right *from the* START

AN INSTITUTIONAL PERSPECTIVE ON DEVELOPMENTAL EDUCATION REFORM

Adopting and Adapting Computer-Assisted Learning Strategies

A Practitioner Brief

MDC

Achieving the Dream™

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Achieving the Dream™
Community Colleges Count

About Achieving the Dream

Achieving the Dream, Inc. is a national nonprofit that is dedicated to helping more community college students, particularly low-income students and students of color, stay in school and earn a college certificate or degree. Evidence-based, student-centered, and built on the values of equity and excellence, Achieving the Dream is closing achievement gaps and accelerating student success nationwide by 1) guiding evidence-based institutional improvement, 2) leading policy change, 3) generating knowledge, and 4) engaging the public. Conceived as an initiative in 2004 by Lumina Foundation and seven founding partner organizations, today, Achieving the Dream is leading the most comprehensive non-governmental reform network for student success in higher education history. With over 200 colleges, more than 100 coaches and advisors, and 15 state policy teams—working throughout 34 states and the District of Columbia—the Achieving the Dream National Reform Network helps 3.8 million community college students have a better chance of realizing greater economic opportunity and achieving their dreams.

MDC

About MDC

MDC, a nonprofit with an extensive history working to improve the effectiveness of community colleges around the nation, was established in 1967 and manages programs across the U.S. that connect education, employment, and economic security to help people “learn, earn, and save” their way to a place in the middle class. MDC’s strategies, aimed at removing the barriers that separate people from opportunity, include: using data to define gaps and mobilize leaders to create a will for change; demonstrating sustainable solutions and developing them into effective models; and then incubating them so they can be replicated at scale for maximum impact.

Right from the Start: ATD and MDC's Approach

Broad access to quality education and training is essential to a robust economy, and an engaged society. With affordable tuition and campuses in big cities and small towns, community colleges make that education and training accessible to thousands of citizens every year. We developed the *Right from the Start* series of practitioner-focused, evidence-based briefs to highlight strategies that support the significant number of students who arrive on campus underprepared for credit-bearing coursework. Serving these students, who often undertake adult basic education and developmental education courses, is an important part of the community college dual mission of access and success.

What Colleges Can Do

Developmental education shines a light on broader issues of access, success, and equity. Colleges can improve equitable outcomes by addressing several underlying issues:

1) Understand the diversity of developmental education students. Colleges need to carefully consider the varied experience of underprepared students when assessing the support those students need to succeed in credit-bearing courses. It may be necessary to have multiple developmental education strategies that are tailored to different student groups.

2) Emphasize teaching and learning. Focusing attention on teaching and learning is a critical thread in all of the successful developmental education reforms featured in this series. That means colleges address academic content and structures as well as non-academic topics, such as navigating college culture and student self-efficacy.

3) Build whole-college solutions. Lasting, scaled change is most likely when efforts engage a broad range of college practitioners in examining student outcomes, designing the change process, mastering the skills required to implement new approaches, and refining these efforts over time.

It is our hope that these briefs will spark new ideas for practitioners who are committed to helping their students succeed — *right from the start*.

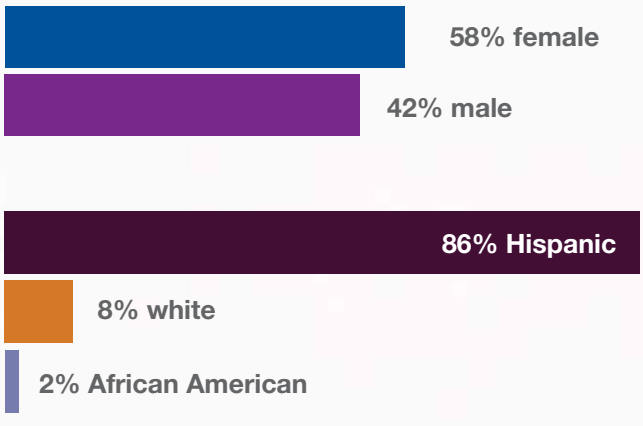
Adopting and Adapting Computer-Assisted Learning Strategies

Three community colleges—El Paso Community College, Bunker Hill Community College, and Patrick Henry Community College—incorporated technology into the curriculum to support student progress in mathematics through developmental education. Each college took its own path: El Paso developed a self-accelerated emporium-style computer lab, Patrick Henry incorporated fully modularized math curricula, and Bunker Hill's contextualized redesign integrated tutoring and skill building. With a comprehensive look at the experience at El Paso Community College and supplementary examples from Bunker Hill Community College and Patrick Henry Community College, we begin to understand how colleges can enact effective reforms in developmental education that are uniquely appropriate to their institutions.

El Paso Community College

With five campuses, 32,225 students, and six early college high schools, El Paso Community College (EPCC) is a cornerstone in the El Paso region's education and training system. EPCC connects students to secondary and postsecondary credentials, the local workforce, and four-year universities (especially the University of Texas-El Paso and New Mexico State University). With an 86 percent Hispanic student body, El Paso is designated as a Hispanic-Serving Institution. Almost 70 percent of EPCC's students are enrolled part-time.

Student profile: El Paso Community College



Note: All figures reflect 2009 data from the Achieving the Dream National Database.

When EPCC joined the Achieving the Dream network in 2004-2005, almost 98 percent of its students were not college-ready in mathematics, based on the college's placement test (at the time, the College Board's ACCUPLACER). When the college first submitted data to the Achieving the Dream National Database, just over 50 percent of the ATD cohort[i] tested three levels below transfer-level math and 30 percent tested one level below. The college's early success at turning these figures around led to their selection as a Leader College within the ATD network in 2009, an acknowledgement of its commitment to and success in improving student outcomes and closing achievement gaps. EPCC continued its focus on college readiness and by 2011, those testing three levels and one level below transfer-level math had improved to 35 percent and 13 percent, respectively. Moreover, the percentage of students placing into transfer-level math had risen from 5 percent to almost 40 percent, following intensive efforts that engaged the college, local school districts, and the University of Texas-El Paso (UTEP).

These improvements were the result of a multi-year improvement effort. In 2009, EPCC could point to some progress, but developmental math students still had to complete a lengthy sequence of four courses before they could enroll in a transfer-level math course. The college wanted to ensure that developmental education would be a stepping stone for EPCC students and not a stumbling block. To help it address this challenge, EPCC was an active participant in the Developmental Education Initiative (DEI), a 3-year MDC initiative, funded by the Bill & Melinda Gates Foundation, that supported 15 ATD colleges and 6 ATD state policy teams in efforts to identify the resources, policies, and practices necessary to scale up effective developmental education practices. In addition to shortening the developmental math sequence to three courses, through its work in DEI, EPCC implemented a computer-based instruction model (a math emporium[ii]) that has resulted in improved course completion rates and retention while enabling students to accelerate their own progress through developmental math.[iii] As a result of this reform effort, EPCC has seen improvements for students and learned some valuable lessons about institutional change.

[i] The Achieving the Dream cohort includes all first-time students, both part- and full-time.

[ii] A lab-based course in which all instruction is computer-based and students in the same lab may be working on different courses, with support from tutors and full-time instructors

[iii] A similar approach to reform can be seen across Texas in the New Mathways project, a state-wide effort to create new curricular pathways that allow students to complete all required remediation and the first transfer-level math course in one year. See www.utdanacenter.org/higher-education/new-mathways-project for more information

Results

As reported in the table below, the first two years of implementation of the DEI reforms at EPCC resulted in a higher percentage of emporium students completing the developmental sequence in two years. Emporium students also had higher term-to-term and year-to-year retention rates. From 2009 to 2011, 66 percent of students at EPCC successfully completed emporium courses with a grade of A, B, or C. Withdrawal rates were 9 percent, compared with 13 percent in lecture courses.[iv]

Completed Developmental Math within Two Years

	Emporium	Traditional
First year of redesign	41%	36%
Second year of redesign	36%	28%

Retained to Next Term

	Emporium	Traditional
First year of redesign	92%	79%
Second year of redesign	92%	78%

Retained to Next Year

	Emporium	Traditional
First year of redesign	89%	61%
Second year of redesign	78%	61%

[iv] While many colleges that have implemented such reforms report improved rates of success and persistence in both developmental and transfer-level math, there is a need for additional study (preferably involving comparison groups) to determine the efficacy of particular technology solutions and pedagogical strategies to support students' learning in this format. See Hodara, Michelle, "Improving Students' College Math Readiness: A Review of the Evidence on Postsecondary Interventions and Reforms." Center for the Analysis of Postsecondary Education and Employment, Columbia University, 2013.

Lessons Learned

Reform across an institution requires leadership and engagement across the institution. All three college examples in this brief demonstrate the necessity of philosophical and financial support from administration, along with curricular and pedagogical change that is faculty-designed and led. This means that there is a commitment from senior administration to courageously review data and to provide the resources and time to assess and refine the reform. At El Paso, the college always had a representative on the math emporium implementation team that was directly connected to the president's office and to each of the vice presidents in charge of facilities, technology, registration, and instruction. This connection improved communication and empowered individuals throughout the institution to embrace the reform and take the steps necessary for successful implementation.

The institution must have a culture and infrastructure that support data-based decision making. First, there must be a student information system whose output is trusted. Institutional research (IR) and information technology (IT) departments need clearly defined roles and a productive working relationship. IR departments need the capacity to help other departments on campus ask the right questions to guide analysis that will lead to usable information that can be translated into action. This requires clear definitions and expectations for data collection and analysis, along with access to data and the ability to translate that information into action at the administrative and classroom level. Such analysis helps build support for adopting reform and make the case for expansion.

Continuous improvement hinges on regular assessment, refinement and on giving new practices time to take root. Faculty and staff at EPCC emphasized the importance of giving the new practice time to prove itself. As one said, "You can't expect to see good results the first semester, especially when you scale. Your data might actually suffer. Give it time; if it fails the first semester, it doesn't mean it will always will." Institutions that are committed to responsive reform will continue to evaluate and modify. Data gathered after assessing those modifications may suggest further improvements and reform measures.

Developmental Mathematics at EPCC Today

When students enroll at EPCC, they are assessed and placed in developmental- or transfer-level courses in math, reading, and writing based on their performance on the Texas Success Initiative assessment (TSI).[v] Students who test into any of the developmental math courses have the option of enrolling in a traditional, 16-week lecture course or a math emporium section. The emporium model at EPCC derives from the work of the National Center for Academic Transformation.[vi] The term "emporium" designates a lab-based course in which all instruction is computer-based, with support from tutors and full-time instructors; students in the same lab may be working on different courses. (At EPCC, emporium and lecture courses cover the same material in the same sequence.)

EPCC's developmental math sequence is as follows:

- MATH 0301: College-Prep Math; introduces basic mathematical concepts and real-numbers skills
- MATH 0303: Introductory Algebra; introduces basics of linear equations and systems, functions, and factoring
- MATH 0305: Intermediate Algebra; extends the study of beginning algebra

While students have the option to complete all three developmental math courses in one semester, they register for *one* course—the one determined by their placement score. Classes meet two days a week for 80 minutes per day and are led by an EPCC math faculty member (full-time or adjunct), who is supported by one or two student tutors,[vii] depending on class size.

Emporium courses are taught in computer labs, with no more than 30 students. EPCC strives to maintain a 12:1 student to teacher/tutor ratio in emporium sections. The emporium courses use MyLabsPlus,[viii] a Pearson product; students pay a $150 materials fee for the course, which grants them access to all of the online content and support.

While faculty have the option of leading mini-lectures with the entire class or organizing small group work, students generally progress through the course modules[ix] at their own pace, taking pre- and post-tests, viewing videos and

[v] If students are not recent high school graduates and have not taken the TSI, the college uses the ACCUPLACER exam to determine placement.

[vi] National Center for Academic Transformation. 2005. "The Emporium Model." Accessed October 11, 2013. http://www.thencat.org/PlanRes/R2R_Model_Emp.htm.

[vii] Tutors must have completed 24 credits of transfer-level work with a GPA of at least 2.5.

[viii] When the emporium courses were first offered, EPCC used MyMathLabs, another Pearson product.

[ix] While some colleges that use this format specify mastery of certain modules for individual degree programs and not others, EPCC requires all students to complete every module for their courses. See Hodara, Michelle, "Improving Students' College Math Readiness: A Review of the Evidence on Postsecondary Interventions and Reforms." Center for the Analysis of Postsecondary Education and Employment, Columbia University, 2013.

prepared slide shows, and completing homework, in the computer lab or online off-campus. (The college offers open lab hours that are staffed by tutors.) Students also maintain a portfolio-like course notebook, with weekly progress updates and copies of completed homework assignments and tests.

When students have completed the required homework for a module, they check in with their instructor, who reviews homework and progress reports. The instructor then unlocks the assessment for the student, which is completed on a lab computer. (Tests cannot be taken off-site.) After students complete all of the modules for a course, they take a paper-based final exam, either during finals week or earlier, if they complete the course before the semester ends.

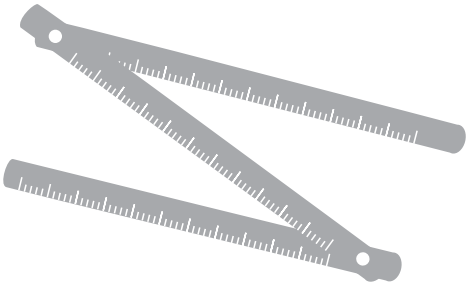
At El Paso, the connection between the math emporium implementation team and college leadership improved communication and empowered individuals throughout the institution to embrace the reform and take the steps necessary for successful implementation.

Students take many different paths, depending on how many developmental courses they are required to complete before advancing to transfer-level study. In the emporium sections, students can complete one, two, or three courses within the 16-week semester; they may finish one and begin the second; or they might not complete a course, but make significant progress. If they don't finish a course, their work is saved so that they can start where they left off when they enroll in the following semester. At the end of a semester, students receive credit for the highest level they complete. For example, if a student is placed into College Preparatory Mathematics and thus has to complete the entire sequence and completes both College Prep and Introductory Algebra in one semester, they are retroactively dropped without penalty from College Prep and assigned a grade for Introductory Algebra. If students do not complete a course but are making adequate progress at the end of the semester as determined by test and homework grades, they take a grade at semester end (if necessary for financial aid eligibility) or take an incomplete. The following semester, when they complete the course, the transcript is updated.

Adoption and Adaptation: Developmental Mathematics Reform at EPCC

The Community College Research Center's "adoption and adaptation" framework provides a useful tool to describe the process of reform at the colleges featured in the *Right from the Start* series.[x] The framework lays out six components that can generate the activity and relationships necessary to sustain true reform:

Adoption

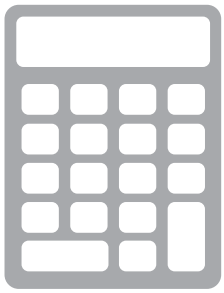


Diagnosis

determining the particular challenge students are facing, identifying institutional barriers, and gathering evidence to demonstrate the need for reform

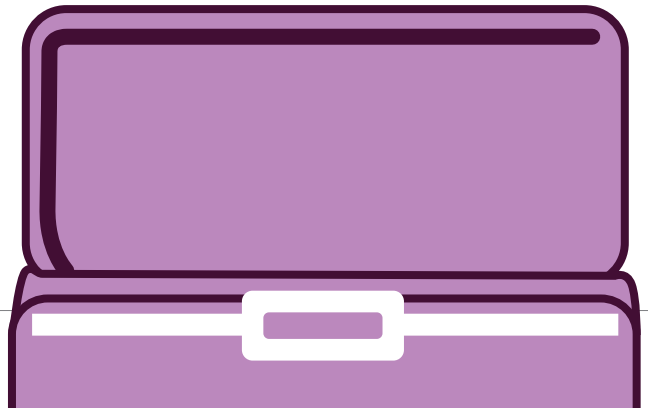
Selection

choosing a reform model that responds to challenges identified during the diagnosis phase



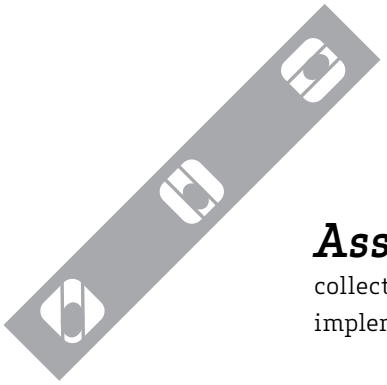
Preparation

conducting activities necessary for a successful reform launch—from curriculum development to space allocation to recruitment



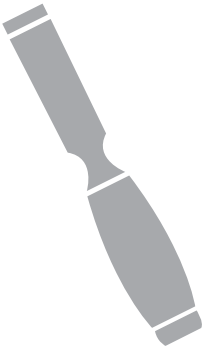
[x] Edgecombe, Nikki, Maria Scott Cormier, Susan Bickerstaff, and Melissa Barragan, "Strengthening Developmental Education Reforms: Evidence on Implementation Efforts from the Scaling Innovation Project." Community College Research Center Working Paper 61, Columbia University, 2013.

Adaptation



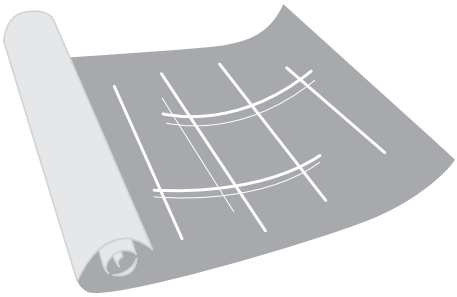
Assessment

collecting and analyzing data about reform implementation and outcomes



Refinement

converting data gathered from quantitative and qualitative assessment into action, improving instruction, streamlining processes, and addressing unexpected obstacles

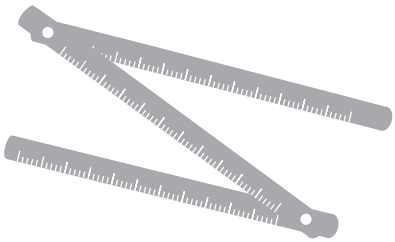


Scaling

institutionalizing the reform with the resources needed to sustain it so that it serves all of the students who can benefit

All of these components inform each other as colleges go about the complex work of reform. Rather than a prescriptive process for a specific "best practice," the framework clears a path for colleges to design and implement new practices and programs that meet the needs of students, respond to institutional constraints, and build capacity for continuous improvement. The following narrative details key aspects of three colleges' reform efforts according to the adoption and adaption framework. CCRC researchers found that that when colleges conducted assessment early on in implementation, they were able to involve more people in refinements, which led to more successful growth and development of the reform. Thus, in the *Right from the Start* briefs, reform implementation is discussed between the "preparation" and "assessment" phases.

Adoption



DIAGNOSIS

Diagnosis is the process of determining the particular challenge students are facing, identifying institutional barriers, and gathering evidence to demonstrate the need for reform.

Success in this phase at EPCC was predicated on four interrelated factors:

- Adopting new data management and analysis practices to disaggregate student data and undertake analysis of longitudinal data
- Broadening and deepening faculty in analysis of student data
- Expanding the role of the Institutional Research and Information Technology departments to support new data analysis practices
- Allocating institutional resources—both financial and human—to respond to state-wide policy reform efforts

Disaggregation and close analysis of student data began in earnest with EPCC's participation in Achieving the Dream. EPCC had an IR department and a student information system (Banner), but Achieving the Dream asked that the college analyze its data in different ways. To that end, EPCC broadened responsibility for data analysis beyond the IR department. The college formed a Faculty Data and Research Team and three Developmental Education Standing Committees, one for each developmental discipline. The Faculty Data and Research Team included faculty representatives from all five campuses in the district. (The team added IR and IT representatives in subsequent years. It still meets regularly to discuss data and played a significant role in developmental education reform efforts.)

The initial analysis found that first-time-in-college students (FTIC)[xi] were placing into developmental education courses at high rates. That was true even for students who had recently graduated from high school. As the standing committee on developmental mathematics reviewed placement and completion rates for the four course math sequence, however, they noted that very few students enrolled in the second course. That raised a central question—"Do we need that course?"—and sparked a two-year curriculum redesign effort that reduced the sequence to three courses.

[xi] For these analyses, EPCC used ATD's definition of FTIC, meaning students who were attending *EPCC* for the first time; they may have enrolled previously at other institutions.

Another View: Patrick Henry Community College

In the 2011–2012 academic year, after a three-year redesign effort, the Virginia Community College System instituted a new developmental math curriculum across all 23 colleges in its system. The new curriculum is composed of nine one-credit modules that are intended to address all developmental math needs within two semesters. Students must demonstrate competency on specific modules for particular programs of study. The required modules are determined by a custom assessment test, developed as part of the redesign. All VCCS colleges are required to use the curriculum, but they were granted flexibility in the delivery method, ranging from traditional lecture courses to computer-assisted emporium models.[xix]

Patrick Henry Community College (PHCC) is a VCCS institution in Martinsville, Virginia, with a fall 2012 enrollment of 3,100 students. Eighty-five percent of PHCC students attend part-time. PHCC joined the Achieving the Dream network in 2004. The college has made a name for itself in the cooperative and active learning field. This approach has become the dominant pedagogy at PHCC, and has changed the college's classrooms, professional development practices, job descriptions, and performance evaluations. Moreover, faculty from PHCC travel across the country helping other community colleges adapt their curricula and adopt new ways of teaching. This work—and the resultant student success improvements—were a major factor in the college's designation as an ATD Leader College in 2009.

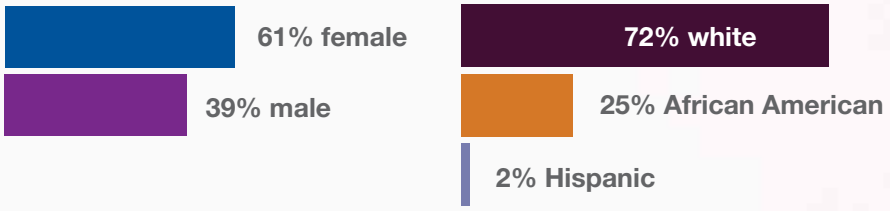
At first, PHCC faculty worried that a modularized developmental math curriculum and cooperative learning would be like oil and water in the classroom. After much discussion and creative thinking, the college instituted three different offerings for the new developmental math modules:

- A traditional math emporium in which students work at their own pace on computer-based modules, with support from faculty and tutors
- A traditional lecture course, with 2–3 modules in the first eight weeks of the semester and 2-3 modules in the second eight weeks. Students can take the entire course as a three-credit class and participate in the typical PHCC cooperative learning experience with a teacher facilitator using active learning practices
- Students who just have one or two modules to complete can register for a co-requisite course that follows the Accelerated Learning Program (ALP) model; these students enroll in the transfer-level course and a supporting lab section

The college incorporates technology (Pearson's MyMathLab) into all three offerings; the courses also have standardized quizzes and exit requirements.

[xix] For additional information on the VCCS redesign, see Asera, Rose, "Innovation at Scale: How Virginia Community Colleges Are Collaborating to Improve Developmental Education and Increase Student Success." Jobs for the Future, 2011.

Student profile: Patrick Henry Community College



Note: All figures reflect 2009 data from the Achieving the Dream National Database.

College leaders knew that incorporating the new curriculum without jeopardizing the positive effects of PHCC's cooperative learning work would require significant professional development. PHCC applied for and received a grant from the VCCS Chancellor's Innovation Fund to develop a train-the-trainer approach that ensured that all faculty delivering the new curriculum—no matter the method—would have the background and support they needed.

While the implementation is going well, it hasn't been without difficulty. The different course structures create new financial aid implications and scheduling challenges. With students demonstrating mastery of the modules at different times, Greg Hodges, dean of academic success and college transfer, says, "it's like an amoeba that is constantly changing." Based on one semester of data, early assessments of student outcomes were mixed. This is disappointing for PHCC's math department, which had successful completion rates of 75-80 percent before the redesign; courses offering the new curriculum have yet to achieve that level of success, except for ALP courses. However, the majority of students are completing the developmental sequence more expeditiously and PHCC has seen an uptick in transfer-level math enrollment and completion, since students are getting to the course more quickly. The college knows that the one semester of data does not make a trend; it will continue assessing, refining, and making improvements to ensure student success.

The reform effort at PHCC yielded lessons similar to those found at EPCC:

- Engage the faculty experts. This was critical for PHCC, even though the reform came as a system-level directive. Faculty led the way to creative ideas that preserve what works at PHCC.
- Maximize flexibility. While system-level changes are sometimes anything but flexible, PHCC found ways to be flexible within the parameters defined in the new developmental math curriculum.
- Keep experimenting. For PHCC, ALP was an experiment that proved successful; the college is now experimenting with "flipped classroom" activities for these courses. If that works, the college will adapt that approach for traditional lecture courses, too.

While EPCC was reforming its approach to developmental mathematics, related reforms were being instituted at the state level. In 2009, the Texas state legislature allocated $5 million to fund pilot innovative developmental education programs at community colleges throughout the state, led by the Texas Higher Education Coordinating Board (THECB).[xii] During the 2011–2012 session, the legislature mandated the establishment of a single set of standards for college readiness assessments[xiii] and required colleges to include technology-based options in their developmental offerings.[xiv]

SELECTION

Selection is choosing a reform model that responds to challenges identified during the diagnosis phase

Success in this phase at EPCC can be attributed to three key actions:

- Creating a structure to engage and honor faculty expertise in program design and testing
- Authorizing the use of institutional resources—financial and human—for site visits so administrators and faculty can see the reform in action and more informed comparison of institutional characteristics and needs
- Investing appropriate time and resources into technology testing to ensure fit with institutional norms and student needs

The Developmental Education Math Standing Committee was disheartened by data showing that 98 percent of students tested into developmental math and that very few of those developmental education students made it to transfer-level courses. Those data inspired EPCC's decision to redesign the sequence and eliminate at least one of the courses—thus removing a barrier to student success and enabling students to accelerate their progress toward transfer-level study.

[xii] One of the first was the Community College Developmental Education Initiative Program, of which EPCC was managing agent. EPCC identified 10 colleges to receive $100,000 grants to fund short-term developmental education innovations. This informed THECB funding priorities. See Texas Higher Education Coordinating Board, "Statewide Developmental Education Plan 2010-2011 Biennium." Texas Higher Education Coordinating Board, Austin, TX, 2009.

[xiii] Relating to the assessment of public school students for college readiness and developmental education courses to prepare students for college-level coursework, H.B. 3468, Texas House of Representatives, 82nd Legislature. (2011).

[xiv] Relating to developmental education and the assessment of student readiness under the Texas Success Initiative and to students enrolled in developmental education at public institutions of higher education, H.B. 1244, Texas House of Representatives, 82nd Legislature (2011).

Faculty led the restructuring effort. Each campus in the district had at least one representative on the developmental math standing committee. The reform initiative intentionally included both full and part-time instructors. Committee members began by asking faculty on every campus to respond to two questions:

- What do students need to know and be able to do before they come into each course?
- What should students know and be able to do after they finish each course?

The Committee identified themes that permeated the responses and developed recommendations that were then sent back to the faculty so they could see how their responses were synthesized. The committee created a matrix that listed competencies for each course, a structure that helped faculty identify and eliminate duplicate competency requirements. Through this iterative process (and ongoing work through the college's existing Curriculum Committee), EPCC created a new developmental math course sequence that covered the necessary competencies but eliminated one course. Speaking of this process, one of the committee members said, "Reaching out to everyone gives you ideas you haven't thought of, but also shows that you're asking for feedback and that you're responding to it. The process honored [faculty] expertise."

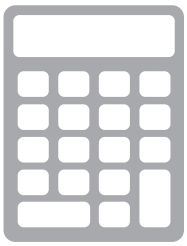
While the curriculum redesign was under way, the developmental math standing committee also was exploring different ways to deliver that curriculum. Ideas came from different places, including the vice president of instruction and EPCC's president, who had reviewed a program being used by the college's four-year partner, UTEP. Another colleague suggested that the committee look into the work of the National Center for Academic Transformation (NCAT). EPCC applied for and received a small NCAT planning grant, which enabled EPCC staff to attend a national conference to learn about different models for technology-supported instruction. The college used the grant to also research the six redesign formats recommended by NCAT. The research included site visits to colleges that had implemented emporium models, including Virginia Tech, San Antonio College, Glendale Community College, and UTEP. EPCC sent a dean and a faculty member on the visits. Every faculty member on the developmental math standing committee participated in at least one site visit.

Even though EPCC decided not to apply for an NCAT implementation grant, it continued to investigate the emporium concept. Standing Committee members researched how the emporium model might affect student experience and accelerate student progress. They also performed a cost analysis (including staffing and tutoring costs) of the emporium approach.

After much deliberation, the committee decided that the emporium was a good approach for EPCC. The committee suggested three options for implementing the emporium model to EPCC's president; faculty, campus, and district-wide leadership agreed to create an emporium at every campus. There was also agreement that

while emporium-style courses would be an option at EPCC, they would never be the *only* option. At every level of the campus, there is acknowledgment that students learn differently and that while some may flourish in an emporium setting, others will be most successful in a lecture-based course.

After opting to implement the emporium model, EPCC had to decide which software product to use. The college wanted a product with online resources that would allow students to accelerate their learning as needed, in a password-protected environment. According to one faculty member, "reviewing all the technology is overwhelming because each software company has different priorities." After screening many software options, the college tested two different products in classrooms over a semester. To help gauge the software's efficacy based on data, faculty administered a common final in all courses.[xv] Ultimately, EPCC decided to use MyMathLab,[xvi] chosen because students using that product had consistently better scores on the common final.



PREPARATION

Preparation means conducting activities necessary for a successful reform launch—from curriculum development to space allocation to recruitment.

EPCC learned that several factors are vital to this stage of the reform:

- Engaging full-time and adjunct faculty in the development and delivery of professional development that connects the reform to their expertise and practice; provide financial support to make participation feasible
- Involving the registrar and registration staff in early in the design of enrollment processes to ensure streamlined access for students
- Engage advising staff in the design of a recruitment and advising approach that is well-integrated with existing processes

[xv] Each final was graded by two different faculty, with an agreed upon rubric. The scoring was calibrated to ensure points were being awarded consistently.

[xvi] The college has subsequently adopted a different Pearson product, MyLabsPlus, for the emporium courses.

When preparing for implementation, essential groups to include are faculty, student services and advising staff, and students.

Faculty. While some faculty at each EPCC campus were involved in the product testing phase of the college's developmental math reform, the college recognized that if emporium courses were to be implemented at each EPCC campus, many more faculty had to be introduced to this new method. The college decided to create an emporium on every campus, but resource constraints necessitated a campus-by-campus roll-out. The initial trainings were district-wide and held before the first campus launched an emporium. A few members of the Developmental Education Math Standing Committee led two math emporium institutes. Stipends were offered for both full-time and adjunct instructors.[xvii] (Organizers noted that they required sign-in and sign-out to ensure completion.) All math faculty, full-time and adjunct, were invited to the first institute, even if they weren't immediately teaching an emporium section. Faculty also had an opportunity to tell coordinators what they needed to prepare for emporium teaching. The second institute, held later in the first semester of implementation, provided faculty who were already teaching in the emporium with advanced training on how to manage the course technology and troubleshoot classroom issues. The committee also offered—and continues to offer—workshops to introduce and enrich emporium-style practice.

Registration Services. EPCC has a centralized registrar and its registration system serves all five campuses. Observing that "we don't do something if it only works on one campus," the registrar insisted that EPCC produce a district-wide registration solution for emporium classes from the onset; there would be no campus-by-campus "work-arounds" to try things out. While they tested products, campus math coordinators worked with the registrar and staff to design an enrollment process that would be easy for faculty, seamless for students, and something that registration services could support. The college worked within existing policies and amended practices to address the unique registration challenges of the emporium classes. When EPCC hit snags, they were able to call on colleagues at other ATD colleges in Texas to learn how they had addressed similar challenges. While there are still some kinks to be worked out, students are able to register for emporium classes through the central registration system. EPCC was also able to draw on its experience in collaboration undertaken through its participation in Achieving the Dream and other implementation efforts. Establishing the emporium process went smoothly because it built on the lessons of those other efforts and, importantly, because it included student services early on in the design.

Counseling and Advising. EPCC learned that even if it designed a great emporium course and smooth registration process, students wouldn't necessarily sign up for it—especially if they didn't know about the offering. When emporium

[xvii] A Developmental Education Initiative grant from MDC with funding from the Bill & Melinda Gates Foundation provided the resources for professional development stipends.

"Reaching out to everyone gives you ideas you haven't thought of, but also shows that you're asking for feedback and that you're responding to it. The process honored [faculty] expertise."

sections were first added to the EPCC course catalog, therefore, math coordinators alerted EPCC's counselors and advisors about the new offering. The coordinators also presented information about the math emporium option at district-wide counseling meetings. In addition to counseling and advising sessions, students were introduced to the emporium option at new-student orientation and college resource fairs. The college produced a short video introducing the emporium that was shown during registration[xviii] and broadcast on the local public access channel.

While these efforts were helpful, counselors and advisors were not part of the development and design team; some noted that including the advising function in research and site visits could have given a more comprehensive picture of how emporiums work on a particular campus. Earlier involvement by counseling and advising staff would have made publicizing and promoting the emporium option easier. One key takeaway lesson, therefore, was that because counselors and advisors often work with students months before a new semester begins, they need all available information that can affect student decisions about their schedules as early as that information is accessible.

[xviii] This was only shown at campuses that have video capability in registration areas.

LAUNCH

Several additional factors became important in the implementation phase:

- Adapting instructional approaches to provide multiple means for students to get answers to content-related questions
- Providing support to help students adjust to computer-assisted instruction and feel comfortable with the technology
- Determining which students are best suited for the emporium model

The emporium sections were first offered on EPCC's Transmountain Campus in spring 2009 and on three additional campuses—Northwest, Valle Verde, and Mission del Paso—in fall 2009. These courses were offered in existing math labs or in computer labs "borrowed" from other disciplines. By spring 2010, 525 students were enrolled in emporium courses, representing 2 percent of EPCC's total enrollment and 6 percent of students who placed into a developmental math course.

One key factor in teaching within the emporium model is how students pair technology content with human support, whether from a faculty member or a tutor. Each faculty and student tutor pair determines how they will approach each section. The district-wide emporium coordinator holds a "meet and greet" workshop for tutors and instructors where they discuss appropriate roles and course management (for example, what resources students are allowed to use on tests). Some faculty noted that students will often approach tutors before they come to the lead instructor; having such options for students means they can get individualized instruction without necessarily connecting directly with a faculty member and gives them more opportunities to get support. The technology offers other avenues for this individualized interaction. For example, a student can use the software to email faculty directly while they work on a particular homework problem. The message includes the problem and faculty can give a specific response by email, thus eliminating the wait time students might experience completing homework for a lecture course.

The emporium model changes the student experience in other ways, too. Instructors have found that some students are more comfortable raising their hand to ask a question in the emporium than they would be in a lecture course. Other instructors found it easier to build trust with lower-level math students in the emporium context. While the emporium model is intended to help students accelerate their progress, it can also help the students who want to go more slowly; students can focus on mastery of the material and not feel pressure to keep pace with their peers. Faculty noted that an emporium instructor plays many different

roles in the emporium class: As one said, "You have to be a cheerleader, a tutor, *and* a computer tech." Faculty also found that working one-on-one with students means they get to know students better and develop a better understanding of when individuals are struggling with the material.

One counselor said that "there is rarely a lukewarm reaction to an emporium course: [students] love it or they hate it." Faculty also noted that younger students seem more comfortable with the emporium model than do their older peers and that many older students seemed nervous about computer-based instruction. Counselors noted that students who are already self-starters and computer-savvy are more comfortable in the emporium. Accordingly, instructors have learned to how to work differently with students who are not technologically savvy. Students for whom the emporium proves not a good fit can still enroll in a lecture course that covers the same material.

Among current math emporium students interviewed for this brief, all were open to the computer-based instruction, but some were more comfortable than others. One student, for example, was directed to the course in an advising session; he was drawn by the opportunity to complete multiple courses in one semester. Another had registered for the emporium section, but didn't realize it was computer-based until the first day of class. He was wary of the method (and of computers), but was getting support from fellow students and was willing to try. Another student embraced both the technology and the potential for acceleration, but was looking for a better orientation to the software; he was less worried about content and more worried about mechanics.

Adaptation

ASSESSMENT

Assessment refers to collecting and analyzing data about reform implementation and outcomes.

Several factors proved vital in this stage of the reform at EPCC:

- Institutional research and information technology departments with clearly defined roles, productive working relationships, and adequate technology to support a shift from compliance and description to analysis and informed decision making
- Respect for and resources to collect different types of data so that colleges can consider quantitative figures as well as the qualitative student experience behind those figures

- A culture of inquiry—and not of blame—so that even unexpected results in the data analysis can lead to improvements and course corrections

Data collection is a central component in assessment. In addition to placement rates and course completion results—the factors that sparked the effort to begin with—EPCC examined how students persist through a semester and whether they are retained from fall-to-spring and fall-to-fall terms.

Several developments in EPCC's IR department supported emporium assessment and data analysis. The college purchased SAS software in 2005; after a lengthy process of exploration and training, the program was fully implemented in 2009. Delays in those early years were attributed to learning about the need for a data warehouse and building the necessary staff capacity to support it. In spring 2010 the college hired two SAS programmers to develop and maintain a data dashboard. (District and campus administrators, as well as the Faculty Data and Research Team, have access to the dashboard, a compilation of customizable reports about enrollment, course completion, persistence, and other indicators. Now dashboard users can generate specific reports without going to IR staff. The college is exploring ways to expand dashboard access to even more faculty.)

In addition to the new technology, changes in the relationship between the IR and IT departments improved data access and practices at the college. EPCC has seven IR staff and 30 IT staff that support all five campuses. IT and IR staff work together to prepare data requested from faculty to monitor the growth of the emporium offerings, as well as data concerning student enrollment, persistence and retention rates, and course completion rates. The quantitative analyses generated by the IR department and dashboard are enhanced by qualitative assessment carried out at the college. Over the years of their participation in Achieving the Dream, the two departments have collaborated more closely and assessed data in new ways, work that generated a better understanding of the different roles the two departments play and highlighted ways they could support one another. This informal relationship is mirrored in office and staff allocations: there is an IT staff member whose office is in the IR suite to facilitate collaboration on reporting and analysis.

EPCC held student and faculty focus groups in the first year of emporium implementation. Feedback from these efforts was incorporated into modifications made in subsequent semesters. To continue collecting this kind of feedback, the college has made student evaluations of faculty accessible through MyLabsPlus; it is working with Pearson to offer an online student survey. The college also gets feedback from faculty during math emporium workshops during an annual campus-wide professional development week.

EPCC was surprised by some of its data findings about the emporium experience. For example, one faculty member expected to see large jumps in course completion rates. She was discouraged when those rates were similar to lecture courses and, initially, discounted data that showed improved persistence and retention rates.

She said, "It's working in a way that I didn't expect; when it didn't work that way, my first thought was 'it's not working.'" EPCC also realized that it wanted to collect data that it was not set up to collect. The college found, for example, that it was unable to use course software to track students who completed more than one course during a semester. For now it is collecting these data manually.

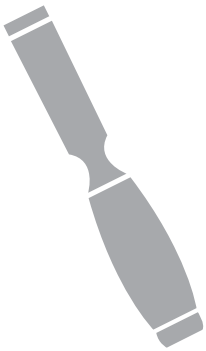
Expect the Unexpected

Early assessment of EPCC's emporium implementation resulted in several instructive insights, some of which were unexpected:

- ***It is hard to make progress without the access code.*** In order to begin work on emporium courses, students must pay a $150 fee for an access code. The college found that many students tried to avoid or couldn't afford the fee. Without the code, students can't access online homework and tests. While Pearson gives students 12 days to purchase the code, the student loses a lot of learning time if there is a delay. The college is exploring ways to attach the fee to the registration process to make it easier for students to apply financial aid in paying the fee.

- ***Language is important.*** "Self-paced"—a phrase that was originally used in reference to student activity in the emporium—was sometimes interpreted as "no pace," and applied to too many students who were not making sufficient progress. EPCC now uses the phrase "self-accelerate" to describe the emporium courses, encouraging an expectation among students that they finish the course in one semester.

- ***Not everyone has the same definition of "user-friendly."*** Faculty and administrators did not anticipate student difficulties with various passwords for EPCC accounts and emporium-specific functions. The technology services department provided support for the first few days of the semester to help students with login protocols. On each campus, there is also a faculty member with administrative access to ensure that logins are entered into the course software correctly.



REFINEMENT

Refinement means converting data gathered from quantitative and qualitative assessment into action, improving instruction, streamlining processes, and addressing unexpected obstacles.

Two key realizations guided this phase at EPCC:

- Continuous improvement requires constant refinement, including adjustments to technology, staffing, and curricula
- Unintentional consequences of unrelated institutional policy changes can jeopardize early reform efforts if the institution is not flexible and willing to respond to reform-related adjustments

The effort to implement the emporium at EPCC is a process of continuous improvement. Even after the initial implementation at all five campuses was completed in spring 2012 semester, for example, there were significant modifications to the math emporium. As one faculty member put it, "it's improvement research. You have to try it out, tweak it, and then go back. You can't say that the math emporium is done."

A major adjustment was upgrading emporium software to MyLabsPlus, another Pearson product, which provided additional structure and course management support. The college also named a district coordinator to support emporium courses on all five campuses. The coordinator is a math faculty member and a member of the Developmental Education Math Standing Committee. EPCC designated a faculty member on each campus to assist the coordinator. The district coordinator works with these campus liaisons and student services in the early weeks of the semester to ensure that enrollment goes smoothly and that courses are set up properly. She helps individual faculty troubleshoot course management issues and can make behind-the-scenes modifications that make everyone's courses run more efficiently. (Any substantive changes to course materials are made only with standing committee approval.) The district coordinator also created an EPCC Mathematics Emporium Handbook for faculty. Compiling all of

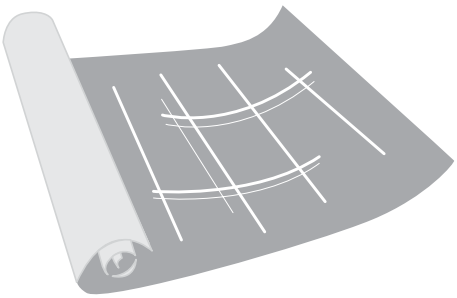
"It's improvement research. You have to try it out, tweak it, and then go back. You can't say that the [reform] is done."

the materials from introductory workshops, the handbook includes extensive step-by-step instructions for various course management actions, as well as quotations from faculty and students about emporium experiences.

EPCC has made a number of modest changes based on student and faculty feedback:

- Titling unit pre-tests "What You Already Know" reduced student anxiety.
- After hearing from faculty that students were not using the learning resources in the software, but instead just trying to do homework, the Math Standing Committee developed a course notebook. The notebook includes a standardized syllabus as well as a required progress report that helps students and faculty track individual advancement through the course materials and ensures that students are taking advantage of all available learning resources.
- The syllabus now outlines recommended pacing for completion of one, two, or three courses. Week-by-week schedules are included in the course notebook and are visible on a whiteboard in every classroom.
- Even janitorial and campus security offices had to make refinements; on one campus, administrators had to make arrangements for the upkeep and security of the new stand-alone building housing the emporium classroom.

The adoption of a "no late registration" policy at EPCC affected emporium students, too. According to EPCC policy, the last day to register for courses is the first day of the semester. Students then have one week to add or drop classes. This creates a tight timeline for students who are new to the emporium model and sometimes makes it difficult for those who decide they prefer a lecture course to get the credits they need for the semester. The college has some late-start "mini-mester" options, but what is available depends on student demand. These policies may require further refinements to make sure students have all the information they need when registering as well as flexibility to make schedule adjustments if necessary.



SCALING

Scaling means institutionalizing the reform with the resources needed to sustain it so that it serves all of the students who can benefit.

Key lessons for EPCC regarding scaling included the following:

- Institutional flexibility and willingness to reallocate varied funding sources and repurpose existing structures can make expansion of necessary infrastructure more feasible
- Expansion will require reallocation of general operating funds. Time-limited grant dollars may be used to ease the transition, as long as a sustainability plan—with clearly defined budgetary consequences—exists from program launch

EPCC wanted to make the emporium-style classes available on every campus, even though the college never intended that path to be the *only* way it offers developmental math. As President William Serrata explained, when the math emporium implementation was considered, "equity was a key term: we had a responsibility to offer this at all campuses and to make equitable resources available at each campus to do so." This meant that while EPCC had a district-wide adoption of the model, roll-out was campus-by-campus. Roll out at one campus at a time made it easier to manage resources and made it possible for the college to help each campus establish emporiums.

The first concerns were space and technology. The campuses employed a variety of solutions:

- Two campuses identified adjacent classrooms and took down the dividing wall to create a large lab space
- One retrofitted an old bakery building in downtown El Paso
- One purchased a portable building
- One set up a temporary space in a reading lab, and then secured a US Department of Education grant to construct a building

The Developmental Education Initiative grant funded the initial technology investment for all five campuses.

Tutors also were essential; if the emporium model was to go to scale *and* be successful, each campus needed to have stable funds to support tutors in the long-term. The college used Developmental Education Initiative grant funds to get tutoring started on each campus; that grant provided two years of support. The college knew that it was expected that, after two years, support for tutors needed to be allocated in the general operating budget. The grant funds gave the college time to plan and include tutor funding in allocation decisions after grant end.

Considering a traditional definition of scale—simply reaching more students—the math emporium is on its way. When the first courses launched, just over 500 students were enrolled. In 2011–2012, after expansion to all five campuses, more than 3,000 students were enrolled in emporium sections—10 percent of the total student body and over 25 percent of developmental math students. But *scale* doesn't necessarily mean *all*; it means reaching those who can benefit from the practice. The steady growth of the emporium model at EPCC appears to be doing just that.

This growth also requires continued support of required technology and staffing. The college plans to sustain the technology investment through instructional technology funds. As noted, funding of tutors was institutionalized before the related grant period ended. Faculty will continue to assess, refine, and decide how many emporium sections are needed to meet student demand and to maintain the desired student/faculty ratio—and successful student outcomes. They also will need to respond to the evolving nature of all mathematics offerings at the college, given new mandates from the Texas Higher Education Coordinating Board.

"You can put it in policy or procedure, but until you hear it in everyday conversation, it's not institutionalized."

What Does Institutionalization Look Like?

A focus on scale emphasizes the importance of institutionalization—a reliable college commitment of resources and will that sustain a practice and help it grow. EPCC administrators, faculty, counselors, and staff named the following as actions that signal an institutionalized practice:

- ***Data collection is a routine part of decision making,*** with an increase in the number and nature of requests for data from the IR department, from people with varied job descriptions.

- ***Practices cross discipline lines,*** sharing something that works in one discipline with another. EPCC refers to emporium labs as "Learning Emporiums," because there is hope—and already discussion—about how other departments at the college might take advantage of the technology.

- ***Enrollment is seamless*** and there is a systematized process for registration and advisement that has few glitches and requires no work-arounds. Everyone understands their roles and can carry them out without confusion. EPCC is on its way, but the college is still refining advising procedures

- ***Students are talking*** about the practice and speak of it routinely as part of their experience at the college. As one staff member in student services said, "you can put it in policy or procedure, but until you hear it in everyday conversation, it's not institutionalized."

What EPCC Learned

As an Achieving the Dream and Developmental Education Initiative college, EPCC submitted student-level data to the Achieving the Dream National Database. This enabled the college to compare performance of emporium students with those enrolled in lecture courses. The data show that:

- In 2009 and 2010, a higher percentage of emporium students had completed the developmental sequence in two years.
- In both years, emporium students had higher term-to-term and year-to-year retention.

These data do not yet account for the possibility of self-selection; it is possible that the emporium model appeals to highly motivated students who are also more likely to succeed, regardless of the instructional method. However, it does give an initial look at the potential of the emporium offering for some students.

While these results are certainly promising, the college will continue its "improvement research" and is considering other assessment, refinement, and scaling possibilities, including:

- Learning more about how and why emporium students succeed and are retained at higher rates; the college also wants more information about how emporium students fare in transfer-level courses
- Creating a systematic way to collect data from counselors and advisors to understand the student experience as they decide between the emporium and the lecture format
- Clarifying registration procedures and providing more extensive explanation of the emporium option in the course catalog and online registration
- Improving information-sharing between students, faculty, and advising regarding mid-semester course completions to make advising for subsequent semesters more accurate
- Exploring non-course-based options to give students who are near completion at the end of the semester additional time to finish a course, without jeopardizing financial aid eligibility or transcripts
- Exploring ways to integrate Texas's New Mathways effort by supporting the first transfer-level course in the emporium
- Exploring ways to support other disciplines' curriculum redesign efforts within the emporium

Another View: Bunker Hill Community College

Bunker Hill Community College (BHCC) in Charlestown, Massachusetts, had a fall 2012 enrollment of 13,456 students; almost 70 percent of its students attend part-time. When the college first became a part of the Achieving the Dream network in 2007, it began looking more broadly at longitudinal student outcome data. The college discovered that, as at so many other colleges, the more developmental education requirements students have, the less likely they are to proceed to transfer-level courses. And like many other colleges, BHCC also learned that the path for developmental math students was particularly challenging.

BHCC's strategy for addressing this challenge involved a lot of testing and trying. The launch of learning communities at Bunker Hill encouraged teaching innovations overall. One of the early successful efforts was linking developmental math courses with a student success course in a learning community. This eventually led to the compression and contextualization of the developmental math curriculum that now represents BHCC's strategy for accelerating student progress to transfer-level math. In addition to shortening the sequence from three to two courses for 89 percent of BHCC students, the college also offers a 6-credit course that allows students to complete the two-course sequence in one semester. In addition to a pedagogical focus on active learning and critical thinking skills, tutoring, student services, and computer-assisted skill-building are integrated into the curriculum. The courses also include a recommended common syllabi, midterms, and finals. According to faculty leaders of the redesign, student data and research on pedagogy and practice were the foundation of this reform; knowledge was integrated into the contextualized instruction and the classroom experience.

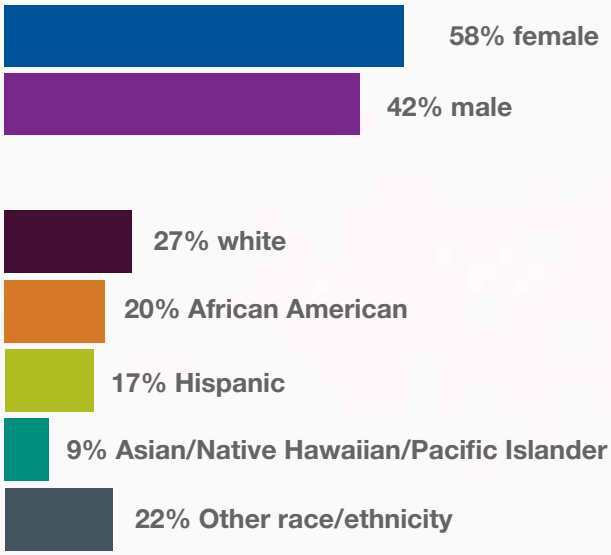
Such a comprehensive reform was a challenging endeavor for the math department and there was some resistance to these changes. BHCC has 15 full-time and over 50 adjunct instructors in the department and wanted everyone to take ownership. Despite the initial unease, the college was eventually able to engage, in the summer of 2012, in difficult but productive discussions about outcomes, methods, and improvements. Once most key stakeholders shared ownership of the problem of students' course outcomes and progress, the department was able to move forward. Sharing student data was a central building block in consensus building. Another lever came in the form of faculty working groups that were formed to develop new strategies. The groups included long-time faculty, those new to the college, and part-time faculty. These groups generated energy and excitement for innovation; they were also supported by college administration, another important key to securing buy-in.

Another signal of support occurred when the college provided stipends for professional development to prepare those who would deliver the new curriculum. This group took a learning-centered approach, reading select books together that served as the philosophical foundation for rethinking pedagogy. BHCC provided several professional development opportunities that helped promote an understanding of the new model and helped secure the support needed to institute it.

BHCC continues to collect data that suggest the new models are working. As of spring 2013, for example, 149 students were enrolled in the accelerated model, with an average success rate of 64 percent compared to 40 percent completion in the traditional lecture course at the beginning of the redesign process.

In addition to these improvements for students, there have been further advancements within the institution. A culture of change has been bolstered within the college as more individuals become more open to learning new approaches to pedagogy and refining practice and policy. Decision-making is being informed more regularly by analysis of both the institutional and state-level data. Another trend has been that faculty members have been learning more from each other. Faculty in the math department have become recognized experts on pedagogical change and are sharing that knowledge outside their department and even outside the college. Their influence can be seen in the BHCC English department, for example, which is following a similar process to pilot accelerated models for developmental

Student profile: Bunker Hill Community College



Source: Achieving the Dream National Database

writing, and in local high schools, which have requested advice on how to do similar work in their classrooms.

Lessons at Bunker Hill echo those learned at EPCC:

- ***Communicate the urgency of making improvements.*** As one BHCC faculty member said, "Convince with evidence and data: That's why faculty own it, act on it, and are open to change."
- ***You can't just expect it to happen.*** Comprehensive reform requires comprehensive professional development. Provide faculty and staff the time and support they need to be more creative. The focus must be on the classroom; reforms on the margin of the institution may only bring marginal results.
- ***Reform must be faculty driven, with administration support.*** This is the way Lori Catallozzi, dean of humanities and learning communities, described the dialogue with faculty after reviewing the developmental education student data: "We all know that we need to do something. As faculty members, you lead the effort and the administration will support you." With faculty taking the lead and building consensus among their colleagues, it was possible for the college to standardize practice within the department.

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