THE LEARNING COMMUNITIES DEMONSTRATION

Learning Communities for Students in Developmental Reading

An Impact Study at Hillsborough Community College

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National Center for Postsecondary Research
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Overview

Over the last four decades, community colleges have played an increasingly important role in higher education. Today, community colleges enroll more than one in every three undergraduates nationally. Unfortunately, among students who enroll in community colleges with the intent to earn a credential or transfer to a four-year institution, only 51 percent achieve that goal within six years. Many postsecondary institutions operate *learning communities* to improve low rates of success. Basic learning communities simply co-enroll a cohort of students into two classes together. More comprehensive learning communities include additional components: The courses have integrated curricula, instructors collaborate closely, and student services such as enhanced advising and tutoring can be embedded, among other approaches.

This report presents results from a rigorous random assignment study of a basic learning community program at Hillsborough Community College in Tampa Bay, Florida. Hillsborough is one of six community colleges participating in the National Center for Postsecondary Research's Learning Communities Demonstration. The demonstration's focus is on determining whether learning communities are an effective strategy for helping students who need developmental education. Hillsborough's learning communities co-enrolled groups of around 20 students into a developmental reading course and a "college success" course. Three cohorts of students (fall 2007, spring 2008, and fall 2008) participated in the study, for a total of 1,071. The findings show that:

- The most salient feature of the learning communities implemented at Hillsborough was the co-enrollment of students into linked courses, creating student cohorts.
- The learning communities at Hillsborough became more comprehensive over the course of the study. In particular, curricular integration and faculty collaboration were generally minimal at the start of the study, but increased over time.
- Overall (for the full study sample), Hillsborough's learning communities program did not have a meaningful impact on students' academic success.
- Corresponding to the maturation of the learning communities program, evidence suggests that the program had positive impacts on some educational outcomes for the third (fall 2008) cohort of students.

These results represent the first in a series of impact findings from the Learning Communities Demonstration. Results from the other five demonstration sites will be released in the next several years, providing a rich body of experimental research on the effectiveness of various learning community models in the community college setting.

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Preface

Hillsborough Community College is one of six colleges participating in the Learning Communities Demonstration, a study that is measuring whether different models of learning communities are effective in improving students' academic outcomes. MDRC is leading the evaluation of these programs, as part of its participation in the National Center for Postsecondary Research, a partnership funded by the federal Institute of Education Sciences that also includes the Community College Research Center at Columbia University's Teachers College, the Curry School of Education at the University of Virginia, and faculty at Harvard University.

Like most community colleges, Hillsborough enrolls large numbers of students who are academically underprepared and are therefore referred to remediation. Many students struggle with developmental reading courses that are required for advancement toward a degree or certificate, and ultimately leave college without earning a credential. Learning communities, which are proliferating on college campuses, may be one way to improve students' chances of succeeding in developmental classes and beyond. Learning communities co-enroll small groups of students in thematically linked classes in order to enhance students' engagement with school, increase their understanding of interdisciplinary connections, and strengthen their cognitive skills.

This report, which presents the first impact findings from the demonstration, describes Hillsborough's learning communities and their effects on students' academic outcomes. Hillsborough's learning communities model linked a developmental reading course and a "college success" course. For the full study sample, we found that the program did not have a meaningful impact on students' academic success. However, as the program matured and curricular integration and faculty collaboration increased during the third semester of the program, the evidence suggests that participation in a learning community had a positive impact on some outcomes for the third cohort of students in the study.

Future reports will share findings on the impact of the learning communities operating at the other five colleges participating in the demonstration. The result of this series of reports will be an extensive body of experimental research on the effectiveness of learning communities in the community college setting.

Gordon L. Berlin
President

Acknowledgments

The Learning Communities Demonstration has received support from several foundations and government agencies, which are listed at the front of this report. We are grateful for their generous backing and ongoing commitment. We owe special thanks to the U.S. Department of Education for providing the support that led to the creation of the National Center for Postsecondary Research. Major funding for the Learning Communities Demonstration was also provided by Lumina Foundation for Education to support the evaluation and development of the program at Hillsborough Community College under the auspices of the Achieving the Dream Initiative. We also owe thanks to the Bill & Melinda Gates Foundation, the Ford Foundation, the Kresge Foundation, and the Robin Hood Foundation, which provided considerable support for this project.

We are grateful to the administrators, instructors, and staff at Hillsborough Community College, who rose to the challenge of developing and expanding a program and participating in a complex research project. It takes courage, time, and effort to subject your program and your institution to the scrutiny of a rigorous evaluation. Space does not permit us to name everyone who has played a role in the study at Hillsborough, but we want to particularly acknowledge some individuals. Judy Alicea, the learning communities coordinator, and Craig Johnson, Vice President for Academic Affairs, worked closely with MDRC and did a terrific job of building up the college's learning community programs, recruiting and supporting instructors, recruiting and enrolling students, and maintaining random assignment procedures. Rachel Singer, from Kingsborough Community College, provided professional development and critical guidance on how to conduct an experiment in the community college setting.

Along with the learning communities coordinator, the learning communities instructors brought the program model to life. They devoted a lot of time and effort to improving students' chances of succeeding in school, and without their hard work this study could never have taken place. We appreciate everyone's willingness to participate in various activities related to the study, including interviews with MDRC staff during numerous campus visits. Finally, we appreciate the help of Nicole Jagusztyn, who provided student records data to MDRC.

Many MDRC staff members have contributed to the Learning Communities Demonstration and to this report. Robert Ivry developed the demonstration, helped design the Hillsborough program, and provided guidance on the study. Thomas Brock provided guidance and feedback throughout the project, serving as a key reviewer of operational issues, analytic decisions, and report writing. John Martinez helped launch the study and worked with Hillsborough to strengthen the program and the random assignment procedures. Leo Yan, Erin Coghlan, and Rashida Welbeck provided critical support in developing, implementing, and

monitoring the random assignment and sample recruitment process. Tom Bailey at the National Center for Postsecondary Research reviewed earlier drafts of this report and provided helpful comments, as did John Hutchins, Lashawn-Richburg Hayes, Dan Bloom, Colleen Sommo, Evan Weissman, and Liz Zachry at MDRC. Hannah Fresques conducted fact-checking. Joel Gordon, Galina Farberova, and Shirley James and her staff developed and monitored the random assignment and baseline data collection process. Kate Gualtieri was our wonderful resource manager. Margaret Bald edited the report, and Stephanie Cowell prepared it for publication.

Finally, we would like to thank the hundreds of students who participated in the study at Hillsborough and, in particular, those who participated in interviews. Many were low-income students striving to get an education, some while juggling work and family responsibilities. We hope that the findings from the study and the other sites in the Learning Communities Demonstration will be used to improve college programs and services for them and others in the future.

The Authors

Executive Summary

Over the last 40 years, community colleges have played an increasingly vital role in American postsecondary education. Since 1963, enrollment in these institutions has increased by more than 700 percent, with enrollment reaching 6.2 million students in 2006-2007. Each fall, community colleges enroll 35 percent of all postsecondary education students.[1] This dramatic growth is largely due to the fact that community colleges are open-entry institutions and are generally more affordable than four-year colleges and universities. 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.[2] While the rates of degree or certificate attainment are low in general, rates are even lower for students who need developmental education, who comprise a significant proportion of the community college student body.[3]

Given these statistics, community college stakeholders are searching with increasing urgency for approaches with the potential to bolster success rates for community college students, particularly for those who need developmental education. One popular strategy is to create "learning communities," an idea that has come to describe an array of programs and services offered at community colleges. The most basic learning community model simply co-enrolls a cohort of students into two classes together. Proponents believe that when students spend time together in multiple classes they are more likely to form social and academic support networks that in turn help them persist and succeed in school. More comprehensive learning communities include additional components: They co-enroll a group of students in multiple classes, the courses have thematically linked curricula, instructors collaborate closely both to align their curricula and to support students, teaching includes project-based and experiential learning experiences, assignments and readings are integrated, and student services such as enhanced advising and tutoring can be embedded.

This report presents results from a rigorous study of a basic learning communities program operated at Hillsborough Community College in Tampa Bay, Florida. Hillsborough is one of six community colleges participating in the National Center for Postsecondary Research's (NCPR) Learning Communities Demonstration.[4] The demonstration's focus is on determining

[1] Provasnik and Planty (2008).

[2] Hoachlander, Sikora, and Horn (2003).

[3] Adelman (2004); Attewell, Lavin, Domina, and Levey (2006); Duke and Strawn (2008).

[4] MDRC, in partnership with the Community College Research Center at Columbia University's Teachers College, the Curry School of Education at the University of Virginia, and faculty at Harvard University, created the NCPR through a grant from the U.S. Department of Education. Several foundations provided (continued)

whether learning communities are an effective strategy for helping students who need developmental education.

Hillsborough's basic learning community model linked a developmental reading course and a "college success" course with the intention of improving the outcomes of academically-underprepared students in particular. Hillsborough developed this program as part of its involvement in Achieving the Dream: Community Colleges Count, an initiative designed to help community colleges make better use of their own data to help students succeed. Hillsborough came up with the model after seeing low success rates for students in developmental courses and higher success rates for students who took a college success course. Learning communities offered the possibility of leveraging the skills acquired in the college success course to assist students who were doing poorly in developmental courses.

The learning communities study at Hillsborough is based on an experimental design in which, from fall 2007 to fall 2008, three cohorts of students in need of developmental education were randomly assigned to either a program group, whose 709 members had the opportunity to participate in learning communities, or to a control group, whose 362 members received the college's standard services. The impact of the learning communities program is estimated by comparing the outcomes of program and control group members using student transcript data collected during the year after random assignment. This report is the first in a series of reports presenting impact findings from the Learning Communities Demonstration.

In summary, the key findings from this report are:

- **The most salient feature of learning communities implemented at Hillsborough was co-enrollment of students into linked courses, creating student cohorts.** Faculty and students suggested that this course structure and the formation of student cohorts increased social linkages among students, a key element of the learning community experience.

- **The learning communities program at Hillsborough became more comprehensive over the course of the study.** Curricular integration and collaboration between faculty members teaching in paired courses are considered a key element of comprehensive, strong learning communities. At Hillsborough, curricular integration and faculty collaboration were generally minimal at the start of the study (as planned), but increased over time.

additional support to the Learning Communities Demonstration: the Bill & Melinda Gates Foundation, the Ford Foundation, the Kresge Foundation, Lumina Foundation for Education, and the Robin Hood Foundation.

- **Overall (for the full study sample), Hillsborough's learning communities program did not have a meaningful impact on students' academic success.** With respect to total credits earned, students in the program group and the control group performed about the same during the program semester and the first postprogram semester. In addition, during the two semesters following the program, students in the program group and the control group registered for courses at around the same rate (that is, their rates of persistence were similar).

- **Corresponding to the maturation of the learning communities program, evidence suggests that the program had positive impacts on some educational outcomes for the third cohort of students.** During the program semester, the program group students who enrolled in learning communities in fall 2008 (the third and final cohort) earned more credits than their control group counterparts. In the semester following the program, the third cohort's program group students registered at a higher rate than their control group counterparts. Readers are advised that when the impacts of the third cohort of students are compared with the impacts of the first and second cohorts, the differences generally are not statistically significant. This indicates that the results for the third cohort should be viewed with caution. Since program maturation was observed at several learning community demonstration sites, analyses will be conducted in future reports to see if there is common improvement in later cohorts.

Notably, this report presents findings from only one of the colleges in the demonstration, which operated one learning communities model. The six colleges taking part in the national Learning Communities Demonstration were selected, in part, because they represent various learning community models. Hillsborough's model was more basic than some of the other colleges' models in the demonstration. In order to better understand the effectiveness of learning communities more broadly, it will be essential to see whether more comprehensive, robustly implemented learning communities yield positive impacts. In addition, the growth and improvement of Hillsborough's program as it scaled up was a pattern exhibited at the other Learning Communities Demonstration colleges. It will also be interesting to see whether more mature versions of the programs tested at the other colleges will similarly yield more positive impacts.

In designing the Learning Communities Demonstration, NCPR was seeking to better understand whether learning communities are an effective strategy to help improve students' chances at succeeding in community college. During the next several years, NCPR will report impact findings from the other five colleges as they become available. The result will be a

significant body of experimental research on the effectiveness of learning communities in the community college setting.

Chapter 1

Introduction

This report presents results from a random assignment evaluation of a learning communities program implemented on three campuses at Hillsborough Community College in Tampa, Florida. The program enrolled cohorts of around 20 first-year students, who were in need of remediation in reading to prepare them for college-level work, into 24 "learning communities" over the course of three semesters. The learning communities were comprised of two linked classes: a developmental-level, or remedial, reading course and a "college success" course designed to teach students knowledge and skills to help them succeed in college.[1] Hillsborough is one of six community colleges that participated in the national Learning Communities Demonstration, one of several research projects conducted by the National Center for Postsecondary Research (NCPR). MDRC, in partnership with the Community College Research Center (CCRC), the University of Virginia, and faculty at Harvard University, established NCPR through a grant from the U.S. Department of Education. Several foundations provided additional support to the Learning Communities Demonstration.[2]

Hillsborough is one of two colleges whose participation in the demonstration was prompted by participation in the Achieving the Dream Initiative, funded by Lumina Foundation for Education. Achieving the Dream is a national initiative now involving over 100 community colleges that encourages colleges to design strategies to improve student outcomes through careful examination of student records and other data. Hillsborough chose to participate in the Learning Communities Demonstration to scale up and then test their learning communities for development education students, one of the key strategies they chose as part of their Achieving the Dream work. A total of 1,071 students enrolled in the demonstration at Hillsborough, 709 of whom were randomly assigned to the program group and were therefore eligible to enroll in learning communities. This report provides some background on the national Learning Communities Demonstration, its purpose, and its research design.[3] It then describes specific features of the program and study at Hillsborough, including how the program was implemented during its one and a half years of operation, and concludes with findings on academic outcomes from

[1]This paper uses the term developmental to refer to precollege courses and students who are enrolled in them. At Hillsborough, the developmental-level reading course that was part of the learning communities program was called "college preparatory reading."

[2]The following foundations generously supported this project: the Bill & Melinda Gates Foundation, the Ford Foundation, the Kresge Foundation, Lumina Foundation for Education, and the Robin Hood Foundation.

[3]For more details on the study, see: Visher, Wathington, Richburg-Hayes, and Schneider (2008).

the semester when students were enrolled in the program as well as one semester after the program was completed.[4]

Key Findings

Key findings from the evaluation of the learning communities program at Hillsborough include:

- Hillsborough began the demonstration by implementing a relatively basic model of learning communities — comprised mostly of co-enrolling groups of students in two courses — but strengthened the program over the course of the demonstration by adding additional features such as joint assignments and themes for the linked courses.
- Assignment to the program group did not lead to statistically significant impacts on the key outcomes of interest, including credit accumulation, completing a developmental reading course, and persistence rates. However, some encouraging signs suggest that the final cohort of students assigned to learning communities performed better academically than their counterparts in the control group.

Background

The Policy Context

Community colleges have played an increasingly vital role in American postsecondary education over the last 40 years. Enrollment in these institutions has increased by more than 700 percent since 1963, with total enrollment reaching 6.2 million students in fall 2006. Community college students now make up over 35 percent of undergraduate enrollees every fall.[5] This dramatic growth is due in large part to the fact that community colleges are open-entry institutions and are typically more affordable than four-year colleges and universities. Unfortunately, overall success rates in community colleges have not kept pace with increasing enrollments;

[4]Limited follow-up is also provided for two semesters after the program was completed.

[5]Provasnik and Planty (2008). Because many community college students enroll part time, a more accurate count may be provided by a 12-month enrollment estimate. National data show that over the course of a year, community college students make up nearly 45 percent of the total undergraduate population. (Knapp, Kelly-Reid, and Ginder, 2009).

only about half the students who enroll in community college with the intention of earning a credential or transferring to a four-year institution meet that goal within six years.[6]

The factors contributing to these low completion rates are currently the focus of much research and debate.[7] One of the major obstacles for students is that many arrive on campus academically underprepared for college-level course work.[8] In fall 2000, for example, 42 percent of first-year community college students took at least one developmental course.[9] This number likely underrepresents the number of students who actually require developmental education, since it is based on course-taking patterns for students during their first year of college only, and many students who place into developmental education based on assessment tests put off taking these courses. Estimates from a longitudinal study that tracked a nationally representative sample of eighth-graders for 12 years suggest that, among students whose first institution of attendance was a community college, over 60 percent took at least one developmental course.[10]

While the rates of degree or certificate attainment are low at community colleges in general, students who need developmental education have even lower success rates.[11] For many students, developmental course work acts as a major obstacle to earning a degree or certificate. A recent study demonstrated this, using data provided by 57 community colleges that are part of the Achieving the Dream Initiative to estimate the rate at which developmental-level students complete the sequence of courses that is required before they are deemed ready to take college-level work.[12] In these 57 colleges, only 20 percent of students who required developmental course work in math passed the first college-level math course within three years.[13] The study further found that only 33 percent of students referred to developmental math and 46 percent referred to the *highest* levels of developmental reading complete these courses within three years. The rates are much lower for students who are enrolled in the lowest levels of developmental education.

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[6]Hoachlander, Sikora, and Horn (2003).

[7]Adelman (2004); Bailey and Alfonso (2005); Levin and Calcagno (2008).

[8]Duke and Strawn (2008).

[9]Parsad and Lewis (2004).

[10]Adelman (2004).

[11]Attewell, Lavin, Domina, and Levey (2006).

[12]*Achieving the Dream: Community Colleges Count* is a national initiative funded by Lumina Foundation for Education to promote data-driven reform in community colleges that has a special focus on low-income students and students of color. By 2009, over 102 community colleges had joined the initiative. As part of their participation, colleges provide student records data to a central database.

[13]Bailey, Jeong, and Cho (2009). While these rates come directly from Achieving the Dream data, the study also demonstrates that they are comparable with those found in the National Education Longitudinal Study of 1988.

Prompted by these statistics and most recently by the Obama Administration's call to dramatically increase the numbers of students who receive a certificate or a degree by 2020, community college stakeholders are searching with increasing urgency for approaches that have potential to increase success rates for community college students, particularly for those who need developmental education.

Learning Communities: A Popular Strategy with Promise

In recent years, a popular response to the problem of low completion rates in community colleges has been learning communities, in which small groups of students are co-enrolled as cohorts in two or more courses, which are often thematically linked and share curriculum, assignments, and assessments. Learning communities seem to be particularly promising for community colleges where students often spend little time on campus due to the competing demands of earning a living or caring for family members, because they are seen as a way to connect such students more closely to college life. For students in developmental courses, learning communities are expected to increase their odds of moving on to college-level work.

Proponents of learning communities believe that linking courses may lead to these better outcomes in two ways: first, by strengthening relationships among students and between students and faculty, and second, by changing how material is taught in the classroom. Specifically, student cohorts allow students to get to know one other better or more quickly, which can then lead them to form social and academic support networks. These networks may lead to deeper engagement with school and access to both academic and emotional support, which in turn may result in higher rates of academic tenacity and persistence. Learning communities also can enable faculty to get to know their students better, keep tabs on their progress, and offer help. Pedagogically, the linked courses are meant to help students understand connections between disciplines and between what they are learning in school and their personal lives and in so doing both engage students more deeply with learning and impart higher-order cognitive skills such as critical and analytic thinking.[14]

Learning communities are a particularly compelling strategy for instructing developmental-level students.[15] The social integration encouraged by co-enrollment in multiple classes can be extremely important for these academically underprepared students, who may be more marginalized from the college community. Moreover, the connection between the developmental-level course and the course with which it is linked — whether another developmental-level course, a college-level course, or a "college success" course that is designed to provide students with skills and tools for reaching their goals in college — can serve to bolster learning in each

[14]Tinto (1997); Minkler (2002).
[15]Boylan (2002); Center for Student Success (2007).

linked course. With a connection to another developmental course, the student's academic skill needs are being addressed from several angles; with a connection to a college-level course, the skills and knowledge in both courses can be mutually reinforcing. (For example, using a psychology textbook as the main text for a developmental reading class gives students practical examples of the skills they are acquiring and supports deeper learning in the psychology course.) Linking with a college-level course also gives students the opportunity to earn college credits even as they go through their developmental sequence. Finally, linking with a student success course can support students' work in the developmental-level course by helping academically underprepared students learn good study habits and how to navigate postsecondary education successfully.[16]

Vincent Tinto conducted important early work on learning communities at LaGuardia Community College and Seattle Central Community College, and subsequent work at 13 community colleges across the country, and concluded that students in learning communities benefit both academically and socially in comparison with similar students who do not enroll in learning communities.[17] But quasi-experimental designs, such as that used by Engstrom and Tinto (2008), leave open the question of whether such positive effects are due to the program itself or to preprogram differences in the characteristics of those students who choose to enroll in the program (such as their ability, motivation levels, or tenacity).

The first random assignment study of learning communities was conducted by MDRC at Kingsborough Community College in Brooklyn, New York, as part of the Opening Doors Demonstration.[18] The findings from this rigorous study showed that the opportunity to participate in a learning community improved students' college experience, improved some educational outcomes while students were in the learning community, and moved students more quickly through developmental English requirements.[19] (See Box 1.1 for more details about this study.)

Overview of the Learning Communities Demonstration

Six community colleges across the country participated in the Learning Communities Demonstration.[20] Each operated its own model of single-semester learning communities but all

[16]Visher, Schneider, Wathington, and Collado (2010).

[17]Tinto, Goodsell-Love, and Russo (1994); Engstrom and Tinto (2008). For a more comprehensive review of research on learning communities, see Visher, Wathington, Richburg-Hayes, and Schneider (2008).

[18]Opening Doors was a multisite study that tested interventions at six community colleges designed to help low-income students stay in school and succeed. For more information, see www.mdrc.org/project_31_2.html.

[19]For more information on the previous MDRC study of learning communities, see Richburg-Hayes, Visher, and Bloom (2008); Scrivener et al. (2008).

[20]As of fall 2009, all six colleges had completed study sample intake.

Box 1.1

The Evaluation of the Opening Doors Learning Communities at Kingsborough Community College: A Snapshot

The Program Model: Between 2003 and 2005, cohorts of 25 incoming freshmen were enrolled in three classes together: English (usually at the developmental level), a course on another academic subject, and a one-credit college orientation course.

Additional Features of the Model: The Opening Doors Learning Communities offered several enhancements not always included in learning community programs, including enhanced counseling, a voucher to purchase textbooks, and access to professional development and support for faculty teaching in learning communities.

Characteristics of the Study Sample: The Kingsborough sample was of traditional college age (79 percent were under 21 years old), racially diverse (there was no racial majority), and financially dependent on their parents (74 percent); some were the first in their family to attend college (33 percent).

The Evaluation Method: MDRC assigned 1,534 freshmen, at random, either to a program group that was eligible for the learning community or to a control group that received the college's standard courses and services. Data sources included transcript data (measures of course and test passing and persistence), a student survey (affective measures, such as engagement, and behavioral outcomes, such as participation in campus services) and qualitative data including interviews and focus groups.

The Experimental Contrast: Course assignments and scheduling were a key contrast between the program and control group students' experiences: Learning communities students took three linked courses that were scheduled in a block, and all of them took an English course and the freshman orientation class. Control group students took whatever courses were available to them (including, potentially, the same courses that were offered to the program group), at whatever times those courses met, and were not required to take English or the freshman orientation. The extent of integration across the linked courses varied from learning community to learning community; in contrast, there was no attempt by the regular college faculty to link the subject matter across courses.

(continued)

Box 1.1 (continued)

Key Findings

- **The program improved students' college experience**. Students in the program group felt more integrated and more engaged than students in the control group.
- **The program improved some educational outcomes** while students were in the program, but the effects diminished in subsequent semesters. For example, program group students passed more courses and earned more credits during their first semester in the study.
- **The program moved students more quickly through developmental English requirements**. Students in the program group were more likely to take and pass an English skills assessment. Notably, program group students enrolled in English classes at a higher rate than control group students (since all learning communities included an English class).
- **The evidence is mixed about whether the program increased persistence**. Initially, the program did not change the rate at which students reenrolled. In the last semester of the report's two-year follow-up period, however, slightly more program group members than control group members attended college.

six colleges were encouraged, over the course of the demonstration, to include the core components described above: student cohorts and instructional practices such as curricular integration and collaborative learning. The colleges, listed below, are spread across the country and all serve large numbers of low-income and developmental students:

- The Community College of Baltimore County (CCBC) (Baltimore, Maryland)
- Hillsborough Community College (Tampa, Florida)
- Houston Community College (Houston, Texas)
- Kingsborough Community College (Brooklyn, New York)
- Merced College (Merced, California)
- Queensborough Community College (Queens, New York)

The six colleges chose different courses to link and in some cases added features such as enhanced access to student services and other forms of support. Table 1.1 summarizes the core features of each program tested as well as its target population. The research team selected

Table 1.1

Overview of the Learning Communities in the Learning Communities Demonstration, by College

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College	Learning Community Program Model	Eligible Population
Developmental English or Reading as Anchor Course		
The Community College of Baltimore County (Baltimore, MD)	• Developmental English or reading linked with a college-level course (e.g., psychology, sociology, business) • Master Learner Component — a faculty member (sometimes the developmental English instructor) sits in on college-level course and conducts a weekly, one-hour, noncredit seminar on learning-to-learn in the context of the college-level course	• Assessed into highest level of developmental English or reading
Hillsborough Community College (Tampa, FL)	• Developmental reading linked with a student success course • Student success course focuses on acclimation to college, study skills	• Assessed into either of two levels of developmental reading • First-time students
Merced College (Merced, CA)	• Developmental English linked with developmental reading, developmental math, a college-level course, or a student success course • Several of the links have supplemental instructors — trained peer instructors who facilitate voluntary group study sessions	• Assessed into any of three levels of developmental English

(continued)

Table 1.1 (continued)

College	Learning Community Program Model	Eligible Population
Developmental Math as Anchor Course		
Houston Community College (Houston, TX)	• Developmental math linked with a student success course • Student success course focuses on acclimation to college, study skills	• Assessed into lowest level of developmental math • First-time students at Houston
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)	• Assessed into lowest levels of developmental math • New students, or continuing students or transfers with less than a semester of credits
Integrative Seminar as Anchor Course		
Kingsborough Community College (Brooklyn, NY)	• Two linked courses recommended or required for an occupational major • Required attendance in an "integrative seminar," a 1-credit course designed to help students make connections between their linked courses, course content, career plans, and the real world	• In targeted occupational major: business, accounting, allied health, mental health, early childhood education, tourism and hospitality, and liberal arts • Continuing students and transfers from 4-year schools

programs to represent the broad range of models and links in use in community colleges. For example, the program at CCBC was of a relatively comprehensive nature, linking a college-level course with a developmental English or reading course and including a third "Master Learner" course designed to help students "learn to learn" and work on integrated assignments. The Hillsborough and Houston Community College programs — at the more basic end of the spectrum of possible learning community programs — both linked a "college success" course with a developmental course (reading at Hillsborough and math at Houston) and at least initially involved minimal expectations of faculty to collaborate or offer integrated curriculum. Merced College and Kingsborough Community College, which had long histories of running strong learning communities, encouraged a relatively higher level of integration between the linked courses. Merced linked a variety of courses, both college-level and developmental, with a developmental English class. Kingsborough, unlike the other five colleges, targeted continuing and transfer students who had already satisfied any requirements for developmental courses. Like CCBC, Kingsborough linked three courses: two college-level courses in specific majors with a single-credit "integrative seminar" designed to help students see connections between their course work and career goals.

Between spring 2007 and fall 2009, a total of 6,794 students across the six colleges volunteered to be part of the study and were randomly assigned to either the program group or the control group. Nearly 4,000 of these students were randomly assigned to the program group, where they could enroll in a learning community that fit their schedules and course needs; the rest were assigned to the control group, where they were allowed to enroll in any course for which they were eligible or that was required, but could not enroll in a learning community. A total of 171 learning communities were included in the study.[21]

Study sample sizes were sufficient at each college to permit researchers to test for the effects of the program at each site separately. Key outcomes of interest vary slightly from site to site, but the following outcomes were examined for each site:

- Number of credits attempted and earned, both developmental and regular
- Persistence rates, defined as re-enrollment in semesters subsequent to the program semester
- Course withdrawal rates
- Grade Point Average

[21]For a description of the methodology of the Learning Communities Demonstration, see Visher, Wathington, Richburg-Hayes, and Schneider (2008). See Appendix A for information on impact estimation procedures.

A Note on the Random Assignment Design

As mentioned above, random assignment creates two groups of students that are similar both in characteristics that can be measured, such as age and gender, and those that are more difficult to measure, such as motivation and tenacity.[22] Any subsequent substantial differences in outcomes can be attributed, with a high level of confidence, to systematic differences in students' experiences *after* they were randomly assigned; in this case, the opportunity to experience a learning community.

A random assignment evaluation is an extremely reliable way to test a program's overall effectiveness; however, there are limitations to this method. Random assignment does not typically enable the disentanglement of the effects of one program component from another. For the Hillsborough learning communities program, for example, this study will determine whether the *entire package* was effective. This package included the linking of two classes (creating cohorts of students), the college success course (focusing on acclimation to college life and study skills), certain instructional strategies (such as integration of material across the two courses), and the qualities of teachers who taught in the learning communities.[23] The qualitative research conducted as part of this study can help inform which components of this program package mattered the most to the program leaders, faculty, and students who participated in the learning communities; however, it will not yield definitive answers to the question of which of these components mattered most for student outcomes, such as passing courses and persistence to the next semester.

Organization of This Report

Chapter 2 describes Hillsborough Community College, the characteristics of the study sample, and the data sources used in the report. Chapter 3 provides an overview of the program's history and implementation at Hillsborough. Finally, Chapter 4 describes the program's effects on various educational outcomes, discusses the implications of the findings, and offers some conclusions.

[22]The two groups should be similar in terms of averages as well as other distributional characteristics.

[23]Teachers were not randomly assigned to teach in the learning community's classes or the control group classes. As a result, program impacts (positive, negative, or not statistically significant) may be influenced by teacher effects. Notably, some program group teachers may also have taught unlinked versions of their courses, courses that were available to control group students, thus partially mitigating concerns regarding teacher effects.

Chapter 2

Hillsborough Community College, Its Study Participants, and Data Sources

The College

Hillsborough Community College is a large, urban community college located in Tampa, Florida, a Gulf Coast city on the west coast of Florida. Hillsborough serves around 24,000 students each year, and three of the college's five campuses, Dale Mabry, Ybor City, and Brandon, participated in the Learning Communities Demonstration. Table 2.1 provides selected characteristics of Hillsborough and its student body. Across the entire college, just over half of students are white, with black and Hispanic students each making up around 20 percent of the remaining student population. Thirty-six percent of all students are age 25 or over, and two-thirds attend college part time. While the data in Table 2.1 provide a broad profile of Hillsborough's students, this study targeted a particular subset of the student body.

Targeting and Enrollment for the Hillsborough Learning Communities

To be eligible to participate in the learning communities study at Hillsborough, students had to meet *all* of the following eligibility criteria:

- Age 18 or over,
- First-time student, and
- Placed into developmental reading (College Preparatory Reading I or College Preparatory Reading II)

Learning communities program staff conducted outreach to make students aware of the study and to encourage them to participate. Before attending an orientation session, first-time students at Hillsborough took a placement test to determine whether they required any developmental course work. Students who placed into developmental courses were told about the Learning Communities Demonstration and its eligibility requirements.[1] Although the random

[1]At two of the campuses, developmental-level students attended a separate orientation session in which information about the demonstration was shared; at the third, both developmental- and college-level students attended the same orientation session, and developmental students were invited to a supplementary session to hear about the demonstration.

The Learning Communities Demonstration

Table 2.1

Selected Characteristics of Hillsborough Community College

Hillsborough Community College Report

Institution size category	20,000 and above
Has tenure system	Yes
Undergraduate characteristics	
Gender (%)	
Male	41.7
Female	58.3
Race/ethnicity (%)	
White	52.2
Black	18.6
Hispanic	22.4
Other	6.8
Age[a]	
18-24	63.8
25-34	21.9
35 and older	14.1
Enrollments (%)	
Full time	32.6
Part time	67.4
Full time retention rate (%)[b]	65
Part time retention rate (%)	47

SOURCES: MDRC calculations using U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) data.

NOTES: Data are from fall 2007.
Distributions may not add to 100 percent because of rounding.
[a] Age categories may not add to 100 percent because of missing data.
[b] According to IPEDS, this is the percentage of first-time degree/certificate-seeking students from the previous fall who either re-enrolled or successfully completed their program by the current fall.

assignment process meant that only some of the participants in the study would ultimately be eligible to participate in learning communities (since the rest would be in the control group), college staff emphasized that students had nothing to lose by applying. Applicants who completed the process were given a $25 gift card from a major discount store as both an incentive and as compensation for their time.

If students agreed to participate, their written consent was obtained and they filled out a baseline information form that captured demographic characteristics of students before they

were randomly assigned. Once the paperwork was complete, college staff logged on to MDRC's secure Web site with applicants' names and identification numbers, and MDRC's computer system randomly assigned students to the program or control group.[2] The college informed students of their research status right away.

After students were randomly assigned, staff registered program group students in a learning community that linked a College Success course with either College Preparatory Reading I or College Preparatory Reading II (depending on how the student tested).[3] Students enrolled in these two courses as a pair, creating learning communities where the same small groups of students took two linked courses together.

In contrast, staff registered control group students into appropriate unlinked classes. Because *all* study participants required developmental reading, and developmental reading is a prerequisite for most other courses at Hillsborough (including developmental math), the majority of control group students enrolled in College Preparatory Reading I or II. Control group students had the option of enrolling in a college success course, and many of them did.[4] However, even when control group students enrolled in a college preparatory reading course and a college success course, they encountered different students in each class (unlike program group students).

Enrollment in the study was carried out between May 2007 and September 2008. During this time, three "cohorts" of students entered the study: the fall 2007 cohort, the spring 2008 cohort, and the fall 2008 cohort. In total, 1,071 individuals enrolled in the study at Hillsborough.

Characteristics of the Study Sample

Table 2.2 presents selected characteristics of the 1,071 individuals who enrolled in the learning communities study at Hillsborough. Information on the characteristics shown in Table

[2]At the start of the study a 50:50 random assignment ratio was used, meaning that each student was equally likely to be randomly assigned to the program group or to the control group. Early on during enrollment of the first wave of students (fall 2007), the random assignment ratio was changed to 67:33, making students twice as likely to be assigned to the program group as to the control group. This change was made because the college was having trouble filling its learning communities, so a ratio that favored program group students helped the college avoid delinking, cancelling, or backfilling the underenrolled learning communities with nonstudy participants. All analyses are conducted using weights to account for the change in the random assignment ratio.

[3]Reading II is the higher-level course.

[4]College policy at Hillsborough dictates that all students who require one or more developmental courses must enroll in a college success course; however, students are not required to enroll immediately. This allowed control students to choose whether or not to enroll in the college success course, whereas program students who enrolled in learning communities were required to enroll in the course by virtue of its inclusion in the learning community.

The Learning Communities Demonstration

Table 2.2

Characteristics of Sample Members at Baseline: Fall 2007, Spring 2008, and Fall 2008 Cohorts

Hillsborough Community College Report

	Full Sample	Program Group	Control Group
Gender (%)			
Male	43.0	44.3	40.3
Female	57.0	55.7	59.7
Age (%)			
18 - 20 years old	70.2	70.2	70.1
21 - 25 years old	16.2	15.9	16.6
26 - 30 years old	5.6	5.9	5.1
31 and older	8.1	8.0	8.2
Race/ethnicity[a] (%)			
Hispanic	32.4	32.2	32.7
White	24.7	25.8	22.6
Black	36.8	35.3	39.7
Asian or Pacific Islander	3.7	4.1	3.0
Other	2.4	2.7	1.9
Marital status (%)			
Married	8.7	8.6	8.9
Unmarried, living with partner	18.2	18.1	18.4
Unmarried, not living with partner	59.2	58.3	60.9
Decline to answer	13.9	15.0	11.8
Number of children (%)			
None	81.0	81.4	80.1
One	9.1	8.2	11.0
Two	5.0	5.5	4.1
Three or more	4.8	4.8	4.9
Household receiving any government benefits[b] (%)	15.6	15.4	15.9
Decline to answer	19.1	18.3	20.7
Financially dependent on parents (%)			
Yes	34.9	33.2	38.1
No	48.7	48.9	48.2
Missing	16.5	17.9	13.6
Currently employed (%)			
Yes	56.4	56.0	57.2
No	39.6	40.3	38.2
Decline to answer	4.1	3.8	4.6

(continued)

Table 2.2 (continued)

	Full Sample	Program Group	Control Group	
Received financial aid during semester of random assignment (%)				
Yes	25.0	24.4	26.2	
No	40.8	41.2	40.1	
Missing	34.1	34.4	33.7	
Highest grade completed (%)				
11th grade or below	12.3	13.2	10.6	
12th grade	87.7	86.8	89.4	
Diplomas/degrees earned[c] (%)				
High school diploma	84.4	84.4	84.2	
GED	14.1	14.5	13.4	
Occupational/technical certificate	6.5	5.9	7.7	
None of the above	1.1	0.4	2.4	***
Date of high school graduation/GED receipt (%)				
During the past year	58.5	59.4	56.6	
Between one and five years ago	21.1	21.2	20.9	
More than five years ago	15.2	14.9	15.8	
Decline to answer	5.2	4.5	6.8	
Taken any college courses (%)	8.8	8.0	10.4	
First person in family to attend college (%)	31.1	29.6	34.0	
Highest degree/diploma earned by father (%)				*
Not a high school graduate	13.5	14.4	11.8	
High school diploma or GED	31.7	32.2	30.9	
Occupational/technical certificate or associate's degree	13.7	12.6	15.7	
Bachelor's degree or higher	12.8	14.2	10.1	
Missing	28.3	26.6	31.6	
Highest degree/diploma earned by mother (%)				
Not a high school graduate	12.1	12.6	11.1	
High school diploma or GED	31.5	31.3	31.8	
Occupational/technical certificate or associate's degree	25.2	25.1	25.6	
Bachelor's degree or higher	13.4	14.0	12.1	
Missing	17.8	17.0	19.4	
Own or have access to a working car (%)	84.8	86.5	81.5	**
Language other than English spoken regularly in home (%)	28.5	28.9	27.7	
Sample size	1,071	709	362	

(continued)

Table 2.2 (continued)

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

NOTES: Calculations for this table used all available data for the 1,071 sample members who were in the fall 2007, spring 2008, and fall 2008 cohorts.

A two-tailed t-test was applied to differences between the program group and control group for variables that are not mutually exclusive and mutually exhaustive (e.g., diplomas/degrees earned). Levels for statistically significant differences between program and control groups are indicated as: * = 10 percent; ** = 5 percent; and *** = 1 percent.

A chi-squared test was applied to differences between the groups of categorical variables that are mutually exclusive and mutually exhaustive (e.g., race/ethnicity). Levels for statistically significant differences between program and control groups are indicated as: * = 10 percent; ** = 5 percent; and *** = 1 percent.

Random assignment ratios vary across cohorts. Estimates are weighted to account for probability of being assigned to the treatment group.

Missing values are not included in individual variable distributions.

Distributions may not add to 100 percent because of rounding.

[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]Goverment benefits include food stamps, Temporary Assistance for Needy Families (TANF), unemployment insurance benefits, and Supplemental Security Income (SSI).

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

2.2 was collected by Hillsborough staff just before each student was randomly assigned.[5] The first column shows the data for the full sample, which provide a descriptive profile of the composition of all students who participated in the study.

Like community college students nationwide and at Hillsborough as a whole, the majority of participants in the study are women (57.0 percent). Just over 70 percent of the participants were between 18 and 20 years old at the time they enrolled in the study; that is, most sample members were of traditional college age. The study sample is racially diverse, with no racial majority — 32.4 percent of sample members are Hispanic, 24.7 percent are white, 36.8 percent are black, and the rest are Asian, Pacific Islander, or Other.

At the time of random assignment, when the baseline form was completed, the vast majority of sample members had no children (81.0 percent), and more than half of sample members reported being currently employed (56.4 percent). While their job status may have changed once the semester began, this provides some indication that many participants in the study were likely juggling the competing demands of work and school. Most (84.4 percent) sample members had earned a high school diploma, and a large proportion (58.5 percent) had graduated from high school or earned a GED during the year before they agreed to participate in the study. Around 30 percent of sample members are the first in their family to attend college. Only 13 percent indicated that their mother had earned a bachelor's degree or higher.

[5]The data sources are described in more detail later in this chapter.

The second and third columns of data in Table 2.2 present characteristics of sample members for the program and control group students separately. Separating this data into program and control groups is one way to show that random assignment resulted in similar research groups at baseline. Since students were randomly assigned to the program and control groups, the characteristics of students in each group should generally be similar at baseline. For example, the percentage of men in the program group should be about the same as the percentage of men in the control group.

An asterisk to the right of the control group column in the table indicates that the percentage of program group members with that characteristic is statistically significantly different from the percentage of control group members with that characteristic. There are a few differences between the two research groups, but no more than would be expected to occur by chance.[6] This helps to show that random assignment led to program and control groups that were very similar when the study began.

A comparison of the demographic variables in Table 2.1 and Table 2.2 shows that students participating in the learning communities study are younger and more likely to be a member of a minority group than the student body as a whole at Hillsborough. Since the study targeted students who need developmental education courses, it is unsurprising that the participants in the study are somewhat dissimilar from Hillsborough's population as a whole.

Data Sources

To study the learning communities program at Hillsborough, the analyses presented in this report rely on several data sources. These data sources are described below:

Baseline Data

Before being randomly assigned to the program or control groups, all students completed an informational form, called the Baseline Information Form (BIF). The BIF collected information on demographic and other background characteristics of students before they were influenced in any way by the program. Baseline data are used to describe the sample (for example, see Table 2.2) to demonstrate the similarity between research groups at the onset of the study and to identify students for subgroup analyses.

[6]In addition to the individual tests, an omnibus test was conducted to assess whether overall systematic differences in baseline characteristics were observed between the two research groups. The model's likelihood ratio test yielded a p-value of 0.71. This suggests that jointly, students' baseline characteristics are *not* a good predictor of their research status, as is expected in a random assignment study.

Operational Site Visits, Field Research, Faculty Survey, and Faculty Syllabi

Periodically throughout the operation of the learning communities program, NCPR research staff visited Hillsborough and maintained detailed "site diaries" that documented information on the random assignment process and study intake, the process of setting up and staffing the learning communities, and professional developmental activities. Changes in the learning communities programs were documented as well, along with problems encountered and solutions applied by the college.

In addition, a two-day field research visit was conducted in fall 2008. During this trip, the research team interviewed many college administrators, faculty, and staff, including those involved in the learning communities program. The interviews provided information about the operation of the program and key differences between the program and the college's standard services (what the control group was offered). The research team observed some learning community classes and also interviewed a small subset of program and control group students to gain a deeper understanding of their experiences at the college and, for program group students, in the learning communities program.

In addition, a faculty survey was administered to document the faculty's characteristics and pedagogical beliefs and practices. The survey was administered to all learning communities faculty as well as to all faculty who taught in stand-alone versions of those courses that were linked in the learning communities (that is, faculty that control group students may have encountered if they signed up for developmental reading or a college success course). Survey questions were designed to capture instructional strategies commonly associated with learning communities, participation in professional development opportunities, and the characteristics of teachers that might be associated with differences in teaching approaches, such as age, gender, seniority, and part-time versus full-time status.[7]

Finally, faculty syllabi from the learning communities linked courses were examined for evidence of practices commonly associated with learning communities, such as joint assignments, team teaching, and combined curriculum.[8]

These data sources are used primarily in Chapter 3 to describe the learning communities program, to illustrate how it was different from the college's standard services, and to describe its evolution.

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[7]The faculty survey at Hillsborough had an overall response rate of 58 percent. A disproportionately high percentage of program group faculty members responded compared with comparison group faculty members. For more detail on the faculty survey see Visher, Schneider, Wathington, and Collado (2010).

[8]For more detail on the syllabi analysis see Visher, Schneider, Wathington, and Collado (2010).

The Learning Communities Demonstration

Table 2.3

Three Cohorts of Enrollment into the Learning Communities Study

Hillsborough Community College Report

	Fall 2007	Spring 2008	Fall 2008	Spring 2009	Fall 2009
Cohort 1 (Fall 2007)	Program Semester	1st Postprogram Semester	2nd Postprogram Semester		
Cohort 2 (Spring 2008)		Program Semester	1st Postprogram Semester	2nd Postprogram Semester	
Cohort 3 (Fall 2008)			Program Semester	1st Postprogram Semester	2nd Postprogram Semester

Transcript Data

Hillsborough provided student-level transcript data for the sample members (program and control) participating in the study. These data are used to provide a detailed look at sample members' performance in college through various measures, such as enrollment status, credits attempted and earned, and grade point average (GPA). This report presents a range of transcript data outcomes for the first semester each sample member was in the study (called the "program semester") and the following semester (called the "first postprogram semester"). This yields a two-semester follow-up period. The report also presents registration information for a third semester (the second postprogram semester). Table 2.3 displays the timing of the program and postprogram semesters for the three cohorts of students in this study. The transcript data are used in Chapter 4 to describe the impacts of the learning communities program on education outcomes.

Chapter 3

The Learning Communities Program at Hillsborough Community College

This chapter provides an overview of the implementation of the learning communities program at Hillsborough Community College. College leaders initiated the program with the express goal of boosting the success rates of students who need developmental education. The implementation research, summarized in this chapter, sought to understand how the program was initiated, launched, and operated. This chapter describes the program model, as well as the institutional support for learning communities; registration, enrollment, and participation rates during the demonstration; a contrast of experiences between those who participated in learning communities and those who did not; and the growth and evolution of the learning communities program.

Key implementation findings include:

- A "basic" learning communities model was designed and implemented;
- A noteworthy portion (31 percent) of students assigned to the program group did not enroll in a learning community during their first semester in the study;
- Faculty and students suggested that co-enrollment in courses and the formation of student cohorts increased social linkages among students;
- A key element of teaching in learning communities — integration of curriculum in the two courses in the link — did not take hold until the last semester of the program;
- Overall, the learning communities program became stronger over the course of the demonstration, increasingly exhibiting practices that are characteristic of well-implemented and comprehensive learning communities.

The Program: A "Basic" Model for Students Who Need Developmental Reading Instruction

In the decade before it participated in the demonstration, Hillsborough had experimented with a small number of learning communities on several of its campuses, linking developmental reading or writing classes with freshman English, sociology, history, and

psychology. These learning communities were few in number and fairly basic, in that little systematic effort was made to combine the curriculum from the linked courses, and no extra services such as tutoring or supplemental instruction were incorporated into the program.

It was only after Hillsborough joined Achieving the Dream that learning communities took hold as a central strategy to improve the persistence and completion rates of developmental students. The college's leaders were encouraged by their own analyses of student records that suggested that students who had taken a college success course seemed to do better than those who had not. The college success course examines a range of academic and personal subjects, including educational goals, planning, time management, study skills, learning styles, leadership skills, child care concerns, health concerns, and career counseling. In addition to learning about managing test-taking anxiety and time management techniques, instructors informed students about other academic resources. The success course was designed to be interactive, and students engaged in many group projects and active learning activities. In addition, an explicit goal of the course was to foster stronger communication between faculty and students.

Based on its data, the college decided not only to require this course for all students who needed one or more developmental courses (although students were not required to take the course in their first semester) but also to link it with a developmental reading course as the model to be tested in the Learning Communities Demonstration. The college chose developmental reading to anchor the learning communities to be tested for two reasons: It was a prerequisite for most courses at the college, and the number of Hillsborough's students that successfully transitioned out of developmental reading into college-level courses was not only low, but was below the Florida Community College System average. By linking the courses, college leaders hoped that skills learned in the college success course could be applied in the developmental reading course. The learning communities program was launched in fall 2007, and the first cohort of students was randomly assigned that semester.

The developmental reading anchor included either the highest developmental reading course (a level below college-level English) or the intermediate developmental reading course (two levels below). Students enrolled in the course as required by their score on a state-mandated placement test. Both reading courses emphasized vocabulary acquisition, reading comprehension, and writing to enhance literacy development. Learning community experts would describe Hillsborough's program model as the most basic form of a learning community because it linked two courses without additional supports or enhancements. Because many community colleges adopt this straightforward learning community model, it was important to examine it within the national demonstration to understand its effects on student success and how the effects of this model might differ from those of more comprehensive models.

Once configured, the learning communities program required leadership and maintenance. Successful, sustainable learning communities programs depend on a number of institutional characteristics, including a paid coordinator who manages the program, strong support from college leadership, solid buy-in from faculty, and a collaborative relationship between academic and student affairs divisions.[1] The program at Hillsborough enjoyed all of these elements, including early support from college leaders, enthusiasm from faculty that grew over time, and a skilled and dedicated program coordinator. The learning communities coordinator, who assumed her position in the first semester of the study, served as the chief organizer for the demonstration; she worked with administrators to recruit faculty to teach in the learning communities, organized events and meetings for faculty development, coordinated workshops and monthly meetings, oversaw random assignment activities, and communicated with NCPR researchers.

Hillsborough offered learning communities throughout the day and evening, but by the second semester of the study the college had altered how it scheduled learning communities in order to boost enrollment. At the start of the demonstration, linked courses were scheduled on the same days, but not always contiguously. For example, sometimes the college offered a course in the morning and scheduled its link in the afternoon. This led to registration and attrition challenges because course schedules were not always compatible with students' schedules. College leaders addressed the registration challenges by the second semester of the study and employed a "blocked scheduling" strategy. That is, linked courses were scheduled back to back or with a one-hour break between classes in either the morning, afternoon, or evening. Student recruitment and registration in the learning communities improved once the college instituted blocked scheduling.

Both adjunct and full-time faculty taught in the learning communities; according to the faculty survey, nearly two-thirds of learning community survey respondents were adjuncts. This was a deliberate strategy on the part of the college's leaders because it not only sent the message to adjuncts that students' success was a priority for the college; in many cases, adjuncts were paired with full-time faculty. In this way, the program facilitated relationships between adjuncts and full-time faculty that would not otherwise have developed. The college hoped that through these faculty pairings, full-time faculty would help to draw adjunct faculty into the college's aspirations and goals for developmental students, and reciprocally, that adjunct faculty could bring new ideas and experiences into the classroom.

[1] Visher, Schneider, Wathington, and Collado (2010).

Program Participation

As shown in Figure 3.1, a total of 1,071 students across the three campuses and three semesters of the study were randomly assigned to either a program group, whose members were told they could enroll in a learning community, or a control group, whose members were advised that they had to enroll in a developmental reading class as a prerequisite for college-level courses and that they had to take the college success course eventually in order to graduate. Note that although students were advised that these courses were required, students were not mandated to register for either course at the time of random assignment.

Over the three semesters of Hillsborough's participation in the demonstration, 24 learning communities were offered to the 709 students randomly assigned to the program group. Of the 709 students in the program group, 99 percent registered for a course but only 581 (82 percent of all program group students) were still enrolled at the date of the add/drop deadline.[2] Of those that were still enrolled as of that date, 491 (69 percent of all program group students) were enrolled in a learning community (and potentially other courses as well). Ninety were not enrolled in a learning community, but were enrolled in at least one stand-alone course.[3] Registration rates for control students were similar: 99 percent of the 362 students assigned to the control group registered for courses and 83 percent of all control group students were still enrolled at the add/drop deadline date.

Participation rates for the program group did improve for the third cohort of students participating in the study. Compared with program group students in the first two cohorts, the third cohort's program group students were most likely to enroll in a learning community.[4] The improved participation rate may have been due to a number of factors, including a decision to postpone dropping students for failure to pay tuition (known as "purging"),[5] rearranging the schedule so that classes in learning communities were scheduled back to back rather than spaced out during the day, and improved outreach to students and intake procedures.

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[2]The add/drop deadline typically occurred around one week after the semester began.

[3] Enrolling in a learning community is defined as being enrolled in a college success course and a developmental reading course that required co-enrollment in the two courses (this ensures that these student, at a minimum, were part of a cohort of students).

[4]Among the third cohort's program group students, 81.5 percent enrolled in a learning community. In contrast, only 62.4 percent of the first two cohort's program group students enrolled in a learning community.

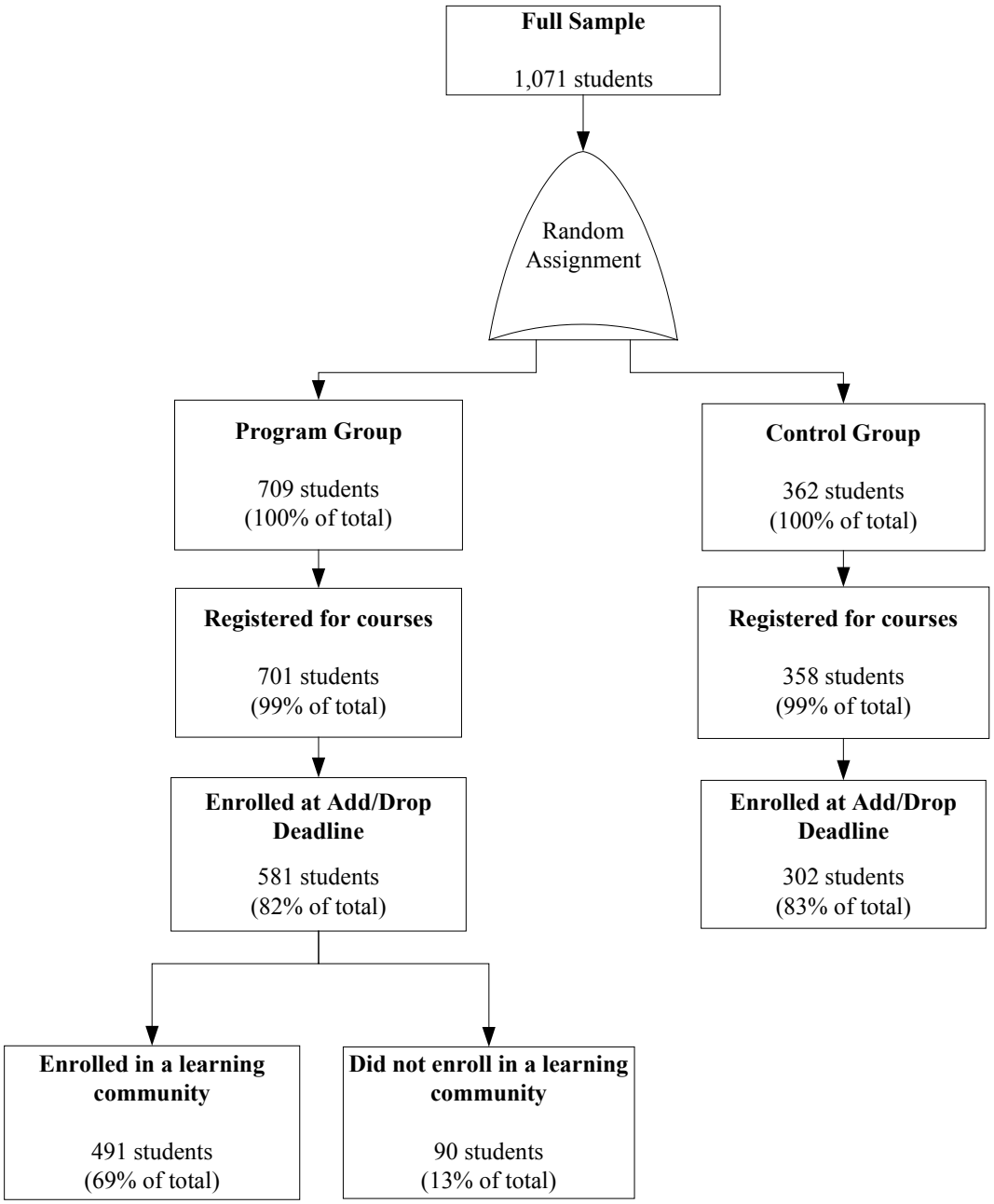
[5]Based on advice from MDRC, the college suspended purging for both program and control group students during the fall 2008 semester. MDRC was concerned that the purging policy could result in too few program group students participating in learning communities, thereby reducing the power of the study to detect the effects of the treatment.

The Learning Communities Demonstration

Figure 3.1

Registration Flow Diagram

Hillsborough Community College Report



How the Learning Community Experience Differed from Regular Services for Developmental Students

Table 3.1 compares the experience and services that were available to students enrolled in learning communities with those available to students who enrolled in stand-alone classes. In addition to these program differentials, evidence suggests that there were a few qualitative differences between the group experiences. For example, relationships between learning communities faculty were distinct from those between non-learning communities faculty, and relationships between students in learning communities appeared to be stronger than those between students in stand-alone classes. As the learning communities model evolved, and faculty began incorporating more integrative instructional techniques, reading courses also became dissimilar. In addition, students chose their first-semester courses differently; enrollment rates show that program group students took the college success course at higher rates than control group students.

The pedagogical hallmarks of learning communities — integration, collaboration between faculty, and student cohorts — are not expected to be found in regular classes, or at least not to the same degree as in learning communities. On the other hand, teachers in stand-alone classes may be just as likely as teachers in learning communities classes to use instructional strategies that encourage active, collaborative learning; students in these classes are also free to access support services such as tutoring and advising. When considering the college success courses, interviews with faculty suggested that the success courses that were taught in learning communities were similar in content and approach to those that were stand-alone and unlinked — the version of the college success course experienced by those control group students who chose to take it (at a significantly lower rate than program group students). Faculty who taught both linked and stand-alone college success classes were required to make at least three contacts with each student in the class. This requirement ensured high levels of faculty-student engagement within the course. In focus groups, students reported overall satisfaction with the course and their instructors, with no clear difference between learning community students and control group students. Clear contrasts in satisfaction were also not evident across developmental reading classes; however, the approach to developmental reading began to differ somewhat as the learning communities model evolved over time. Integrated assignments within the learning community and group projects began to take the place of typical developmental reading assignments.

Relationships between faculty and relationships between students in the learning community may have differed somewhat from the relationships established between control group participants. In responses to the faculty survey, learning community faculty said that they were more likely to collaborate with their teaching partner to help students as a result of teaching in learning community. All learning community faculty (22 survey respondents) reported commu-

The Learning Communities Demonstration

Table 3.1

Program Differential

Hillsborough Community College Report

Program Feature	Learning Communities Program	Regular College Services
Curricular integration	• Theme-based approach to integrating courses • Courses include at least three thematic assignments • Minimal at start of demonstration, increased over time	• Informal, at the discretion of faculty members • Limited, since students not all taking the same classes together
Faculty collaboration	• Teaching pairs collaborate to choose a theme and plan assignments and projects • Minimal at start of demonstration, increased over time	• Faculty rarely collaborate to plan their courses
Active learning	• Faculty encourage active learning by assigning group projects and group presentations • Student success course was designed to be interactive	• Limited information on control faculty's use of active learning strategies • Student success course was designed to be interactive
Student engagement	• Student cohorts increased opportunity for students to create peer support networks • Students had open, supportive relationships with faculty	• Students formed fewer close relationships with peers • Students had open, supportive relationships with faculty
Connection to student support services	• The student success course provides information about services available on campus • Access of services depends on students' needs	• The student success course provides information about services available on campus • Access of services depends on students' needs

SOURCE: MDRC field research.

nicating with other faculty about shared students, with over one-third (8 of 22) having such conversations more than five times a semester.

One faculty member characterized the positive aspects of collaborative instruction in a learning community: "There is another person working with the same set of students, which enables multiple perspectives on that group individually and collectively. You have a designated partner to work with throughout the term instead of leaving your involvement with other faculty to chance." When asked what was different about teaching in a learning community, about half the faculty who completed the survey echoed that stronger faculty collaborations were part of the learning community model. One faculty member described the extra work that that was a necessary part of this collaboration: "In a learning community, both professors make a commitment and have to communicate in order to develop a shared syllabus, as well as to implement the shared strategies."

The learning communities fostered strong relationships among students. Faculty reported in focus groups and on the survey that students felt more comfortable because the same group shared two instructors and two classes. Relationships among students in the same cohort seemed to benefit, as students established friendships and support networks with other students in their learning community. When asked what was different about teaching in a learning community, about half of learning communities faculty said that students developed stronger bonds. For example, one faculty member stated: "Students in a learning community are more personally aware and involved with each other and the instructor. The bond and connection helps with retention and the ability to help each other instead of always looking for the instructor to help."

Students' behavior also differed with respect to course selection. Table 3.2 illustrates that course-taking patterns were different between the program and control groups. While the two groups were about equally likely to enroll in a developmental reading class (about 79 percent for the program group and 76 percent for the control group), the program group was more likely than the control group to enroll in the college success course — by 27 percentage points. This is not surprising, given that all study participants were required to take the developmental reading course before attempting college-level courses, whereas enrollment in the college success course could be postponed. However, the difference is important to note, since it represents one dimension of a service differential that could account for any program impacts observed in the study. It is also important to note that even when control group students enrolled in a college preparatory reading course and a college success course, they encountered different students in each class (unlike program group students).

The Learning Communities Demonstration

Table 3.2

Course-Taking Patterns,
Program Semester Through First Postprogram Semester

Hillsborough Community College Report

Outcome	Program Group	Control Group	Difference (Impact)	Standard Error
Program Semester				
Attempted College Prep Reading (%)	78.6	75.9	2.6	4.1
Attempted College Prep Reading I	47.9	50.8	-2.9	7.7
Attempted College Prep Reading II	30.6	25.1	5.5	7.1
Attempted College Success course (%)	76.5	49.3	27.2 ***	4.5
First Postprogram Semester				
Attempted College Prep Reading (%)	27.8	28.5	-0.8	4.0
Attempted College Prep Reading I	5.5	6.4	-0.8	1.6
Attempted College Prep Reading II	22.2	22.2	0.1	3.6
Attempted College Success course (%)	5.2	5.1	0.1	1.5
Sample size (total = 1,071)	709	362		

SOURCE: MDRC calculations from Hillsborough 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 within cohorts, and estimates are weighted to account for the different random assignment ratios. Standard errors are clustered by learning community link.

Estimates are adjusted by cohort and campus.

Cumulative outcomes include summer terms.

Program Evolution

The discussion to follow describes the extent to which the learning communities at Hillsborough incorporated the pedagogical components considered by experts to contribute to robust learning communities. In addition, this section illustrates how implementation of these core components changed over time. These pedagogical components include curricular integration, close collaboration between faculty pairs in planning and delivering curriculum, and instructional strategies that encourage active, collaborative learning. As its participation in the demonstration continued, Hillsborough made intentional changes to strengthen and scale up its learning communities model.

Considered a key element of strong learning communities, curricular integration is a teaching approach in which strategies are used to enhance and facilitate learning across disci-

plines, courses, or personal experiences. To achieve curricular integration, collaboration between faculty pairs takes on great importance. At the beginning of the demonstration, there was large variation in the level of collaboration between faculty pairs. This is not surprising, given that most program leaders had not fully endorsed curricular integration and were preoccupied with getting random assignment procedures running smoothly, so that they had little time to focus on the program itself. Similarly, many faculty members were new to learning communities and had received little or no training in curricular integration or other strategies commonly used in learning communities.

However, in part due to participation in professional development activities over the course of the demonstration, attitudes and practices among faculty changed over time. These faculty development activities included workshops led by experienced Hillsborough faculty and faculty from neighboring Valencia Community College, where a strong learning community program had recently developed; consultant visits from the Washington Center for Improving the Quality of Undergraduate Education at Evergreen State College; and visits to Kingsborough Community College to see its well-established program in action.[6] In addition, Hillsborough sent faculty teams to the National Summer Institute on Learning Communities coordinated by the Washington Center in 2007 and to the Summer Workshops on Learning Communities at Kingsborough in 2008.

As more faculty were exposed to the ideas presented in these settings about how to better take advantage of the learning community structure to change the way teaching and learning take place, more faculty began to use integrative and other instructional strategies in the classroom. On the faculty survey, one faculty member reflected on the positive potential of integrative strategies by stating, "Working on cross-curricular assignments helps students make the connection between courses and take the step from taking courses to gaining an education." The growth of these practices is reflected in Table 3.3, which highlights key faculty development events attended by Hillsborough faculty and the related maturation in practices. Nevertheless, variation in the level of integration remained, as reflected by responses to the faculty survey: Only 14 percent of faculty reported collaborating frequently with other faculty on syllabi or assignments for their course, with around 33 percent doing so only once per term.

Statements made during interviews and focus groups as well as the assessment of the syllabi collected from the learning communities faculty illustrate the maturation of the learning communities to become more comprehensive and include more curricular integration. As

[6]The Washington Center at The Evergreen State College is renowned for its training on learning community theory and practice. Kingsborough Community College, another Learning Communities Demonstration college, has long experience with developmental learning communities and runs regular summers workshops for practitioners across the country.

Table 3.3

Faculty Development Activities and Learning Community Program Evolution

Hillsborough Community College Report

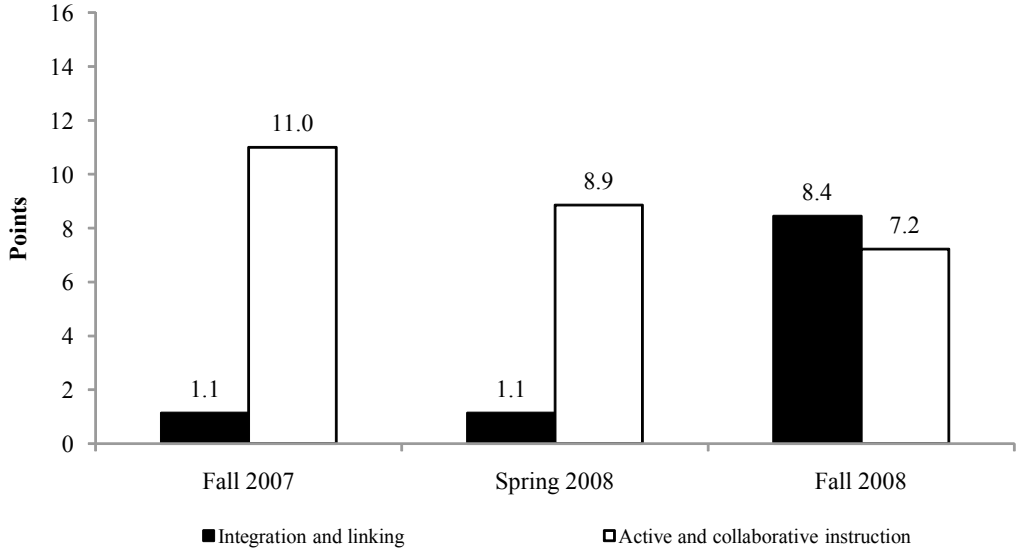
Fall 2007	Spring 2008	Fall 2008
Washington Center consultants observe learning community classrooms in October, provide feedback	Coordinating team visits Kingsborough Community College	In preparation for final semester, faculty attend Kingsborough Community College's Summer Learning Community Institute (June)
Hillsborough faculty with learning community experience offer in-house workshop	Learning community themes emphasized by coordinator and created by faculty	Kingsborough consultant visits for faculty development workshop (October)
	Integrated assignments introduced	Monthly mandatory in-house faculty workshops continue
	Valencia Community College learning community expert conducts workshops	Coordinator requests creation of a single syllabus for both courses in the learning community
	Three in-house meetings required of all learning community faculty	

The Learning Communities Demonstration

Figure 3.2

Average Scores on Two Dimensions from an Assessment of Learning Community Syllabi: Fall 2007 - Fall 2008

Hillsborough Community College Report



SOURCE: MDRC calculations used syllabi collected from learning communities at Hillsborough Community College.

NOTES: Syllabi were evaluated using a rubric to calculate the number of references made to three key dimensions: references to learning communities, references to use of integrated curriculum, and references to use of active and collaborative instruction. References to learning communities and to the use of integrated curriculum are collapsed into the category '"ntegration and linking."

Results are based on evaluations of seven syllabus sets from learning communities in the fall 2007 semester, seven syllabus sets from learning communities in the spring 2008 semester, and 10 syllabus sets from learning communities in the fall 2008 semester. The total of 24 syllabi sets represents 100 percent of all syllabi in use by learning communities at Hillsborough Community College across the three semesters.

Figure 3.2 shows, the frequency with which integrative practices, such as themes for the linked courses and joint assignments, were mentioned in learning communities faculty syllabi steadily increased over time (Appendix Table C.1 breaks down these ratings by indicators of these practices).

Interestingly, while linking and integration activities increased significantly over the three semesters, evidence of active and collaborative learning was present during the first semester and decreased slightly over time. Perhaps, as faculty spent more time linking and

integrating their courses, their focus on active and collaborative learning weakened, at least in the information they provided on their syllabi. Evidence from faculty focus groups and interviews made it clear that active learning that involved students collaborating with one another on long-term projects was always a feature of the learning communities. Faculty encouraged active learning by assigning group projects and group presentations, such as team competitions, investigative reporting, and short in-class group activities. According to the faculty, these methods helped to develop skills in both reading and overall social development. As one instructor explained: "When they get into groups, they have to learn how to work together as a team and be tolerant of other people, people's ideas...and it's about learning to work together and sometimes they'll say, well, she's not saying anything, not contributing, but it's because she's a different learning style or personality type, so it's learning how to work together."

During the last semester of the demonstration (fall 2008, during which the third cohort of students enrolled in learning communities), some faculty spoke enthusiastically and at length about in-classroom activities and development of crossover skills between the courses. One faculty member described her collaborative process with her teaching partner: "[We] planned on what we could share, what we could actually work across the two courses...mainly the reading materials or what we selected. What type of reading materials could be used for both the study skills class and their reading class as well as what type of activities could we do? Could we do a jigsaw activity where you break up what the students are doing? Is it a straight lecture? Will it be I'll have them read it and then draw the main idea, and then she'll talk about how to study for a test?"

In addition, by the final semester of the demonstration, faculty pairs had selected overarching themes to both motivate students and show how materials in the two courses linked. Themes included social issues, such as censorship, diversity and immigration, plagiarism, and poverty and homelessness. Another significant development by the time the third cohort had enrolled was that the learning communities coordinator began to strongly encourage (some said require) faculty pairs to develop at least three joint assignments related to the theme of their learning community and adapt lessons for their individual course to fit with the theme. For example, in the plagiarism-themed learning community, students were required to write a brief paper illustrating the differences between plagiarized work and genuine authorship as a reading/writing assignment for both courses.

Summary

Over the course of the three semesters, the learning communities program at Hillsborough evolved from a basic model that relied on student cohorts to bring about the expected and desired outcomes, to a more comprehensive model that incorporated other key elements of comprehensive, robustly implemented learning communities, including faculty collaboration

and curricular integration. Faculty became more engaged as they participated in training and professional development activities and as practices such as joint assignments, overarching themes, and common readings became more prevalent. The differential between the experience of the learning communities students and the control students expanded as a result of this evolution. Even so, the primary contrast between the learning communities and regular services remained in the cohorts created by co-enrollment in courses, as well as in different course-taking patterns in which learning communities students enrolled in the college success course at a much higher rate.

Chapter 4

Program Impacts on Educational Outcomes and Conclusions

A key goal of learning communities is to increase educational attainment among students. This chapter focuses on the impact of Hillsborough's learning communities program on academic progress for three semesters after students first enrolled in the demonstration. Academic outcomes are measured using student transcript data collected after students were randomly assigned either to the program group (who were eligible to participate in a learning community) or to the control group (who were eligible to participate in the college's standard services).

The key impact findings are:

- **For students overall, the learning communities program did not have meaningful impacts on educational outcomes during the program semester.** For example, there was very little difference between program group students and control group students in enrollment rates, average total credits attempted, average total credits earned, or likelihood of completing developmental reading during the program semester.

- **For students overall, the learning communities program did not have meaningful impacts on students' rates of persistence (that is, continued enrollment).** In the first *postprogram* semester 60.0 percent of program group students registered for at least one course and 54.7 percent of control group students registered for at least one course. This 5.3 percentage point difference is not statistically significant.[1] By the second postprogram semester, the difference in registration rates between program and control group students dropped to -0.5 percentage points, also not a statistically significant difference.

- **For the third cohort of students (fall 2008), who received a more comprehensive version of learning communities,[2] evidence suggests that the learning communities program had a positive impact on some educational outcomes.** For example, in the program semester, the third cohort's

[1] See Box 4.1 for an explanation of statistical significance.

[2] For more detail about the growth and evolution of Hillsborough's learning communities program, see Chapter 3.

program group students earned 1.2 credits more than their control group counterparts. In addition, in the first postprogram semester, the third cohort's program group students were 10.3 percentage points more likely than their control group counterparts to register for at least one course. However, this impact on registration did not persist through the second postprogram semester.

As described more fully in Box 4.1, the tables that follow in Chapter 4 present average outcomes for the students assigned to the program group and the control group, the difference between the two groups' averages (which represents the estimated impact of the program), and the standard error of the difference.[3]

This chapter begins with an overview of the academic outcomes examined in the study. This is followed by a discussion of the program's impact on academic outcomes, above and beyond the college's standard program services, during students' first semester in the study (the "program semester"); it then presents the impacts on academic outcomes during the following semesters (the "postprogram semesters"). Next, the chapter discusses the program's impacts for some key subgroups of sample members. The chapter concludes with reflections on the findings and a discussion of how they fit into the body of evidence available on the effectiveness of learning communities.

Selected Academic Outcomes

The key indicators of student academic progress examined in this report reflect measures that are commonly viewed as important in the community college setting. In order to reduce the likelihood of observing chance relationships, the number of primary outcomes examined is limited.[4] The three primary indicators of student academic progress are:

- *Credits Earned* — In order for a Hillsborough student to earn an associate in arts (AA), associate in science (AS), or an associate in applied science (AAS), she must complete at least 60 credits.[5] As such, a key indicator of

[3]The average outcomes are adjusted for each student's cohort, which reflects the point at which the student was randomly assigned to the program group or control group as well as his or her campus. Weights are applied to adjust for the change in random assignment ratio that occurred during the enrollment of the first cohort of students. No other covariates are included. For a description of the statistical model used in the impact analyses, see Appendix B.

[4]Schochet (2008). For each individual statistical test conducted in this report the chance of detecting a spurious relationship is around 10 percent. The more tests that are conducted, the more likely that at least one test will yield a spurious relationship. As a result, it is advisable to focus analyses on a limited number of primary outcomes.

[5]http://www.hccfl.edu/media/8262/assoc_degree.pdf.

Box 4.1

How to Read the Impact Tables in This Report

Most tables in this report use a similar format, illustrated below. The abbreviated table below displays transcript data and shows some educational outcomes for the program group and the control group. The third row, for example, shows that 76.5 percent of the program group members and 49.3 percent of the control group members enrolled in the college success course.

Because individuals were assigned randomly either to the program group or to the control group, the effects of the program can be estimated by the difference in outcomes between the two groups. The "Difference" column in the table shows the differences between the two research groups' outcomes — that is, the program's estimated *impacts* on the outcomes. For example, the estimated impact on attempting the college success course can be calculated by subtracting 49.3 percent from 76.5 percent, yielding an increase or estimated impact of 27.2 percentage points. This difference represents the *estimated* impact rather than the *true* impact because, although study participants are randomly assigned to the program and control groups, there is still a possibility that differences could be observed by chance.

Differences marked with one or more asterisks are *statistically significant*, meaning that there is only a small probability that the observed difference occurred by chance. The number of asterisks indicates the probability of observing differences at least as extreme as the observed differences if the program's true impact is zero. One asterisk corresponds to a 10 percent probability; two asterisks, a 5 percent probability; and three asterisks, a 1 percent probability. For example, as the third row of the table excerpt shows, the program's estimated impact on students enrolling in the college success courses is 27.2 percentage points. The three asterisks indicate that this difference is statistically significant at the 1 percent level, meaning that there is less than a 1 percent chance of observing a difference this large if the program's true impact is zero.

The statistical significance is calculated using the standard error of the impact estimate, shown in the rightmost column. The standard error is a measure of uncertainty or variability around the impact estimate. Some useful rules of thumb are that there is about a 90 percent chance that the true impact is within plus or minus 1.65 standard errors of the estimated impact, roughly a 95 percent chance that the true impact is within plus or minus 1.96 standard errors of the estimated impact, and about a 99 percent chance that the true impact is within plus or minus 2.58 standard errors of the estimated impact. For example, in the third row of data below, there is roughly a 99 percent chance that the program's impact on students' likelihood of attempting the college success course lies between 15.59 and 38.45 percentage points, calculated as $27.2 \pm (2.58 \times 4.5)$.

(continued)

Box 4.1 (continued)

Outcome	Program Group	Control Group	Difference (Impact)		Standard Error
Attempted College Prep Reading (%)	78.6	75.9	2.6		4.1
Completed College Prep Reading (%)	60.4	58.5	1.9		4.0
Attempted College Success course (%)	76.5	49.3	27.2	***	4.5
Completed College Success course (%)	59.9	36.9	23.0	***	4.1

student progress toward a degree is the number of credits a student has earned.

- *Persistence (as measured by continued enrollment)* — One of the goals of learning communities is to provide a more engaging educational experience for students. This increased engagement is hypothesized to increase students' likelihood to persist in school.[6] As such, an important indicator of the success of learning communities is whether students continued to enroll in school.

- *Completion of developmental reading course* — The learning communities program at Hillsborough targeted students who need remediation in reading. Each of the learning communities linked a developmental reading class with a college success course. The learning communities program may increase a student's likelihood of completing a developmental reading course, which would allow her to enroll in a higher-level developmental reading course or to enroll in college-level courses for which developmental reading is a pre-requisite.

Secondary indicators of student progress include:

- *Grade Point Average (GPA)* — Grades are a common indicator of academic performance, although some believe they provide little information about what students have actually learned.[7] GPA is used here as a secondary indicator of academic performance.

[6]Tinto (1975, 1997).
[7]Adelman (2004).

- *Course withdrawals* — Students have the option to formally withdraw from a course once the add/drop period has ended during the first 10 weeks of the semester. It may be advantageous for a student to withdraw from a course rather than receive a failing grade, since withdrawals are not included in a student's GPA. However, withdrawing from a course can affect a student's enrollment status, which in turn can affect financial aid. Some students might not be able to afford to see their financial aid reduced, while others might prefer to avoid an "F" on their transcript at any cost. Because there is no straightforward interpretation of course withdrawals, this outcome is considered a secondary indicator of the program's effectiveness.

Effects on Educational Outcomes: The Full Sample

Learning communities may be an effective strategy to improve students' chances of achieving academic success at community colleges. Explored below is whether the opportunity to participate in a learning community at Hillsborough had a positive impact on educational outcomes during the program semester. This is followed by analyses of whether the opportunity to participate in a learning community had impacts during the two postprogram semesters.

Program Semester

Table 4.1 displays academic outcomes from the program semester. During this semester, program and control group students registered at similar rates (82.0 percent and 83.4 percent, respectively).[8] It is unsurprising to observe nonsignificant differences in registration rates during the program semester, since the add/drop deadline occurred before the program group students had received significant program services (usually about one week into the semester).

While the learning communities program might not be expected to influence program semester registration rates, advocates of learning communities would likely expect them to have a positive impact on other academic outcomes, such as credits earned, the likelihood of completing a developmental reading class, and grades. However, this generally was not the case at Hillsborough. As shown in Table 4.1, during the program semester program group students earned an average of 6.7 credits and control group students earned an average of 6.5 credits. This difference in total credits earned is not statistically significant. Similarly, the percentage of

[8]Registration rates presented in Table 4.1 (and throughout this report) reflect the percentage of students enrolled in at least one course at the end of the add/drop deadline. The add/drop deadline generally occurs around one week after classes begin and reflects the deadline for a refund.

The Learning Communities Demonstration

Table 4.1

Transcript Outcomes, Program Semester

Hillsborough Community College Report

Outcome	Program Group	Control Group	Difference (Impact)	Standard Error
Program semester				
Registered for any courses (%)	82.0	83.4	-1.4	3.6
Enrolled in a learning community (%)	69.0	0.4	68.6 ***	4.6
Number of credits attempted	9.3	9.2	0.0	0.4
Regular credits	4.1	3.9	0.2	0.2
Developmental credits	5.1	5.3	-0.2	0.3
Number of credits earned	6.7	6.5	0.3	0.4
Regular credits	3.0	2.6	0.3	0.2
Developmental credits	3.7	3.9	-0.1	0.3
Attempted College Prep Reading (%)	78.6	75.9	2.6	4.1
Attempted College Prep Reading I	47.9	50.8	-2.9	7.7
Attempted College Prep Reading II	30.6	25.1	5.5	7.1
Attempted College Success course (%)	76.5	49.3	27.2 ***	4.5
Completed College Prep Reading (%)	60.4	58.5	1.9	4.0
Completed College Prep Reading I	35.9	38.0	-2.1	6.3
Completed College Prep Reading II	24.6	20.5	4.0	6.0
Completed College Success course (%)	59.9	36.9	23.0 ***	4.1
Withdrew from any courses (%)	11.5	10.8	0.7	2.2
Term GPA (%)				
2.0 to 4.0 or C/A	56.0	56.6	-0.5	3.7
0 to 1.9 or F/C-	20.8	22.5	-1.7	2.6
No GPA[a]	23.1	20.9	2.3	3.7
Sample size (total = 1,071)	709	362		

SOURCE: MDRC calculations from Hillsborough 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 indicated as: *** = 1 percent; ** = 5 percent; * = 10 percent.

The probability of being assigned to the treatment group varies within cohorts, and estimates are wei account for the different random assignment ratios. Standard errors are clustered by learning community

Estimates are adjusted by cohort and campus.

The measures "Number of credits attempted" and "Number of credits earned" include developmental and vocational credits. Vocational credits can be applied to a certificate but are not considered college cr thus do not count toward an associate's degree or transfer. Vocational credits are not shown separately in because they represent a negligible proportion of total credits attempted and earned.

[a]"No GPA" category includes students who did not enroll.

program group students and control group students who passed developmental reading was similar during the program semester.

Notably, control group students attempted an average of 9.2 credits and passed an average of 6.5 credits, for an overall pass rate of slightly over 70 percent. Similarly, among control group students who attempted developmental reading, pass rates were 77 percent.[9] This is noteworthy because it demonstrates that the program group had a fairly high bar to surpass, since control group students performed well in the courses they attempted.

The one outcome on which the program had a clear and positive impact during the program semester is completing the three-credit college success course. During this semester, 59.9 percent of program group students completed the college success course, compared with only 36.9 percent of control group students. This 23.0 percentage point difference is highly statistically significant. Importantly, it largely reflects the fact that program group students were 27.2 percentage points more likely to attempt this course. Given that the program did not have an impact on overall credits attempted or earned, the findings with respect to the college success course suggest that control group students simply took (and passed at a similar rate) other courses instead of the college success course. That said, since more program group students took and passed the college success course, it is possible that any knowledge and skills they gained from this course related to navigating life in college could translate into other positive academic outcomes during the postprogram semesters.

Postprogram Semesters

Table 4.2 shows academic outcomes during the two postprogram semesters (that is, for the second and third semesters after random assignment). During the first postprogram semester, 60.0 percent of all program group students were registered for at least one course at the add/drop deadline, compared with 54.7 percent of all control group students. This 5.3 percentage point difference is not statistically significant. While the magnitude of this difference might be considered noteworthy, and its statistical insignificance is on the borderline ($p = .13$), the fact that the difference in registration rates for the second postprogram semester is near zero (-0.5) suggests that the program did not have any longer-term impacts on students' likelihood of persisting in school.

[9]Pass rates shown in tables reflect the percentage of *all s*tudents who passed the course, including those who did not attempt the course. Those students who did not attempt the course are counted as not having completed the course. Comparisons among only those students who attempt a course are "nonexperimental," since the program may influence who takes a particular course. As a result, in order to ensure the integrity of the experiment, the calculations shown in the tables are conducted for *all* students. See the section of this chapter called "Was Low Program Uptake a Serious Problem?" and Appendix B to learn more about analyses conducted for only those students who registered during the program semester.

The Learning Communities Demonstration

Table 4.2

Transcript Outcomes, Postprogram Semesters

Hillsborough Community College Report

Outcome	Program Group	Control Group	Difference (Impact)	Standard Error
First Postprogram Semester				
Registered for any courses (%)	60.0	54.7	5.3	3.5
Enrolled in a learning community (%)	2.9	0.3	2.6 ***	0.9
Number of credits attempted	6.5	6.1	0.4	0.4
Regular credits	3.2	3.0	0.2	0.3
Developmental credits	3.2	3.1	0.2	0.3
Number of credits earned	4.3	3.9	0.4	0.3
Regular credits	2.1	1.9	0.2	0.2
Developmental credits	2.1	2.0	0.2	0.2
Withdrew from any courses (%)	14.7	10.6	4.1 *	2.3
Term GPA (%)				
2.0 to 4.0 or C/A	36.7	34.5	2.2	3.0
0 to 1.9 or F/C-	19.9	17.7	2.2	2.5
No GPA[a]	43.3	47.8	-4.5	3.5
Second Postprogram Semester				
Registered for any courses (%)	45.9	46.4	-0.5	3.4
Number of credits attempted	4.6	4.9	-0.3	0.4
Regular credits	3.3	3.4	-0.1	0.3
Developmental credits	1.3	1.5	-0.2	0.2
Sample size (total = 1,071)	709	362		

SOURCE: MDRC calculations from Hillsborough 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 within cohorts, and estimates are weighted to account for the different random assignment ratios. Standard errors are clustered by learning community link.

Estimates are adjusted by cohort and campus.

The measures "Number of credits attempted" and "Number of credits earned" include developmental, regular, and vocational credits. Vocational credits can be applied to a certificate but are not considered college credits and thus do not count toward an associate's degree or transfer. Vocational credits are not shown separately in the table because they represent a negligible proportion of total credits attempted and earned.

[a]"No GPA" category includes students who did not enroll.

Much like the lack of program impacts on persistence during the postprogram semester, the program did not have a meaningful impact on the number of credits students attempted or earned during the first postprogram semester.

Cumulative Outcomes

Table 4.3 shows cumulative academic outcomes for the program semester and the first postprogram semester combined. This table reiterates the findings presented in Tables 4.1 and 4.2 — that the opportunity to participate in learning communities did not have a meaningful impact (positive or negative) on students academically.

Was Low Program Uptake a Serious Problem?

The analyses described in this report are *intent-to-treat (ITT)* analyses, answering the question "What is the impact of being assigned to the program group?" rather than the question "What is the impact of receiving the program?"[10] At Hillsborough, 31 percent of students who were randomly assigned to the program group did not enroll in a learning community during the program semester (in experimental nomenclature, these students are sometimes referred to as "no-shows").[11] The ITT analyses presented above compare outcomes for *all* program group students with outcomes for *all* control group students. These estimates of the program's impacts are likely a dampened measure of the effect of Hillsborough's learning communities on those who actually experienced them, because the program is unlikely to have any impact on no-shows. As a result, it is reasonable to wonder whether the findings presented above reflect the 69 percent rate of program uptake, rather than indicating that Hillsborough's learning communities did not add value above and beyond the college's usual services.

In order to attempt to address this question, nonexperimental analyses were conducted for only those students (program group and control group) who enrolled in at least one class by the add/drop deadline of the program semester. These students are of interest because they had a significantly higher rate of program uptake, or participation in learning communities (84 percent), than the full sample of students participating in the study. As a result, analyses using this subset of students may provide a closer estimate of the impact of the learning communities program on the students who actually participated in them. These "sensitivity" analyses confirm the general finding that, overall, the learning communities program was not more effective than the college's usual services. Therefore, the rate of program uptake is an unlikely explanation for the absence of observed program impacts. For more details on these analyses, see Appendix B.

[10]For a detailed description of the difference between these two types of analyses and their interpretations, see: Bloom (2006).

[11]Bloom (1984, 2006).

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Table 4.3

Cumulative Transcript Outcomes, Program Semester Through First Postprogram Semester

Hillsborough Community College Report

Outcome	Program Group	Control Group	Difference (Impact)	Standard Error
Registered for any courses (%)	87.9	85.1	2.8	2.9
Average number of semesters registered	1.5	1.5	0.0	0.1
Enrolled in a learning community (%)	71.7	0.7	71.0 ***	4.3
Number of credits attempted	16.6	16.2	0.4	0.8
Regular credits	7.7	7.3	0.4	0.5
Developmental credits	8.8	8.9	-0.1	0.5
Number of credits earned	11.6	11.1	0.5	0.7
Regular credits	5.3	4.9	0.5	0.4
Developmental credits	6.2	6.2	0.0	0.4
Term GPA (%)				
2.0 to 4.0 or C/A	48.8	50.0	-1.2	3.2
0 to 1.9 or F/C-	33.7	31.1	2.6	2.9
No GPA[a]	17.5	18.9	-1.4	3.1
Sample size (total = 1,071)	709	362		

SOURCE: MDRC calculations from Hillsborough 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 within cohorts, and estimates are weighted to account for the different random assignment ratios. Standard errors are clustered by learning community link.

Estimates are adjusted by cohort and campus.

Cumulative outcomes include summer terms.

The measures "Number of credits attempted" and "Number of credits earned" include developmental, regular, and vocational credits. Vocational credits can be applied to a certificate but are not considered college credits and thus do not count toward an associate's degree or transfer. Vocational credits are not shown separately in the table because they represent a negligible proportion of total credits attempted and earned.

[a]The "No GPA" category includes students who did not enroll.

Effects on Educational Outcomes: Subgroup Analyses

Impacts on educational outcomes were examined for some different subgroups of students, defined using characteristics measured at or before the onset of the study.[12] Past research on learning communities included exploratory analyses of the effectiveness of learning communities for men and for women as well as for students with different needs for remediation. These analyses, part of the Opening Doors study of learning communities at Kingsborough Community College, found that learning communities may be a more effective strategy for men than for women and may be more effective for students who need remediation in two areas (math and English), compared with students who need remediation in just one area.[13] Similar analyses conducted at Hillsborough found no meaningful differences in impacts according to students' gender or level of remediation.[14]

Exploring Academic Outcomes by Cohort

As described in Chapter 3, there are several indications that the implementation of the learning communities program changed, and improved, over time. Analyses of faculty syllabi provide evidence that curricular integration was greater for the third cohort of students (fall 2008) compared with the first two cohorts of students (fall 2007 and spring 2008). Interviews with faculty members and administrators suggest that it took time to learn how best to get learning communities up and running. This learning curve included finding the right faculty pairings, giving the faculty time to develop and refine their linked course content, and making random assignment procedures routine. Only after taking these steps did administrators and learning community coordinators have more time to think about and plan trainings for faculty on teaching and pedagogy. Based on this qualitative information, an analysis of whether the program's impacts changed over time, as the perceived quality of the learning communities program improved, has the potential to provide a richer depiction of the learning communities story at Hillsborough.

Presented below are the program's estimated impacts on educational outcomes, by cohort. These analyses assess whether there were impacts for the first two cohorts of students and/or for the third cohort of students, separately. In addition, these analyses assess whether there were differential impacts between the first two cohorts of students and the third cohort of

[12]The gender and level of remediation subgroups were prespecified for analyses in the Learning Communities Demonstration Design Report (Visher, Wathington, Richburg-Hayes, and Schneider (2008).

[13]Scrivener et al. (2008).

[14]At Hillsborough, analyses were conducted for students requiring one level of developmental reading compared with students requiring two levels of developmental reading.

students — that is, was the magnitude of the program's estimated impact on the first two cohorts of students different from the magnitude of its impact on the third cohort of students?

Academic Outcomes by Cohort

Tables 4.4 through 4.6 show the results of analyses of the program's impacts for cohorts one and two combined (fall 2007 and spring 2008) and the program's impacts for cohort three (fall 2008) alone. The first striking statistic from Table 4.4 is that for cohorts one and two, only 62.4 percent of students assigned to the program group enrolled in learning communities. In contrast, 81.5 percent of cohort three's program group students enrolled in learning communities. These vastly different rates of program uptake reflect, in part, the overall higher registration rates for the third cohort of students. As discussed in Chapter 3, they also may reflect other factors, like improved scheduling of the learning communities, changes in practices with regard to "purging" students for nonpayment, and different characteristics of students across cohorts.

Tables 4.4, 4.5, and 4.6 suggest that the learning communities experienced by the first two cohorts did not have any meaningful impacts.[15] However, for the third cohort, there is evidence that the program had a positive impact on credits earned in the first program semester (Table 4.4) and persistence into the first postprogram semester (Table 4.5). However, there was no difference between the program and control groups in registration (persistence) in the second postprogram semester (Table 4.5).

Table 4.6 shows cumulative academic outcomes for the program semester and the first postprogram semester, by cohort. This table reiterates the finding that the third cohort experienced academic benefits from enrolling in learning communities. One academic year after being randomly assigned, the third cohort's program group students earned 2.0 more credits than their control group counterparts. The majority of this impact stems from the fact that the third cohort's program group students earned 1.6 more regular credits than their control group counterparts, credits that count toward a degree. Notably, the magnitude of the impact on regular credits earned for the third cohort (1.6 credits) is significantly greater than that for the first two cohorts (-0.2 credits), suggesting that the program worked better for the third cohort than for the first two cohorts.

The last column in Tables 4.4, 4.5, and 4.6 indicates whether the impacts for cohort three are statistically distinguishable from the impacts for cohorts one and two combined. For example, in Table 4.4, the estimated program impact on total credits earned is -0.2 for cohorts one and two, and 1.2 for cohort three. The difference between these two impacts (1.4 total

[15]Given that none of the differences between program group students and control group students even border on statistical or practical significance, there is little reason to believe that low program uptake led to the lack of program impacts for the first two cohorts of students.

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Table 4.4

Transcript Outcomes by Cohort, Program Semester

Hillsborough Community College Report

Outcome	Cohorts 1 & 2 (fall '07 & spring '08) Program Group	Control Group	Difference (Impact)	Standard Error	Cohort 3 (fall '08) Program Group	Control Group	Difference (Impact)	Standard Error	Difference Between Subgroups
Program semester									
Registered for any courses (%)	78.0	82.4	-4.4	4.9	89.5	85.2	4.3	4.7	
Enrolled in a learning community (%)	62.4	0.6	61.8 ***	6.5	81.5	0.0	81.5 ***	5.4	††
Number of credits attempted	8.3	8.8	-0.5	0.6	11.1	10.1	1.0	0.7	†
Regular credits	3.6	3.7	-0.1	0.3	5.1	4.3	0.8 **	0.3	†
Developmental credits	4.6	5.1	-0.5	0.3	6.0	5.8	0.3	0.4	
Number of credits earned	6.0	6.2	-0.2	0.5	8.2	7.0	1.2 *	0.7	
Regular credits	2.5	2.5	0.1	0.3	3.7	2.9	0.8 **	0.3	†
Developmental credits	3.4	3.7	-0.4	0.3	4.5	4.1	0.4	0.4	
Withdrew from any courses (%)	10.7	11.3	-0.6	2.6	12.9	9.8	3.1	3.8	
Term GPA (%)									
3.0 to 4.0 or B/A	35.4	34.9	0.4	4.4	41.1	34.4	6.7	5.7	
2.0 to 2.9 or C/B-	16.6	22.1	-5.4 *	3.3	22.6	21.3	1.3	4.4	
1.0 to 1.9 or D/C-	9.2	8.8	0.4	2.3	8.9	9.8	-1.0	3.3	
0 to 0.9 or F/D-	12.6	14.4	-1.8	2.8	10.1	11.5	-1.4	3.2	
No GPA[a]	26.2	19.8	6.4	4.8	17.3	22.9	-5.6	5.6	
Sample size (total = 1,071)	461	240			248	122			

(continued)

Table 4.4 (continued)

SOURCE: MDRC calculations from Hillsborough 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.

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.

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

Estimates are adjusted by random assignment cohort and campus.

The measures "Number of credits attempted" and "Number of credits earned" include developmental, regular, and vocational credits. Vocational credits can be applied to a certificate but are not considered college credits and thus do not count toward an associate's degree or transfer. Vocational credits are not shown separately in the table because they represent a negligible proportion of total credits attempted and earned.

credits earned) is not statistically significant, as noted by the fact that there is no "†" in the last column of the table. This suggests that the 1.4 credit difference in impacts may have occurred by chance. It can be observed in Tables 4.4, 4.5, and 4.6 that the impacts for cohort three are sometimes statistically distinguishable from the impacts for cohort one and two, but frequently they are not significantly different. The fact that the impacts for cohort three are often not distinguishable from those of the first two cohorts may reflect the limited power to detect differential impacts in a study of this size, or it may reflect the possibility that the observed differences in impacts occurred by chance. This uncertainty is important to keep in mind when considering the program's positive impacts on the third cohort of students.

What Should Be Made of the Positive Impacts for the Third Cohort?

The findings presented above show evidence that suggests that the learning communities program had a positive impact on academic outcomes for the third cohort of students enrolled in the study at Hillsborough. This result deserves careful consideration, especially given how well it aligns with the qualitative evidence presented in Chapter 3, which found that the quality of the learning communities program at Hillsborough improved over the course of the study. This result is also of particular interest, since the most salient theme from the implementation research conducted across all six colleges participating in the Learning Communities Demonstration is that the quality of learning communities generally improved over the course of the demonstration.[16]

[16]Visher, Schneider, Wathington, and Collado (2010).

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Table 4.5

Transcript Outcomes by Cohort, Postprogram Semesters

Hillsborough Community College Report

Outcome	Cohorts 1 & 2 (fall '07 & spring '08) Program Group	Control Group	Difference (Impact)	Standard Error	Cohort 3 (fall '08) Program Group	Control Group	Difference (Impact)	Standard Error	Difference Between Subgroups
First Postprogram Semester									
Registered for any courses (%)	53.8	51.2	2.7	4.4	71.8	61.5	10.3 *	5.8	
Enrolled in a learning community (%)	4.4	0.5	3.9 ***	1.3	0.0	0.0	0.0	0.0	†††
Number of credits attempted	5.6	5.5	0.1	0.5	8.3	7.2	1.1	0.7	
Regular credits	2.7	2.9	-0.2	0.4	4.2	3.2	1.0 *	0.6	†
Developmental credits	2.8	2.6	0.2	0.4	4.1	4.0	0.1	0.6	
Number of credits earned	3.6	3.5	0.1	0.4	5.6	4.7	0.9	0.6	
Regular credits	1.7	1.9	-0.2	0.3	2.9	2.1	0.8 **	0.4	††
Developmental credits	1.8	1.6	0.2	0.3	2.7	2.7	0.0	0.4	
Withdrew from any courses (%)	12.9	12.4	0.6	2.7	18.1	7.4	10.8 ***	3.7	††
Term GPA (%)									
3.0 to 4.0 or B/A	17.0	17.1	-0.1	3.0	22.6	22.9	-0.4	4.2	
2.0 to 2.9 or C/B-	14.4	15.7	-1.3	3.1	24.2	14.7	9.4 **	3.8	††
1.0 to 1.9 or D/C-	8.4	6.7	1.7	2.0	9.7	11.5	-1.8	3.7	
0 to 0.9 or F/D-	10.1	8.7	1.5	2.2	12.9	10.7	2.2	3.3	
No GPA[a]	50.0	51.8	-1.8	4.3	30.6	40.2	-9.5 *	5.7	

(continued)

Table 4.5 (continued)

Outcome	Cohorts 1 & 2 (fall '07 & spring '08) Program Group	Control Group	Difference (Impact)	Standard Error	Cohort 3 (fall '08) Program Group	Control Group	Difference (Impact)	Standard Error	Difference Between Subgroups
Second Postprogram Semester									
Registered for any courses (%)	42.7	44.6	-1.8	4.1	52.0	50.0	2.0	5.8	
Number of credits attempted	4.1	4.6	-0.5	0.5	5.7	5.6	0.1	0.7	
Regular credits	2.7	3.1	-0.4	0.4	4.4	3.8	0.6	0.6	
Developmental credits	1.3	1.4	-0.2	0.2	1.3	1.7	-0.4	0.3	
Sample size (total = 1,071)	461	240			248	122			

SOURCE: MDRC calculations from Hillsborough 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.

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.

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

Estimates are adjusted by random assignment cohort and campus.

The measures "Number of credits attempted" and "Number of credits earned" include developmental, regular, and vocational credits. Vocational credits can be applied to a certificate but are not considered college credits and thus do not count toward an associate's degree or transfer. Vocational credits are not shown separately in the table because they represent a negligible proportion of total credits attempted and earned.

[a]"No GPA" category includes students who did not enroll.

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Table 4.6

Cumulative Transcript Outcomes by Cohort, Program Semester Through First Postprogram Semester

Hillsborough Community College Report

Outcome	Cohorts 1 & 2 (fall '07 & spring '08) Program Group	Control Group	Difference (Impact)	Standard Error	Cohort 3 (fall '08) Program Group	Control Group	Difference (Impact)	Standard Error	Difference Between Subgroups
Registered for any courses (%)	85.7	84.6	1.2	3.8	91.9	86.1	5.9	4.2	
Average number of semesters registered	1.5	1.5	0.0	0.1	1.6	1.5	0.1	0.1	
Enrolled in a learning community (%)	66.5	1.1	65.5 ***	6.0	81.5	0.0	81.5 ***	5.4	††
Number of credits attempted	15.1	15.6	-0.5	1.0	19.4	17.3	2.1 *	1.3	
Regular credits	6.9	7.2	-0.2	0.6	9.2	7.5	1.7 **	0.8	††
Developmental credits	8.0	8.4	-0.3	0.6	10.2	9.8	0.4	0.8	
Number of credits earned	10.4	10.7	-0.3	0.9	13.8	11.8	2.0 *	1.1	
Regular credits	4.7	4.8	-0.2	0.5	6.6	5.0	1.6 ***	0.6	††
Developmental credits	5.7	5.9	-0.3	0.5	7.2	6.8	0.4	0.7	
Term GPA (%)									
3.0 to 4.0 or B/A	26.3	26.8	-0.5	3.5	26.6	28.7	-2.1	4.6	
2.0 to 2.9 or C/B-	21.5	25.4	-3.9	3.4	24.2	17.2	7.0 *	4.2	††
1.0 to 1.9 or D/C-	10.7	7.5	3.2	2.1	14.5	9.8	4.7	3.9	
0 to 0.9 or F/D-	22.7	22.8	-0.1	3.1	19.8	23.0	-3.2	4.3	
No GPA[a]	18.9	17.6	1.3	3.9	14.9	21.3	-6.4	5.1	
Sample size (total = 1,071)	461	240			248	122			

(continued)

Table 4.6 (continued)

SOURCE: MDRC calculations from Hillsborough 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.

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.

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

Estimates are adjusted by random assignment cohort and campus.

Cumulative outcomes include summer terms.

The measures "Number of credits attempted" and "Number of credits earned" include developmental, regular, and vocational credits. Vocational credits can be applied to a certificate but are not considered college credits and thus do not count toward an associate's degree or transfer. Vocational credits are not shown separately in the table because they represent a negligible proportion of total credits attempted and earned.

[a]"No GPA" category includes students who did not enroll.

While it would be desirable to be highly confident in the finding that the program had positive impacts for the third cohort of students, the evidence is deemed "suggestive" for three main reasons. First, while there is evidence of positive program impacts for the third cohort, the estimated impacts for this cohort are, more often than not, statistically indistinguishable from the program's estimated impacts for the first two cohorts of students combined (as noted by the lack of "†" in last column of Tables 4.4, 4.5, and 4.6). Second, sensitivity analyses conducted among program group *registrants* and control group *registrants* in the third cohort (similar to the analyses described in the section above, "Was Low Program Uptake a Serious Problem?") find virtually no statistically significant program impacts, suggesting a greater degree of uncertainty in these results.[17] Third, the cohort subgroup was not prespecified at the design stage of this study,[18] a factor that some consider a prerequisite for treating analyses as anything other

[17]For the third cohort of students, there was a 4.3 percentage point difference in registration rates during the program semester (see Table 4.4). The core components of the learning communities program are unlikely to have caused this difference, since program group students had received very limited program services at the point of this measurement (although it is possible that the improved block scheduling could have driven this difference). While the 4.3 percentage point difference is not statistically significant, it has practical significance, since nonregistrants do not earn any credits and are probably less likely to enroll in the next semester (the two key indicators of the program's positive impacts for the third cohort of students). As a result, the sensitivity analyses, which remove the initial differences in registration rates, eliminate the majority of statistically significant differences between the third cohort of program group students and the third cohort of control group students. This suggests the need for further research to confirm the findings from the third cohort.

[18]See Visher, Wathington, Richburg-Hayes, and Schneider (2008).

than exploratory.[19] In general, exploratory analyses should be viewed with caution, as hypothesis generating, until confirmed in future studies.

The above factors explain the need for caution when considering the positive findings for the third cohort of students. However, the magnitude of the estimated impacts for the third cohort is such that they should not simply be dismissed. Since the Hillsborough study is part of the larger Learning Communities Demonstration, more will be known as the results from the other five colleges in the demonstration become available. In future reports, similar analyses will be conducted at each college, comparing impacts for earlier cohorts with those of later cohorts.[20] If such analyses confirm the findings in this report, there will be much stronger evidence that more comprehensive, better-implemented learning communities correspond with improved program impacts.

* * * *

Conclusions: Reflections on the Hillsborough Findings

Hillsborough's Learning Community: A Basic Model

The overall result (for the full sample) of this study is that the learning communities program operated at Hillsborough did not appear to add value above and beyond the college's usual services. When considering this finding, it is important to understand Hillsborough's program in the context of learning communities more broadly. By design, Hillsborough's learning communities represent a basic model: The college co-enrolled students in two courses, forming student cohorts and laying the groundwork for implementing other features associated with comprehensive learning communities. In time, there were, in fact, signs of faculty collaboration and curricular integration, a key facet of more comprehensive learning communities. However, with respect to the depth and spread of collaboration and curricular integration, there was a high degree of variability across learning community faculty pairs. As such, this study was not a test of comprehensive, robustly implemented learning communities; rather, it was a test of the effectiveness of the learning communities at Hillsborough; some were very basic and others were more comprehensive and strongly implemented. This type of basic model did not yield results that were significantly different from the college's usual services.

[19]Schochet (2008). The fear is that, if enough subgroup analyses are conducted, the chances of observing false positives greatly increases. Prespecifying subgroups of interest can help prevent researchers from data mining.

[20]Such analyses will be conducted at four of the other five colleges in the demonstration. Merced is the exception, since the qualitative research at that college did not suggest that the program changed significantly over time.

In addition to being a test of a basic model, it is possible that evaluating a program like the learning communities program at Hillsborough, which was still under development, may not accurately reflect how well the program would work once it had been in place for a while and had become more institutionalized. In this study, the closest test of a more mature program comes from the cohort subgroup analyses presented above, which provide some evidence that as the program improved it yielded positive impacts that were not evident at the beginning of the study.

Importantly, Hillsborough is one of six colleges taking part in the Learning Communities Demonstration. These colleges were selected, in part, because they represent various learning community models. Hillsborough's model was more basic than some of the other colleges' models. It will be interesting to see whether more comprehensive, robustly implemented learning communities yield positive impacts. In addition, the growth and improvement of Hillsborough's program as it scaled up throughout the demonstration was a pattern also exhibited at the other Learning Communities Demonstration colleges.[21] It will also be interesting to see whether more mature versions of the programs tested at the other colleges will yield more positive impacts. Future NCPR reports on the Learning Communities Demonstration will provide further insight.

Connecting This Study to the Opening Doors Learning Communities Study

As policymakers, community college administrators, faculty, and others consider the results from the learning communities study at Hillsborough, it is valuable to think about them in a wider context of experimental research on learning communities. The Learning Communities Demonstration began largely as a consequence of the positive impacts of learning communities observed in MDRC's Opening Doors study at Kingsborough Community College. As a result, it is worthwhile to reflect on the findings at Hillsborough in the context of this small, but growing body of experimental research on the effectiveness of learning communities.

The Opening Doors study at Kingsborough found generally positive, though modest, impacts, whereas the program at Hillsborough did not have overall positive impacts. There are several possible explanations for these different findings, including, but not limited to: (1) The two colleges ran different learning communities models (see Text Box 1.1 for more details regarding the Kingsborough study); (2) The two colleges serve different populations of students (for example, compared with sample members in the Hillsborough study, sample members in the Kingsborough study were much more likely to be financially dependent on their parents and more likely to be in a household receiving governmental benefits); (3) The two colleges offered

[21] Visher, Schneider, Wathington, and Collado (2010).

different "business as usual" services to their control group students; (4) Some of the key outcomes differed across the two studies (for example, at Kingsborough, positive impacts were observed on several affective measures and passing a standardized test. Similar data were not collected at Hillsborough).

The above examples provide several possible explanations for the different results of these two particular studies. As results from the other five colleges participating in the Learning Communities Demonstration become available, patterns may begin to emerge that will provide greater insight into which, if any, of the above explanations shed light on which learning communities work best for whom.

Forthcoming Research

In designing the Learning Communities Demonstration, NCPR was seeking to better understand whether learning communities are an effective strategy to help improve students' chances at succeeding in community college. The demonstration took place in five states and six postsecondary institutions throughout the United States. This report presents findings from one of the colleges in the demonstration that operated one learning communities model. While the results from this report are a significant contribution to the experimental literature on the effectiveness on learning communities, there are still many unanswered questions. In the next several years, as the impact findings from the other five colleges become available, there will be a much richer understanding of what types of learning communities work best for whom. The result will be a significant body of experimental evidence on the effectiveness of learning communities in the community college setting.

Appendix A

Impact Analyses

Many evaluations of education interventions are designed so that clusters or groups of students, rather than individual students, are randomly assigned to program and control groups. The study design of learning communities at Hillsborough is different, in that randomization occurred at the student level; however, most students in the program group were clustered into learning communities, while all students in the control group were essentially unclustered.[1] This partially nested design may need to be accounted for in the analyses, because the clustered program group students' outcomes may not be independent. However, it may not be appropriate to use the typical hierarchical linear model commonly used in a cluster-randomized trial, because the control group is comprised of what can be thought of as many independent clusters of size one. As such, models that explicitly account for the partially nested design have been suggested. Such a model can be written as:

Level 1: $$y_{ij} = \beta_{0j} + \beta_{1j} T_{ij} + r_{ij}$$

Level 2: $$\beta_{0j} = \gamma_{00}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

Where y_{ij} is an academic outcome (for example, credits earned) for student *i* in classroom *j*. T_{ij} is a binary indicator of treatment status for student *i* in classroom *j*. In addition, r_{ij} is the student-level residual and u_{1j} allows for differences across clusters in the treatment effect.[2]

This model implies that the intercept is constant (has no source of variation) and represents the average outcome for the control group. In contrast, the second part of the level 2 equation shows that the program group has a mean difference of γ_{10} from the control group average, but this difference has some variation around it due to different learning communities. This seems plausible for the learning communities intervention: The control group has an average outcome that varies only because of student-level variation, while program group students have an average difference from the control group mean that varies both because of student-level differences as well as because of variation associated with the learning community they are enrolled in. The average learning community impact could vary because the efficacy of some learning community links vary, or the instructors teaching the links vary in effectiveness, or the particular mix of students in the linked classes induce a positive (or negative) spillover effect. Such a model can be fit using a software procedure like SAS's PROC MIXED.

[1]Control group students were free to enroll in courses of their choosing. It is likely that on occasion multiple control group students were in the same class. Less common (but still possible), some control group students may have been in multiple classes together. However, in all analyses, control group students are treated as though they are in independent clusters of size 1.

[2]This model is described in detail in Bauer, Sterba, and Hallfors (2008).

However, the analyses presented in this report are further complicated by nonparticipation. At Hillsborough, the program group is not fully nested, since 31 percent of program group students did not enroll in a learning community. As such, 31 percent of program group students were in clusters of size one, whereas the remaining 69 percent of program group students were in clusters whose average size was around 20. Moreover, the outcomes of interest (for example, credits earned, continued registration) were related to cluster size, since over half of the program group students who were in clusters of size one did not register for any courses. Thus, their mean outcomes are much lower than the rest of the program group. Essentially, the program group can be thought of as coming from two different populations, one population of larger clusters (with relatively high means), another population of clusters of size one (with relatively low means). In this circumstance, using a statistical procedure like SAS's PROC MIXED yields point estimates that are inappropriate, *given a study design where each individual should contribute equally to point estimates*.[3] Point estimates derived using PROC MIXED are driven toward the mean of the clusters of size one (that is, individuals in clusters of size one have more weight than individuals in larger clusters). Such analyses are inappropriate given the design of this study.

An alternative statistical procedure that can be used with this data structure is SAS's PROC SURVEYREG.[4] This procedure allows users to identify clusters in order to account for the lack of independence of observations within clusters (that is, it uses cluster robust standard errors). In addition, point estimates derived using this procedure are nearly identical to those using a general linear model (such as using SAS's PROC GLM).[5] MDRC conducted analyses on simulated data[6] and found that this procedure produced the expected point estimates (given the data-generating mechanism and the desire to have each student contribute equally to the point estimates) and slightly conservative standard errors (that is, standard errors tended to be slightly larger than expected). Consequently, this procedure was used in all impact analyses.

[3]MDRC's internal simulations tested and demonstrated this point. Please contact authors for more information.

[4]See http://support.sas.com/documentation/cdl/en/statug/63033/HTML/default/surveyreg_toc.htm for more information on how this procedure calculates regression coefficients and standard errors.

[5]This would seem to imply that each observation has an equal weight toward point estimates, unless user-specified weights are included.

[6]Several data-generating mechanisms were tested. The mechanisms were intentionally designed to create data that were fairly similar to the observed data in this study.

Appendix B

Sensitivity Analyses

As displayed in Figure B.1 (also displayed in Figure 3.1 in Chapter 3), students who enrolled in at least one class at the add/drop deadline represent 82 percent of all program group students and 83 percent of all control group students. For simplicity, these students are referred to as "registrants." While only 69 percent of *all* program group students enrolled in a learning community, 84 percent of program group *registrants* enrolled in a learning community (0.69 / 0.82 = 0.84 or 84 percent). In other words, registrants have a much higher rate of program uptake than the full sample (that is, among registrants there are significantly fewer no-shows). Consequently, analyses comparing program group registrants with control group registrants may provide a closer estimate to the impact of Hillsborough's learning communities on those students who actually experienced learning communities in this study.

Analyses that compare the subsets of registrants are internally valid (meaning that they maintain the integrity of the experimental design) only if registrants in the program group are compositionally similar to registrants in the control group. These similarities must be true in terms of observable characteristics (such as gender and race) as well as unmeasured characteristics (such as ability, motivation, tenacity). This assumption is represented by ≈ in Figure B.1. Notably, with respect to those observable characteristics measured on the baseline information form, program group registrants and control group registrants look very similar, suggesting that there is *not* any evidence that dropping nonregistrants from the analyses creates compositionally dissimilar groups. Another way to think about this is that these analyses rely on the untestable assumption that nonregistrants in the program group and nonregistrants in the control group were approximately equivalent at the time of random assignment. In this study, this assumption may be tenable because program group students had very little exposure to the program before the add/drop deadline, so it is not very likely that the program influenced students' decision to become a registrant. One piece of evidence that the program did not influence students' decisions to register is the fact that the percentage of registrants in the program group and control group are nearly identical; nonetheless, it is possible that there are unobserved compositional differences between program and control group registrants caused by the program. It is for this reason that the sensitivity analyses described here are not the main analyses in this report.

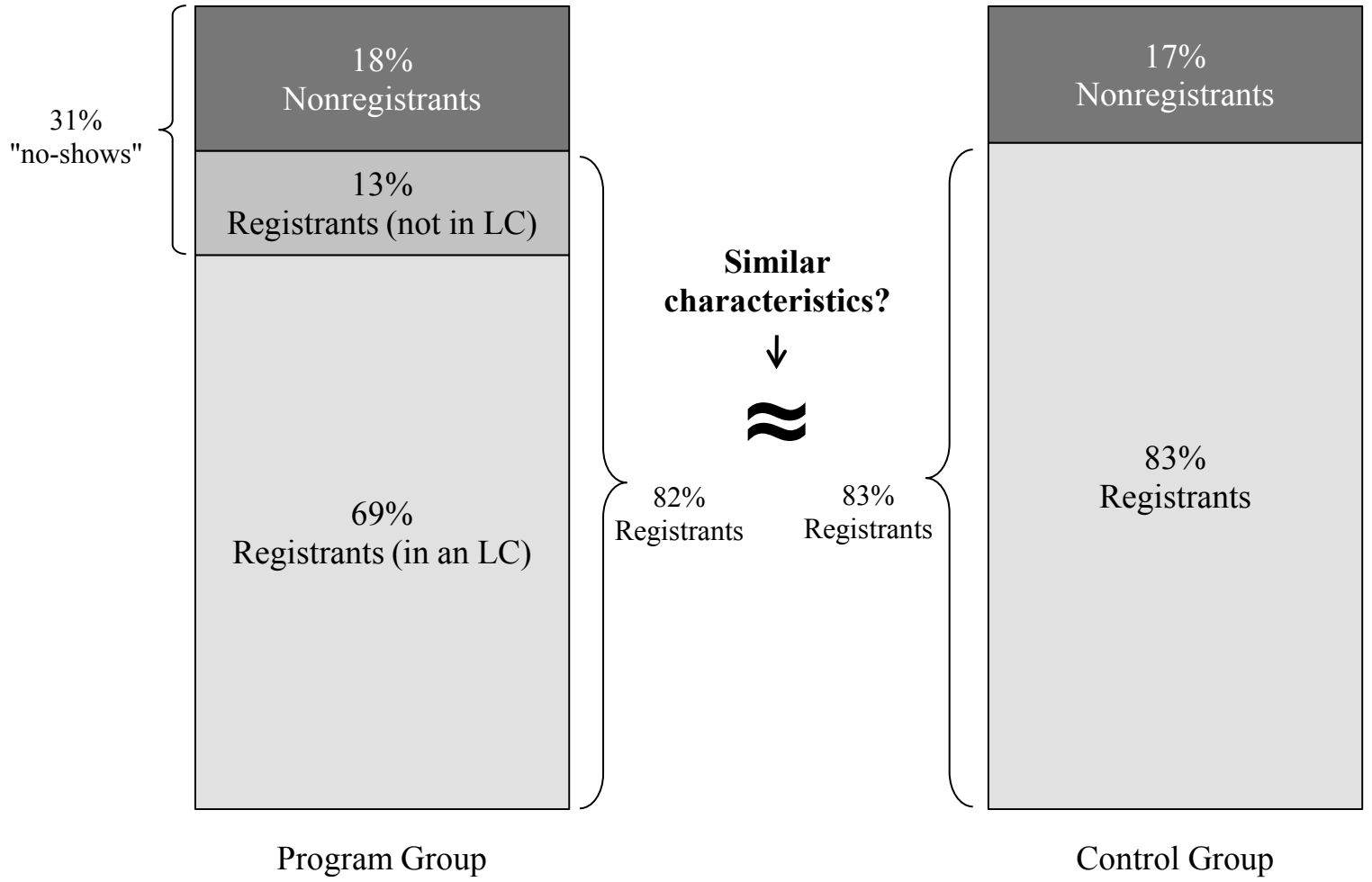
Analyses similar to those presented in Tables 4.1, 4.2, and 4.3 were conducted for registrants only. These analyses yield results that are qualitatively similar to the analyses for the full sample of all study participants. As such, low program uptake is an unlikely explanation for the absence of observed program impacts.

The Learning Communities Demonstration

Figure B.1

Sensitivity Analyses

Hillsborough Community College Report



Appendix C

Assessment of Syllabi

The Learning Communities Demonstration

Table C.1

Results of Assessment of Learning Community Syllabi

Hillsborough Community College Report

Practice	Number of References to Practices		
	First Semester (Fall 2007)	Second Semester (Spring 2008)	Third Semester (Fall 2008)
Integration and linking			
Mentioning other link/instructor in title	4	2	17
Referring to both/all classes as a learning community in the course description	1	3	17
Clear description of what a learning community is	0	0	1
Theme is mentioned	0	0	4
Joint practices (for example, if students drop one class, they must drop both)	0	0	0
Instructors team teach	0	0	0
Instructors sit in on each other's classes	0	0	0
Synchronized assignments	0	1	0
Integrated/shared assignments	3	2	9
Synchronized topics/readings	0	0	10
Theme reflected in assignments and readings	0	0	2
Shared grading	0	0	0
Common readings or textbooks for both classes	0	0	6
Other	0	0	10
Subtotal	8	8	76
Active and collaborative instruction			
Group or team work	19	15	17
Student or team presentations	3	3	3
Peer evaluations	0	0	0
Reflections on own work (journals, portfolios)	17	7	11
Class discussions	19	17	21
Credit for participation	19	15	13
Theme-connected, project-based learning	0	0	0
Service learning project reinforcing LC theme	0	0	0
Field trip related to LC theme	0	0	0
Other	0	5	0
Subtotal	77	62	65
Total references	**85**	**70**	**141**
Total syllabi sets received	**7**	**7**	**9**
Total syllabi sets possible	**7**	**7**	**10**

SOURCE: MDRC analysis using learning community syllabi collected from Hillsborough Community College.

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