NATIONAL CENTER FOR POSTSECONDARY RESEARCH

NCPR BRIEF

MAY 2011

Learning Communities for Students in Developmental Math: Impact Studies at Queensborough and Houston Community Colleges

Evan Weissman, MDRC
Kristin F. Butcher, Wellesley College
Emily Schneider, MDRC
Jedediah Teres, MDRC
Herbert Collado, MDRC
David Greenberg, University of Maryland, Baltimore County
with
Rashida Welbeck, MDRC

Community colleges offer great promise to students in the United States. However, 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. Students who are academically underprepared for college-level work succeed at even lower rates, particularly those who are referred into developmental math.

Developmental math—prerequisite courses that are intended to prepare students for college-level math but do not offer credits that count toward a degree or transfer—is a major barrier to college success for many students. In response to this problem, community colleges and other stakeholders are beginning to suggest and implement a range of strategies to move students more successfully through the developmental sequence. Learning communities are one popular and prominent approach that is being implemented across the nation.

The most basic learning community model co-enrolls a cohort of students in two classes together. More comprehensive learning communities include additional components; for example, courses are often thematically linked and may share curriculum, assignments, and assessments. Proponents believe that linking courses will lead to better outcomes for students 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 by contextualizing the skills and knowledge taught in each course. For students in developmental math, a primary short-term goal of learning communities is to accelerate students' progression through the math sequence and into college-level coursework. A longer-term goal is that enrolling in developmental math learning communities will increase students' ultimate likelihood of earning a credential or transferring to a four-year institution.

Queensborough Community College and Houston Community College are two large, urban institutions that have implemented developmental math learning communities with these goals in mind. At each school, cohorts of 20 to 25 students co-enrolled in developmental math and a linked course; at Queensborough, all levels of developmental math were linked primarily with college-level courses, and at Houston, the learning communities linked the lowest level of developmental math with the college's student success course, which is designed to prepare students for the demands of college.

These colleges are two of the six participating in the National Center for Postsecondary Research's (NCPR) Learning Communities Demonstration. The demonstration at these colleges was designed to determine whether the programs succeeded in boosting their students' success. The study used an experimental design in which students who were interested and eligible for the courses included in the learning community were randomly assigned to either a program group, whose members were

The National Center for Postsecondary Research is a partnership of the Community College Research Center, Teachers College, Columbia University; MDRC; the Curry School of Education at the University of Virginia; and faculty at Harvard University.

strongly encouraged to participate in the learning communities, or to a control group, whose members received the college's standard services. The impact of the learning communities program was estimated by comparing the academic outcomes of students in both groups for two to three semesters after random assignment. A total of 1,034 students at Queensborough and 1,273 students at Houston entered the study between 2007 and 2009. Based on a longer report of the same title, this Brief presents impact findings for Queensborough and Houston's developmental math learning communities.

Key Findings

Both Queensborough and Houston began by implementing a basic model of a semester-long developmental math learning community; the programs strengthened over the course of the demonstration by including more curricular integration and some connections to student support services. Throughout the demonstration, the learning community programs at Queensborough and Houston successfully co-enrolled groups of students into both courses in the learning communities; students and faculty at both schools, and particularly at Houston, reported that students felt supported both personally and academically as a result of these cohorts.

However, curricular integration and faculty collaboration—the other key components of comprehensive learning communities—were initially fairly minimal at both schools and increased over time as a result of leadership by program coordinators, growing faculty experience, and participation in professional development activities. By the end of the demonstration at Queensborough, many of the learning communities had themes supported by several assignments that integrated content across both courses. At Houston, faculty began to include at least three integrated assignments in their courses and included additional informal linkages between the courses. Both programs also explored promising means of using the learning communities to connect students to available support services at the campuses, such as counseling and tutoring.

The level of curricular integration at both schools remained closer to the basic end of the spectrum when compared with the most robust learning communities discussed in the literature; nevertheless, the maturation of each program led to increasing differences between the experience of students in the learning communities and their counterparts in the control group. These differences were achieved at a relatively modest cost above that of standard classes: At Houston, program expenditures were about $120 per student, plus another $80 associated with increased use of tutoring and other services.

Learning community students attempted and passed their developmental math class at higher rates at both colleges. When Queensborough and Houston launched their learning communities, one of the short-term goals of college administrators was to encourage and assist students in beginning the developmental math sequence early in their college tenure. Both colleges succeeded in this goal, as the offer to participate in learning communities led to significantly higher rates of enrollment in the developmental math courses that were part of the learning communities.

Students in the learning communities at both colleges also passed developmental math at higher rates than their control group counterparts (34% compared with 22% at Queensborough; 54% compared with 40% at Houston), an important first step toward further success. At Queensborough, this result was driven largely by higher rates of enrollment in the learning communities; at Houston, the higher pass rates were driven both by higher attempt rates and by the fact that students who attempted math in learning communities were more likely to pass the course than those who attempted the same coursework in stand-alone classes. Possible explanations for this increased performance in the course could be that the student success course at Houston gave learning communities students the study skills they needed to better succeed in math or that the high levels of student engagement and peer support arising from co-enrollment were particularly beneficial for students in Houston's diffuse setting. Another explanation could be that the teachers in these learning communities were more likely to give their students passing grades, either as a result of more effective teaching methods or simply of more generous grading curves. Interestingly, and perhaps as a result of the different placement test cut scores used, students at Houston—who were generally placed into a lower-level math course—experienced higher overall pass rates (for both the program and control groups) than students at Queensborough, where equal scores could place students into a course with more advanced material.

Regardless of the differences between colleges or the explanation for these differences, students in learning communities at each college were more likely than their control counterparts to enter the next semester a "step ahead" in the math sequence.

In the semesters following program participation, impacts on developmental math progress were far less evident. By the end of the study period, control group members at both colleges had largely caught up with learning community students in the developmental math sequence. In the first postprogram semester, learning community students at both colleges were more likely to attempt the next level of developmental math, but only at Queensborough were they significantly more likely to pass the course.

Additional students (in both the program and control groups) also continued to pass the first math class in the sequence in later semesters, so that the overall percentage that passed the class increased. At Queensborough, by the end of the second postprogram semester (three semesters total), control group members had caught up and "closed the gap" in terms of passing the first math class in the sequence, so that program group members were not significantly more likely than control group members to have passed the class.

By the end of the second postprogram semester, fewer than 20% of Queensborough students in the study had passed their second math course in the required sequence, and fewer than 5% had passed the third course in the sequence. There were no significant differences between program and control group members' math pass rates.

A similar pattern of control group members catching up to program group members can be observed at Houston, although only two semesters of data are available. As at Queensborough, fewer than 20% of students in the study sample went on to pass the second math class in the sequence, and there was no significant difference between program and control-group members' pass rates—though in the first postprogram semester learning communities students maintained an advantage over their control group counterparts in passing the first math class in the sequence.

Overall, at these two colleges learning communities clearly led students to take and pass developmental math earlier in their college careers, but this impact generally did not translate into increased cumulative progress along the math sequence by the end of the two or three semesters studied. Moreover, there is evidence that some of the initial progress along the developmental math sequence at Houston represents a substitution away from developmental English courses; thus, there was no increase in overall developmental credits earned by learning communities students at Houston. This enrollment trade-off between developmental math and developmental English may serve as a reminder of the constraints community college students face in their time and ability to tackle multiple courses.

On average, neither college's learning communities program had an impact on persistence in college or on cumulative credits earned. In addition to examining progress through the developmental math sequence, this study measures two key indicators of long-term success: persistence in college and credit accumulation, both of which are necessary steps on the path to earning a degree or credential or transferring to a four-year institution. At the end of the study period covered in this report, neither college had achieved measurable impacts on these outcomes.

Thus, while the learning communities at Queensborough and Houston gave students a significant boost in their start along the developmental math sequence, this initial boost does not appear sufficient on its own to generate improvements in longer-term measures of success.

Some subgroups of students may have benefited more from the developmental math learning communities. Subgroup analyses conducted for students at Queensborough and Houston suggest that the program effects differed somewhat between some groups of students, but there is no subgroup or type of student that clearly or consistently benefits the most from developmental math learning communities.

At Houston, the most encouraging program impacts were seen for students who placed in the lower half on the math placement test in relation to other students in the course. In addition to the increased progress along the math sequence that was seen for the full sample, there were also indications that students with lower-level math skills were earning more credits overall than their control counterparts. Although this impact was apparent in the program semester, there was no significant impact on credits earned in the postprogram semester. At Queensborough, a similar analysis did not show any differences based on level of math placement.

Placing These Findings in a Broader Context

The findings presented here, along with previous rigorous research on learning communities, show a similar pattern of impacts. Basic semester-long learning communities for students in developmental classes have the potential to significantly increase students' success in the program semester, but these impacts—the differences between students in learning communities and students in regular stand-alone classes—diminish sharply over the semesters after program participation ends, as students in the control group catch up with those in the program group. While any progress in helping students initially move more quickly through the developmental sequence is promising, it appears that semester-long learning communities alone cannot be expected to help large numbers of students progress through the developmental sequence and into the college-level courses that are typically required for a degree or transfer.

The literature on learning communities also points to other routes to success for students in learning communities: These programs could boost persistence and success by providing students with a sense of engagement with the institution, as well as by facilitating deeper learning. However, while students and faculty reported that students in the learning communities at Queensborough and Houston felt supported both personally and academically, this did not translate into a measurable increase in their likelihood to persist in college. Similarly, the lack of longer-term impacts on passing classes further along the math sequence or on cumulative credits earned, suggests that there was not a substantial sustained effect on learning. However, without post-test scores for all sample members, it is impossible to know for certain whether deeper learning was engendered by Queensborough's and Houston's learning communities.

It is important to remember that the learning communities programs in this study were—on the whole—relatively basic models compared with the comprehensive theoretical models in the literature, which feature extensive and consistent faculty collaboration, curricular integration, and integrated student supports. However, anecdotal evidence suggests that the majority of learning communities programs nationally—like those in the Learning Communities Demonstration—do not consistently implement all of the components in an advanced model and generally experience variation or fluctuation within the programs and over time.

Looking Ahead

With findings from three of the six community colleges in the Learning Communities Demonstration released to date, there is still a much fuller understanding to be gained. Subsequent reports on the remaining colleges will present results on Kingsborough Community College's learning communities, which target continuing students in several career tracks, and on the developmental English learning communities at Merced College and the Community College of Baltimore County (CCBC). A final report scheduled to be released in 2012 will synthesize findings across all six colleges.

The National Center for Postsecondary Research (NCPR) was established by a grant (R305A060010) from the Institute of Education Sciences of the U.S. Department of Education. The Learning Communities Demonstration is supported by NCPR, the Bill & Melinda Gates Foundation, the Ford Foundation, the Kresge Foundation, Lumina Foundation for Education, and the Robin Hood Foundation.

The contents of this Brief were developed under a grant (R305A06060010) from the Institute of Education Sciences, U.S. Department of Education. However, those contents do not necessarily represent the policy of the Institute or the U.S. Department of Education, and you should not assume endorsement by the federal government. The findings and conclusions reported here do not necessarily represent the official positions or policies of the funders.

National Center for Postsecondary Research

National Center for Postsecondary Research
Teachers College, Columbia University
525 West 120th Street, Box 174, New York, NY 10027
212.678.3091 fax: 212.678.3699 ncpr@columbia.edu
www.PostsecondaryResearch.org

This Brief is based on an NCPR report titled "Learning Communities for Students in Developmental Math: Impact Studies at Queensborough and Houston Community Colleges," which is available for download at www.PostsecondaryResearch.org.