and mathematics (STEM). Findings positively indicated that first-year Latina/o STEM students can achieve academic success in college when they are matched and supported by culturally similar upperclassmen peer coaches.

Resumen

Este estudio desarrolló y examinó la implementación de un programa modelo intrusivo de compañeros entrenadores; en una institución universitaria de cuatro años y maestría clasificada como Institución de Servicio a Hispanos (HSI) en el sur de Texas. El programa de entrenadores proporcionó apoyo y promovió persistencia incrementada entre los estudiantes latina/os de primer año en STEM (ciencias, tecnología, ingeniería y matemáticas). Resultados indicaron positivamente que estudiantes latina/os de primer año pueden lograr éxito académico universitario cuando se aparean y apoyan con entrenadores compañeros en años posteriores y culturalmente semejantes.

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Introduction

Increasing college persistence and graduation rates of Latina/o students is crucial as they continue to lag behind their peers. In response, colleges have often implemented peer mentoring programs as institutional support systems for traditionally underserved student populations. While these mentoring programs have demonstrated to have positive effects on students, there is a need for additional research and literature to better understand the impact that culturally similar upperclassmen coaches (mentors) can have on Latina/o undergraduate traditionally at-risk students (mentees) entering their first year of college. This study examines the development and implementation of a peer-to-peer coaching program, at a Hispanic Serving Institution (HSI) funded by the U.S. Department of Education (DOE), aimed at increasing persistence and supporting Latina/o students pursuing science, technology, engineering, and mathematics (STEM) pathways during their first year in college. Due to the scope and complexity of the study, it is important to note that this study is an overview of the peer coaching program development for Cohort I; subsequent papers will follow with additional program findings. Findings in the current study challenge institutions to rewrite the narrative of educational success by supporting Latina/o students beyond merely the first year of college. Latina/o students require guidance and support throughout their undergraduate education. HSIs have a responsibility to create a culture that encompasses academic success by assisting students in all facets of their educational journey.

Background

Although college access has increased among Latina/o students, the issue of college degree completion continues to be prevalent (Contreras & Contreras, 2015). HSIs play a critical role in raising the academic achievement of Latina/o students (Medina & Posadas, 2012). The HSI designation emerged as accredited, degree granting institutions (as cited in Medina & Posadas, 2012), intended to help further support student success (Crisp & Cruz, 2010). The HSI distinction grants institutions DOE federal funds such as Title V (Contreras & Contreras, 2015), as well as Title III, Part F, HSI, STEM to increase the number of degrees granted for Hispanic and/or low-income students majoring in STEM disciplines (DOE, 2017).

Beyond college access, Hispanic students require institutional support systems that address persistence (Richmond, 1986). HSIs must not only dedicate themselves to serving the needs of low-income minorities, but also be committed to student success by being "Hispanic-graduating institutions" (Arciniega, 2012). College degree completion of Latina/o students depends highly upon institutional support services (Medina & Posadas, 2012). A central principle to increasing Latina/o college student retention, especially in STEM, is student "involvement" (Tinto, 1997, 1998). Latina/o students

need assistance managing and prioritizing their time, opportunities to build "peer networks," and academic monitoring (Hurtado & Kamimura, 2003). The environment of higher learning institutions significantly determines student success (Contreras & Contreras, 2015) and peer mentoring approaches have materialized to be influential (Alcocer & Martinez, 2018) in helping students overcome first-year barriers. Mentoring programs are a widely used retention strategy that help address first-year student transition and acclimatization (e.g., Bettinger & Baker, 2011; Bordes & Arredondo, 2005; Crisp & Cruz, 2010; Cruz, Rajpal, Lecocke, Martines, & Lurie, 2018; Hurtado & Ponjuan, 2005; Moschetti, Plunkett, Efrat, & Yomtov, 2017; Salas, Aragon, Alandejani, & Timpson, 2014; Yomtov, Plunkett, Efrat, & Garcia Marin, 2017).

Mentoring programs can be either formal or informal (Bynum, 2015) in structure. A mentor plays a significant role in a relationship by providing mentees with much needed advice, guidance, and encouragement (Bohannon & Bohannon, 2015). Peer-to-peer mentoring/coaching consisting of mentees receiving assistance from upperclassmen with similar experiences benefits underserved student populations (Cruz et al., 2018; Rios-Ellis et al., 2015), especially first generation. Furthermore, peer mentors can also provide mentees with supplemental remediation that can aid them in building the needed academic and social skills to integrate onto campus environments (Carpi, Ronan, Falconer, Boyd, & Lents, 2013). Moreover, planned mentoring programs can help mentees navigate the educational demands of higher education (Cruz, Rajpal, Lecocke, Martines, & Lurie, 2019; Santos & Reigadas, 2002).

Theoretical Framework for Developing a Peer Coaching Program Model at an HSI

The first-year educational experience is crucial for all students, particularly during this social integration period when students begin to form their identities (as cited in Connolly, Flynn, Jemmott, & Oestreicher, 2017). Involvement strongly predicts student success during the first year (Tinto, 1998). Students demonstrate that they will stay in college if the environment is supportive (Contreras & Contreras, 2015). Latinas/os, juxtaposed to other students, need additional assistance in understanding and navigating the academic demands of college (Phinney, Campos, Kallemeyn, & Kim, 2011).

In addition to Latina/o students needing support in college, first-generation students are more critically in need of support as they are less likely to receive a college degree than their peers (as cited in Collier & Morgan, 2008). First-generation students enrolled in higher education are defined as students whose parents have never previously attended college (National Center for Education Statistics, 2018). Unfortunately, first-generation students often cannot turn to their family for academic support (Ceballo, 2004; Cruz et al., 2019; Salas et al., 2014). Therefore, connecting students to the university and encouraging them to develop trusting relationships with their peers results in increased retention (Tinto, 1997). Research indicates that Latina/o students must feel a greater sense of belonging, feel supported, and connected to the institution to overcome barriers that result in first-year college persistence (e.g., Collier & Morgan, 2008; Cruz et al., 2019; Ishitani, 2006; Salas et al., 2014; Tinto, 1997).

Relevant Peer Coaching/Mentoring Literature

A review of peer mentoring literature indicates that mentoring has positive effects on student academic success with regard to college transition and adjustment, navigating institutional environments, sense of belonging, and support systems (e.g., Andrade, 2007; Bettinger & Baker, 2011; Bordes & Arredondo, 2005; Crisp & Cruz, 2010; Cruz et al., 2019; Hurtado & Ponjuan, 2005; Moschetti et al., 2017; Salas et al., 2014; Yomtov et al., 2017). In addition, researchers also found linkages between peer mentoring programs and Latina/o students' academic success (Rios-Ellis et al., 2015). The role of a mentor encompasses modeling successful behaviors, guiding their mentees in the right direction, and experiencing personal growth as the relationship evolves (as cited in Alcocer & Martinez, 2018).

Bettinger and Baker (2011), in partnership with InsideTrack, investigated the approach of coaching as a mentoring model to increase student persistence where universities were provided a listing of students based on their own institutional priorities. Bettinger and Baker selected student coaches to work with assigned students over the duration of two academic semesters. Coach responsibilities included assisting students in navigating institutional environments and helping identify success strategies to increase persistence and retention. The Bettinger and Baker findings indicated that higher learning institutions can ease the first-year college experience and transition of students through a peer network system.

Salas et al. (2014) examined the experiences of 17 Latina/o students who participated in a university mentoring program during their first year in college. In the Salas et al. study, researchers employed a phenomenological study design approach to capture the voices of their Latina/o research participants and identify factors that contributed to their academic success and persistence while in college. Salas et al.'s LAO Resource Mentors Program (LAROMP) at the institution connected upperclassmen Latina/o students with first-year undergraduate students. Salas et al.'s program efforts were twofold and assisted the mentors with acquiring leadership experience/skills coupled with providing Latina/o first-year students with transitional support onto the university campus. Students were supported with weekly dialogue from their mentor who encouraged them to maximize the use of services, resources, and programs on the campus. Salas et al.'s findings indicate that participants felt mentoring experiences gave them a stronger sense of belonging and a sense of community. Results also indicate to have a statistical positive significance on Latina/o student retention rates.

Moschetti et al. (2017) evaluated a university peer mentoring program implemented at an HSI in southern California. In the program, students voluntarily enrolled in a University 100 course cohort that consisted of 20 to 25 students during their initial first semester. Moschetti et al. trained two mentors per cohort who received training on professionalism and how to foster relationships with mentees. Moschetti et al.'s findings indicate that mentees increased in connectedness to the university in comparison with a control group utilized in the study. Mentees did, however, indicate that they would like additional interaction with mentors outside of class.

Although numerous mentoring research studies have proven to improve college student success (e.g., Bettinger & Baker, 2011; Bordes & Arredondo, 2005; Crisp & Cruz, 2010; Cruz et al., 2019; Moschetti et al., 2017; Salas et al., 2014; Yomtov et al., 2017), studies addressing peer-to-peer mentoring models associated with positive outcomes is minimal, especially with culturally matching peers. "When mentors and mentees share common viewpoints through similar ethnic or cultural backgrounds, homogeneity may enhance supportiveness" (Santos & Reigadas, 2002, p. 42). Alcocer and Martinez (2018) alluded to the notion that Hispanic students may prefer to be mentored by Hispanic peers as they can better identify, relate, and understand their culture. To date, there exists no current research that focuses directly on the academic success of first-year Latina/o STEM students participating in a peer coaching program with upperclassmen students serving as peer coaches while also sharing culturally similar backgrounds. Recognizing the increasing demands of postsecondary success among Latina/o STEM students during their first year in college, the present study sought to develop a cost-effective and replicable persistence peer coaching model that could be sustained at an HSI.

Peer Coaching Program Development

An intrusive peer-to-peer coaching program, funded by the DOE, was developed and examined at a private master's degree granting 4-year HSI located in South Texas, of which 70% of the total student population are Latinas/os. The model was developed by the STEM coach and piloted with Cohort I but continues to be used at the institution with future cohorts. The peer coaching model focused on social and academic integration of students employing Latina/o peer-to-peer coaching services. The program consisted of a STEM coach, peer coaches (mentors), and students (mentees). The STEM Coach was a female, Latina, and first-generation educational leader. For the purpose of the program, intrusive coaching is defined as peer mentors maintaining regular contact with mentees via regularly scheduled meetings, email, phone, social media, and text messaging to provide guidance, encouragement, and timely interventions during the first year in college.

University faculty assisted with the selection/recommendation of peer coaches based on the following criteria: Latina/o descent, STEM major, upperclassmen, and strong academic records. Interested students submitted an application, resume, transcript, and a letter of recommendation. The STEM coach interviewed candidates and looked for them to possess qualities, such as being skillful, knowledgeable, and inspirational (see Table 1). Six upperclassmen Latina/o peer coaches were hired for Cohort I from the following disciplines: mechanical engineering, engineering management, chemistry, biology, and engineering science. Peer coaches each received hourly pay, were assigned seven to eight Latinas/os to mentor closely matched to their STEM discipline, and worked an average of 8 to 10 hr a week for 16 weeks (1 week was designated for training/orientation) each academic semester.

Table 1. Qualities to Become a Peer Coach.

Quality	Description
Upperclassmen	Students who are resourceful and can provide peers who are just beginning their undergraduate program with support, encouragement, and information needed to navigate the institutional environment.
Academic record	Students who are majoring in a STEM discipline and have a cumulative GPA of 3.2 or higher.
Skillful	Students who welcome open dialogue with their fellow peers and can genuinely participate in conversations by being both an active listener and a participant.
Knowledgeable	Students who are aware of resource availability on the university campus and when not aware are willing to research resources for fellow peers. Students who can easily detect problems that may arise and direct their peers to the appropriate department and/or resources as needed. Students who exercise appropriate judgment and will reach out to the STEM Coach to ensure peers receive the needed resources when barriers are present.
Inspirational	Students who are genuine and willing to share their own personal first-year experiences to inspire others in the pursuit of academia; students who will remind others that as you go through life, one should always remember that all things truly are possible. ¡Sí Se Puede (Yes, You Can)!

Note. For the purposes of the peer coaching program, the following descriptions were used. STEM = science, technology, engineering, and mathematics; GPA = grade point average.

Peer Coach Training and Facilitation

All peer coaches lived on the university campus and four of the six peer coaches were first-generation students. Peer coaches took part in a formal orientation (4 hr) at the beginning of each semester to review mentoring strategies with the STEM Coach. Each peer coach received a coaching handbook developed by the STEM Coach that encompassed best mentoring practices, university resources and contact information, and media/confidentiality policies. Peer coaches received weekly trainings that consisted of training topics aimed at allowing students to help them transition into the university environment while also helping them in overcoming common barriers to postsecondary success.

Peer coach training sessions were followed up with the STEM Coach emailing and/or texting frequent weekly reminders as needed to both coaches and mentees. Throughout the academic year, peer coaches also received continuous training on the following concepts: being supportive of their peers, being active listeners, encouraging discourse and dialogue, and how to look for warning signs of student disengagement (e.g., being tardy and/or missing meetings, being present at meetings but lacking participation, and how to identify indicators of university departure). Peer coaches

were required to immediately contact the STEM Coach when warning signs appeared. The STEM Coach then reached out to both the student and the Office of Retention periodically as needed. Depending on the situation, disengaged Latinas/os were provided institutional resources, departmental information was obtained, and faculty were contacted to assist.

Semester topics covered by the peer coaches included setting goals, overcoming procrastination, financial literacy, grit, growth mind-sets, career skills, time management, study skills, note taking, midterm setbacks, learning to self-advocate, cultural diversity, and so on. While the training topics utilized have traditionally been known to acclimatize students during first-year college transition, the peer coaching program took a different approach by discussing the topics in depth using personal metaphor/reflection, sharing of cultural experiences, establishing trust through reciprocal relationships, networking, and so on. Lesson topics included various materials researched and/or developed by the STEM Coach (e.g., handouts, fliers, and newsletters) for each of the mentees to have as a point of reference. Peer coaches facilitated informal training topics to their mentees in group settings, where they could socially interact with their peers, and provided individual sessions as required.

As part of professional development, Latina/o peer coaches also had the opportunity to attend an HSI conference during the academic year. The STEM Coach was awarded a grant from the National Science Foundation (NSF) for all six coaches to travel and attend the conference. While at the conference, peer coaches presented and disseminated program information. All peer coaches were required to sign Family Educational Rights and Privacy Act (FERPA) forms of confidentiality. In addition, coaches were also trained on the computer software program of MapWorks to log in all weekly student contacts and work in partnership with the university Office of Retention.

The program consisted of voluntary self-selected Latina/o students (mentees) attending weekly meetings (15 weeks each semester) with their Latina/o peer coaches. The students participated in academic workshops, most of which were facilitated by the STEM Coach (e.g., research symposiums, career fairs, and writing skills), and on/off-campus activities (i.e., game nights, campus socials, service-learning projects, etc.). Peer coaches were readily available to students throughout the academic year via face-to-face meetings, email, and text. The STEM Coach was also readily available to participants in the University Non-Disciplinary face-to-face Orientation Course, during office hours, after hours via peer coaches, and through university email. At the beginning of each semester, students were required to create a semester goal plan consisting of both social and academic goals. Student grades were audited at midterms and at the conclusion of each semester. The STEM Coach met individually with all Latina/o STEM students as needed to address academic deficiencies, strategies, and/or interventions available for students to overcome setbacks. The STEM department academic dean funded student program activities and transportation costs for the 2017-2018 academic year.

Purpose of Developing a Peer Coaching Program

The purpose of this study was to examine the development and implementation of an intrusive peer-to-peer coaching model that would promote increased persistence among STEM Latina/o students entering first year in an HSI. In addition, the program also intended to enhance the first-year undergraduate experience of Latinas/os by promoting and facilitating genuine conversations between the student (mentee) and the upperclassman (peer coach) assigned as their coach. Taken collectively, the goals for the peer coaching program were to help first-year Latina/o STEM students overcome adversity by helping them feel a greater sense of social belonging within the campus community and aid them in achieving their academic goals of pursuing a STEM pathway. The peer coaching study was guided by the following research questions:

Research Question 1: How are peer coaching services addressing the social and academic needs of undergraduate first-year Latina/o students (mentees) pursuing STEM pathways?
Research Question 2: To what extent, if any, do peer coaching services promote persistence of undergraduate first-year Latina/o students (mentees) pursuing STEM pathways?

Method

The university institutional review board committee approved the present study and all participants signed consent forms. The study was piloted with a Cohort I treatment sample of STEM Latina/o students living both on- and off-campus during the 2017-2018 academic year. Students were provided peer coaching program information materials at orientation, in freshmen nondisciplinary university courses, and in math courses. Students were required to complete an application and meet the following criteria: first-year student (dual enrollment classified as sophomores were eligible), Latina/o descent, majoring in STEM, and possessing a commitment to academic success.

Participants and Design

A quasi-experimental study was designed using a randomly generated comparison group. Descriptive analyses of the data were conducted followed by an analysis of the propensity scores using the logistic regression model in the *R* statistical software package. In this study, three covariates were proposed: Classification (freshman or sophomore), Pell grant eligible (low income), and First generation. The analysis confirmed that the ranges of propensity "look like the target population" (Kern, Stuart, Hill, & Green, 2016), thus ensuring baseline equivalence between the treatment and control groups.

The peer coaching Cohort I treatment group (mentees) had 45 students and the control group (non-mentees) had 45 students (see Table 2). Qualitative data were collected and triangulated (Mirriam, 2001). Qualitative data consisted of peer

Table 2. Peer Coaching Latina/o Student Treatment and Control Group Demographics.

	Treatment		Control		Total[a]	
	Mentored ($n = 45$)		Nonmentored ($n = 45$)		($n = 90$)	
	n	%	*n*	%	*n*	%
Gender						
Female	25	56	22	49	47	52
Male	20	44	23	51	43	48
Classification						
Freshmen	37	82	30	67	67	74
Sophomore	8	18	15	33	23	26
Pell eligible						
Yes	32	71	30	67	62	69
No	13	29	15	33	28	31
Generation status						
First-gen	26	58	30	67	56	62
Second-gen	19	42	15	33	34	38

[a]There were 90 students in total for both the treatment and control groups wherein all students were of Latina/o descent; mentee countries of origin were, however, not collected.

coaching student (mentee) focus groups, anecdotes, and reflective index cards ($n = 36$). Applying Krueger's (1994) model, focus group questions serving distinct purposes were formulated that included opening, introductory, transitioning, key questions, and ending questions. Consistent with Marshall and Rossman (2010), focus groups were conducted in a relaxing atmosphere on the university campus. Four semi-structured, open-ended focus groups were conducted with a range of four to six participants ($n = 21$).

In addition, quantitative data collection consisted of pretest and posttest survey instruments that were administered at the start of the fall semester and at the end of the spring semester. For pretests, the treatment sample had a 96% completion rate, whereas the control group had 67%. For posttests, the treatment sample had a 93% completion rate juxtaposed to 84% for the control group. The survey was developed using 16 items that consisted of five distinct constructs: social engagement, academic preparedness, time management, leadership skills, and degree attainment. The following rating scale was used to determine the level of agreement among the participants: 5 = *strongly agree*, 4 = *agree*, 3 = *neither agree nor disagree*, 2 = *disagree*, and 1 = *strongly disagree* (see Table 3). Student academic records were obtained from the university Argos/Banner system for periodic grade audits. The final end-of-term spring 2018 grade point average (GPA) was obtained from the University Office of Institutional Effectiveness to make end-of-semester GPA comparisons of the treatment and control groups.

Table 3. Average Level of Latina/o Student Agreement on Survey Instrument.

	Peer coaching mentored group		Nonmentored control group	
Survey construct	Pretest	Posttest	Pretest	Posttest
Social engagement	4	4	4	4
Academic preparedness	5	5	5	5
Time management	4	4	4	4
Leadership skills	4	4	4	4
Degree attainment	4	4	4	4

Note. 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither disagree nor agree*, 4 = *agree*, 5 = *strongly agree*.

Analysis

SPSS and Microsoft Excel software programs were used to interpret the statistical data obtained from statements, figures, and tables of emerging themes. A qualitative analysis of triangulated data was used to answer Research Question 1. Triangulated data assisted researchers in establishing themes based on the multiple sources of data (Creswell, 2009). Focus group audio was recorded, transcribed into text, coded, and exported into SPSS. A frequency distribution on the number of occurrences and percentages of each of the emerging themes was compiled. Data were entered into NVivo11 for further analysis of emerging themes. The themes were interpreted and compared with the literature (Creswell & Clark, 2011).

A quantitative analysis of the survey and university data was completed to help answer Research Question 2. Survey instruments were constructed using Qualtrics and unique links were emailed to students. Paper surveys were also collected and entered into Excel. Completed surveys were combined and analyzed. For validity, pretests and posttests were checked and retested. Survey item constructs were averaged based on the level of agreement and then compared to identify changes from pretests to posttests. Latina/o STEM student academic records were examined by individual student, by group, and then compared for end-of-term spring, 2018 average GPA.

Results

For Research Question 1, qualitative data were utilized to determine how peer coaching services addressed the social and academic needs of STEM Latina/o students. Four themes emerged from the data: (a) social support system, (b) academic support system, (c) helpful lesson topics, and (d) sense of belonging (see Figure 1). Student voices displayed were used to describe their first-year experiences in a peer coaching program (see Table 4).

Social Support System and Sense of Belonging

The vast majority of Latina/o participants stated that having the opportunity to build trusting relationships with their peer coaches provided them a beneficial social support

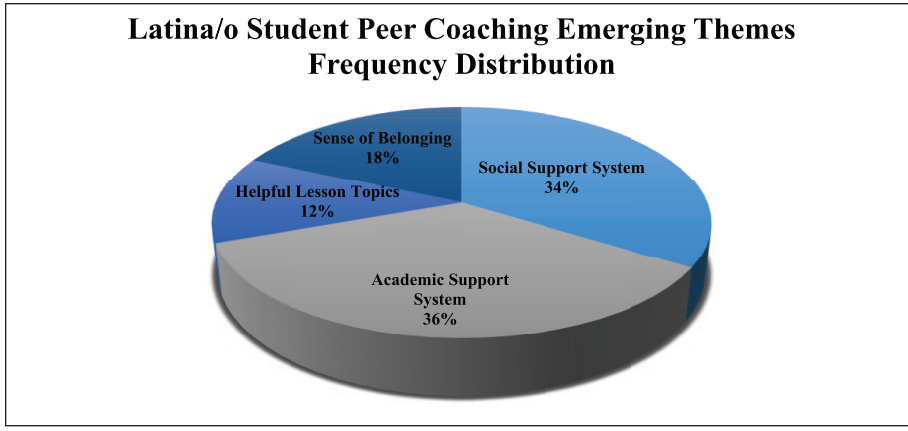

Figure 1. Latina/o peer coaching qualitative data emerging themes frequency distribution.
Note. Academic support system and helpful lesson topics = 48%; social support system and sense of belonging = 52%.

system during their first year. Mentees indicated a high level of satisfaction with their coaches. They valued that coaches were genuinely concerned about their well-being. Mentees declared that they greatly valued being able to have open communication with their mentors. In addition, mentees found speaking with their coaches became easier as the relationship continued to evolve throughout the course of the year.

Academic Support System and Helpful Lesson Topics

Latina/o participants reported that academic resources provided to them by their peer coaches were helpful. Mentees reported peer coaches as being extremely knowledgeable and that the academic workshops were beneficial to their learning. Mentees found the goal-setting lesson to be the most beneficial. A total of 22% of first-year mentees obtained a summer internship, research opportunity, or participated in a service-learning project. Overall, the peer coaching program model and findings positively addressed the needs of first-year Latina/o students, mainly first generation (see Figure 2).

Latina/o First-Year College Persistence

For Research Question 2, quantitative data sets from surveys and student academic records were utilized. Latina/o participants were asked to identify obstacles they may have to overcome to achieve academic success during the first year. Latina/o participants listed surmounted barriers of financial cost (81%) as the highest, 44% selected academic skills, 42% selected performance pressure, and 14% selected family support. The Latina/o control group equally selected (70%) both performance pressure and

Table 4. First-Year Latina/o Mentee Experience Anecdotes.

Theme	Anecdote
Social support system	I have a good relationship with my peer coach; I can ask him a question via text or in person and he will always help me out.
	I feel very connected to my peer coach and group, we do stuff outside of meetings, and we are very close.
	I feel our peer coach always supports us not just as a coach, but also as a friend, we have bonded.
	I like how our coach was there to help us through our stressful weeks of school.
Academic support system	Talking to my peer coach makes me feel like if they can do it, I can too.
	My peer coach made a lot of emphasis on meeting with professors in the beginning to get more explanations.
	My peer coach has been there to guide me and push me to achieve my goals; she has also helped me in obtaining outside resources that I would not have received on my own.
	She has given me study tips . . . advice on how to talk to our professors.
Helpful lesson topics	Setting goals pushed me to try to work harder, not just academically, but personally.
	My peer coach helped me throughout the year by teaching me how to manage my time and stop procrastinating.
	I never thought about doing research or anything during the summer, but my peer coach always pushed us to think about it, although we are only freshmen.
Sense of belonging	Even though this is a small university, you are stepping onto a whole new ground and it is a new level in your life. Having a peer coach in the beginning, even when you are not so close, it was nice to have an ally. Someone who, in the beginning, was hired to help you, but as you become closer friends, they are willing to do anything in their power to help you, make you feel more comfortable in your transition. I definitely feel an impact from having had a peer coach. An extra friend may not be such a big deal to others, but it is a big deal to a lot of us during our first year who are first generation.
	Being a first-generation student, you don't know who to ask, you cannot really go to your parents or family members, but having another student that you can trust, one who you can go to when you have questions, is really nice to have
	My peer coach helped me reach my full potential and helped me understand why I belong here.

financial cost, academic skills as 43%, and 2% selected family support. Findings indicated that there was no change in either the pretests and posttests in the treatment or the control groups based on the constructs generated. However, it is important to note

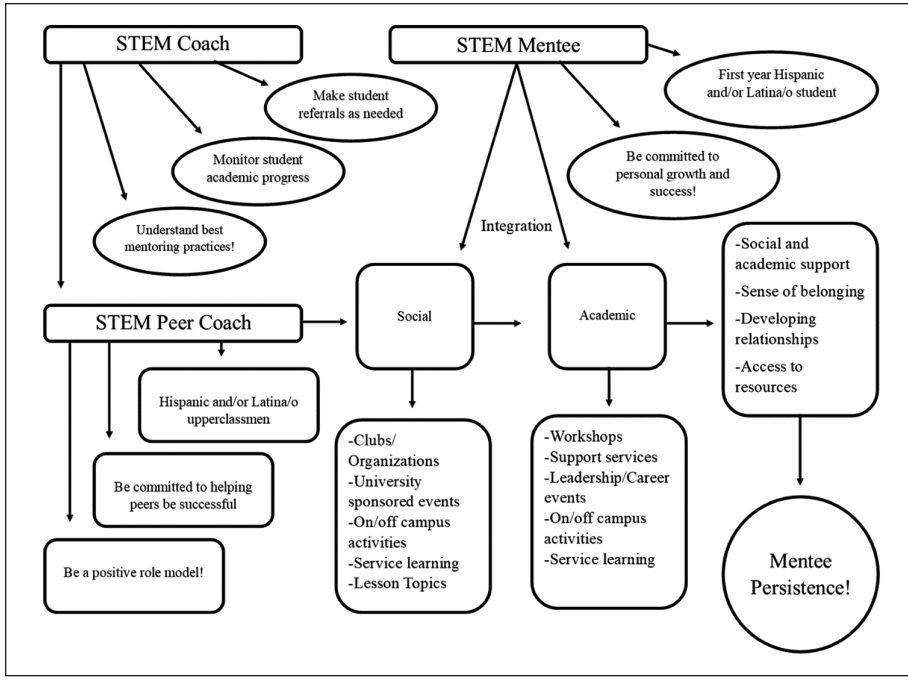

Figure 2. Peer coaching program model (developed by the STEM Coach for Cohort 1 and currently being utilized at the institution with future cohorts) of first-year Latina/o student persistence.
Note. STEM = science, technology, engineering, and mathematics.

that based on the propensity scores, the two Latina/o STEM student groups were "like" one another.

To help answer the research question, student major and end-of-term average GPA of both the treatment and the control groups were used. Latina/o program participants and the control group were both equally representative of 11 STEM majors, with eight of the disciplines overlapping. The treatment sample had an average 3.28 GPA, whereas the control group had a 2.78 average GPA for the spring 2018 term. Latina/o STEM participant GPA indicated that the peer coaching program services had a statistical significance on student academic persistence during their first year to the extent that the treatment students were higher (0.50) than the control group in the end-of-term spring 2018 average GPA (see Table 5). Institutional data reported that an overall average cumulative GPA for first-year 2017-2018 STEM students was 2.97 and for the institution, inclusive of all majors, it was 3.05.

Discussion

The purpose of this study was to develop an intrusive peer-to-peer coaching model that would promote increased persistence of first-year STEM Latina/o students attending

Table 5. Latina/o Peer Coaching Sample and Nonmentored Control Group Academic Records.

	Sample		Control		
Major	GPA (avg.)	*N*	*N*	GPA (avg.)	Major
Biochemistry	3.22	6	1	1.76	Biochemistry
Biology	2.86	14	24	2.86	Biology
Computer science	2.9	3	2	3.42	Computer science
Mechanical engineering	3.18	6	4	2.7	Mechanical engineering
Engineering science	3.36	2	5	3.22	Engineering science
Forensic science	2.96	6	1	2.94	Forensic science
Industrial engineering	3.36	2	1	3.64	Industrial engineering
Physics	4	1	2	2.5	Physics
Engineering management[a]	3.3	3	1	2.25	Chemistry[a]
Mathematics[a]	3.93	1	3	3.13	Computer engineering[a]
Software engineering[a]	2.99	1	1	2.14	Electrical engineering[a]
GPA[b]	3.28	45	45	2.78	

Note. GPA = grade point average; STEM = science, technology, engineering, and mathematics.
[a]Majors that are different between the two Latina/o student groups.
[b]The total *N* and end-of-term spring 2018 average GPA for Latina/o students. Institutional data reported that the average cumulative GPA for all STEM students entering first year (2017-2018) was 2.97 and inclusive of all majors was reported as 3.05. Peer coaching services demonstrated to be statistically significant, $t = 2.3966$, $df = 20$, standard error of difference = 0.209, and a two-tailed p value equals .0264 at 95% confidence interval. By conventional criteria, the difference is considered to be statistically significant; null was rejected.

an HSI. This study revealed that Latina/o students were able to benefit from having a peer coach in college as in similar studies (e.g., Bettinger & Baker, 2011; Bordes & Arredondo, 2005; Bordes-Edgar, Arredondo, Kurpius, & Rund, 2011; Crisp & Cruz, 2010; Cruz et al., 2019; Moschetti et al., 2017; Salas et al., 2014). The quantitative and qualitative data indicate that Latina/o participants were better prepared to overcome social and academic barriers, therefore supporting Tinto's (1993) theoretical position on students needing social and academic integration in college to avoid early departure. The following three Latina/o students described their personal experiences from participating in the peer coaching program:

> Overall, this year was a huge transition from high school to college, but I honestly owe a "thank you" to this program. It has impacted me in more ways I would have thought. I came here completely clueless as to what college had to offer and thanks to this program, I was given so many more opportunities that have greatly impacted my education. Every week was a reminder to stay on track, to keep my grades up, and to focus on what truly matters, while also keeping healthy relationships and know what to prioritize. I feel that you grow up very quickly your first-year or you go down the wrong path. This program influences you to become a better student and a well-rounded person. I am more prepared for my sophomore year, than I ever thought I would be.

A second student concurred by stating,

> The program has truly been a remarkable experience with my peer coach and all the faculty involved. I most often recall last semester when large concerns arose from my advising sessions. The STEM Coach was there to mediate and introduced me to other faculty for help. My peer coach has been a remarkable mentor and has truly invested so much in us and our well-being. She has evolved us into smart, conscientious students so that next year we can succeed, even though she will not be there. Honestly, I could not be any more grateful.

A third student also found their peer coach invaluable and stated,

> This program has definitely given me a group of people who support and care for my aspirations. My peer coach pushed me to do better in classes and other aspects of my life. I gained a friend (my mentor) and was able to get closer to other friends through this program. This program also encouraged me to get involved with my community by volunteering. This program has overall impacted my life greatly in the best way possible.

Latina/o participants affirmed a great level of satisfaction with their mentor. They recognized that their mentors were genuinely concerned with their academic success and appreciated how much they could identify with their peer coaches, reinforcing Rios-Ellis et al. (2015). Similar to Bettinger and Baker (2011), students valued being able to maintain open communication with their coaches. The study revealed that having a peer coach with culturally similar backgrounds was fundamental to STEM Latina/o students during their first year in college.

Comparable with Salas et al. (2014), many of the participants found it difficult at times to be away from home. However, having the support of their peers helped the participants alleviate stress. Despite the odds, Latinas/os in this study were able to break barriers by overcoming adversity and achieve academic success in college while majoring in a STEM discipline. In the annual program evaluation, all students who participated in the qualitative data collection ($n = 36$) indicated that they would strongly recommend the program to other Latinas/os because the experience was invaluable. Mentees appreciated the "head start" that they were afforded through peer mentorship as in similar studies (e.g., Rios-Aguilar & Deil-Amen, 2012).

Recommendations for Future Research

While the present study adds to the existing literature on mentoring best practices among first-year Latina/o students attending an HSI and majoring in STEM, continued future research on the intrusive peer-to-peer coaching model developed is highly recommended. It is suggested that institutions seeking to further study the model could identify whether a control group is necessary by determining the advantages and disadvantages of having a control group. Subsequently, it is also recommended that multiple survey instruments, such as mentoring scales, self-efficacy models, and rating

scales, be explored prior to implementation (e.g., Moschetti et al., 2017; Nora & Crisp, 2007; Solberg, O'Brien, Villareal, Kenner, & Davis, 1993).

Latina/o students matched up to ethnic mentors perceive their mentoring experiences as "being more self-efficacious" (Santos & Reigadas, 2002). Therefore, institutions should also seek to identify whether having a STEM Coach with the same cultural background as the Latina/o program participants has an impact on program development, implementation, and/or mentee perceptions. Finally, HSIs should explore the impacts of providing Latina/o students social and academic support systems well beyond the first year of college. At the conclusion of the year, mentees expressed a desire to continue to be a part of a program that could keep them on track and further motivate them to push forward. Despite the cost to support Latinas/os in higher education, students must be supported through degree attainment. Bordes-Edgar et al. (2011) asserted that the monitoring of students should be inclusive at all levels of an educational structure, which includes faculty, staff, advisors, mentors, and so on, to create an institutional culture that is committed to the success of all students, not merely freshmen. Students require continuous monitoring and periodic intervention to avoid early departure (Bordes-Edgar et al., 2011).

Conclusion

Historically, Latina/o students have struggled to achieve academic success in college (Contreras & Contreras, 2015; Mount, 2015; Salas et al., 2014) and this academic deficiency narrative necessitates change. The barriers to degree attainment are far from over (Tinto, 2006). The new academic success narrative should focus on social and academic support systems for Latina/o students at all levels of their undergraduate education, through degree attainment. As educational leaders in higher learning institutions, we would be remiss if we did not continue to explore alternative approaches that foster and promote college degree attainment of Latina/o students. It is critical that higher learning institutions adequately prepare Latinas/os for the future by increasing graduation rates over the next decade (Arciniega, 2012).

Higher learning institutions, especially HSIs, continue to face the difficult task of finding ways to better support Latina/o student academic success. Approaches that support postsecondary success of Latina/o students must continue to be reexamined (Salas et al., 2014). Although an increased number of Latina/o students continue to seek postsecondary education opportunities, walking across the stage unfortunately often never materializes for many Latina/o students. Targeted intervention approaches that address the social and academic needs of Latina/o students must continue to resonate within educational structures, particularly HSIs receiving federal funds.

The present study sought to examine the first-year experience of Latina/o students pursuing STEM pathways at an HSI, coupled with addressing persistence through the development and implementation of a peer coaching program. Latina/o peer coaches demonstrated to be extremely dedicated, committed, and influential to the personal growth and academic achievement of their Latina/o mentees. Through intrusive peer coaching support services from their Latina/o STEM peers at an HSI, Latina/o STEM

mentees were able to realize that learning truly has no boundaries. Moreover, Latinas/os were able to realize and demonstrate to the Latina/o community that pursuing a STEM pathway in postsecondary education truly is possible. Latinas/os can be academically successful regardless of discipline, ethnicity, and socioeconomic status. Barriers can be overcome by Latinas/os when institutional support systems are in place to guide students in the right direction.

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