

## **BRCC to LSU Engineering Pathway to Success**

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## BRCC to LSU Engineering Pathways to Success

### ABSTRACT

The National Science Foundation (NSF) S-STEM scholarship program, *Engineering Pathway to Success*, is a joint effort of the College of Engineering at Louisiana State University (LSU) and Baton Rouge Community College (BRCC). It supported the engineering degree progression program with students earning a BRCC associate of science in engineering and completing a bachelor's of science engineering degree at LSU. Over five years, the program provided scholarships and academic/ professional support to 36 students who demonstrated academic talent and financial need. The primary goals of the program were: to utilize scholarships to create and sustain a pathway for BRCC transfer students and to develop a successful model for transfer students from other community colleges and 4-year institutions based on the experiences and outcomes of the project.

The Pathway Scholarship project in collaboration with the STEP 1B Engineering Grant had specific objectives supporting these goals. They were: (1) develop and maintain an effective liaison between BRCC and LSU; (2) utilize scholars in a peer ambassador program facilitating transfer success; (3) establish a pre-transfer academic counseling program; (4) expand existing seminars to orient and integrate BRCC and other transfer students into LSU and (5) invite BRCC math, science and engineering faculty to participate in ongoing Faculty Development.

Activities of the program included outreach, professional development, advising, and developing an overall assessment tool. All scholars participated in outreach activities that consisted of Peer-to-Peer talks at BRCC each semester and Shadow Days at LSU for BRCC students. The Pathway scholars also were incorporated into the formalized LSU peer mentor training program and participated in Transfer Career Day for new transfer students. Advising for BRCC students was enhanced with the addition of a counselor who spent time at both campuses. Survey tools were created to gain a better understanding of the transfer students at key points of their academic career and to assess the program. The questionnaire was administered to students considering transferring to LSU and Pathway scholars.

Scholarships were awarded to four cohorts; Cohort 1- five students, Cohort 2 – seven students, Cohort 3 - twelve students, and Cohort 4 – twelve students. The eligibility and selection criteria included earning pre-engineering AS degree from BRCC with a 2.75 minimum cumulative GPA and financial need, and the selection committee included faculty and staff from both campuses. The overall persistence (i.e. retention and graduation) of Pathway Scholars in LSU engineering was 94% and the mean GPA was 3.09. All scholars from Cohort 1 graduated, and the mean GPA was 3.22. LSU engineering retention and graduation for Cohort 2 was 86%, and the mean GPA at graduation was 2.89. Cohort 3 students transferred to LSU fall 2013 or spring 2014, and the persistence was 100%. Cohort 3 continuing students (n= 2) have a mean GPA of 3.35 and the graduates (n=10) had a mean GPA of 2.94. Cohort 4 students transferred to LSU fall 2014 or spring 2015, and the persistence was 92% after one scholar relocated. Cohort 4 continuing students (n= 10) had a mean GPA of 3.17 and the graduates (n=2) had a mean GPA of 3.35. Results indicate that the Pathway scholars have a graduation rate that greatly exceeds the historical (2003-2009) 25% rate for BRCC transfers to LSU. Overall, the Pathway Scholar Program is rated very highly by the scholars according to the questionnaire, and the program is delivering on its promise of supporting the students financially so they can focus more on their education, and connecting students with others in their field.

### INTRODUCTION

In 2010, BRCC and LSU formally agreed on developing a degree progression program with students earning a BRCC associate of science in engineering and completing a bachelor's of science engineering degree at LSU. Numerous factors and demographics suggested that a joint effort between the State's largest and fastest growing community college system (BRCC) and the Louisiana's Flagship University (LSU) would help yield additionally trained engineers for Louisiana's workforce. First, the State of Louisiana does not produce enough engineers to meet its yearly demand. All engineering programs combined (7 Colleges of Engineering in the State) graduated 814 B.S. level students in the 2008-09 academic year<sup>1</sup> while the state demand was 1,150<sup>2</sup>. Louisiana State University (LSU) graduated 42% of all engineers in the state during the 2008-09 academic year<sup>3</sup>. Second, many students strive to enter LSU but do not meet the

institution's entrance requirements as an incoming freshman, and thus begin their academic career at a community college. Third, numerous Baton Rouge Community College (BRCC) students have stated that they actively choose to attend BRCC for their first two years due to lower cost, smaller campus, smaller student body and convenient class times (early morning, nighttime and weekend). Fourth, the state appropriations for Higher Education have been reduced several times over prior years and further reductions anticipated into future fiscal years. Thus, strategic alignments of 2- and 4-year programs would help alleviate some costs to the higher education system by encouraging more students to begin their careers at a community college. Last, the socio-economic demographics of the state suggest that many talented, but financially needy students are not afforded opportunities to achieve an education at a 4-year institution. Thus, the demographics of a community college tend to vary vastly from that of LSU in terms of race/ethnicity/family education level. This scholarship program will help Louisiana State University, Baton Rouge Community College and the State of Louisiana meet the present and predicted future engineering workforce demands. In addition, the BRCC-LSU partnership will serve as a model that can be transported to other community colleges in the State to afford educational opportunities at LSU to a larger and more diverse population of Louisianans who may not have the resources or the confidence to enter LSU as true freshmen.

The NSF S-STEM funded scholarship program, *BRCC to LSU Engineering Pathway to Success*, is a joint effort of the College of Engineering at LSU and BRCC. The five-year S-STEM project focuses on students who transfer from BRCC to LSU, demonstrate academic talent, and have a financial need and the first year of implementation was 2011. This five-year grant supports the collaborative effort and will provide scholarships and academic/professional development to approximately 36 engineering undergraduate students over the course of the entire program. The two primary goals of the program are to:

1. Utilize the S-STEM scholarships to create and sustain a pathway of success for the target students.
2. Develop a successful pathway model for transfer students from other community colleges and 4-year institutions based on the experiences and outcomes of the project.

The Pathway Scholarship project in collaboration with the STEP 1B Engineering Engagement Grant has specific objectives that will support meeting the overall needs of the state and specific goals. They are: (1) develop and maintain an effective, collaborative liaison between BRCC and LSU personnel with each having key and joint roles; (2) utilize a selected group of BRCC transfer students already at LSU to develop a peer Ambassador program to help facilitate the transfer process and promote success; (3) establish and conduct a pre-transfer academic counseling program building upon the recently established MOU and utilizing counselors from both institutions; (4) expand and enhance the existing NSF sponsored S-STEM project seminar series to include the orientation and integration of BRCC and other transfer students into the LSU student body; (5) provide opportunities for BRCC and other area community college students to participate in the activities of LSU professional student organizations; and (6) invite BRCC math, science and engineering faculty to participate in the ongoing Faculty Development Program, which is part of LSU's existing NSF-sponsored STEP Project. The successful implementation of these objectives and supporting activities will in turn help increase the number of transfer students seeking and obtaining a BS degree in engineering from LSU.

## SCHOLASHIP CRITERIA AND APPLICATION

The eligibility and selection criteria for the scholarship are: earn pre-engineering AS degree from BRCC; have a BRCC 2.75 minimum cumulative GPA; demonstrate financial need as determined by FAFSA cost of attendance; and exhibit success oriented attributes- motivation, leadership and professional orientation. The first cohort of scholars were selected from BRCC transfer students who had completed one semester at LSU and were not required to have an pre-engineering AS degree due to the newly approved BRCC degree program. The scholarship program focused on identifying current BRCC students through the engineering program liaison, and LSU outreach activities. The scholarship was offered each fall and spring semester and potential AS degree graduates were sent emails with the scholarship application in May and November each year and an announcement with application information was posted on the LSU College of Engineering website. Applicants submitted a comprehensive application packet that included a transcript of college work; a resume listing work experience, achievements, honors, awards, participation in professional student organizations; a personal statement of career goals; a financial need statement

and two letters of recommendation. The number of students graduating with the AS in Pre-Engineering from BRCC has increased each semester, thus, selection became more competitive.

## PARTICIPANTS

The project supported 36 BRCC transfer students through the course of the five year scholarship grant. Scholarships were awarded to four cohorts with five students selected in 2011-2012 (Cohort 1), seven students selected in 2012-2013 (Cohort 2), twelve students selected in 2013-2014 (Cohort 3), and twelve students selected in 2014-2015 (Cohort 4). The scholarship was limited to four semesters of financial support at an average \$3,750 per semester with the exception of Cohort 1. Initially, the plan was have all scholars in each cohort begin the program in the fall semester. As the associates degree program was implemented at BRCC, approximately the same number of BRCC students were on track to transfer to LSU fall and spring semester. Thus, the scholarships were awarded each semester.

### Cohort 1 (2011-2012)

The first cohort of five students received the Pathway Scholarship in fall 2011. The emphasis of the Pathway Scholarship Program continues to support the scholars financially and provide critical support for their success. With this in mind, three scholars who were in their third year had their scholarships extended until graduation, and this was based on their academic performance and funds available as a result only six of the ten new scholarships were awarded in 2012-2013. The engineering majors represented by this cohort were chemical, civil, electrical, mechanical, and petroleum, and they entered LSU as transfer students in the fall 2010 or spring 2011 semester. The scholars' academic performance at selection (i.e. at the end of the spring 2011 semester) was on average well above the scholarship criteria, and demographics indicate that the program has benefited underrepresented groups (Table 1).

### Cohort 2 (2012-2013)

One BRCC student received the Pathway Scholarship for fall 2012, and all five students who applied for 2013 spring semester received the scholarship. It was also decided to award one scholarship to a current LSU student who applied with the first cohort. The engineering disciplines of this cohort were: five mechanical majors, one electrical major and one environmental. The academic performance of this cohort at selection was also well above the scholarship criteria, and the demographics were in line with the previous cohort (Table 1). Attrition in this cohort was the result of one scholar decided to enroll only as a part-time engineering student, and one scholar who transferred to another university after the spring 2014 semester.

### Cohort 3 (2013-2014)

Six BRCC students received the Pathway Scholarship for fall 2013, and six students received the scholarship for the spring 2014 semester. The engineering disciplines of this cohort were: two civil, five electrical, three mechanical and two petroleum majors. The academic performance of this cohort at selection was well above the scholarship criteria, and demographically, this cohort did not have any female students although the students were racially and ethnically diverse (Table 1).

### Cohort 4 (2014-2015)

Table 1. The Pathway Scholars GPA at selection and demographics for the Pathway Scholarship cohorts were summarized.

Description	Cohort 1		Cohort 2		Cohort 3		Cohort 4	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Mean cumulative BRCC GPA	3.47	-	3.39	-	3.31	-	3.42	-
Female	1	20	1	14	0	0	3	25
Male	4	80	6	86	12	100	9	75
Asian American	1	20	-	-	2	17	5	42
Black	1	20	1	14	2	17	3	25
Caucasian	3	60	5	71	7	58	4	33
Hispanic	0	0	1	14	1	8	0	0

Six BRCC students received the Pathway Scholarship for fall 2014, and six students received the scholarship for the spring 2015 semester. The engineering disciplines of this cohort were: one biological, two chemical, one computer, two electrical, two mechanical and four petroleum engineering majors. The academic performance of this cohort at selection was also well above the scholarship criteria, and the demographics were diverse with respect both gender and race/ethnicity compared to previous cohorts (Table 1).

## PROGRAM ACTIVITIES

The overall goals of the program activities were to promote the success of the scholarship recipients and engage engineering transfer students. Within the framework of the scholarship program, activities were initiated during the first year and changes were made each year to reflect the needs of the students. These activities included outreach to BRCC, seminars, advising and promotion of employment opportunities. The program was unable to award all of the scheduled scholarship for the second cohort year, thus significant efforts were continued to recruit BRCC transfer students for the remaining two years. The efforts were effective as 20 students applied to the program when Cohort 3 was selected versus only six for Cohort Two.

### Outreach

It was deemed important to have all the scholars participate in outreach activities and utilize resources that promote success. The scholars have participated in Peer-to-Peer talks at BRCC and LSU Shadow Days held each semester beginning with the first year of the program. A transfer career orientation workshop was added for the spring 2014 semester.

### Peer-to-Peer Talks

The Pathway Scholars from all cohorts visited BRCC classes in the fall and spring semesters for the Peer-to-Peer talks, and each scholar participated in the presentation and answered questions from current BRCC students. BRCC classes at various points of the pre-engineering curriculum were visited in an attempt to reach more students, and to engage the students at an earlier point in their academic career. Peer-to-Peer talks were held over two days whereby the current Pathway Scholars, participating as Pathway Ambassadors, went to BRCC classes to recruit transfer applicants. Each semester, presentations were made to math (differential equations, calculus I, II, and III), physics and engineering classes (statics.) During the talks, there was a presentation by LSU staff and Pathway Scholars whereby information was provided, and questions were answered. Also, the Pathway Scholars were able to communicate their experiences in the program. Typically, a total of 100 BRCC students were reached each semester. The majority (~85%) of the participants indicated engineering as their major, and the remainder indicated other STEM disciplines.

An informational lunch on the BRCC campus was added to the outreach activities, and it served as a supplemental session to the Peer-to-Peer Talks. This allowed attending students to ask detailed and follow-up questions about the Pathway Scholarship Program and engineering programs at LSU. Several current Pathway Scholars attended and helped answer questions from the student perspective.

### Shadow Day

The 2011 Pathway Scholars (Cohort 1) recommended that potential BRCC transfers visit the LSU campus to help alleviate some of the concerns a transfer student would have. These concerns ranged from being overwhelmed by a much larger physical campus, large class size and transfer logistics. During the Peer-to-Peer talks at BRCC, Shadow Day information was provided, and students were able to register for a time and course that they would like to attend at LSU during the designated "BRCC at LSU Shadow Day." Registration forms were also provided to the BRCC liaison and BRCC transfer counselor. Each semester, the interest by the students was high at typically 20-25 students registering for the visit, but only about half of them participating. The students who participated toured the engineering building, attended at least one class related to the area of their intended engineering major with a current Pathway Scholar, and met LSU staff and counselor for a wrap up session to answer questions. In spring 2013, a transfer counselor who spends time at both the LSU and BRCC campus was added to the team, and this staff member provided very timely and useful information. This resulted in a sharp decrease in BRCC student interest in the Shadow Day, thus this activity was discontinued.

## Workshops

In conjunction with the STEP IB grant objectives and tasks, the LSU College of Engineering held career orientation workshops (Transfer Career Day) for all transfer students immediately before the start semester starting in spring 2014. The goals of this workshop were to:

- Connect transfers to current LSU engineering students.
- Provide information about engineering internships and careers.
- Encourage student organization involvement.
- Familiarize students with details about the LSU Olinde Career Center and the online application process.

The workshop participants were solicited by emails and postcards sent to admitted transfer students. The agenda consisted of an icebreaker teambuilding activity with Peer Mentors ; a panel session with student leaders on the benefits of actively participating in student organizations; lunch with industry engineers with a panel discussion; tours of key engineering facilities and laboratories; and a presentation on accessing the LSU Olinde Career Center services and preparing a professional resume. The Pathway Scholars lead ice breaker and design activities and participated on discussion panels. This workshop format with slight adjustments based on participant surveys has been held each semester.

## Seminars

The Pathway Scholars were regular participants in the Professional Development Seminars that have been offered to LSU College of Engineering undergraduates served by the Diversity Initiatives Office. The topics varied from general student networking to career skills. Each winter the Pathway Scholars were included in the required book club reading that supports developing a strong work ethic, leadership and overall success. The selections were, *EntreLeadership* by Dave Ramsey, *QBQ! The Question behind the Question* by John Miller, and *It Worked for Me* by Colin Powell, and roundtable discussions were held during the first seminar of the spring semester. The graduate assistant who is in the cogitative psychology PhD program also conducted a “How to Study Better” session with the scholars. This session utilized active learning demonstrations to demonstrate how memory is affected by many factors and this was followed by presenting material and strategies to improve learning.

The Pathway Scholars were also included in the formalized College Peer Mentor and Leadership Annual Training that was a five-hour session held on a Saturday. This training covered a variety of topics and activities to prepare them as a mentor to incoming students. Specific agenda topics were: “What is Leadership”, professionalism and boundaries, a leadership style assessment using the DiSC<sup>®</sup> tool, and putting goals into action.

## Advising Meetings & Communications

The Pathway Scholars were required to meet with a staff member from the Office for Diversity Initiatives on a regular basis. The purpose of these meetings was to cover critical areas that contribute to being a successful student, and the meetings were held with the scholars as a group and with individual students. Each student was required to improve his/her resume and utilize all the resources of the LSU Career Services. Students were encouraged to actively participate in student organizations to build their network of study groups and connections with employers.

## Internships and Employment

The Pathway Scholars have entered the program with a variety of work experience, with much of it was related to engineering and they have reported working fulltime while taking courses at BRCC. All of the Pathway Scholars have reported a reduction in the number of hours worked during the academic year as a result of the financial support. The value of internships and engineering experience has been communicated to all students who participate in College of Engineering Programs. Ten of the twenty-five active scholars were employed in engineering internships or research experiences scholars in summer 2015, with one in cohort 2, four in Cohort 3 and 5 in cohort 4. Also, two additional scholars from Cohort 3 held an engineering co-op positions in 2014-15. Thus, 12 of the scholars were able to gain valuable work experience during the 2015-16 year.

The Cohort 1 Scholars graduated in previous years and all are employed in engineering fields. One active Cohort 2 Scholar graduated from LSU in May 2016 with a fulltime permanent position. Four Cohort 3 scholars graduated during the 2015-16 year and three of them confirmed accepting

permanent engineering positions prior to graduation. Two Cohort 4 scholars graduated in 2015-16, but neither indicated fulltime employment at graduation.

## ASSESSMENTS

The Pathway S-STEM Program was primarily assessed using student academic performance and program surveys completed by students at the end of the each semester. The scholars were selected based on their BRCC GPA, although their official overall cumulative GPA was calculated by the LSU registrar’s office. The recalculation is based on all classes taken during a student’s academic career unless they declare academic bankruptcy, i.e. deleting all college credit prior to a set date. This official recalculation does not occur until after the student enrolls in LSU. The cumulative GPA for all scholars were tracked for each fall and spring semester through their four funded semesters and until graduation. Several students participated in engineering co-ops and these semesters were not included as academic semester. A new assessment survey of current scholars and potential transfer students was developed for the Pathway Scholars program in fall 2012 (Appendix A), and this was done with a goal of providing information about students and their experiences that would help improve the program.

### Academic Assessments

Cohort 1 Pathway Scholars had a mean cumulative GPA of 3.47 when they began the scholars program (Table 2). All scholars in this cohort maintained a cumulative GPA above the minimum 2.75 required to retain the scholarship. The 0.25 drop in mean, cumulative GPA of this cohort during their tenure at LSU speaks clearly to the sound, academic rigor and preparation of the students while at BRCC.

Cohort 2 had a total of seven scholars, and two were active though not funded scholars at some point (Table 2). The students were well qualified with a mean BRCC GPA of 3.39, but the calculated LSU GPA was 3.20. Three of the scholars attended other universities prior to starting the BRCC program and cumulative grades were negatively impacted by their early academic career, although the students performed well at BRCC. With this recalculation, one student’s LSU GPA was below the 2.75 GPA minimum, and it was decided to keep the student as a Pathway Scholar. The mean cumulative GPA for this cohort while at LSU dropped by 0.32 or 10% after based on their GPA at graduation.

Cohort 3 Pathway Scholars consisted of 12 students, and this cohort of students performed well at BRCC with a mean BRCC GPA of 3.31. Six of these scholars attended other universities prior to starting the BRCC program and the LSU recalculated cumulative grades were negatively impacted by their early academic career. The average drop was 0.23 on a 4.0 scale with one student having a 0.585 decrease. One student’s recalculated GPA fell below the 2.75 GPA minimum, and two other student had recalculated GPAs at 2.8 which is close to the minimum scholarship criteria. Thus, each student was academically evaluated with consideration given to the large initial negative change in the LSU cumulative GPA.

Table 2. Pathway Scholars’ GPAs were tracked from entry through graduation for the number of semesters in the program.

	Cohort 1 n=5	Cohort 2 n=7	Cohort 3 n=12	Cohort 4 n=12	All Cohorts n=36
BRCC GPA @ AS Degree	-	3.39	3.31	3.42	3.37
LSU Entry GPA *	3.47	3.20	3.19	3.39	3.27
1	3.37	3.05	3.08	3.36	3.21
2	3.28	2.98	3.03	3.32	3.16
3	3.23	3.01	3.02	3.28	3.14
4	3.22	2.88	3.02	3.20	3.09
5	3.22	2.88	3.02	3.02	3.02
6	3.26	2.83	3.05	-	3.05
7	-	2.85	2.99	-	2.90
8	-	2.55	-	-	2.55
At Graduation	3.22	2.89	2.94	3.35	3.03

\*Includes grades from all institutions attended and all classes taken regardless of repeat status.

Cohort 4 Pathway Scholars were selected for the 2014-15 academic year with six scholars added in the fall and six in the spring. The mean BRCC GPA was 3.42 and the recalculated LSU GPA was 3.39 with all scholars meeting the 2.75 minimum. As a group Cohort 4 did not initially experience the drop in GPA that Cohorts 2 and 3 did during the first year transition, but their cumulative GPA did drop during the second year (Table 5).

The Pathway Scholars, as a group, have experienced a cumulative GPA drop upon the completion of the first semester at LSU. Not all students experienced this, and five students actually increased their cumulative GPA after the first semester. The mean drop for the 31 students who completed four semesters as a funded scholar was 0.18 GPA points, and the decrease for the 23 graduates was 0.26 GPA points.

#### Activities and Work

The Pathway Scholars were requested to self-report academic and professional development activities on a semester basis via an online survey. The results indicate that as a group they were involved in professional development and community service. The scholars seem to under report their activities when they complete semester surveys. Many of the scholars do not report community building and recruitment although all of them have participated in Peer-to-Peer Talks, Transfer Career day each semester and other outreach activities.

One of the goals of the scholarship program was to provide significant financial support that would alleviate a scholar's need to maintain a heavy work schedule while enrolled in academically rigorous courses. A semester survey of the scholars (both funded and unfunded) indicates that approximately 85% of the participants work each semester. The average number of reported hours worked per week was 15.

#### Retention and Graduation

The project team anticipated attrition of the Pathway Scholars based on the historical 25% retention and graduation rates for BRCC transfer students. The Pathway Scholars program has retained 92% of all students in the scholarship program and 94% of the participants in the LSU College of Engineering (Table 3). Only three scholars left the program or LSU. One Cohort 2 student opted out of the scholarship program and continued as a part-time engineering student. Two students, one each from cohorts 2 and 4, moved to other states with plans to continue their engineering education at another university. It is notable that both Cohort 2 students graduated in May 2016, and the student who left LSU received an engineering degree from Embry-Riddle Aeronautical University. The staggered award of scholarships has yielded a graduation rate to date of 64% with a 3.03 mean GPA, and the average time to graduation after transferring or receiving the scholarship was 5.6 semesters (Table 3). All Pathway Scholars from Cohort 1 graduated and six of the Cohort 2 scholars graduated from LSU with engineering degrees. Ten scholars from Cohort 3 graduated with the other two scholars retained in LSU Engineering. Two scholars from Cohort 4 graduated and nine scholars were retained in LSU Engineering.

#### Overall Assessment

In order to assess the effectiveness of the Pathway Scholars program and the experiences of transfer students, questionnaires were developed and distributed to students. These questionnaires queried demographic information as well as information regarding students' choice and feelings towards the experiences they have had within an engineering program. Further, the questionnaires allowed for the assessment of anticipated hurdles upon entering the four-year university system. Responses were compared between existing Pathway scholars attending LSU (Appendix A) and those students anticipating transfer into the college (Appendix B). Another subset of questions was administered specifically to the Pathways scholars in order to examine the effectiveness and impact of the program.

#### Comparing Current Students and Transfer Students

The questionnaires were completed by 27 Current Pathways students and 32 Anticipating Transfer students. Comparisons between the demographic characteristics of these two groups revealed that a significant difference was only evident in the rate of memberships to professional or student organizations, with 51.9% of Current Pathways students and 22.6% of Anticipating Transfer students demonstrating involvement,  $X^2(1) = 5.35, p = .02$ . Although Anticipating Transfer students do not have the same level of access to such organizations on their community college campus, it is very possible that involvement in these organizations after attending LSU is a result



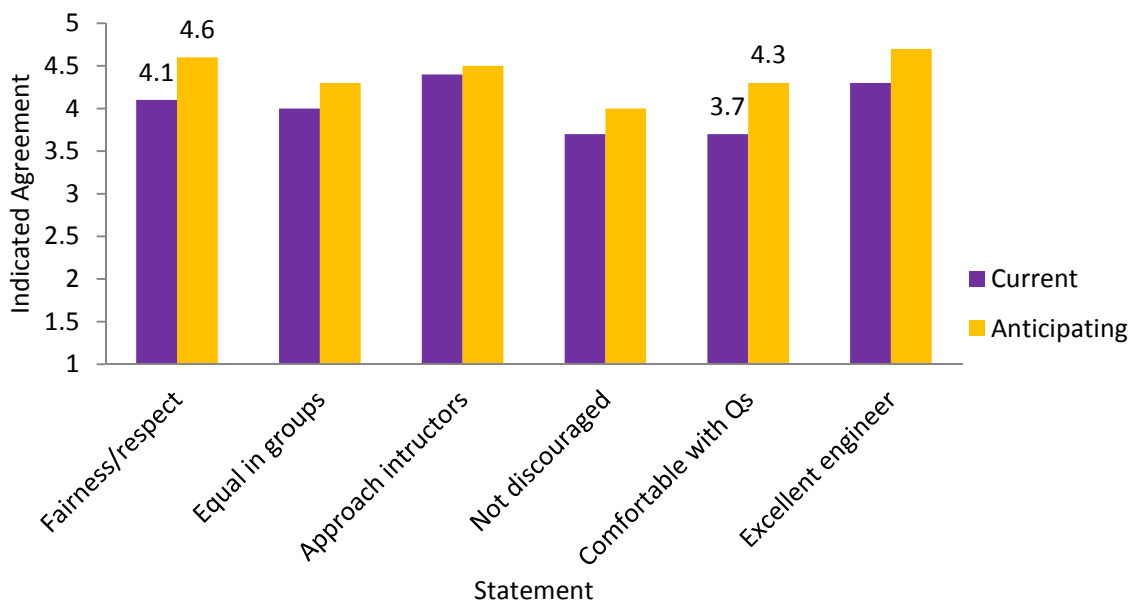


Figure 1. Students' agreement to the six statements regarding engineering self-efficacy. Scale "1 = Strongly Disagree and 5 = Strongly Agree"

of the Pathways Scholars program, which specifically aims to involve students with the organizations corresponding to their engineering major.

All participants were also asked to rate their level of agreement with six statements aimed at determining feelings of self-efficacy in an engineering program (adapted from Henes, Bland, Darby, and McDonald, 1995). Level of agreement with the presented statements can be seen in Figure 1, and the statements presented were as follows:

1. All faculty members treat me with fairness and respect
2. I feel that I am an equal participant in group work.
3. I am comfortable approaching instructors for help outside of class.
4. I have not felt discouraged about pursuing an engineering degree.
5. I am comfortable asking questions in the classroom.
6. I will be an excellent engineer.

Overall, Current Pathways scholars indicated lower levels of self-efficacy on all items. These ratings were significantly lower in areas regarding classroom-based self-efficacy: belief that faculty treated students with fairness and respect (4.1 for Current student versus 4.6 for Anticipating students,  $t(40.17) = 2.20, p = .03$ ) and comfort in asking questions in the classroom (3.7 for Current students versus 4.3 for Anticipating students,  $t(45.36) = 2.50, p = .02$ ). It is possible that these differences exist because the curriculum at a four-year university is more challenging than that of the community college or because class sizes are much larger than the community college classrooms that students have grown used to. However, it is also important to keep in mind that the Pathways scholars have already completed their pre-requisites and are entering LSU while simultaneously beginning their major-specific courses. These courses are, by their very nature, more challenging, complex, and time-intensive and so it is possible that students are attributing their difficulties to personal factors rather than acknowledging the material itself as difficult.

#### Program Assessment

Several items were included in the questionnaire in order to assess the Pathway Scholars attitudes toward the scholarship program. Specifically, students were asked to rate the program in terms of support amongst six areas: academic, financial, social, career, professional development, and personal. Ratings were made on a Likert scale ranging from 1 (No support at all) to 5 (A lot of support) and students were given the opportunity to include open-ended comments as well.

The Pathway scholarship program was given high ratings across all six areas, with average ratings within each area significantly surpassing the mid-line rating on the scale ( $t's(21) > 3.02, p's < .01$ ). Financial support was rated as the most beneficial aspect overall, with 72% of students rating this area a 4 or 5. Open-ended comments revealed that the financial support afforded scholarship students time to concentrate on studies and work fewer hours than if support had not been provided. Many of the students also appreciated the personal support and guidance provided to them by the

scholarship staff, frequently citing knowledge that someone at the university was specifically invested in their progress as motivational.

Overall, the Pathway program is rated very highly by the current student-scholars. Responses to questions regarding their perceptions of the program indicate that it has been

successful in delivering on its promise to financially support students so that they might focus more on their education, as well as successfully connecting scholars with others in their field through networking and professional organizations (Figure 2). These questionnaire results can be used to improve this program and others like it in the future.

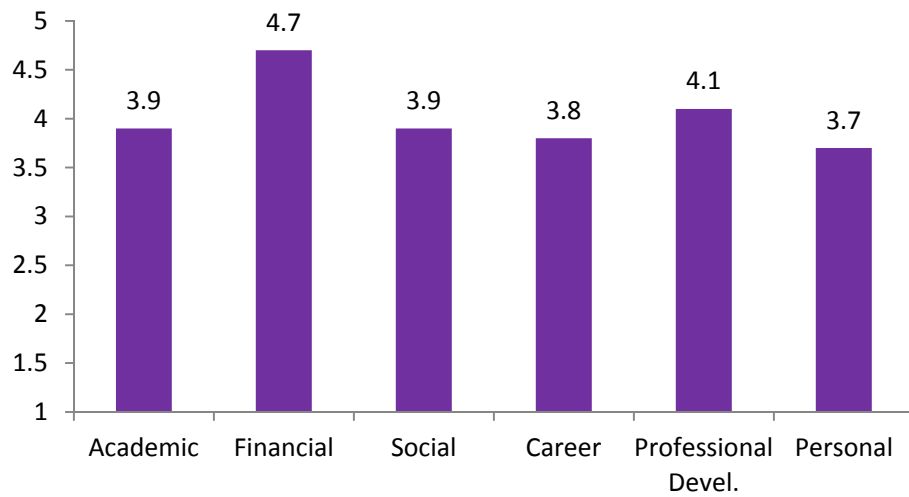


Figure 2. Overall Pathway Scholars' rating of the level of support provided to them in six areas of interest. Likert scale 1 = "No Support at All" and 5 = "A lot of Support".

## CONCLUSIONS AND FUTURE PLANS

Overall, the Pathway Scholar Program is rated very highly by current students, and the program is delivering on its promise of supporting the students financially so they can focus more on their education and connecting the students with others in their field. All Pathway Cohorts have completed four semesters at LSU, and the program yielded an engineering persistence rate of 92% while maintaining scholarship eligibility. Based on the 64% graduation rate and current retention, the Pathway scholars will have a graduation rate that greatly exceeds the historical (2003-2009) 25% rate for BRCC transfers to LSU. Additionally, the survey results have been used to improve the program by adding targeted workshops focused on the needs of transfer students such as the Transfer Career Day and Study Skills workshop. Some recommendations include: providing the same experiences for all students, better informing the students of all supportive resources available, and encouraging all students to work less outside of school.

With the conclusion of the scholarship program, the College will seek funding to expand the scholarship program and associated resources to additional partner community colleges across the State and region. The College takes its commitment to the State very seriously and truly believes future partnerships with other institutions such as BRCC are critical to ensuring a diverse engineering workforce is trained.

## References

1. Louisiana Board of Regents. 2010. Inventory of Degree and Certificate Programs, Statewide program completers by subject. Retrieved from <http://as400.regents.state.la.us/pdfs/crin/crinctot.pdf> (2010, July 19).
2. Louisiana Workforce Commission. State of Louisiana. 2009. Projections for All Occupations (2006-2016). Retrieved from [http://www.laworks.net/LaborMarketInfo/LMI\\_employmentprojections.asp](http://www.laworks.net/LaborMarketInfo/LMI_employmentprojections.asp).
3. Louisiana Board of Regents. 2010. Inventory of Degree and Certificate Programs, Programs completers report by institution. Retrieved from <http://as400.regents.state.la.us/pdfs/crin/crinempl.pdf> (2010, July 19).
4. Previous ASEE proceeding that would identify the authors.

## APPENDIX A

### SECTION 1

In this section, you will be asked to **think back to when you were about to transfer to LSU**. Specifically, what were your concerns regarding the potential hurdles you were going to face?

1. Did you expect to face any ACADEMIC hurdles?
  - a. If so, please describe them:
  - b. How did you plan to overcome the hurdles?
  - c. Did you actually experience these hurdles in your first year?
  - d. If so, how did you overcome them?
  
2. Did you expect to face any PERSONAL hurdles?
  - a. If so, please describe them:
  - b. How did you plan to overcome the hurdles?
  - c. Did you actually experience these hurdles in your first year?
  - d. If so, how did you overcome them?
  
3. Did you expect to face any FINANCIAL hurdles?
  - a. If so, please describe them:
  - b. How did you plan to overcome the hurdles?
  - c. Did you actually experience these hurdles in your first year?
  - d. If so, how did you overcome them?
  
4. Did you expect to face any hurdles with FACULTY MEMBERS?
  - a. If so, please describe them:
  - b. How did you plan to overcome the hurdles?
  - c. Did you actually experience these hurdles in your first year?
  - d. If so, how did you overcome them?
  
5. Did you expect to face any hurdles with OTHER STUDENTS?
  - a. If so, please describe them:
  - b. How did you plan to overcome the hurdles?
  - c. Did you actually experience these hurdles in your first year?
  - d. If so, how did you overcome them?
  
6. Did you expect to face any hurdles with your FAMILY AND FRIENDS?
  - a. If so, please describe them:
  - b. How did you plan to overcome the hurdles?
  - c. Did you actually experience these hurdles in your first year?
  - d. If so, how did you overcome them?
  
7. Were there any other hurdles you anticipated?
  - a. If so, please describe them:
  - b. How did you plan to overcome the hurdles?
  - c. Did you actually experience these hurdles in your first year?
  - d. If so, how did you overcome them?

## SECTION 2

In this section, you will be asked to think about your concerns about your upcoming year at LSU. Specifically, what are your concerns regarding the potential hurdles you are going to face?

1. Do you expect to face any ACADEMIC hurdles?
  - a. If so, please describe them:
  - b. How do you plan to overcome the hurdles?
  
2. Do you expect to face any PERSONAL hurdles?
  - a. If so, please describe them:
  - b. How do you plan to overcome the hurdles?
  
3. Do you expect to face any FINANCIAL hurdles?
  - a. If so, please describe them:
  - b. How do you plan to overcome the hurdles?
  
4. Do you expect to face any hurdles with FACULTY MEMBERS?
  - a. If so, please describe them:
  - b. How do you plan to overcome the hurdles?
  
5. Do you expect to face any hurdles with OTHER STUDENTS?
  - a. If so, please describe them:
  - b. How do you plan to overcome the hurdles?
  
6. Do you expect to face any hurdles with your FAMILY AND FRIENDS?
  - a. If so, please describe them:
  - b. How do you plan to overcome the hurdles?
  
7. Are there any other hurdles you anticipate?
  - a. If so, please describe them:
  - b. How do you plan to overcome the hurdles?

### SECTION 3

In this section, you will be asked to rate the effectiveness of the program.

1. Which part(s) of the Pathway Scholars program have you found to be the MOST helpful in supporting you in your transition to LSU?
2. Which part(s) of the Pathway Scholars program have you found to be the LEAST helpful in supporting you in your transition to LSU?

Please rate to what extent the Pathway Scholars program has supported your transition to LSU based on the specified aspects.

Please use the following scale:

1-----2-----3-----4-----5  
No Support at all A lot of support

1. Academic support:
2. Financial support:
3. Social support:
4. Career support:
5. Professional Development support
6. Personal support:

Why did you decide to apply to the Pathway Scholars program at LSU?

How effective was the recruitment efforts of the Pathway Scholars program?

How did you learn about the Pathway Scholars Program?

How easy was the application process for the Pathway Scholars program?

#### SECTION 4

In this section, please describe different aspects of your support system (friends and family).

1. What financially supportive role do you play in your family?
2. What emotionally supportive role do you play in your family?
3. Is your family financially supportive of your education plans?
4. Is your family emotionally supportive of your education plans?
5. Are your friends emotionally supportive of your education plans?
6. Do you know anyone in your personal life who is an engineer?
  - a. If yes, who is this person in your life?
  - b. Is he or she a mentor for you?
7. Do you belong to a student or professional organization?
  - a. If yes, which one(s)

## SECTION 5

In this section, please provide some demographic information.

1. What is your gender?
  - a. Male or Female
2. How old are you?
3. Please indicate your race/ ethnicity (select all that describe you):
  - a. American Indian/Alaskan
  - b. Asian
  - c. Black/African American
  - d. Hispanic
  - e. Native Hawaiian/Pacific Islander
  - f. White
  - g. Other (please describe)
4. Were you born in the USA?
  - a. If not, please describe your immigration status
5. Are you married?
  - a. If yes, for how long?
  - b. What does your spouse do for a living?
6. Do you have children?
  - a. If yes, how many? Ages?
  - b. Are you the primary caregiver?
  - c. Do you co-parent or are you a single parent?
7. Do you have a job?
  - a. If yes, how often do you work per week?
  - b. Is it related to the engineering field?
8. Have you ever served in the military?
  - a. If yes, please describe the branch, highest rank and for how long
9. Did either parent graduate from college?



## SECTION 6

In this section, you will be asked questions regarding your decision to go to school for engineering.

1. Why did you choose engineering? Check all that apply:
  - a. Interest in mathematics and science
  - b. Ability in mathematics and science
  - c. Good financial rewards
  - d. Information from a parent or friend
  - e. Recommended by co-worker/supervisor
  - f. Interest in electronics, electricity
  - g. "I like it"
  - h. Interest in mechanical things, building
  - i. Seemed interesting, I thought I would like it
  - j. Other; describe
2. How old were you when you chose engineering?
3. What are your ideal career goals in engineering?
4. Was there another field that you sincerely considered entering?
  - a. If yes, why did you not pursue that field?

## SECTION 7

In this section, you will be asked to answer questions regarding your experience in an engineering program.

Please use the following scale:

1-----2-----3-----4-----5  
Strongly Disagree Strongly Agree

1. All faculty members treat me with fairness and respect
2. I feel that I am an equal participant in group work
3. I am comfortable approaching instructors for help outside of class
4. I have not felt discouraged about pursuing an engineering degree
5. I am comfortable asking questions in the classroom
6. I will be an excellent engineer