Abstract Title Page

Title: Mixed Results from Six Large Randomized Controlled Trials of Learning Communities in Community Colleges

Authors and Affiliations:
Alexander K. Mayer (MDRC)
Michael J. Weiss (MDRC)
Mary G. Visher (MDRC)
Colleen Sommo (MDRC)
Timothy Rudd (MDRC)
Dan Cullinan (MDRC)
Evan Weissman (MDRC)
Heather D. Wathington (University of Virginia, Curry School of Education)

with

Kelley Fong (MDRC)
Hannah Fresques (MDRC)
Jedediah Teres (MDRC)

Abstract Body

Background / Context:

These studies are especially well-suited for the spring 2013 SREE conference theme – Capitalizing on Contradiction: Learning from Mixed Results. In one, the first, large randomized controlled trial in higher education, MDRC tested the impact of learning communities at Kingsborough Community College in New York. In part because of early positive findings at Kingsborough, the National Center for Postsecondary Research, of which MDRC is a partner, launched additional tests of learning community programs in six colleges. In contrast to the early results at Kingsborough, short-term findings in these trials were, on average, much more modest. Follow-up of the sample at Kingsborough, however, demonstrated positive long-term impacts: after six years, the estimated impact on degree completion was 4.6 percentage points. The present research explores similarities and differences across these six randomized controlled trials of learning communities in community colleges. It examines several competing explanations for the mixed findings and draws lessons to inform further research and the field.

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 first-time students who enrolled in community colleges during the 2003-2004 academic year, only about a third earned a degree or certificate in six years (U.S. Department of Education, 2011). 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).

Learning communities, which consist of groups of students who enroll together in two or more linked classes, are a popular reform aimed to improve students' academic outcomes. These linked classes often incorporate shared assignments and curricula, collaboration between faculty teaching pairs, and connections to student support services. The theory of change for learning communities predicts that students in them will become more engaged in what they are learning and more connected with each other and with their instructors. The theory predicts that students will then be more likely to develop higher-order thinking skills, master the course material, pass their classes, and persist from semester to semester (Visher et al., 2008; Smith et al., 2004).

Prior research on learning communities in community colleges includes theoretical work, nonexperimental studies, and a few quasi-experimental studies of the effects of learning communities on psychological and academic outcomes, but no randomized trials. The reported benefits of learning communities include more positive feelings about the college experience, increased levels of engagement, more meaningful relationships among students, increased interaction around academic activity, stronger recognition of connections across disciplines, and improved higher-order thinking skills (Visher et al., 2008; Smith et al., 2004). Academic outcomes have also been evaluated in nonexperimental and quasiexperimental studies. These studies suggest that learning communities may have modest positive associations with outcomes such as course completion, grades, and persistence in college (Gordon, Young, and Kalianov, 2001; Tinto, 1997; Tinto, 1998; Engstrom and Tinto, 2008). While these findings are promising,

the designs of these studies leave open the question of whether their effects are due to the program itself or to preprogram differences in the characteristics of those students who chose to enroll in the program (such as their academic ability or motivation levels).

Purpose / Objective / Research Question / Focus of Study:

This research adds to the knowledge base, offering reliable evidence from six randomized controlled studies at different colleges implementing learning communities, most of which included developmental education classes (classes for students found to be underprepared for college-level material). Five of these studies track students' progress in the program semester and two follow-up semesters, and one study follows students for six years. These studies together provide the most extensive evidence available on the promise and limitations of learning communities for improving the academic outcomes of students in community colleges.

Setting:

The research took place in six community colleges across the United States.

- The Community College of Baltimore County (CCBC) comprises three main campuses and three additional locations in suburban Maryland, near the city of Baltimore. It serves about 20,000 students each fall.
- Hillsborough Community College is an urban community college located in Tampa, Florida. It serves approximately 20,000 students each fall.
- Houston Community College, the largest college in the study, is a community college system comprised of six colleges located in and around Houston, Texas. These colleges, several of which have multiple campuses, serve over 40,000 students each fall.
- Kingsborough Community College, located in Brooklyn, New York, is one of seven community colleges in the City University of New York (CUNY) system. Kingsborough's student enrollment each fall is approximately 15,000.
- Merced College is a midsized college in Merced, in California's agricultural Central Valley. It serves about 11,000 students each fall, and is the smallest college in this study.
- Queensborough Community College, a midsized college in Queens, New York, serves over 13,000 students each fall and, like Kingsborough, is part of the CUNY system.

Population / Participants / Subjects:

The trials in these studies constitute one of the largest experiments of an intervention in higher education: more than 7,000 students are included across the six sites, nearly all of whom required some developmental education classes. Study participants came from a diverse set of backgrounds and experiences. Study participants were primarily of traditional college age at baseline and were racially diverse. Many study participants were the first person in their family to attend college. For more details on the study participants, see Tables 1 and 2.

Intervention / Program / Practice:

The learning communities each lasted for one semester, and consisted of four key components, although there was variation in their emphasis and implementation:

- **Linked Courses and Student Cohorts***:* The learning communities consisted of groups of students who enrolled together in two or more courses, often scheduled back-to-back.
- **Faculty Collaboration:** As part of a learning community, instructors of the linked courses collaborated to plan and run their classes.
- **Instructional Practices:** Teaching methods in the learning communities focused on integrated instruction, emphasizing the interconnections between the linked courses, and active and collaborative learning, including strategies like group work and hands-on assignments. Instructors tried to foster integrated learning by connecting course content with the other course in the link and with students' own lives and the world around them.
- **Student Supports:** Some learning communities programs included enhanced student support services that provide students with increased access to tutors, designated counselors, or supplemental instruction in the classroom.

Research Design:

Students were assigned, at random, either to the program group, whose members had the opportunity to participate in learning communities, or to the control group, whose members received the college's standard services. Each college's research sample was comprised of three or four groups (or cohorts) of students. Each cohort started at the beginning of subsequent semesters (e.g. fall 2007, spring 2008, etc.). The random assignment process occurred separately at each college for each cohort and was controlled by MDRC. The Kingsborough students were tracked for six years. Students at the other colleges were tracked for three semesters.[1]

Data Collection and Analysis:

The research uses several data sources:

- **The Baseline Information Form:** Just before random assignment, students completed a short survey to collect information on demographic and other background characteristics.
- **Operational Site Visits, Field Research, and Instructor Survey:** The research team interviewed college administrators, faculty, and staff and students involved in the learning communities, and conducted informal observations of some learning community classes. A survey of instructors in learning communities was also administered.
- **Student Records:** Each college provided information on program and control group students' academic outcomes from their student transcripts. The six-year follow-up at Kingsborough includes CUNY transcript data and National Student Clearinghouse data.

Findings / Results:

- **Long-Term Findings from Kingsborough Community College:** After six years, more students in the learning communities earned a degree (35.9 percent) than did students in the control group (31.3 percent) — an impact of 4.6 percentage points. The increase in

[1] At Kingsborough, some learning communities did not include developmental education classes, while at the other colleges all learning communities included developmental education classes. The analyses of short-term outcomes include these outcomes for the sample of students at Kingsborough who placed into developmental English.

degree receipt was most evident for students who placed into college-level English at baseline, although there is evidence that the program also improved the long-term outcomes of students with the greatest developmental needs in English. The program also increased average credit accumulation by 4.0 credits over six years (see Tables 3 and 4).

- **Short-Term Findings from Six Community Colleges That Operated Learning Communities with Developmental English or Math:** On average, these programs produced no impact on persistence, a half-credit impact on credits earned in the targeted subject (English or mathematics), no impact on credits outside that subject, and a half-credit effect on total credits earned. There was also evidence that program effects varied by college with respect to credits earned in the targeted subject (with the estimated impacts at Kingsborough being the largest), but no evidence of discernible variation in impacts on the other key short term outcomes (see Figures 1 – 4).

Conclusions:

Taken together, the results from the studies suggest the following:

- One-semester learning communities can have a long-term impact and even boost graduation, as shown in the study of the Kingsborough program.
- However, the combined results all six trials suggest that on average learning communities for developmental education students produce only a modest impact on credits earned in the targeted subject of English or mathematics.

Notably, these studies purposely selected programs that represent a range of typical learning community programs as they exist in community colleges. As a result, the research provides good tests of learning communities as they appear to be typically enacted, but not a test of the "ideal" or "advanced" learning communities described in the literature.

Together these trials produce highly reliable estimates of the impacts of six programs, both individually and as a whole. However, important questions remain. In particular, was there something about the Kingsborough program or its setting that accounts for the larger impacts in the short term and the impact on completion? The program at Kingsborough Community College was the subject of the long-term follow-up, and also the program with the largest estimated effects in the short term. While a number of factors may have played a role in the impacts at Kingsborough, the studies cannot pinpoint which of these features mattered most.

This research explores a number of competing explanations to help understand the mixed results across the six randomized trials. Together, analyses of these studies suggest important lessons, both for researchers confronted with mixed results from multiple trials, and for community college practitioners who are considering implementing learning communities for their students.

Appendices

Not included in page count.

Appendix A. References

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Appendix B. Tables and Figures

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.
For Kingsborough, only students in the sample who placed into developmental English are included in this table. At the other colleges, the trials required students to be enrolled in developmental education for the subject offered in the learning communities.

Table 2: Baseline Characteristics of Full Kingsborough Sample

Characteristic (%)	Sample
Gender	
Male	45.4
Female	54.6
Age	
17-18 years old	44.5
19-20 years old	34.2
21-34 years old	21.3
Marital status	
Married	3.9
Unmarried	96.1
Race/ethnicity[a]	
Hispanic/Latino	20.4
Black, non-Hispanic	37.7
White, non-Hispanic	26.9
Asian or Pacific Islander	8.6
Other	6.4
Has one or more children	8.7
Household receiving any government benefits[b]	28.4
Financially dependent on parents	74.2
Ever employed	78.2
Currently employed	35.5
Diplomas/degrees earned[c]	
High school diploma	70.9
General Educational Development (GED) certificate	28.6
Occupational/technical certificate	2.0
Date of high school graduation/GED receipt	
During the past year	70.2
Between 1 and 5 years ago	22.8
More than 5 years ago	7.0
Main reason for enrolling in college[c]	
To complete a certificate program	2.8
To obtain an associate's degree	29.7
To transfer to a 4-year college/university	50.2
To obtain/update job skills	10.8
Other	8.4

(continued)

Table 2: Baseline Characteristics of Full Kingsborough Sample (continued)

Characteristic	Full Sample
First person in family to attend college	33.4
Working personal computer in home	79.7
Owns or has access to a working car	25.6
Language other than English spoken regularly in home	46.9
U.S. citizen	72.6
Respondent born outside U.S.[d]	39.9
Respondent or respondent's parent(s) born outside U.S.[d]	74.4
Region in which respondent was born	
North America	60.0
Asia	6.3
Commonwealth of Independent States[e]	9.5
Latin America and the Caribbean	18.7
Other[f]	5.5
Region in which respondent's mother was born[g]	
North America	28.2
Asia	9.8
Commonwealth of Independent States[e]	11.0
Latin America and the Caribbean	41.5
Other[f]	9.6
Sample size (total = 1,534)	1,534

SOURCE: MDRC calculations using Baseline Information Form (BIF) data.

NOTES: Distributions may not add to 100 percent because of rounding. Missing values are not included in individual variable distributions.

[a]Respondents who indicated that they are Hispanic and who also chose a race are included only in the Hispanic/Latino category.

[b]Benefits include unemployment/dislocated worker benefits, Supplemental Security Income (SSI) or disability, cash assistance or welfare, food stamps, and Section 8 or public housing.

[c]Distributions may not add to 100 percent because categories are not mutually exclusive.

[d]"U.S." includes Puerto Rico.

[e]This commonwealth comprises Armenia, Azerbaijan, Belarus, Georgia (until 2009), Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan (unofficial member), Ukraine (unofficial member), and Uzbekistan.

[f]Other regions include the Baltics, Eastern and Western Europe, North Africa, Sub-Saharan Africa, the Near East, and Oceania. Countries are grouped by region according to the U.S. Bureau of the Census, International Data Base.

[g]The majority of respondents reported that both parents were born in the same region as each other.

Table 3: Key Academic Outcomes at Kingsborough, Six Years after Random Assignment

Outcome	Program Group	Control Group	Difference (Impact)		Standard Error
Earned a degree[a] (%)	35.9	31.3	4.6	*	2.7
Highest degree earned[b] (%)					
Bachelor's degree or higher	11.8	9.4	2.4		1.8
Associate's degree	23.3	21.1	2.2		2.2
Number of semesters enrolled	6.1	5.9	0.2		0.2
Total credits earned[c]	56.3	52.3	4.0	*	2.3
Ever enrolled in a four-year institution (%)	42.4	42.0	0.4		2.7
Sample size (total = 1,534)	769	765			

SOURCE: MDRC calculations from CUNY Institutional Research Database (IRDB) and National Student Clearinghouse 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.

Estimates are adjusted by research cohort. Standard errors are clustered by learning community link.

Degree and enrollment measures include outcomes from any college. Credits measure refers to credits earned at any CUNY college.

[a]No one with a known degree type earned a certificate, although there may have been a small number of certificate earners whose degree type was unknown.

[b]Percentage who earned bachelor's degree or higher and percentage who earned associate's degree do not add up to total because degree-earners whose degree type was unknown were excluded.

[c]Total credits include both college-level and developmental credits.

Table 4: Key Academic Outcomes by English Skills Assessment at Baseline, Six Years after Random Assignment

Outcome	Program Group	Control Group	Difference (Impact)		Standard Error	Difference Between Subgroups
Passed both English tests at baseline						
Earned a degree[a] (%)	50.3	37.7	12.6	***	4.4	†
Number of semesters enrolled	6.8	6.4	0.4		0.3	
Total credits earned[b]	64.2	56.9	7.3	*	3.7	
Sample size (total = 445)	225	220				
Failed one English test at baseline						
Earned a degree[a] (%)	32.3	32.5	-0.2		3.2	†
Number of semesters enrolled	5.9	5.8	0.1		0.3	
Total credits earned[b]	53.1	53.4	-0.4		3.1	
Sample size (total = 704)	347	357				
Failed both English tests at baseline						
Earned a degree[a] (%)	26.0	21.1	4.9		5.0	†
Number of semesters enrolled	5.6	5.2	0.3		0.4	
Total credits earned[b]	52.7	44.7	8.0	*	4.3	
Sample size (total = 385)	197	188				

SOURCE: MDRC calculations from CUNY Institutional Research Database (IRDB) and National Student Clearinghouse 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.

A two-tailed t-test was applied to differences of impacts between subgroups. Statistical significance levels are indicated as: ††† = 1 percent; †† = 5 percent; † = 10 percent.

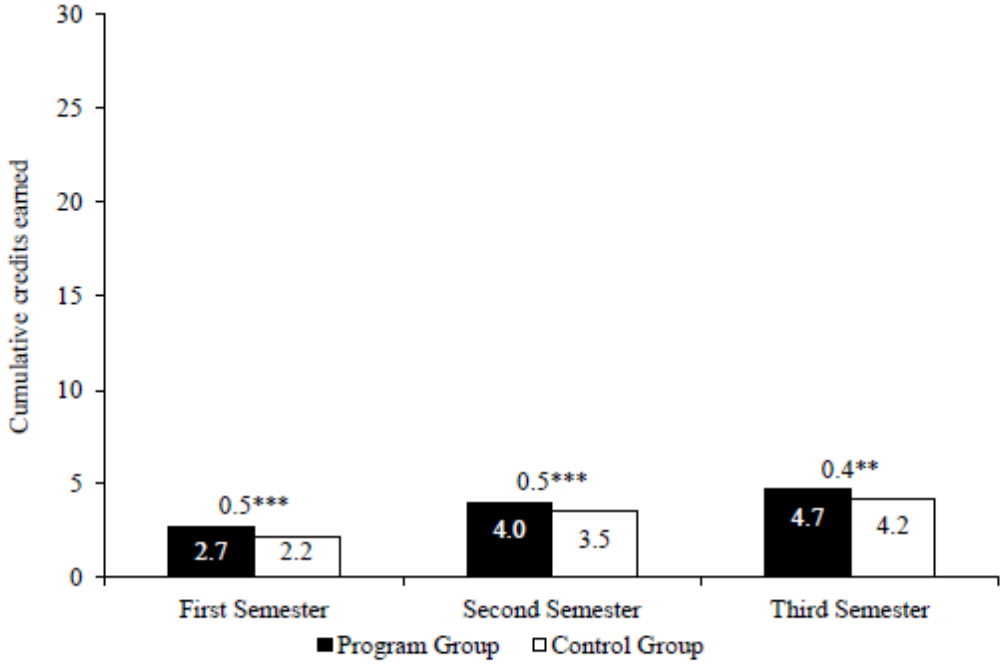
Estimates are adjusted by research cohort. Standard errors are clustered by learning community link.

Degree and enrollment measures include outcomes from any college. Credits measure refers to credits earned at any CUNY college.

[a]No one with a known degree type earned a certificate, although there may have been a small number of certificate earners whose degree type was unknown.

[b]Total credits include both college-level and developmental credits.

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



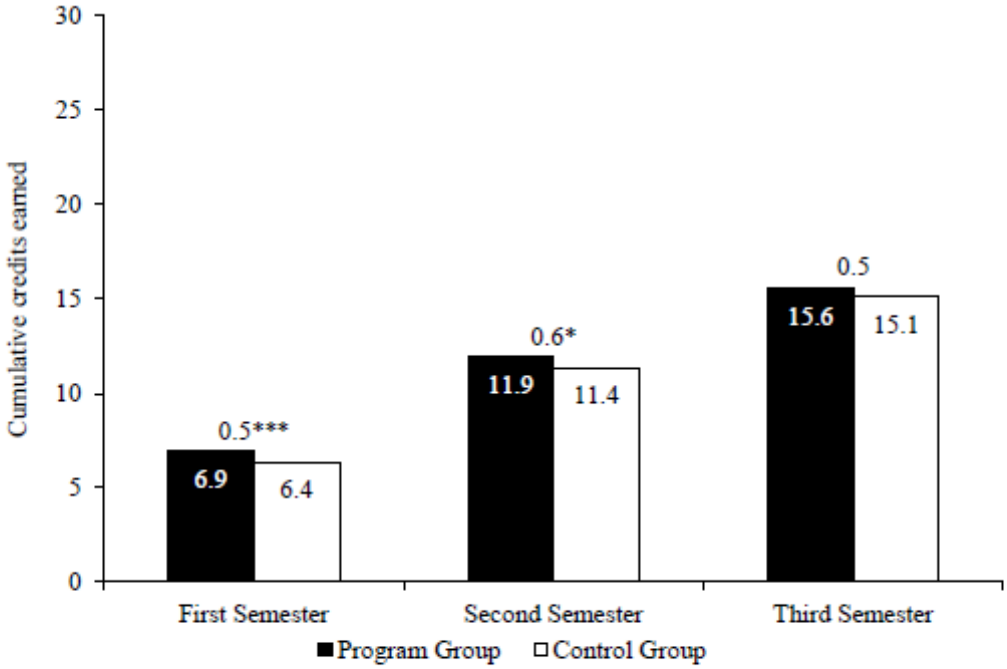
SOURCE: MDRC calculations from the Community College of Baltimore County, Hillsborough Community College, Houston Community College, Kingsborough Community College, Merced College, and Queensborough Community College transcript data.

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



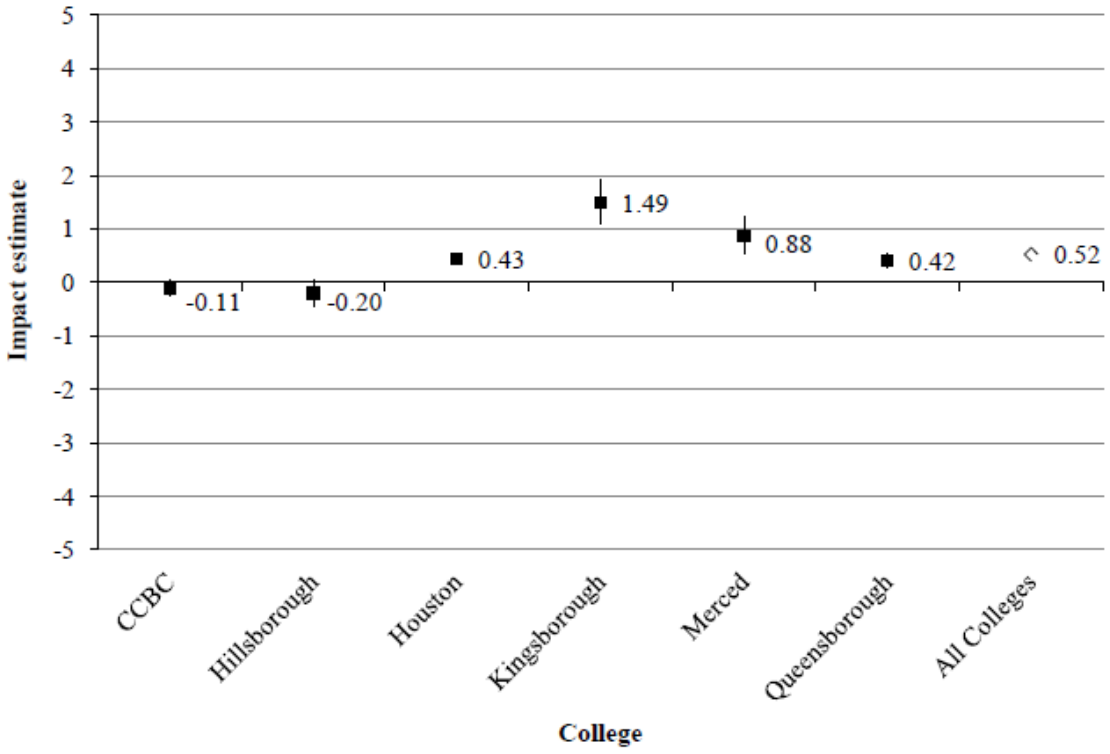
SOURCE: MDRC calculations from the Community College of Baltimore County, Hillsborough Community College, Houston Community College, Kingsborough Community College, Merced College, and Queensborough Community College transcript data.

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.

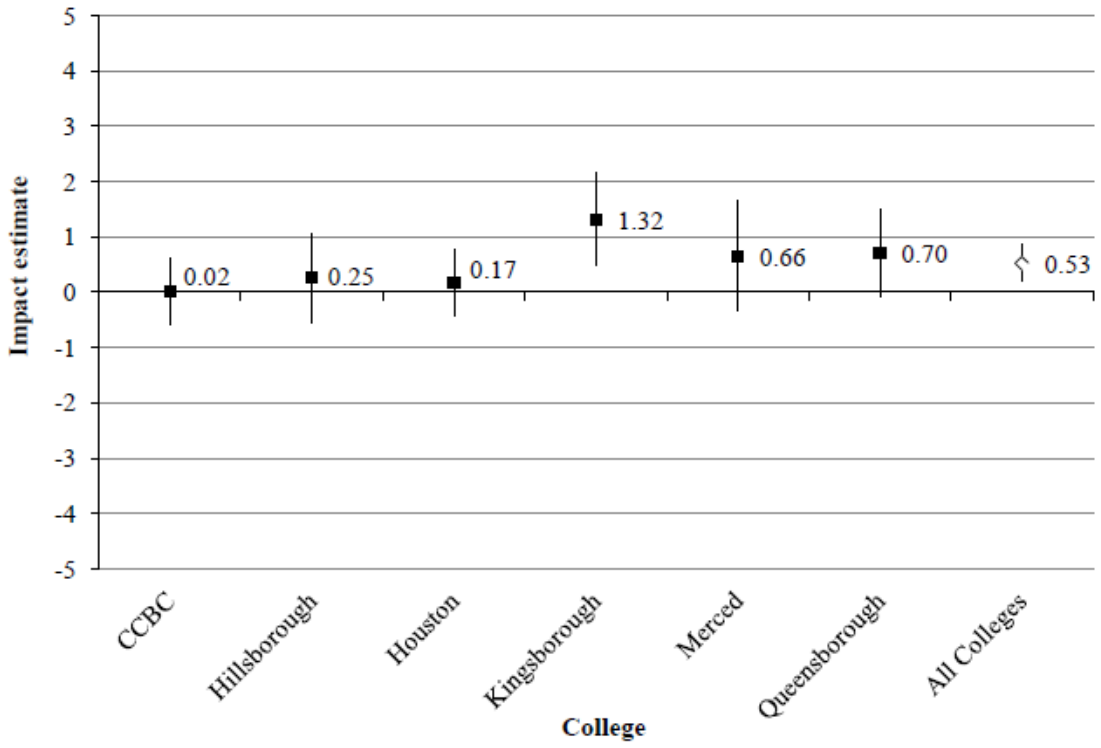
The probability of being assigned to the treatment group varies across colleges and within random assignment cohorts, and estimates are weighted to account for the different random assignment ratios. Estimates are adjusted by campus and cohort. Standard errors are clustered by learning community link.

Figure 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.