

PCC PATHWAYS



STUDENT SUCCESS STUDY

Prepared by

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as part of the PCC/UCLA Evaluation Partnership
for Pasadena City College

October 2015

UCLA Graduate School of Education & Information Studies

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EXECUTIVE SUMMARY

WHAT IS THE PCC PATHWAYS PROGRAM?

PCC Pathways was launched in 2011 to increase the success, persistence, and completion rates of students at Pasadena City College.

The program uses a prescriptive “guided pathway” approach, which includes a comprehensive set of support services and embedded high impact practices, including a first-year seminar, access to counselors, coaches, tutors, and a dedicated resource center. The program currently applies to students in their first and second years at PCC.

To maintain Pathways status in their first year, students must...

- Attend a summer orientation, called Jam
- Carry a minimum of 12 units (full-time student status)
- Enroll in math, English, and a first-year seminar (College 1)
- Meet regularly with their coach and counselor
- Develop an ePortfolio
- Participate in various workshops and activities
- Maintain a GPA of 2.5 or better

Students who meet all program requirements receive priority registration.

In fall 2014, PCC Pathways piloted its second-year component. Students in the program must attend a summer orientation and participate in career exploration, leadership, and campus engagement activities during the academic year to keep priority registration and have access to the program’s resources and services.

HOW DID WE DEFINE SUCCESS?

To better understand how well the PCC Pathways program is serving students, we examined student success in relationship to four highly relevant indicators:

- **Credits** earned at the end of each academic year
- **Persistence** (fall-to-fall)
- **Transfer status**
- **Degrees and certificates** awarded

Data from PCC's Office of Institutional Effectiveness were analyzed for three Pathways cohorts: academic years 2012–2013, 2013–2014 and, when relevant, 2014–2015. For each cohort, a comparison cohort was constructed of students who...

- Were first-time students at PCC
- Had graduated high school within two years of their cohort start date
- Had not earned more than 6 units prior to their first-time student start date

HOW WELL ARE PCC PATHWAYS STUDENTS PERFORMING?

In each of the cohorts studied, Pathways students outperformed non-Pathways students in regard to all four indicators:

- **Credits:** Pathways students earned significantly more credits each year than non-Pathways students.
- **Persistence:** Pathways students persisted each year at significantly higher rates than non-Pathways students.
- **Transfer status:** At the end of their second and third years, a significantly higher percentage of Pathways students had achieved transfer-directed, transfer-ready, and/or transfer-prepared status than non-Pathways students. **The transfer-directed, transfer-prepared, and transfer-ready rates of Pathways students were more than double those of non-Pathways students.**
- **Degrees and certificates:** A significantly higher percentage of Pathways students than non-Pathways students received a degree at the end of three years. Roughly the same proportion of Pathways and non-Pathways students received a certificate at the end of three years.

HOW DOES PCC PATHWAYS IMPACT COMPLETION?

1. **Participation in the PCC Pathways program significantly increases students' likelihood of attaining transfer-ready status.** This is achieved because Pathways students...
 - Are full-time students, a key factor in persistence and transfer status
 - Persist from year to year
 - Begin the math and English sequences immediately, helping them reach transfer-level math and English courses more quickly
 - Earn more credits, positioning themselves for transfer and/or AA/AS degree or certificate attainment
2. **PCC Pathways positively impacts Latino and African-American students' academic performance and their likelihood of completing their academic goals.**

WHAT CAN PCC DO TO FURTHER SUPPORT STUDENT SUCCESS CAMPUS-WIDE?

1. Guarantee enrollment in math and English for all new first-year students and provide support (i.e., tutoring, study groups, coaching) to increase their chances of success in these classes
2. Strongly encourage students to enroll full time (a minimum of 12 units) each semester
3. Develop resources and services to increase the number of full-time students
4. Provide mandatory advisement to ensure that students follow their education plans and select courses that further their academic goal(s)

WHAT SHOULD BE EXPLORED IN FUTURE STUDIES?

This study did not evaluate the impact of specific program components, resources, or requirements on the four indicators identified for this study. With that in mind, we highly recommend the following:

1. Evaluate the relative impact of essential Pathways components—extended orientation to college (Jam), advisement and coaching, the first year seminar (College 1), and resource centers—on the four success indicators listed above
2. Explore the reasons some new first-year students do not enroll full time
3. Continue to evaluate the impact of PCC Pathways on closing the achievement gap for Latino and African American students
4. Conduct a cost-effectiveness study of the Pathways program
5. Continue to track Pathways cohorts in this study, as well as future cohorts, for three years and beyond

PCC PATHWAYS PROGRAM

PCC Pathways was launched in 2011 to increase success, persistence, and completion rates of students at Pasadena City College. There are five pathways: XL, a general pathway, open to all students; ISP, for international students; Career Pathway, for students interested in a career in design technology or media arts; Athletes Pathway, for students enrolled in PCC's athletic programs; and Ujima, which focuses on African American themes and issues.

The Pathways program model utilizes a prescriptive “guided pathway” approach, which is complemented by a comprehensive set of support services and high impact practices as identified by the Association of American Colleges and Universities (www.aacu.org/leap/hips Kuh, 2008).

In their first year, Pathways students are required to attend summer orientation, (Jam); be full-time students with a minimum of 12 units; enroll in math, English, and a first-year seminar (College 1); develop an ePortfolio; meet regularly with their coach and counselor; participate in various workshops and campus activities; and maintain a GPA of 2.5 or better. In return, Pathways students receive priority registration, as well as access to tutors and a dedicated resource center.

In their second year, students must attend a summer orientation and participate in career exploration, leadership, and campus engagement activities during the academic year to keep priority registration and have access to the program's resources and services.

THE CURRENT STUDY

The purpose of this study was to assess the intermediate and longer-term indicators for PCC Pathways students. This study examined Pathways program student outcomes for two cohorts (2012–2013 and 2013–2014), and included some data for the 2014–2015 cohort where relevant. Looking at these cohorts over time allowed us to examine student outcomes at the end of their first, second, and third years at PCC. Comparison cohorts of non-Pathways PCC students were constructed to examine whether Pathways students differed from other PCC students on four key student success indicators: cumulative credits earned, persistence, transfer status, and degrees and certificates awarded.

The study addressed four key questions:

- Are there mean differences between Pathways and non-Pathways students on cumulative credits earned at the end of their first, second, and third years?
- Are there proportional differences between Pathways and non-Pathways students regarding persistence from year one to year two and from year two to year three?
- At the end of three years, are there proportional differences between Pathways and non-Pathways students on reaching transfer-directed, transfer-prepared, and transfer-ready status?
- At the end of three years, are there proportional differences between Pathways and non-Pathways students on degree and/or certificate attainment?

METHODS

We conducted a cohort study to assess the intermediate and longer-term success of Pathways students. A cohort study is similar to a longitudinal study, such that a cohort—individuals who share the same experience, characteristic, or treatment within a specified time—are compared to another group of people from the same general population. In this case, Pathways students were compared to students from the general PCC student population who had minimal or no participation in Pathways program activities or services.

Comparison groups comprised students who:

- Identified as first-time students at PCC
- Had graduated high school within two years of their cohort start date
- Had not earned more than 6 units prior to their first-time student start date

Three Pathways cohorts (2012–2013, 2013–2014 and, where relevant, 2014–2015) were compared to cohorts of non-Pathways students in regards to four academic indicators:

Intermediate Indicators

1. **Cumulative credits earned**—Number of credits earned at the end of each academic year. Any credits earned during summer sessions were included in annual totals, with the exception of 2015 summer sessions.
2. **Persistence**—Students attempting any credits during fall, spring, and subsequent fall semesters (e.g., fall 2012, spring 2013, and fall 2013) were identified as persisting.

Longer-term Indicators

3. **Transfer status**— Using the California Community Colleges Chancellor’s Office (CCCCO) metrics for tracking transfer outcomes, we assessed for three transfer statuses: transfer-directed, transfer-prepared, and transfer-ready.
 - a. Transfer-directed students have successfully completed a transfer level math and English class
 - b. Transfer-prepared students have earned 60 transferable credits with a GPA of 2.0 and higher
 - c. Transfer-ready students have completed transfer level math and English, and have earned 60 transferable credits with a GPA of 2.0 and higher
4. **Degree/Certificate**—AA or AS degree awarded and/or certificate awarded

In addition to assessing for overall differences between Pathways and non-Pathways students on the four indicators listed above, differences between Latino and African American Pathways and non-Pathways students were also assessed. Student data indicate that Latino and African American students have the lowest rates of course success, degree attainment, and transfer when compared to other ethnic groups (PCC’s 2015 Student Equity Report). Thus, subgroup analyses were conducted to assess the impact of Pathways on closing the degree and transfer achievement gap. Given that the proportion of Latino students at PCC is increasing, it was especially crucial to assess how these students were performing.

In collaboration with the Office of Institutional Effectiveness, student data obtained for the study included:

- courses taken for each semester enrolled
- credits attempted and earned for each course
- grades
- GPA
- cumulative credits earned at the end of each semester
- degree and certificate awarded status
- residency status
- high school graduation date
- demographic information, such as gender, age, and ethnicity

A series of mixed model ANOVAs and t-tests were conducted to assess for mean differences among Pathways and non-Pathways students on cumulative credits earned at the end of each academic year. To assess for proportional differences between Pathways and non-Pathways students on persistence, transfer statuses, and award/certificate attainment, a series of chi-square tests was conducted.

FINDINGS

DEMOGRAPHICS

Demographic information for Pathways and non-Pathways (comparison cohort) students is provided in Table 1 below.

Summary:

- Student enrollment in Pathways has increased steadily over the past three years.
- Pathways students and non-Pathways students were very similar in terms of age, gender, and ethnicity for all three academic years.
- The average age for incoming Pathways and non-Pathways students in the study was approximately 18 years.
- The proportions of female and male students for Pathways and non-Pathways students in the study were roughly the same. For example, in the 2013–2013 cohort, 48% of Pathways students were female and 47% of non-Pathways students were female.
- Males made up approximately 51% of Pathways students and 53% of non-Pathways students during the 2012 – 2013 cohort year.
- For the 2012–2013 cohorts, roughly the same proportion of students in the Pathways and non-Pathways groups were in-district students (64% and 63%, respectively).
- For the 2013–2014 cohort, a higher percentage of non-Pathways students (63%) lived in district compared to students in the Pathways program (56%).

Table 1. Demographic information for Pathways and non-Pathways students in all cohorts

	2012–2013		2013–2014		2014–2015	
	Pathways Cohort	Non-Pathways Cohort	Pathways Cohort	Non-Pathways Cohort	Pathways Cohort	Non-Pathways Cohort
SAMPLE SIZE	620	4,035	905	4,599	1,102	5,226
AGE	17.9	18.1	17.9	18.1	17.8	18.3
GENDER						
Female	48%	47%	49%	48%	50%	50%
Male	51%	53%	51%	51%	49%	49%
ETHNICITY*						
Asian	25%	20%	22.2%	23%	27%	28%
African American	7%	5%	5%	5%	3%	4%
Latino	49%	51%	57%	53%	57%	49%
Multi-race	3%	4%	3.3%	3%	2.1%	3.2%
Unknown/ no response	2%	9%	1%	5.6%	1.4%	4.5%
White	14%	11%	11.5%	11%	10.4%	11.5%
RESIDENCY**						
In-District	64%	63%	56%	63%	44%	21%
Other	36%	37%	44%	37%	56%	79%

Note: Percentages may not add up to 100% due to rounding and not displaying the percentage of those who did not provide gender or ethnicity information.

* Ethnicities presented in the table are listed in alphabetical order.

** Residency status information includes residency information when a student started at PCC, and therefore may not be up to date, especially if students have moved in the past two to three years. "Other" includes: AB540, in-state resident, international, out-of-state, and undeclared statuses.

1. CREDITS EARNED

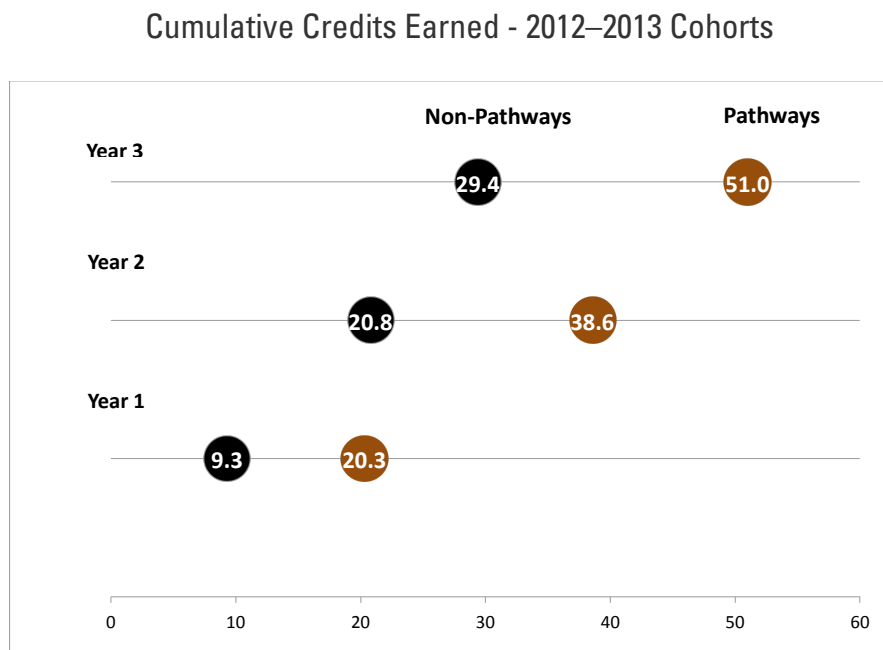
Cumulative credits earned by the end of each academic year were calculated for all students. For the 2012–2013 Pathways and non-Pathways cohorts, mean differences were assessed at the end of the first, second, and third years. For the 2013–2014 cohorts, mean differences were assessed at the end of the first and second years. For the 2014–2015 cohorts, mean differences were assessed at the end of the first year. Each of these analyses is presented separately.

2012–2013 COHORTS: CREDITS EARNED

For the 2012–2013 cohorts, there were statistically significant mean differences in the number of cumulative credits earned at the end of each academic year. Figure 1 shows that Pathways students, on average, had earned approximately 11 credits more by the end of their first year, approximately 18 more credits by the end of their second year, and approximately 21 more credits by the end of their third year, compared to non-Pathways students. Pathways students increased the number of credits earned over non-Pathways students each subsequent year.

Mean differences between Pathways and non-Pathways students at the end of each year were statistically significant¹. Statistical results indicate that mean differences between the two groups are not likely due to chance.

Figure 1. Average cumulative credits earned by the end of each academic year by students in 2012–2013 cohorts

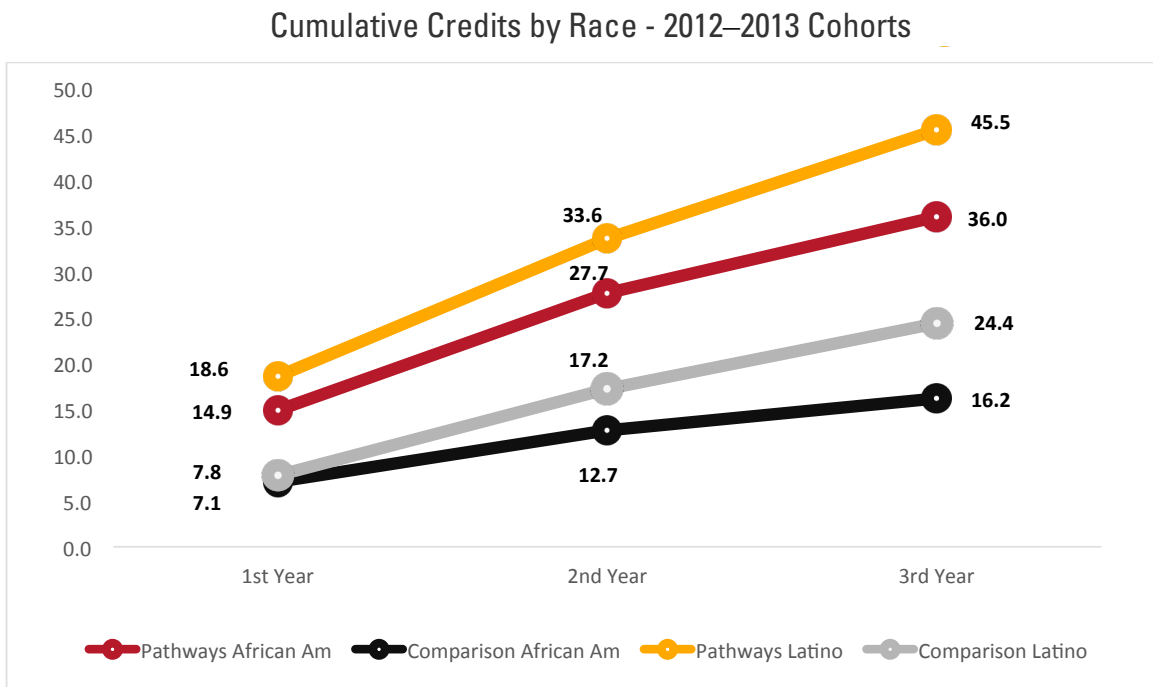


Pathways cohort N=620; non-Pathways cohort N=4,035

¹ $F(1.181, 5494) = 115.992, p < .01$

As shown in Figure 2, African American Pathways students earned significantly more credits by the end of their first, second, and third years, compared to non-Pathways African American students². Similarly, Latino Pathways students earned more credits by the end of their first, second, and third years, compared to non-Pathways Latino students³. African American and Latino students in Pathways increased the number of credits earned each year over African American and Latino students who were not in the Pathways program. Overall, Latino students earned more credits compared to African American students for most years, regardless of whether they were in Pathways or not.

Figure 2. Average cumulative credits earned by Latino and African American students at the end of each year, 2012–2013 cohorts



Pathways Latino N= 303, Pathways African American N=42;

non-Pathways Latino N=2,053, non-Pathways African American N=195

² F (1.211, 284.49) = 17.05, p<.01

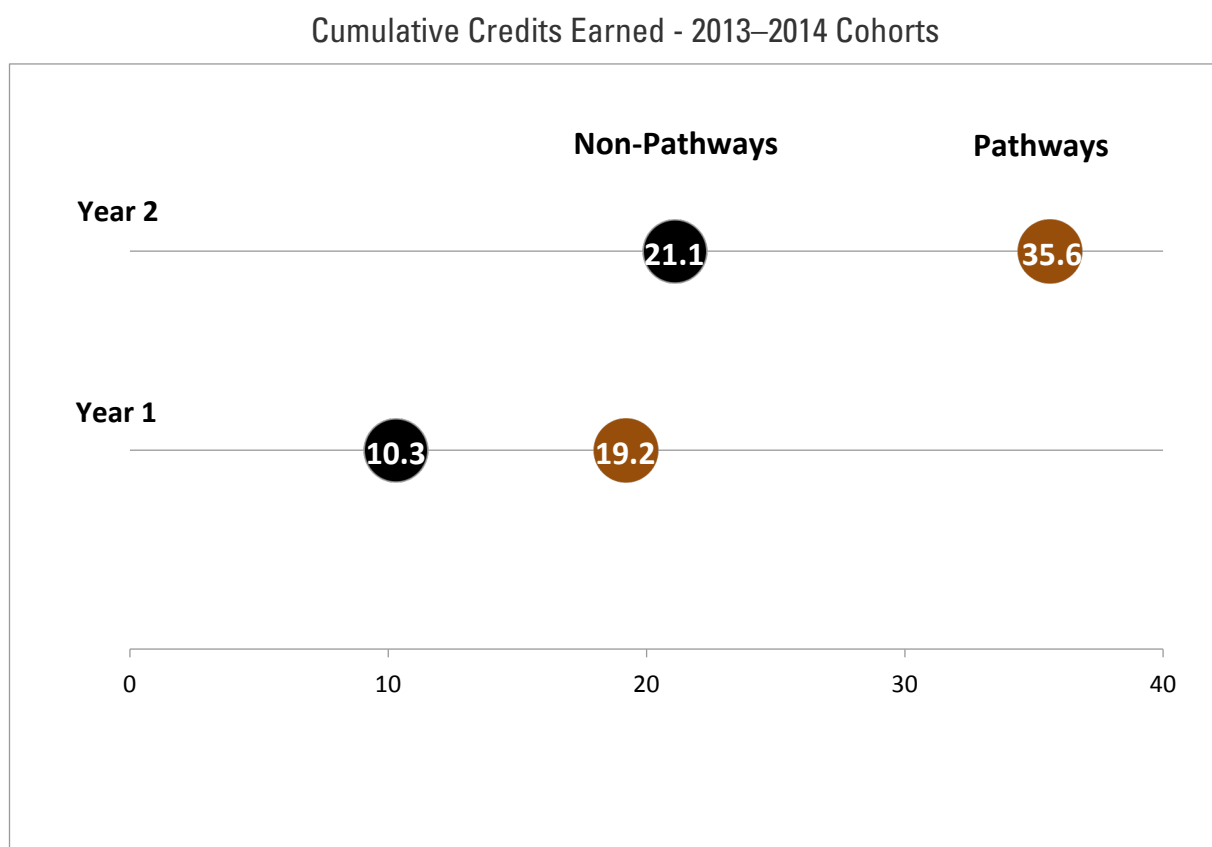
³ F (1.162, 2734.588) = 67.08, p<.01

2013–2014 COHORTS: CREDITS EARNED

For the 2013–2014 cohorts, there were statistically significant differences in the number of cumulative credits earned at the end of each year.⁴ In other words, mean differences between Pathways and non-Pathways students are not likely to be due to chance.

Figure 3 below shows that Pathways students, on average, earned approximately 9 more credits by the end of their first year, and approximately 12 more credits by the end of their second year, compared to non-Pathways students. And, similar to 2012–2013 cohort results, Pathways students increased the number of credits earned over non-Pathways students from year to year.

Figure 3. Average cumulative credits earned by the end of each year by students in 2013–2014 cohorts

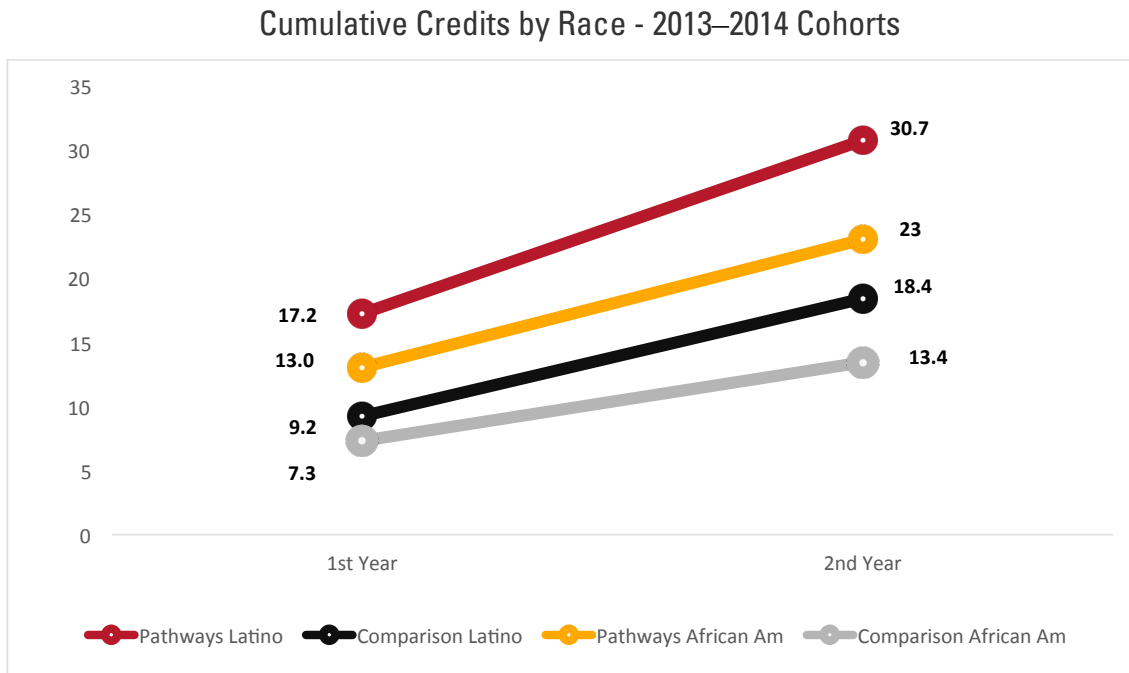


Pathways cohort N=905; non-Pathways cohort N=4,599

⁴ $F(1, 5502) = 117.753, p < .01$

As shown in Figure 4 below, African American and Latino Pathways students earned significantly more credits by the end of their first and second years than did non-Pathways African American and Latino students.⁵

Figure 4. Average cumulative credits earned by Latino and African American students by the end of each year, 2013–2014 cohorts



Pathways Latino N=503, Pathways African American N=45

Non-Pathways Latino N=2,288, non-Pathways African American N=211

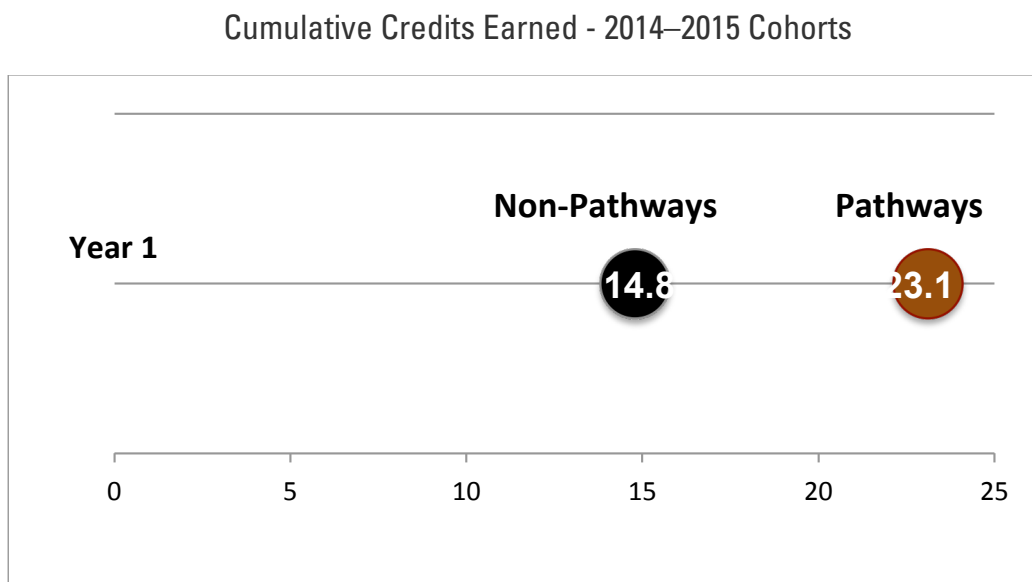
⁵ African American students: $F(1, 254) = 4.75, p < .05$, Latino Students: $F(1, 2789) = 58.61, p < .05$

2014–2015 COHORTS: CREDITS EARNED

Similar to 2012–2013 and 2013–2014 cohort results, there were statistically significant mean differences in the number of cumulative credits earned at the end of the first year for the 2014–2015 cohorts⁶. Analyses showed that these mean differences between Pathways and non-Pathways students are not likely due to chance.

Figure 5 below shows that Pathways students, on average, earned approximately 8 more credits than non-Pathways students did by the end of their first year.

Figure 5. Average cumulative credits earned by the end of each year by students in 2014–2015 cohorts

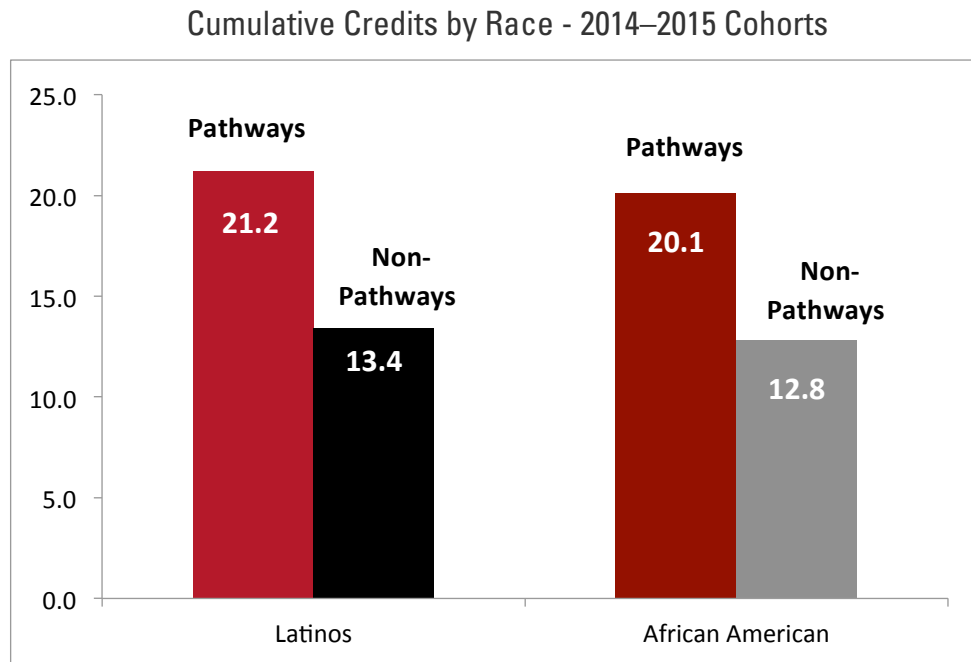


Pathways cohort N=1,102; non-Pathways cohort N=4,096

⁶ $t(2050) = 28.02, p < .01$

As shown in Figure 6 below, in the 2014–2015 cohorts, African American and Latino Pathways students earned significantly more credits by the end of their first year than did non-Pathways African American and Latino students.⁷

Figure 6. Average cumulative credits earned by Latino and African American students in 2014–2015 cohorts



Pathways Latino N=610, Pathways African American N=29;

Non-Pathways Latino N=2,014, non-Pathways African American N=167

CONCLUSIONS: CREDITS EARNED

1. By the end of each academic year, Pathways students had earned more credits than non-Pathways students did.
2. For the three cohorts studied, by the end of each academic year, African American and Latino Pathways students had earned more credits than non-Pathways African American and Latino students.
3. In each cohort year following the first, Pathways students increased the average number of credits earned over non-Pathways students.

Importantly, a key feature of the Pathways programs is the full-time status requirement; however, not all Pathways students attempted full time credits. This is still probably the key reason for mean differences at the end of year one between Pathways and non-Pathways students.

⁷ African Americans: $t(136) = 3.68, p < .01$, Latinos: $t(1089) = 20.06, p < .01$

2. PERSISTENCE

For the 2012–2013 Pathways and non-Pathways cohorts, persistence rates from year one to year two, and from year two to year three, were assessed. For the 2013–2014 Pathways and non-Pathways cohorts, persistence from year one to year two was assessed. Persistence was not assessed for the 2014–2015 cohorts.

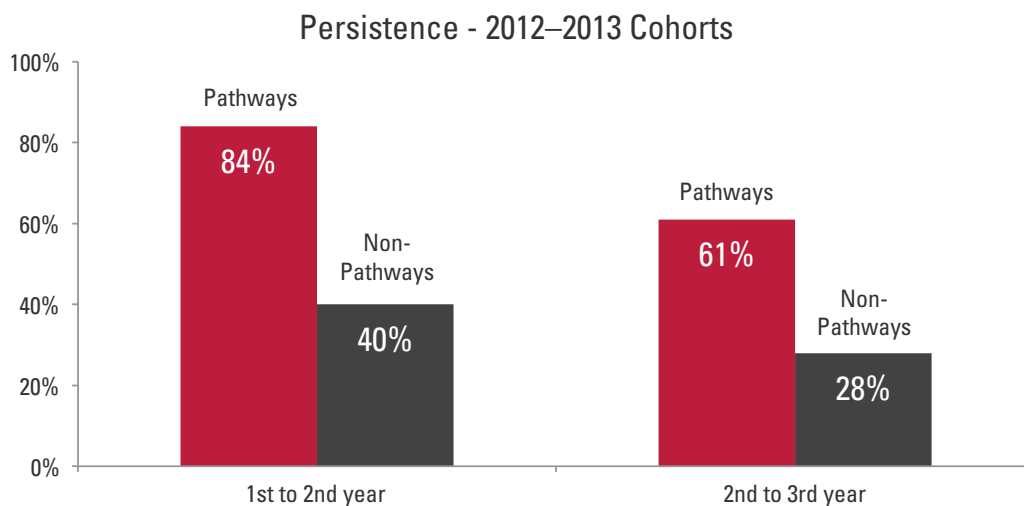
Persistence in this case was defined as fall-to-fall enrollment. More specifically, students in the 2012–2013 cohorts who attempted credits during the fall 2012, spring 2013, and fall 2013 semesters were identified as persisting from year one to year two. Those who persisted from year one to year two and who attempted credits during the spring 2014 and fall 2014 semesters were identified as persisting from year two to year three.

In the 2013–2014 cohorts, students who attempted credits during the fall 2013, spring 2014, and fall 2014 semesters were identified as persisting from year one to year two. Persistence from year one to year two for the 2014–2015 cohort could not be calculated because student data were retrieved prior to the start of the fall 2015 semester.

2012–2013 COHORTS: PERSISTENCE

As shown in Figure 7, significantly higher percentage of Pathways students persisted from the first year to the second year compared to non-Pathways students⁸. A significantly higher percentage of Pathways students persisted from year two to year three compared to non-Pathways students⁹.

Figure 7. Persistence of students in 2012–2013 cohorts



Pathways cohort N=620; non-Pathways cohort N=4,035

⁸ $\chi^2(1) = 430.32.02, p < .01$

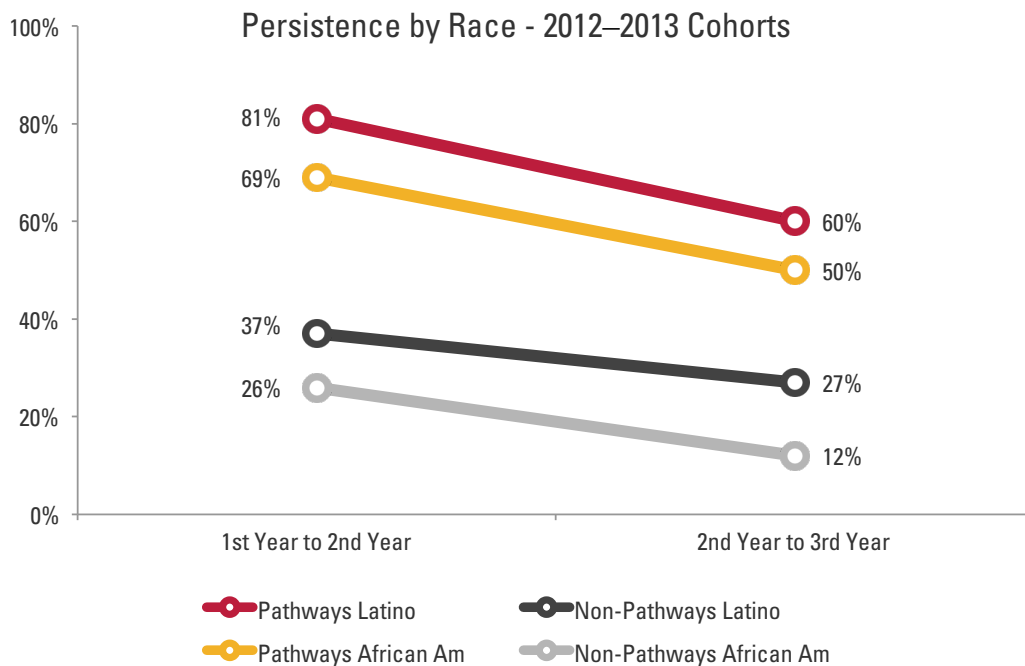
⁹ $\chi^2(1) = 270.64, p < .01$

As displayed in Figure 8 below, a higher percentage of African American students in Pathways persisted from year one to year two¹⁰, and from year two to year three, compared to African American students not in the program¹¹.

A higher percentage of Latino students in Pathways persisted from year one to year two¹², and from year two to year three, compared to non-Pathways Latino students¹³.

A higher percentage of Latino students persisted from year one to year two and from year two to year three compared to African American students, regardless of whether students were in the Pathways program or not.

Figure 8. Persistence of Latino and African American students in 2012–2013 cohorts



Pathways Latino N=503, Pathways African American N=45;

non-Pathways Latino N=2,288, non-Pathways African American N=211

¹⁰ $\chi^2 (1) = 29.29, p < .01$

¹¹ $\chi^2 (1) = 33.36, p < .01$

¹² $\chi^2 (1) = 211.56, p < .01$

¹³ $\chi^2 (1) = 142.02, p < .01$

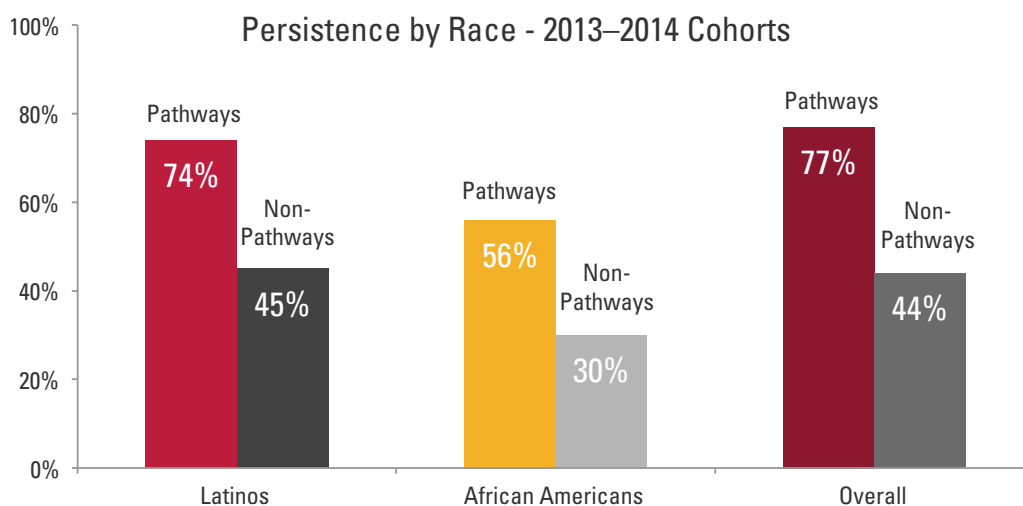
2013–2014 COHORTS: PERSISTENCE

Similar to the 2012–2013 cohorts, within the 2013–2014 cohorts, a higher percentage of Pathways students persisted from the first year to the second year compared to non-Pathways students (77% versus 44%; see Figure 9).¹⁴

A higher percentage of African American Pathways students persisted from year one to year two, compared to non-Pathways African American students.¹⁵ Similarly, a higher percentage of Latino students in Pathways persisted from year one to year two, compared to non-Pathways Latino students¹⁶.

Overall, a higher percentage of Latino students persisted from the first year to the second year compared to African American students, regardless of whether students were in Pathways or not. Refer to Figure 9 for exact percentages for Latinos and African Americans.

Figure 9. Persistence of students, by race, in 2013–2014 cohorts



Pathways Latino N=503, Pathways African American N=45;

non-Pathways Latino N=2,288, non-Pathways African American N=211

Overall Pathways N = 905, Overall non-Pathways = 4,599

¹⁴ $\chi^2 (1) = 331.30, p < .01$

¹⁵ $\chi^2 (1) = 10.85, p < .01$

¹⁶ $\chi^2 (1) = 145.12, p < .01$

CONCLUSIONS: PERSISTENCE

1. Significantly higher proportions of Pathways students persisted from year one to year two compared to non-Pathways students. Proportional differences between the Pathways and non-Pathways students were substantial—by as much as 44% for the 2012–2013 cohort.
2. When disaggregating results for African American and Latino students, students in Pathways persisted at a significantly higher rate than non-Pathways.
3. Overall, Latino students persisted at higher rates compared to African American students regardless of whether students were in Pathways or not.

One possible explanation for the high persistence rates observed among Pathways students is the full-time enrollment requirement during their first year in college. It can be argued that full-time students have greater opportunities to be engaged in school and, in turn, higher engagement increases the likelihood of persistence. A study conducted by Feldman (1993) identified the factors associated with one-year retention at a community college as well as risk factors associated with dropping out. One of the factors that increased the likelihood of student drop-out was part-time status. Likewise, a study conducted by Windham (1994) found that full-time status was a predictor of persistence, and conversely, part-time status was predictor of dropping out.

3. TRANSFER STATUS

The California Community Colleges Chancellor's Office (CCCCO) Data Mart system tracks three transfer statuses: transfer-directed, transfer-prepared, and transfer-ready.

- To be **transfer-directed**, a student must successfully complete a transfer-level math course and a transfer-level English course.
- To be **transfer-prepared**, a student must earn 60 or more transferable units, with a GPA of 2.0 or better.
- To be **transfer-ready**, a student must successfully complete a transfer-level math course and a transfer-level English course, and earn 60 or more transferable units with a GPA of 2.0 or better.

To align the transfer outcome in this study with how the CCCO identifies transfer, all three transfer statuses were assessed. Proportional differences (if any) were assessed for Pathways and non-Pathways students on transfer-directed, transfer-prepared, and transfer-ready status at the end of three years.

2012–2013 COHORTS: TRANSFER STATUS

A higher percentage of Pathways students in the 2012–2013 cohort reached transfer-directed, transfer-prepared, and/or transfer-ready status at the end of three years, compared to non-Pathways students.¹⁷ The differences between Pathways and non-Pathways students were statistically significant, indicating that differences were not likely due to chance. At the end of three years, the transfer-directed, transfer-prepared, and transfer-ready rates of Pathways students were more than double those of non-Pathways students. Refer to Table 2 below for exact percentages.

A higher proportion of African American students in Pathways reached transfer-directed, and transfer-ready status by the end of three years compared to those not in Pathways. Proportional differences, however, were not statistically significant, indicating that chance cannot be ruled out as a possible explanation. A higher proportion of Latino students in Pathways achieved transfer-directed, transfer-prepared, and transfer-ready status compared to non-Pathways Latino students, these results were statistically significant, meaning results were not likely due to chance.¹⁸ Refer to Table 2 below for exact percentages.

¹⁷ Transfer directed: $\chi^2(1) = 223.65$, $p < .01$, transfer prepared: $\chi^2(1) = 99.26$, $p < .01$, transfer ready: $\chi^2(1) = 107.41$, $p < .01$.

¹⁸ Transfer directed: $\chi^2(1) = 116.38$, $p < .01$, transfer prepared: $\chi^2(1) = 66.42$, $p < .01$, transfer ready: $\chi^2(1) = 57.82$, $p < .01$.

Table 2. Transfer status of Latino and African American students at end of year three, 2012–2013 cohorts

	Transfer-Directed		Transfer-Prepared		Transfer-Ready		Total Students	
	Pathways	Non-Pathways	Pathways	Non-Pathways	Pathways	Non-Pathways	Pathways	Non-Pathways
Latino	30%	9%	15%	4%	13%	3.2%	303	2,053
African American	16.7%	3.1%	2.4%	2.6%	2.4%	1.5%	42	195
Overall*	42.6%	16.7%	24%	10%	22.3%	8.6%	620	4,035

* Overall percentages include all students in Pathways and non-Pathways cohorts, not only those who identified as African American or Latino.

2013–2014 COHORTS: TRANSFER STATUS

Similar to 2012–2013 results, in the 2013–2014 cohorts, a higher proportion of Pathways students reached transfer-directed, transfer-prepared, and transfer-ready status by the end of the second year compared to non-Pathways students.¹⁹ At the end of two years, the transfer-directed and transfer-prepared rates of Pathways students were more than double those of non-Pathways students. Refer to Table 3 below for exact percentages.

African American Pathway students reached transfer-directed status at roughly the same rate as Non-Pathways African American students. No African American Pathways students reached transfer-prepared, or transfer-ready status by the end of their second year. Only one non-Pathways African American student reached transfer-directed and transferred prepared status by the end of their second year. These differences were not statistically significant.

More Latino Pathways students achieved transfer-directed, transfer-prepared, or transfer-ready status at the end of their second year compared to non-Pathways Latino students (see Table 3)²⁰. These results were statistically significant, meaning that findings were not likely due to chance.

¹⁹ Transfer directed: $\chi^2 (1) = 202.76$, $p < .01$, transfer prepared: $\chi^2 (1) = 55.5$, $p < .01$, transfer ready: $\chi^2 (1) = 55.73$, $p < .01$.

²⁰ Transfer directed: $\chi^2 (1) = 76.57$, $p < .01$, transfer prepared: $\chi^2 (1) = 23.94$, $p < .01$, transfer ready: $\chi^2 (1) = 20.02$, $p < .01$.

Table 3. Transfer status of Latino and African American students at the end of year two, 2013–2014 cohorts

	Transfer-Directed		Transfer-Prepared		Transfer-Ready		Total Students	
	Pathways	Non-Pathways	Pathways	Non-Pathways	Pathways	Non-Pathways	Pathways	Non-Pathways
Latino	16%	5%	3.2%	1%	2.4%	0.4%	503	2,288
African American	4.4%	4.3%	0%	.4%	0%	.4%	45	211
Overall*	28.2%	10.5%	7.1%	2.3%	8%	3%	905	4,599

* Overall percentages include all students in Pathways and non-Pathways cohorts, not only those who identified as African American or Latino.

2014–2015 COHORTS: TRANSFER STATUS

Given that students in the 2014–2015 cohorts had just completed their first year in college, the only transfer status attainable at the end of year one was transfer-directed. As such, differences between Pathways and non-Pathways students were assessed at the end of the first year for only this status.

A higher percentage of Pathways students achieved transfer-directed status compared to non-Pathways students (Table 4).²¹ Specifically, a higher percentage of Pathways students completed a transfer-level math and English class at the end of their first year compared to non-Pathways students.

In disaggregating transfer-directed results for African American and Latino students, also shown in Table 4, African American Pathways students had achieved transfer-directed status, at a higher rate than non-Pathways African American students.²² More Latino Pathways students achieved transfer-directed status by the end of their first year compared to non-Pathways Latino students.²³

²¹ Transfer directed: $\chi^2 (1) = 575.65, p < .01$

²² Transfer directed: $\chi^2 (1) = 7.970, p < .01$

²³ Transfer directed: $\chi^2 (1) = 167.45, p < .01$

Table 4. Transfer-directed Latino and African American students at the end of year one, 2014–2015 cohorts

	Transfer-Directed		Total Students	
	Pathways	Non-Pathways	Pathways	Non-Pathways
Latino	13.4%	1.8%	611	2,394
African American	10.3%	1.5%	29	167
Overall*	23.5%	3.4%	1,102	4,096

*Overall percentages include all students in Pathways and non-Pathways cohorts, not only those who identified as African American or Latino.

CONCLUSIONS: TRANSFER STATUS

1. A higher proportion of Pathways students achieved transfer-directed, transfer-prepared, and transfer-ready status by the end of their first, second, and third years, compared to non-Pathways students.
2. The same was true for African American and Latino Pathways students when compared to African American and Latino students who were not in Pathways.
3. Generally, a higher proportion of Latino students reached transfer-directed, transfer-prepared, and transfer-ready status compared to African American students, regardless of whether they were in Pathways or not.

These findings are not surprising when we take into consideration program requirements. Pathways students are required to be full-time students and to take math and English during their first year. The effects of these program requirements were also noted in earlier results concerning cumulative credits earned.

Specifically, at the end of two or three years, Pathways students had earned, on average, more cumulative credits than had non-Pathways students. As such, they were in a better position to have achieved transfer-prepared status (60+ transferable units with a GPA 2.0 or better). Pathways students are also required to take math and English courses in their first year, and this puts them in a better position to reach and complete transfer-level math and English courses, thereby achieving transfer-directed status.

4. DEGREES & CERTIFICATES

Degree and certificate attainment was assessed for the 2012–2013 and 2013–2014 cohorts. It was expected that rates of degree and certificate attainment would be lower for the 2013–2014 cohorts than for the 2012–2013 cohorts, as the latter had only been in school two years compared to three. This was indeed the case.

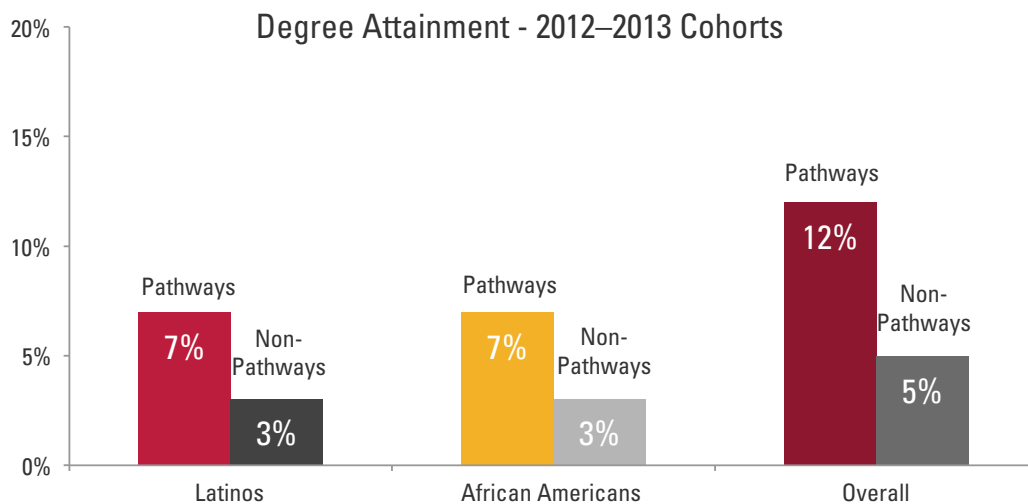
2012–2013 COHORTS: DEGREES & CERTIFICATES

DEGREES

A higher percentage of Pathways students received a degree at the end of three years compared to non-Pathways students.²⁴ Roughly the same proportion of Pathways and non-Pathways students received a certificate at the end of three years.

A higher percentage of African American and Latino students in Pathways attained a degree at the end of three years compared to those not in Pathways. Proportional differences between Pathways and non-Pathways Latino students were statistically significant²⁵; however, proportional differences between Pathways and non-Pathways African American students were not statistically significant. Refer to Figure 10 for exact percentages.

Figure 10. Degree attainment of students, by race, in 2012–2013 cohorts



Pathways Latinos N=303, Pathways African American N=42;

non-Pathways Latinos N=2,053, non-Pathways African American N=195

Overall Pathways N = 620, Overall non-Pathways N = 4,035

²⁴ Degree awarded: $\chi^2 (1) = 49.79, p < .01$

²⁵ Degree Awarded: $\chi^2 (1) = 14.23, p < .01$

CERTIFICATES

Only 1% of both Pathways and non-Pathways students in the 2012–2013 cohorts received certificates at the end of three years. Fewer African American and Latino students, regardless of whether they were in Pathways or not, earned certificates. For instance, no African Americans in Pathways earned certificates, and only one African American not in Pathways earned a certificate. Results were similar for Latino students: only one Pathways Latino student earned a certificate, and only nine non-Pathways Latino students earned certificates.

2013–2014 COHORTS: DEGREES & CERTIFICATES

As expected, rates of degree attainment for the second set of cohorts were lower overall when compared to the 2012–2013 cohort. In the 2013–2014 cohorts, approximately 3% of Pathways students earned a degree by the end of their second year, and approximately 1% of non-Pathways students did so in this timeframe.²⁶

No Pathways students received certificates by the end of year two, and only 10 non-Pathways students did so.

At the end of two years, no African American Pathways students received degrees or certificates, and only one non-Pathways African American student did so. Results for Latino students were similar: approximately 1% of Latino Pathways students and less than 1% of non-Pathways Latino students received degrees. No Pathways Latino students received certificates at the end of two years, and less than 1% of non-Pathways Latino students did so.

CONCLUSION: DEGREES & CERTIFICATES

1. Rates of degree and certificate attainment for all students—both in the Pathways program and otherwise—were low, and lower than the rates of reaching transfer-directed, transfer-prepared, and transfer-ready statuses.

These results are not entirely surprising. For students whose goal is to transfer, obtaining a degree or certificate may not be a priority. Additionally, degrees are not automatically awarded once a student has fulfilled all requirements. Students must apply to receive a degree and it is possible that students are unaware of their eligibility for a degree and as a consequence do not apply for one.

²⁶ Transfer directed: $\chi^2(1) = 11.47, p < .01$

OVERALL CONCLUSIONS

1. **Pathways students consistently earned, on average, significantly more credits by the end of their first, second, and third academic years than non-Pathways students.** This was also the case when results were disaggregated for African American and Latino students.
2. **It is noteworthy that Pathways students increased the number of credits earned over non-Pathways students each subsequent year.**
3. **Pathways students persisted from their first academic year to the second, and from their second academic year to the third at significantly higher rates compared to non-Pathways students.** African American and Latino Pathways students also persisted at higher rates compared to non-Pathways African American and Latino students from year one to year two, and year two to year three.
4. **A significantly higher percentage of Pathways students achieved longer-term milestones, such as becoming transfer-directed, transfer-prepared, and/or transfer-ready.** This was also the case when results were disaggregated for African American and Latino students.
5. **PCC Pathways appears to have a more positive impact on Latino than African American student performances.** For four areas -- cumulative credits, persistence, transfer status, and degrees -- Latino students fared better than African American students. However, for certificate attainment there was no statistical difference between the two groups.

Together, these results illustrate the importance of full-time enrollment and of taking math and English courses during the first year. Pathways results are consistent with the community college research on key indicators of student success. For example, Moore and Shulock (2009) conducted a comprehensive study of the 110 California Community Colleges on indicators of success and milestones. Their results indicated that credit accumulation provides “momentum,” and “the probability of completion rises with the number of credits earned in the first year.” Additionally, they indicate that students should take gateway courses such as math and English as soon as possible. Their results indicated that, “students who completed a college-level math course within two years of initial enrollment were nearly three times as likely to complete as students who did not finish college-level math in that time period.” Persistence to second and third years increases the opportunity to earn more credits and better positions students to reach transfer-prepared and transfer-ready statuses.

The transfer status results, particularly with respect to transfer-prepared status (60+ transferable units, with 2.0+ GPA), are striking. **Almost 30% of Pathways students in the 2012-13 cohort had achieved transfer-prepared status at the end of three years.** To put these numbers in perspective, the California Community College Chancellor’s Office’s 2014 Student Success Scorecard reported an overall state completion rate of approximately 48% at the end of six years. Completion was defined as either AA/AS degree, transfer, or transfer-prepared status. **One aim of the Pathways program is to reduce the number of years to completion. These results indicate that the program is on track towards achieving that goal.**

RECOMMENDATIONS FOR THE COLLEGE

1. Guarantee enrollment in math and English for all new first-year students and provide support (i.e., tutoring, study groups, coaching) to increase their chances of success in these classes
2. Strongly encourage students to enroll full time (a minimum of 12 units) each semester
3. Develop resources and service to increase the number of full-time students
4. Provide advisement to ensure that students follow their personal education plans and select courses that will further their academic goal(s)

RECOMMENDATIONS FOR FUTURE STUDIES

While overall results point to a relationship between being in the Pathways program and higher credit accumulation, increased persistence and transfer, and increased degree attainment, other explanations for the differences found between Pathways and non-Pathways students cannot be entirely ruled out without random assignment. Indeed, this study did not evaluate the impact of specific program components, resources, or requirements on the indicators and outcome identified for this study. Thus, we highly recommend that future evaluation efforts include the following:

1. Evaluate the impact of essential Pathways components—extended orientation to college (Jam), advisement (coaching), the first year seminar (College 1), and resource centers—on the four outcomes listed above. Evaluating the impact of specific Pathways components will allow Pathways staff to direct resources more effectively. Understanding how each component is utilized by each subgroup may help Pathways staff understand why, for example, Latino students fare better than African American students currently.
2. Explore the reasons some students do not enroll full time in their first year of college. Perhaps students are unable to do so for health, family, or financial reasons. On the other hand, some new students may choose to attend college part-time simply because they can.
3. Continue to evaluate the impact of PCC Pathways on closing the achievement gap for Latino and African American students and to understand why Latinos do better on these measures than African American students.
4. The current study only assessed the impact of the Pathways program. Cost-effectiveness and cost-benefit studies of the Pathways program should be conducted to provide information regarding the cost of Pathways effects/outcomes, for example, how much it would cost to graduate/complete an additional student, or the cost for each additional credit attained. A cost-benefit study will provide information as to whether the benefits outweigh the costs of the program.
5. Continue to evaluate future Pathways cohorts to assess whether Pathways' impacts

remain consistent as the program continues to grow. Also, continue to track the Pathways cohorts in this study to assess how many more students reach transfer statuses and degrees/certificates at the end of four and five years to assess at what point (year) the highest percentage of students reach milestones. These results will help inform the development and implementation of the second year of PCC Pathways currently underway. For example if the majority of students are completing at the end of year four or five, then second year resources and services can be tailored to help students complete faster.

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