

RESEARCH BRIEF

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Achievement Gap Analysis Series – Success in Developmental Math: Fall 2011 through Fall 2013

NOVA's commitment to student success is demonstrated by the College's participation in the Achieving the Dream (ATD) National Reform Network. ATD is a comprehensive nationwide reform movement for student success in which NOVA has been a member since 2007 and a Leader College since 2010. NOVA's participation in ATD encourages continuous monitoring of student outcomes in order to identify areas for improvement. Such attempts are based on research that leads to student success and closing the achievement gaps.

This Research Brief is part of a series examining recent trends in achievement gaps among first-time in college (FTIC) students in the following indicators of student success: course completion, retention, graduation rates, success in gatekeeper courses, success in developmental courses, and developmental student success in college-level courses.

This Research Brief examines achievement gaps in developmental math success rates of three cohorts of FTIC students (Fall 2011 through Fall 2013).¹ Data is disaggregated and analyzed by student demographics: enrollment status (full-time or part-time), gender, age, race/ethnicity, and program placement.²

Key Findings

- Overall, achievement gaps in developmental math success rates were found when data was disaggregated by student **enrollment status, gender, age, race/ethnicity, and program placement.**
- The demographic groups with the highest developmental math success rates were full-time students, female students, students 22 and older, Asian or White students, and students enrolled in an A.A. or A.S. program as compared to their counterparts within demographic groups.

¹ OIR originally published the details of this study in "Achievement Gap Analysis Report 5 – Success in Developmental Math by Enrollment Status," available at: <http://www.nvcc.edu/oir/files/SuccessinDevelopmentalMath.pdf>.

² All demographics are as of the student's first term.

Section 1. Achievement Gaps in Developmental Math Success

The success rates are presented for first-time to NOVA students, in the Fall 2011 through Fall 2013 cohorts, who enrolled in a developmental math course during their first term. Success in developmental math is defined as the rate at which students who enrolled in a developmental math course in their first term succeeded in that course within one academic year, i.e., received a grade of “S” (Satisfactory). Students who met this definition of success may not have necessarily completed their entire developmental math sequence, as students may be required to take more than one developmental math course. Students who enrolled in more than one developmental math course in their first semester were counted as successful if they succeeded in at least one of those courses.

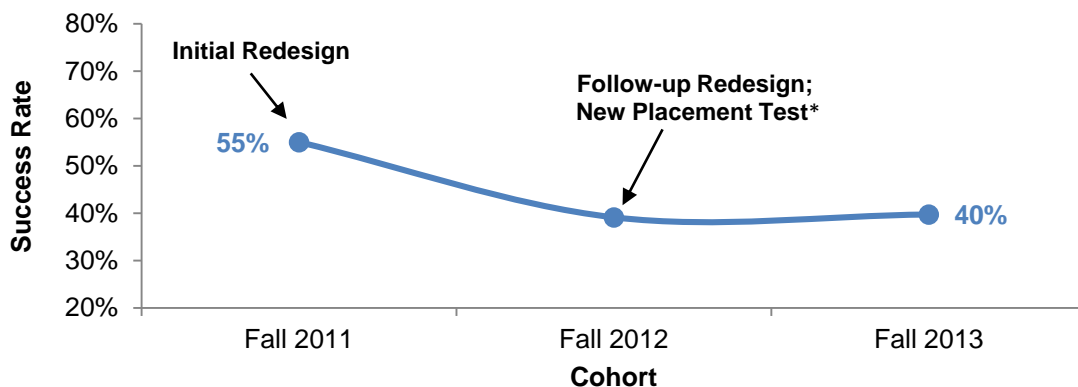
NOVA began teaching a redesigned developmental math curriculum in Fall 2011. In mid-Fall of the same year, a new statewide test for developmental math placement was introduced: the Virginia Placement Test Math (VPT-math). Fall 2012 was the first Fall semester in which most students were placed using the VPT-math. Furthermore, in Spring 2012 a once again revised developmental math format was adopted. Because of this, the analysis in this Research Brief will focus on the Fall 2012 and Fall 2013 cohorts of students who enrolled in a developmental math course and succeeded.

Table 1 shows the overall developmental math success rates of FTIC students from Fall 2011 through Fall 2013. The overall success rates for the cohort decreased from 55 percent in Fall 2011 to 40 percent in Fall 2013; however, there was a slight increase of almost 1 percentage point from the Fall 2012 to the Fall 2013 cohorts (39 to 40 percent).

Table 1. Successful Developmental Math Completion of FTIC Students: Fall 2011 through Fall 2013 Cohorts

Fall 2011 Cohort			Fall 2012 Cohort			Fall 2013 Cohort		
Total Enrolled	Successful		Total Enrolled	Successful		Total Enrolled	Successful	
	#	%		#	%		#	%
2,125	1,168	55.0%	1,792	701	39.1%	1,762	700	39.7%

Figure 1. Successful Developmental Math Completion by Enrollment Status: Fall 2011 through Fall 2013 Cohorts



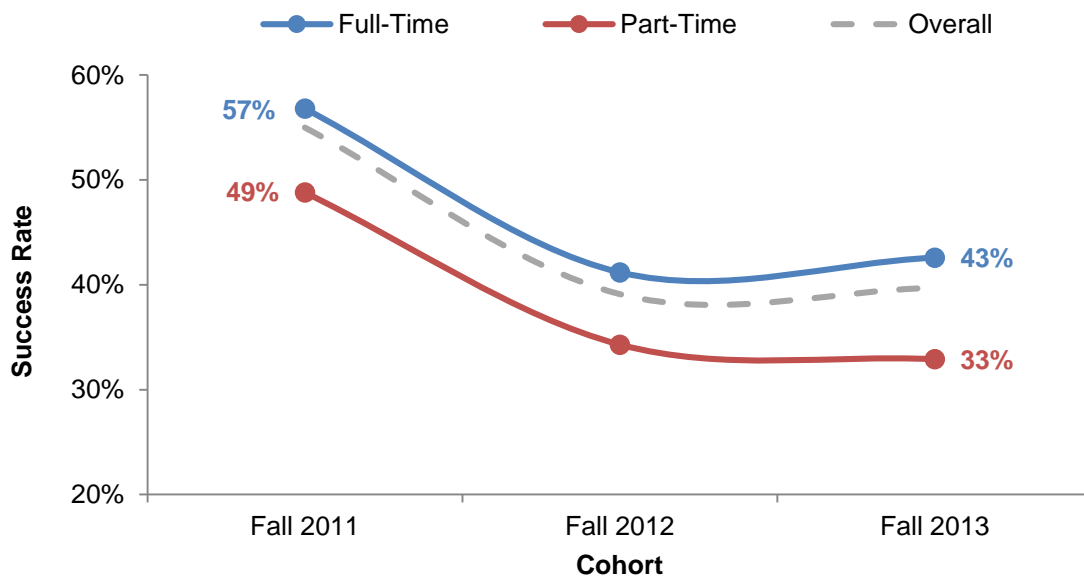
*The VPT-math was introduced in October 2011; however the Fall 2012 cohort was the first fall cohort in which most students were placed using the VPT-math.

Enrollment Status

The data shows an achievement gap in developmental math success rates of FTIC students by enrollment status.

- Developmental math success was consistently higher (up to 10 percentage points) for full-time students than part-time students.
- Full-time students' developmental math success increased 41 to 43 percent from the Fall 2012 to Fall 2013 cohorts, while part-time students' developmental math success rates decreased from 34 to 33 percent.
- The achievement gap increased from 7 to 10 points from the Fall 2012 to the Fall 2013 cohorts.
- Full-time students comprised 70 percent of students in the Fall 2012 and Fall 2013 cohorts.

Figure 2. Successful Developmental Math Completion by Enrollment Status: Fall 2011 through Fall 2013 Cohorts

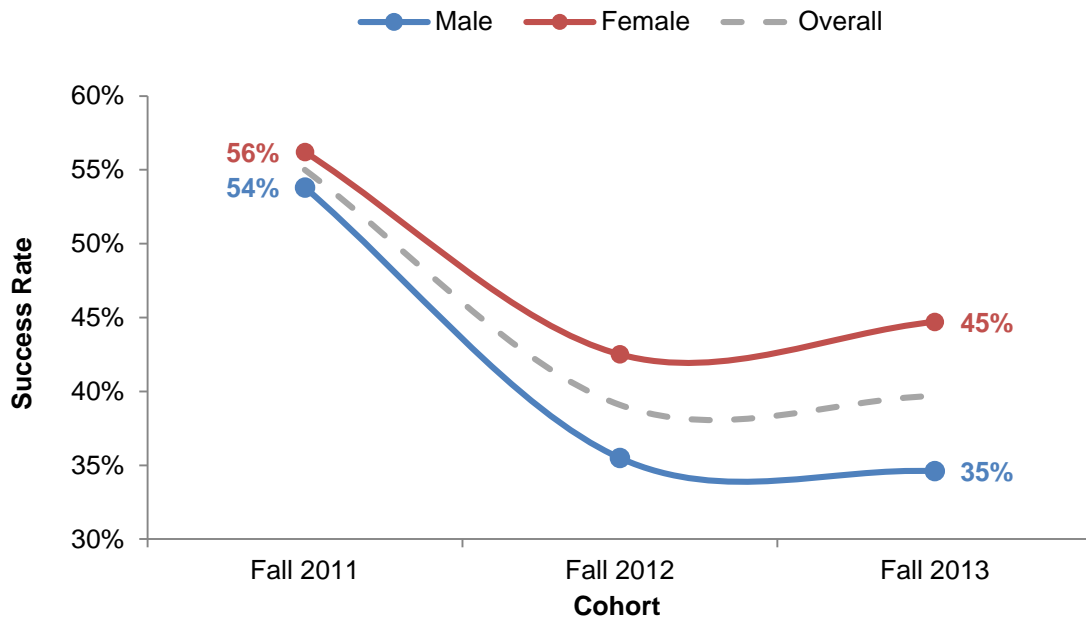


Gender

The data shows an achievement gap in developmental math success rates of FTIC students by gender.

- Male students had an achievement gap of 7 percentage points compared to female students in the Fall 2012 cohort, and this gap increased to 10 percentage points in the Fall 2013 cohort.
- Across these three cohorts, female students had a consistently higher developmental math success rate (average of 48 percent) compared to male students (average of 42 percent).

Figure 3. Successful Developmental Math Completion by Gender: Fall 2011 through Fall 2013 Cohorts

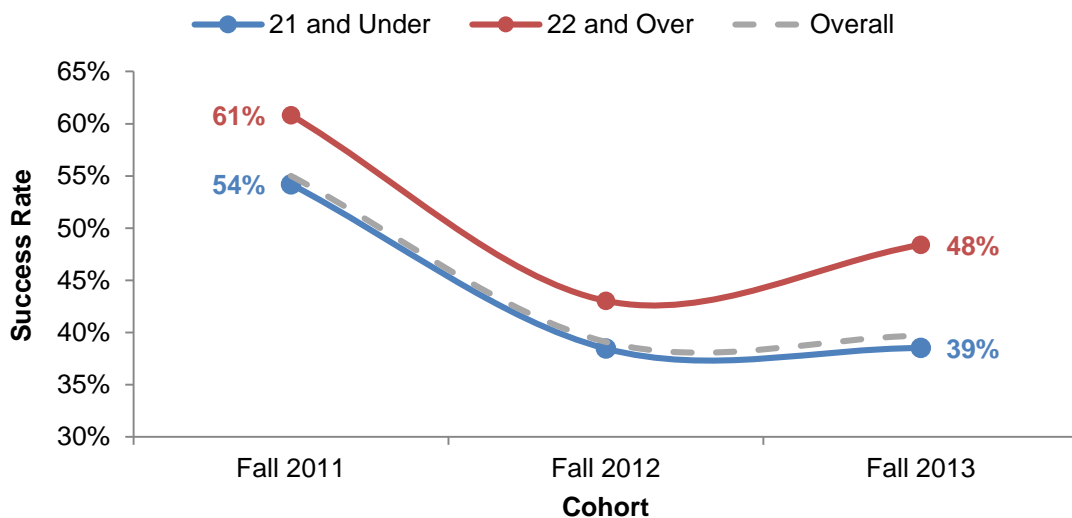


Age

The data shows an achievement gap in developmental math success rates of FTIC students by age group.

- Students age 22 and over had developmental math success rates up to 10 percentage points higher than students 21 and under.
- The achievement gap increased for students age 21 and under from 5 percentage points in the Fall 2012 cohort to 10 percentage points in the Fall 2013 cohort.
- Eighty-seven percent of developmental math students were in 21 and under age group.

Figure 4. Successful Developmental Math Completion by Age: Fall 2011 through Fall 2013 Cohorts

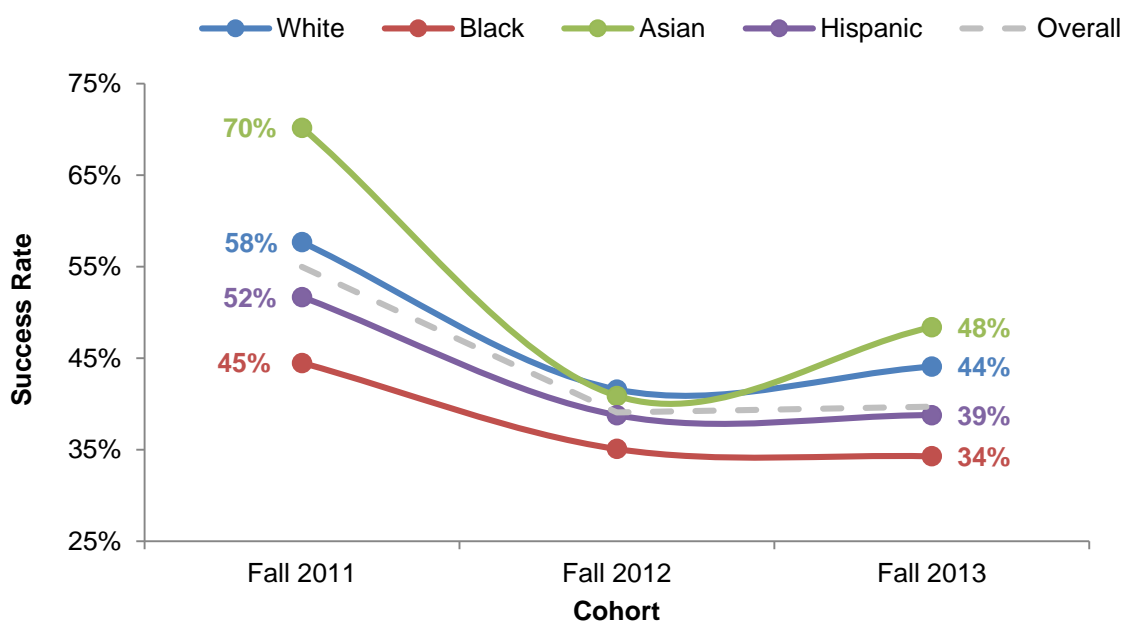


Race/Ethnicity

The data shows an achievement gap in developmental math success rates of FTIC students by race/ethnicity.

- Asian students experienced a large increase in success rate from the Fall 2012 to Fall 2013 cohort, from 41 percent to 48 percent.
- Asian students had the highest success rates in the Fall 2013 cohort (48 percent), followed by White students (44 percent).
- Hispanic students' developmental math success rates in the Fall 2013 cohort were similar to the overall rate, ranging from (39 percent compared to 40 percent).
- Black students had the lowest success rate in the Fall 2013 cohort (34 percent).

Figure 5. Successful Developmental Math Completion by Race/Ethnicity: Fall 2011 through Fall 2013 Cohorts

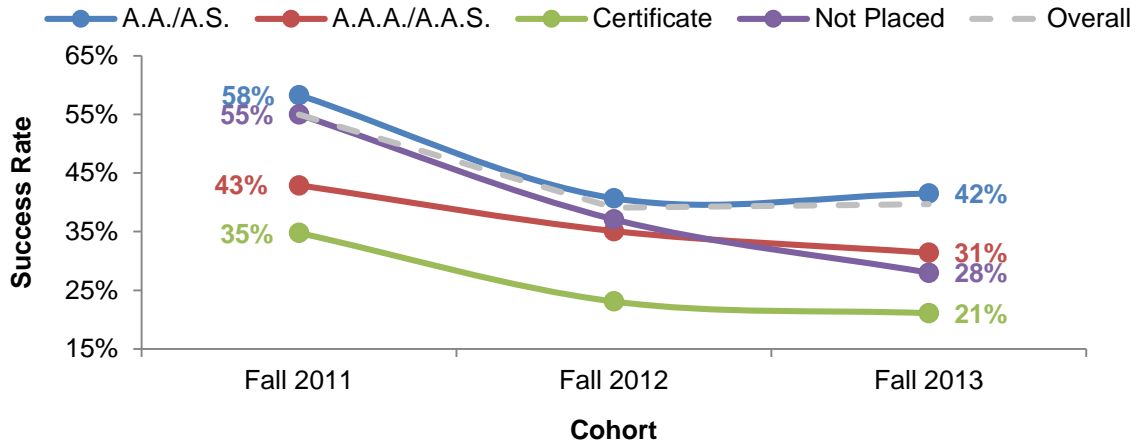


Program Placement

The data shows an achievement gap in developmental math success is based on students' choice of degree or certificate program.

- Over half of FTIC students were enrolled in either an A.A. or A.S. degree program. Of these students, 42 percent were successful in developmental math in the Fall 2013 cohort.
- The developmental math success rate of students in A.A.A. or A.A.S. degree programs was 31 percent, compared to a rate of 21 percent for students in Certificate programs.
- Students who were not enrolled in a degree or certificate program (Not Placed) had developmental math success rates from 28 percent in the Fall 2013 cohort.

Figure 6. Successful Developmental Math Completion by Program Placement: Fall 2011 through Fall 2013 Cohorts



Section 2. Discussion of Findings

Overall, the decline in developmental math course completion across nearly all groups from Fall 2011 to Fall 2012 may be due to more students being placed using the VPT-Math in Fall 2012, as this test may have been more successful at capturing students who were in need of developmental math.

The data in this Research Brief reveals a number of achievement gaps among FTIC students in terms of developmental math success. In general, developmental math success rates were highest among students who were full-time, age 21 and under, female, White or Asian, and enrolled in an A.A. or A.S. degree program. The achievement gap between full- and part-time students increased slightly over time, while the gap between Asian and Black students increased from a 7 percentage point difference in Fall 2011 to a 10 percentage point difference in Fall 2013.

These findings mirror national trends. Current research consistently shows that male persistence and achievement lags behind that of female students.³ The gender gap is most pervasive among Black students, with Black female students earning 68 percent of all associate degrees awarded to Black students.⁴ In addition, national data shows that Black and Hispanic students trail Asian and White students on a number of student success metrics. As of 2008, only 30 percent of African Americans and 20 percent of Latinos between the ages of 25 and 34 had attained an associate degree or higher compared to 49 percent of White students and 71 percent of Asian students.⁵

³ Lee, J. M., & Ransom, T. (2011). The educational experience of young men of color: A review of research, pathways, and progress. Retrieved from College Board website:

<http://youngmenofcolor.collegeboard.org/sites/default/files/downloads/EEYMCResearchReport.pdf>.

⁴ Center for Community College Student Engagement. (2014). Comprehensive Fact Sheet: Men of Color in Higher Education. Retrieved from: http://www.ccsse.org/docs/MoC_Long_Fact_Sheet.pdf?ts=20170113182911.

⁵ Lee & Ransom 2011.

Closing Achievement Gaps at NOVA

Based on ATD's recommendations, NOVA began teaching a redesigned developmental math curriculum in Fall 2011. The reason behind redesign was to reduce the overall need for developmental education and design developmental education in a way that reduces the time to complete developmental reading, writing, and mathematics requirements for most VCCS students to one academic year. In addition to the new curricula, in mid-Fall of the same year, a new statewide placement test, the Virginia Placement Test (VPT-Math), was introduced. NOVA introduced adaptive learning for developmental math in 2012. The redesigned developmental math sequence included modularized units focusing on specific mathematical concepts instead of semester-long courses, and innovative technology that teaches students in the NCAT Emporium style. Under the new model, students study only those concepts for which they do not demonstrate mastery on the placement test, and instructors provide more personal attention to their students through individualized instruction.

NOVA's Start Strong policy changes, launched in Fall 2014, were based on recommendations from the ATD Core Team. Such policy changes are expected to help in closing achievement gaps. For example, NOVA's orientation, advising, and Student Development course policies provide targeted interventions for FTIC students ages 17 to 24 through the GPS for Success program. The goal of GPS for Success is to help students succeed in college by fostering connections with professional advisors and faculty who help students plan for and attain their academic goals. One of ATD's six capacity areas for student success is Equity. This capacity area is used as a framework for a faculty-led pilot on teaching and learning that promotes equitable outcomes for all students.

The Survey of Entering Student Engagement (SENSE) provides additional insight into how NOVA might approach closing achievement gaps. SENSE provides benchmark data in several areas that can help NOVA understand students' critical early experiences and improve policies and practices that affect student success in the first year. Results of the 2015 SENSE indicated that, relative to other community colleges nationwide, NOVA is underperforming in the "High Expectations and Aspirations," "Engaged Learning," and "Academic and Social Support Network" benchmarks. NOVA must continue to explore the implications of these benchmark scores and identify intervention strategies to help boost student success.

In addition, NOVA faculty on ATD teams are currently examining strategies to improve equity in the classroom through teaching and learning. Future research on achievement gaps at NOVA should take a comprehensive approach to data analysis by triangulating NOVA student data along with surveys, focus groups, and outside research on community college best practices for FTIC students. Future research on achievement gaps should focus on the practices that could enhance the completion rate in the redesigned developmental math course and compare NOVA's VPT-Math placement data and completion of developmental courses with those of other Virginia Community College System colleges to determine the effectiveness of the placement test in improving developmental math success.