Abstract Title Page

Title:	**Learning Communities for Developmental Education Students: A Synthesis of Findings from Randomized Experiments at Six Community Colleges**
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Abstract Body

Background / Context:

Over the last 50 years, community colleges have played an increasingly vital role in American postsecondary education. Each fall, community colleges now enroll 35 percent of all postsecondary education students (Provasnik & Planty, 2008). Unfortunately, while enrollments are increasing, overall success rates in community colleges are disappointingly low. Among students who enroll in community colleges with the intention of earning a credential or transferring to a four-year institution, only 51 percent fulfill these expectations within six years (Hoachlander, et al., 2003). While the rates of degree or certificate attainment are low in general, rates are even lower for students in need of developmental education, who comprise a significant proportion of the community college student body (Adelman, 2004; Attewell, et al., 2006).

Given these statistics, community college stakeholders are searching with increasing urgency for approaches with the potential to improve the success rates for community college students, particularly those in need of developmental education. "Learning communities," which place cohorts of students together in two or more courses for one semester, are a popular instructional reform community colleges are implementing to improve the outcomes of developmental education students, and have previously been associated with positive social, psychological, and academic outcomes in non-experimental and quasi-experimental research (Engstrom & Tinto, 2008; Stefanou & Salisbury-Glennon, 2002; Tinto, 1997; Tinto, 1998; Zhao & Kuh, 2004).

Purpose / Objective / Research Question / Focus of Study:

This paper synthesizes results from six random assignment evaluations of developmental education learning communities programs. Five of the six programs were part of the National Center for Postsecondary Research's (NCPR) Learning Communities Demonstration, and the sixth was studied as part of MDRC's Opening Doors Demonstration. The primary question addressed in this study is whether learning communities, compared to "business as usual," lead to better educational outcomes for students who are placed into developmental English and math in community colleges. We also examine whether the effects of learning communities vary across colleges and subgroups.

Setting:

The setting of this research is six community colleges representing a variety of urban and suburban areas across the country: the Community College of Baltimore County, in Baltimore, Maryland; Hillsborough Community College, in Tampa, Florida; Houston Community College, in Houston, Texas; Kingsborough Community College, in Brooklyn, New York; Merced College, in Merced, California; and Queensborough Community College, in Queens, New York.

Population / Participants / Subjects:

The target population varied slightly by college. Some colleges recruited freshmen or returning students, while others focused on freshmen only. The main eligibility criterion was that students had to be in need of developmental education in the subject area targeted by the college.[2]

[2] Although the original study of learning communities at Kingsborough included students with and without developmental needs, the analyses in this study include only those students with developmental needs in English.

At the six sites across the two demonstrations, a total of 6,974 students who tested into developmental math or developmental English (either reading or writing) participated in the study, making this one of the largest postsecondary education experiments to date. Like community college students nationwide, the majority of study participants at each college were women (sample characteristics are provided in Table 1). The sample in this study tended to be of traditional college age – at all six colleges, over 80 percent of sample members were 25 or under. Reflecting the racially diverse populations served at the college, all six samples included racially diverse groups of students. As expected in a randomized experiment, students in the program and control groups had similar background characteristics (not shown in table).

Intervention / Program / Practice:
In recent years, learning communities have been a popular response to the problem of low completion rates in community colleges. The typical learning community model consists of four key components, although considerable variation exists in both how much these components are emphasized and how well they are actually implemented in colleges: (1) groups of students are co-enrolled as cohorts in two or more courses, (2) instructors of the linked courses collaborate to plan and run their classes, (3) teaching methods include integrated instruction and active and collaborative learning, and (4) enhanced student support services are provided.[3]

Proponents of learning communities believe that learning communities may lead to better student outcomes because students will become more engaged in what they are learning and become more connected with each other and with their instructors. The theory of change predicts that as a result of the interdisciplinary connections the instructors emphasize and deeper engagement, students are more likely to develop higher-order thinking skills, master the course material, pass their classes, and persist from semester to semester. For students in need of developmental education in particular, increased basic reading, writing, or math skills as a result of the integrated learning may better prepare them for college-level work in a range of subjects.[4]

The six learning communities programs examined in this study each operated a one-semester learning community model. The courses linked in each model varied by program (see Table 2 for a brief description of each college's model).

Research Design:
This study was a randomized field trial. Eligible students at each college consented to participate in the study prior to the beginning of the semester and were then randomly assigned to either the program group, which was eligible to participate in learning communities, or the control group, which received the college's usual services but was not allowed to enroll in a learning community. Random assignment occurred separately at each college, allowing for unbiased impact estimates to be calculated within each college. In addition, each college had three to four cohorts of students participate in the study (each cohort started in subsequent semesters), allowing for unbiased (though less precise) impact estimates to be calculated for each cohort of students within a college. This research design and large sample size allow for very precise estimation of learning communities main effects, along with unusually well powered estimates of

[3] See Visher, Schneider, Wathington, and Collado (2010) for a review of the literature.
[4] See Visher, Wathington, Richburg-Hayes, and Schneider (2008) and Smith, MacGregor, Matthews, and Gabelnick (2004) for a review of the literature.

differential effects for subgroups, as well as tests for variation in impacts across colleges and cohorts.

Data Collection and Analysis:
The programs' impacts on academic progress were estimated using student-level transcript data provided to MDRC by the individual colleges. Since program group students were clustered into learning communities, it was assumed that their outcomes might not be independent; consequently, a statistical model that accounts for clustering was used to estimate program impacts.[5] At each site, on-campus qualitative interviews were conducted with administrators, learning communities faculty, and non-learning-communities faculty to better understand program implementation. Several student focus groups were also conducted.

Findings/ Results:
The analyses pooled impacts on three primary indicators of academic progress: (1) progress in the targeted subject area (English or mathematics), (2) progress outside the targeted subject area, and (3) overall progress toward a degree. Additional exploratory analyses were conducted to better understand the program's effects on these primary outcomes.

The findings show that learning communities had:

- **No discernible effect on persistence.** Students in the program group were no more likely than the control group to enroll in college in the first, second, or third semester after they entered the study.
- **A positive effect on progress in a targeted subject (either English or mathematics).** Learning communities, on average, had a small, positive impact on students' attempting and earning credits in a targeted subject, either English or mathematics (driven by developmental credits earned). The program's half-credit impact in the program semester was maintained up to two semesters after the program (please insert figure 1 here).
- **No discernible effect on progress outside the targeted subject.** Learning communities had no discernible effect on students' credit accumulation outside of the targeted subject (primarily college-level credits).
- **A small positive effect on overall academic progress (total credits earned).** During the program semester, learning communities students earned half a credit more than their control group counterparts, representing an 8 percent increase in total credit accumulation. This was a result of students earning half a credit more in the targeted subject. Over the following two postprogram semesters the cumulative estimated impact remained the same (half a credit), although it was no longer statistically significant by the third semester (please insert figure 2 here).

We also tested whether the learning communities programs' effects varied:

- Analyses testing for variation in impacts **across the six colleges** found that the programs' average effects varied with respect to credits earned in the targeted subject area (see Figure 3). However, the programs' average effects were fairly similar across the colleges with respect to total credit accumulation, the best proxy of overall progress toward a degree (see

[5] We used SAS's PROC SURVEYREG to conduct all impact analyses. A description of how we came to use this procedure is provided in Appendix A of Weiss, Visher, and Wathington (2010).

Figure 4). This suggests that the pooled results are a reasonable summary of the average effectiveness of learning communities at these six colleges. This does not preclude the possibility that the effects of learning communities vary within colleges (i.e., between learning community links or between teaching teams at each college).

- We also tested for impact variation **across the different cohorts within each college**. (Each college's research sample was comprised of three or four cohorts of students based on the timing of random assignment; each cohort started at the beginning of a different semester.) Implementation research conducted at all six sites found that the learning communities tended to be more advanced as the colleges gained more experience in implementing learning communities at scale while taking part in a randomized experiment. However, our analysis did not find strong evidence supporting the hypothesis that as the programs matured, estimated impacts improved, providing some indication that the fairly modest estimated impacts are likely not a result of programs being studied in their infancy.
- For the main planned **student subgroups**, race by gender and recent high school graduates, there was no discernible evidence that learning communities' effects varied. Based on guidance from a group of external reviewers, we conducted exploratory analyses on several additional subgroups, including students who are the first in their family to attend college, those who usually speak a language other than English at home, single parents, and students whose parents pay for more than half of their expenses. For the first three of these subgroups, there was no evidence that learning communities led to different impacts. For the fourth subgroup, there was some evidence that the program may have been more effective for students who were financially dependent on their parents.

Conclusions:

The overall conclusion from this study is that learning communities as typically operated in community colleges, on average, should not be expected to produce more than a modest impact on credits earned, and that that this intervention by itself will not likely lead to higher rates of reenrollment and completion for academically underprepared students. However, a learning community program with substantially enhanced supports for students such as ongoing or extra advising and the opportunity to accumulate more credits early may lead to greater benefits than the average learning community program. The Opening Doors program at Kingsborough resulted in more credits earned in the targeted subject area than the other programs and these promising short-term impacts grew into long-term impacts. As discussed in Sommo, et al. (forthcoming, 2012), in the six years after the learning community experience at Kingsborough, learning community students consistently outperformed the control group in credits earned and were more likely to graduate.[6]

Notably, this evaluation purposely selected programs that represent a range of typical learning community programs as they exist in community colleges. As a result, this demonstration is a good test of learning communities as we believe they are typically enacted, but it is not a test of the "ideal" or "advanced" learning communities described in the literature. More detail on program implementation is provided in MDRC's full length reports.

[6] The program at Kingsborough was associated with the greatest increases in graduation for students who were not in need of developmental English at the start of the study.

Appendices

Not included in page count.

Appendix A. References

References are to be in APA version 6 format.

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Appendix B. Tables and Figures

Not included in page count.

Table 1: Baseline Characteristics of Students in Sample, by College

	CCBC	Hillsborough	Houston	Kingsborough	Merced	Queensborough
Gender (%)						
Male	41.3	43.1	33.3	48.6	48.7	44.1
Female	58.7	56.9	66.7	51.4	51.3	55.9
Age (%)						
20 years old and younger	77.1	70.2	63.0	75.5	65.4	78.1
21 - 25 years old	12.7	16.2	18.4	18.2	17.1	15.2
26 - 30 years old	4.3	5.6	8.7	3.6	6.3	3.2
31 and older	5.9	8.0	9.9	2.8	11.3	3.6
Average age (years)	22.0	20.4	22.2	21.2	19.9	20.0
Race/ethnicity[a] (%)						
Hispanic	4.4	31.8	54.8	19.8	54.9	32.8
White	31.5	24.5	3.1	22.6	16.5	13.6
Black	54.9	36.6	34.4	38.3	8.9	30.7
Asian or Pacific Islander	2.1	3.7	0.8	9.1	12.9	11.9
Other[b]	3.8	2.3	0.8	6.0	3.2	5.1
Missing	3.3	1.0	6.2	4.2	3.6	5.9
Single parent (%)	11.9	13.9	21.2	7.7	18.3	3.8
Missing	17.5	15.6	19.3	3.9	18.8	25.2
Has one or more children (%)	15.1	18.7	28.2	9.4	26.2	7.4
Missing	2.8	2.3	6.5	1.1	4.6	2.7
Average age of youngest child (years)	*4.3*	*5.3*	*5.2*	*4.6*	*2.9*	*3.5*
Missing	*0.0*	*0.0*	*4.3*	*2.5*	*2.9*	*5.3*
Received financial aid during semester of random assignment (%)	44.9	25.0	43.1	N/A[c]	26.8	27.2
Missing	22.4	34.1	29.9	N/A[c]	30.2	37.9
Financially dependent on parents (%)	41.1	35.0	29.1	72.3	31.8	37.0
Missing	14.8	16.4	18.0	1.0	20.2	29.6
Highest grade completed (%)						
11th grade or lower	5.9	12.0	12.0	27.1	7.9	15.1
12th grade	90.9	85.4	80.8	71.4	87.0	78.4
Missing	3.2	2.5	7.2	1.5	5.1	6.5
Diplomas/degrees earned[d] (%)						
GED	7.9	13.7	11.8	31.1	7.3	16.8
High school diploma	87.9	82.2	78.2	67.5	78.6	75.7
Occupational/technical certificate	5.1	6.4	5.6	2.1	4.0	2.7
Two-year or higher degree	0.1	1.0	0.7	0.1	0.6	0.1
None of the above	1.3	1.1	2.5	0.3	5.0	2.4
Missing	3.1	2.5	6.4	0.0	5.8	4.0
Taken any college courses (%)	23.5	8.7	12.1	5.0	35.0	21.4
Missing	3.0	1.9	6.7	1.3	4.9	4.6
First person in family to attend college (%)	26.2	29.7	40.3	34.3	35.6	24.6
Missing	4.0	4.1	8.3	3.1	5.9	7.7
Working personal computer in home (%)	84.8	83.9	64.8	69.8	63.9	84.8
Missing	2.9	2.2	6.5	9.9	4.4	3.7
Language other than English spoken regularly in home (%)	7.4	28.2	46.4	48.9	44.3	38.8
Missing	2.8	1.0	6.1	1.3	4.3	2.9
Sample size (total = 6,974)	1,083	1,071	1,273	1,089	1,424	1,034

(continued)

Table 1: Baseline Characteristics of Students in Sample, by College (continued)

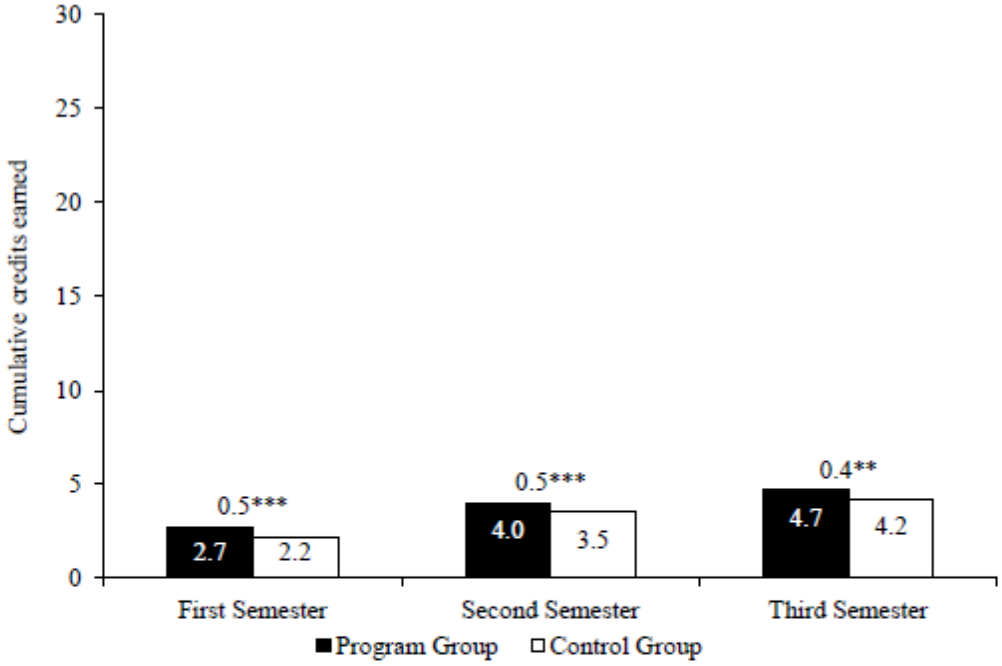
SOURCE: MDRC calculations from Baseline Information Form data.

NOTES: Calculations for this table used all available data for the 6,974 sample members.
Random assignment ratios vary across cohorts. Estimates are weighted to account for probability of being assigned to the treatment group.
Characteristics shown in italics are calculated for a proportion of the full sample.
Distributions may not add to 100 percent because of rounding.
Missing values are only included in variable distributions for characteristics with more than 5 percent of the sample missing.
[a]Respondents who said they are Hispanic and chose a race are included only in the Hispanic category. Respondents who said they are not Hispanic and chose more than one race are only in the multiracial category.
[b]"Other" race/ethnicity includes those who marked "other," more than one race, or American Native/Native Alaskan.
[c]Data on whether sample members received financial aid were not collected at Kingsborough.
[d]Distributions may not add to 100 percent because categories are not mutually exclusive.

Table 2: Overview of Developmental Education Learning Communities, by College

College	Learning Community Program Model	Semesters of Study Intake
The Community College of Baltimore County (CCBC) (Baltimore, MD)	• Developmental reading or writing linked with a college-level course (for example, psychology, sociology, speech) • Master Learner Component — a faculty member (sometimes the developmental English instructor) sat in on a college-level course and conducted a weekly, one-hour, noncredit seminar on learning-to-learn in the context of the college-level course	Spring 2008 – Fall 2009
Hillsborough Community College (Tampa, FL)	• Developmental reading linked with a student success course • Student success course focused on acclimation to college and study skills	Fall 2007 – Fall 2008
Houston Community College (Houston, TX)	• Developmental math linked with a student success course • Student success course focused on acclimation to college and study skills	Spring 2008 – Fall 2009
Kingsborough Community College (Brooklyn, NY)	• Developmental English linked with a college-level course in the student's major and a one-credit freshman orientation course • Program also included enhanced advising, tutoring, and a textbook voucher	Fall 2003 – Spring 2005
Merced College (Merced, CA)	• Developmental writing linked with developmental reading or math, a college-level course, or a student success course • Links included cross-content themes and integrated assignments developed by the learning community instructor pairs before the start of each semester	Spring 2008 – Fall 2009
Queensborough Community College (Queens, NY)	• Developmental math linked with developmental or college-level English (fall 2007) or with a college-level course (spring 2008 and beyond)	Fall 2007 – Spring 2009

Figure 1: Cumulative Credits Earned in the Targeted Subject by Pooled Sample of Developmental Education Students



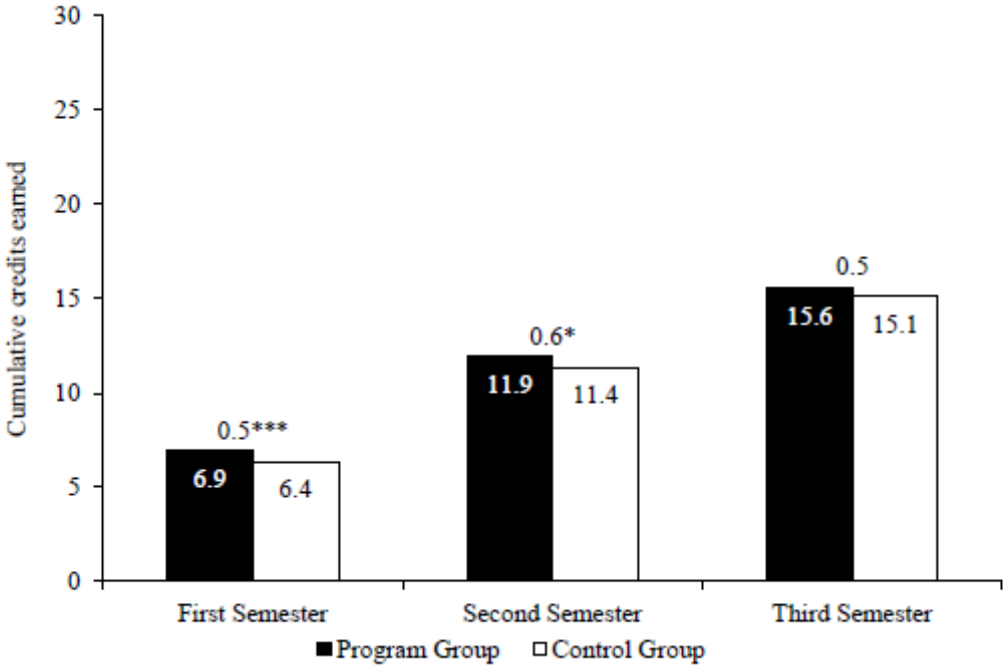
SOURCE: MDRC calculations from the Community College of Baltimore County, Hillsborough Community College, Houston Community College, Kingsborough Community College, Merced College, and Queensborough Community College transcript data.

NOTES: Rounding may cause slight discrepancies in sums and differences.

A two-tailed t-test was applied to differences between research groups. Statistical significance levels are indicated as: *** = 1 percent; ** = 5 percent; * = 10 percent.

The probability of being assigned to the treatment group varies across colleges and within random assignment cohorts, and estimates are weighted to account for the different random assignment ratios. Estimates are adjusted by campus and cohort. Standard errors are clustered by learning community link.

Figure 2: Cumulative Total Credits Earned by Pooled Sample of Developmental Education Students



SOURCE: MDRC calculations from the Community College of Baltimore County, Hillsborough Community College, Houston Community College, Kingsborough Community College, Merced College, and Queensborough Community College transcript data.

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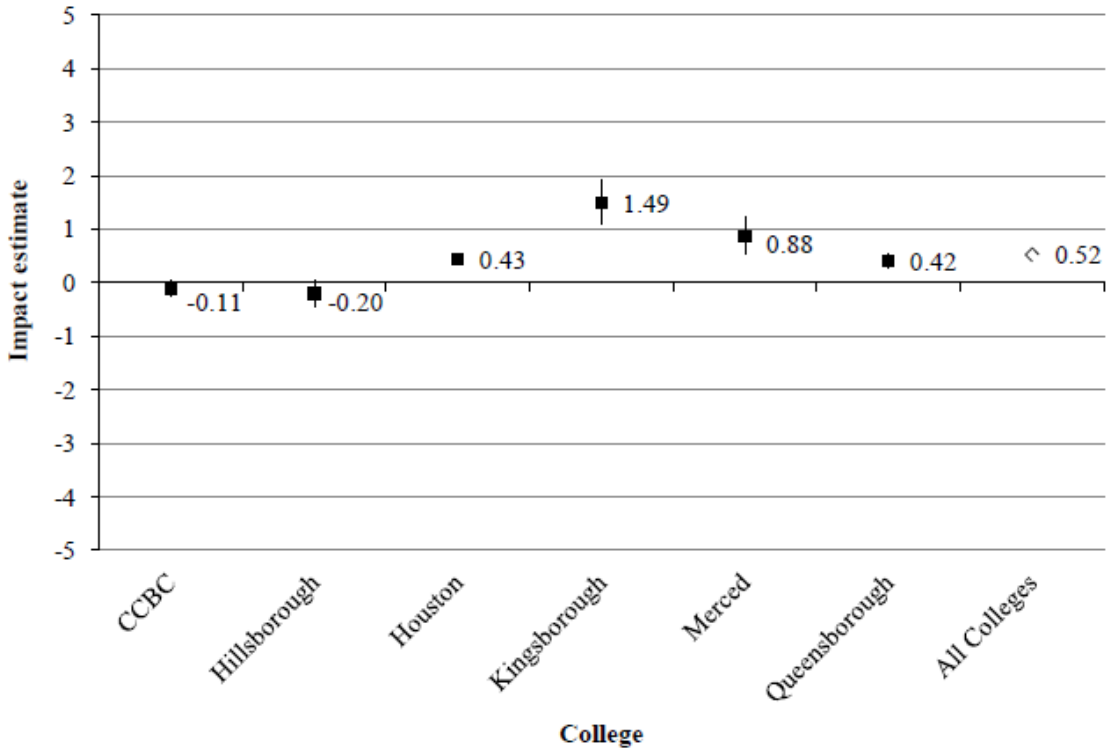
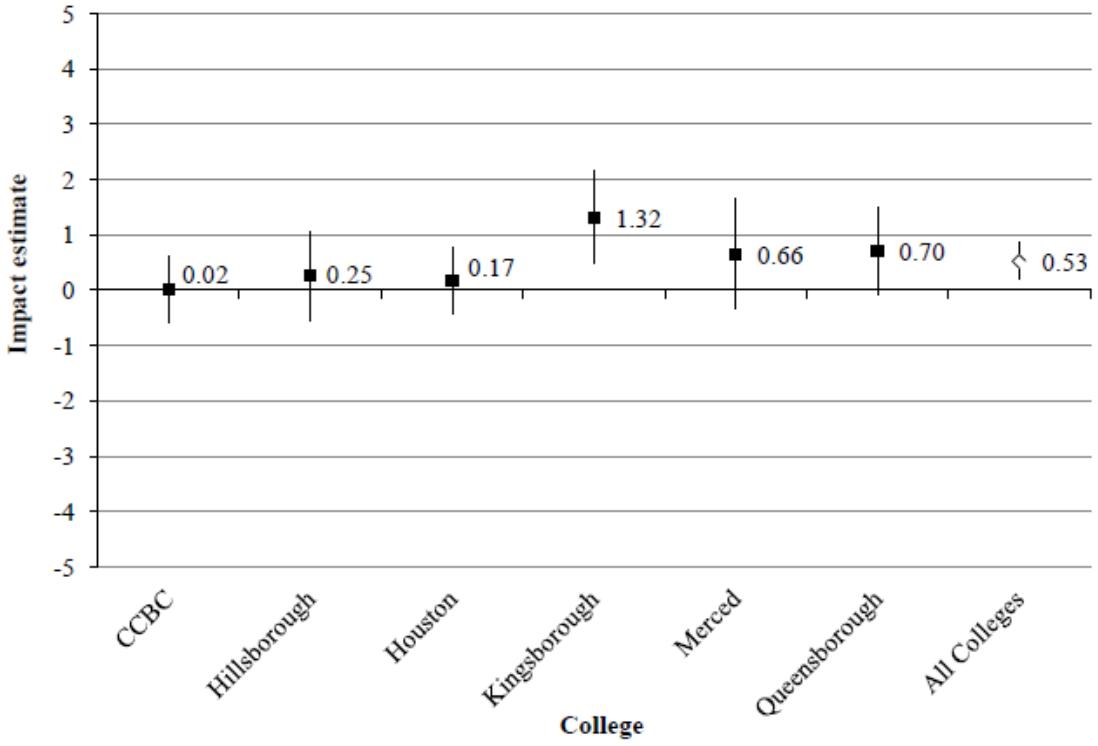
The probability of being assigned to the treatment group varies across colleges and within random assignment cohorts, and estimates are weighted to account for the different random assignment ratios. Estimates are adjusted by campus and cohort. Standard errors are clustered by learning community link.

Figure 3: Impact of the Learning Communities Program on Credits Earned in the Targeted Subject at the End of the Program Semester, by College



SOURCE: MDRC calculations from the Community College of Baltimore County, Hillsborough Community College, Houston Community College, Kingsborough Community College, Merced College, and Queensborough Community College transcript data.

Figure 4: Impact of the Learning Communities Program on Total Credits Earned at the End of the Program Semester, by College



SOURCE: MDRC calculations from the Community College of Baltimore County, Hillsborough Community College, Houston Community College, Kingsborough Community College, Merced College, and Queensborough Community College transcript data.