

Start Strong Policy Evaluation Series – Policies 1 & 4: Placement Testing and Enrollment in Developmental Math Fall 2013 through Fall 2016

Research Report No. 24-17

Office of Institutional Effectiveness and Student Success Initiatives

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OFFICE OF INSTITUTIONAL EFFECTIVENESS AND STUDENT SUCCESS INITIATIVES

The purpose of the Office of Institutional Effectiveness and Student Success Initiatives is to conduct analytical studies and provide information in support of institutional planning, policy formulation, and decision making. In addition, the office provides leadership and support in research related activities to members of the NOVA community engaged in planning and evaluating the institution's success in accomplishing its mission.

When citing data from this report, the Northern Virginia Community College (NOVA) Office of Institutional Effectiveness and Student Success Initiatives must be cited as the source.

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Introduction

I. Background

In Fall 2014, as part of NOVA's efforts to increase student success, NOVA enacted six policy changes based on recommendations by NOVA's Achieving the Dream Core Team. Five of these policies apply only to students in NOVA's GPS for Success population: first-time to college (FTIC) students between the ages of 17 and 24.¹ The sixth policy is for all NOVA students.

GPS for Success: Teaching and Learning Through Advising focuses on the Goals, Plans, and Strategies that students must develop to attain their academic objectives and promotes early engagement, class readiness, student preparedness, and goal attainment. By targeting the GPS population, these five policies are designed to promote a strong academic start for FTIC students at NOVA.

Students in this group must:

1. Take placement tests before registration.
2. Attend Student Orientation before registration.
3. Meet with their advisor before registration.
4. Enroll in developmental courses during the first semester, if placed.
5. Complete a Student Development (SDV) course within the first 15 credits at NOVA.

The sixth policy impacts *all* NOVA students:

6. Register before 11:59 p.m. the day before the session begins.

II. Policies 1 & 4: Placement Testing and Enrollment in Developmental Math

This Report is part of a series examining the impact of these policy changes on student outcomes and focuses on Policy 1: Take placement tests before registration, and Policy 4: Enroll in developmental courses during the first semester, if placed.

This report presents outcomes for developmental math only. Outcomes for developmental English are presented in a separate report.

Students come to NOVA for many reasons including earning a degree, entering a new career field, or transferring to a four-year university. NOVA strives to provide students with every opportunity to succeed. Step one is evaluating each student's college readiness via the required English and math placement tests. If the tests show that a student needs developmental courses, that student is required to complete those courses during their first semester of college.

Section 1 of this Report presents data on compliance with the policies and Section 2 presents outcomes, such as success in developmental math. Lastly, Section 3 explores the demographic characteristics of developmental math students.

¹ Excludes transient students and students who are members of the College Pathway Initiative.

Summary of Findings

Overall, placement test results indicate that a high proportion of recent high school graduates arrive at NOVA underprepared for college-level math and these students generally require at least 4 credits in developmental math. However, the majority of these students do not successfully complete the developmental math course they enroll in during their first semester at NOVA, as between 74 and 78 percent of these students either fail or withdraw from the course.

Compliance with Placement Testing and Enrollment Policies

- The proportion of students who took the VPT-math increased from 76 percent in Fall 2013 (prior to policy implementation) to 88 percent in Fall 2014. Overall, compliance with the math placement test policy has fluctuated between 87 and 89 percent.
- Just under half of the students (between 44 and 47 percent) who took the VPT-math were placed into developmental math. The majority of these students (78 to 83 percent) were placed into a lower level developmental math course, meaning they needed to complete at least 4 developmental math credits before they could progress to college-level math.
- The second part of the policy states that students who test into developmental math must enroll in developmental math in their first semester at NOVA. However, the introduction of this policy only increased the rate at which placed students enrolled in developmental math from 61 percent in Fall 2013 to 65 percent in Fall 2014. In Fall 2015 and Fall 2016, 64 percent of students complied with the policy.

Outcomes by Compliance with Placement Testing and Enrollment Policies

Success in Developmental Math

- The overwhelming majority of students who enrolled in developmental math in their first fall semester did not successfully complete their developmental math course. Overall, between 22 and 26 percent of students were successful in developmental math in their first semester.
 - MTT1 (1 cr.) had the highest success rate in all years (between 42 and 59 percent), while the success rate in MTT4 (4 cr.) was between 16 and 18 percent.

Success in Credit Courses

- Students who did not enroll in developmental math were more likely to be successful in credit courses (with success rates from 58 to 60 percent) than students who enrolled in developmental math (who had success rates from 50 to 54 percent). The high failure rate in developmental math is likely the reason for this outcome.

Demographic Characteristics of the Fall 2016 Cohort

- Female students enrolled in developmental math at a higher rate than male students (26 percent compared to 21 percent)
- Black students and Hispanic students tend to enroll in developmental math at higher rates relative to White students and Asian students.
 - Almost a third of Black students (31 percent) and Hispanic students (29 percent) enrolled in developmental math, while one-fifth (21 percent) of White students and 13 percent of Asian students enrolled in developmental math.

Section 1: Compliance with Placement Testing and Developmental Enrollment Policies

A. Compliance with Math Placement Testing Policy

- With the implementation of the policy, the proportion of the cohort that took the VPT-Math increased from 76 to 88 percent and has remained in that vicinity since Fall 2014.

Students who attain above a certain score on either the SAT, ACT, or GED are exempt from taking the Virginia Placement Test in math (VPT-Math) and may enroll directly in college-level math. Between Fall 2013 and Fall 2016, the proportion of GPS students who were exempt from taking the VPT-Math increased but remained below 4 percent. This report focuses only on those students who were required to take the VPT-Math, and these students are referred to as the Math Placement Test Cohort.

Table 1. Math Placement Test Cohorts: Fall 2013 through Fall 2016

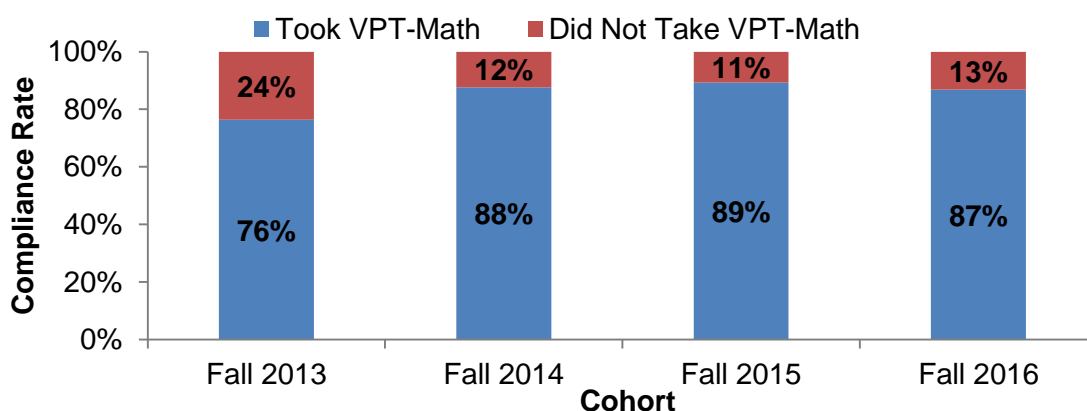
Cohort	Fall 2013 Cohort		Fall 2014 Cohort		Fall 2015 Cohort		Fall 2016 Cohort	
	#	%	#	%	#	%	#	%
Math Placement Test Cohort	4,864	99.4	5,018	97.6	5,224	96.4	5,427	96.4
<i>Exempt from VPT-Math</i>	31	0.6	124	2.4	194	3.6	202	3.6
Total GPS Population	4,895	100.0	5,142	100.0	5,418	100.0	5,629	100.0

In Fall 2013, before the policy was implemented, around 76 percent of the Math Placement Test Cohort sat for the VPT-Math. With the implementation of the policy, the proportion of the cohort that took the VPT-Math increased to 88 percent and has remained in that vicinity since Fall 2014.

**Table 2. Compliance with Math Placement Testing Policy:
Fall 2013 through Fall 2016 Cohorts**

Compliance Status	Fall 2013 Cohort		Fall 2014 Cohort		Fall 2015 Cohort		Fall 2016 Cohort	
	#	%	#	%	#	%	#	%
Took VPT-Math	3,717	76.4	4,398	87.6	4,663	89.3	4,710	86.8
Did Not Take VPT-Math	1,147	23.6	620	12.4	561	10.7	717	13.2
Math Placement Test Cohort	4,864	100.0	5,018	100.0	5,224	100.0	5,427	100.0

**Figure 1. Compliance with Math Placement Testing Policy:
Fall 2013 through Fall 2016 Cohorts**



B. Placement in Developmental Math

- Over the presented time period, the rate at which students who took the VPT-Math were placed into developmental math fluctuated between 43 and 47 percent.

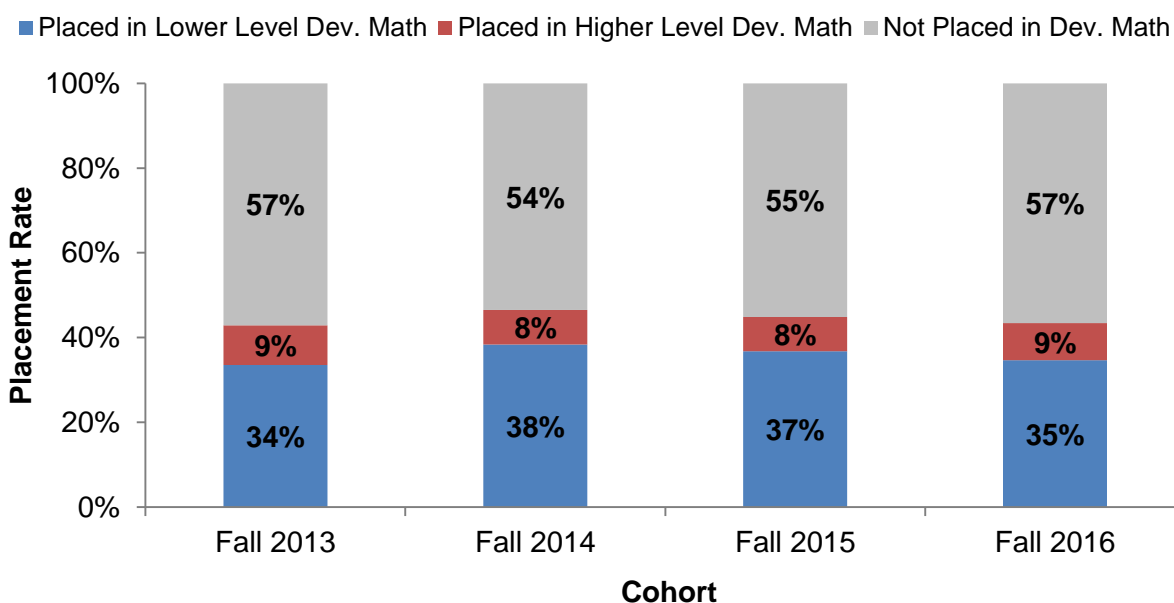
The VPT-Math consists of multiple units. Students who pass fewer than six units are placed into a lower level of developmental math, requiring them to take more units before progressing to college-level math. Students who pass between 6 and 9 units are placed into a higher level of developmental math and are required to take fewer units (see Figure 6 in the Appendix).

Over the presented time period, the rate at which students who took the VPT-Math were placed into developmental math fluctuated between 43 and 47 percent. Over one-third of these students were placed in lower level developmental math plus about 10 percent were placed in higher level developmental math. This indicates that there is a consistently high proportion of recent high school graduates who are arriving at NOVA academically unprepared for college-level math.

Table 3. Developmental Math Placement of Students Who Took the VPT-Math: Fall 2013 through Fall 2016 Cohorts

Developmental Math Placement	Fall 2013 Cohort		Fall 2014 Cohort		Fall 2015 Cohort		Fall 2016 Cohort	
	#	%	#	%	#	%	#	%
Placed in Developmental Math	1,594	42.9	2,043	46.5	2,090	44.8	2,047	43.5
<i>Lower Level (0-5)</i>	1,244	33.5	1,687	38.4	1,714	36.8	1,632	34.6
<i>Higher Level(6-9)</i>	350	9.4	356	8.1	376	8.1	415	8.8
Not Placed in Developmental Math	2,123	57.1	2,355	53.5	2,573	55.2	2,663	56.5
Total (Who Took VPT-Math)	3,717	100.0	4,398	100.0	4,663	100.0	4,710	100.0

Figure 2. Developmental Math Placement of Students Who Took the VPT-Math: Fall 2013 through Fall 2016 Cohorts



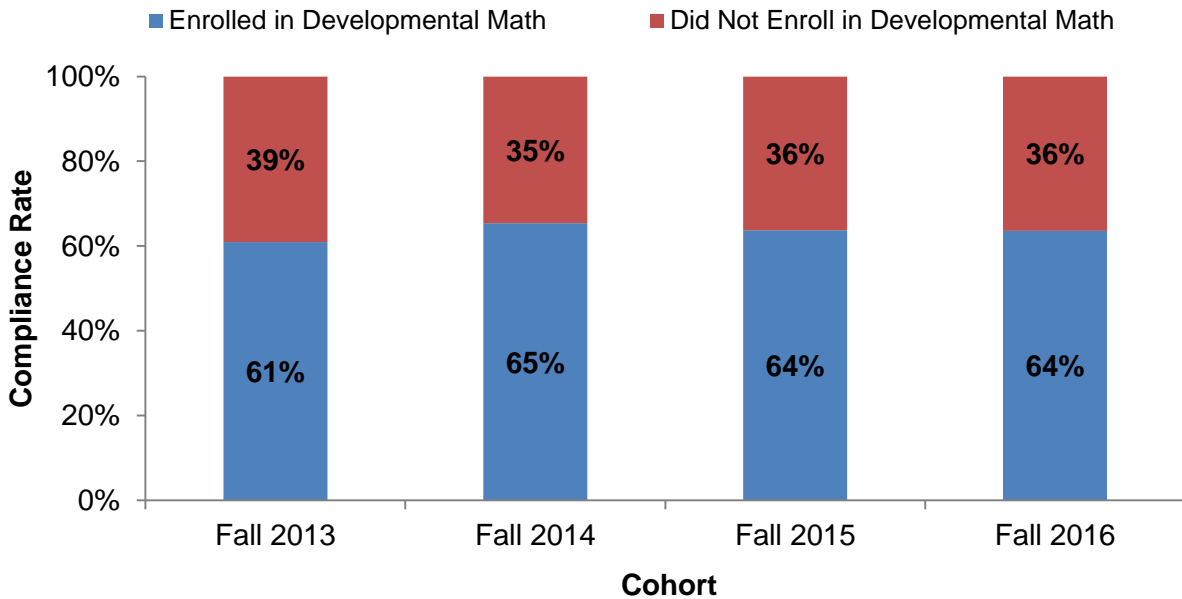
C. Compliance with Developmental Math Enrollment Policy

- While compliance with the policy to sit for math placement testing was relatively high (close to 90 percent), compliance with the second step of the policy (enrolling in developmental math, if placed), fluctuated between 61 and 65 percent.

**Table 4. Compliance with Developmental Math Enrollment Policy:
Fall 2013 through Fall 2016 Cohorts**

Compliance Status	Fall 2013 Cohort		Fall 2014 Cohort		Fall 2015 Cohort		Fall 2016 Cohort	
	#	%	#	%	#	%	#	%
Enrolled in Developmental Math	970	60.9	1,337	65.4	1,331	63.7	1,301	63.6
Did Not Enroll in Developmental Math	624	39.1	706	34.6	759	36.3	746	36.4
Total Placed in Developmental Math	1,594	100.0	2,043	100.0	2,090	100.0	2,047	100.0

**Table 5. Compliance with Developmental Math Enrollment Policy:
Fall 2013 through Fall 2016 Cohorts**



The majority (58 to 64 percent) of GPS students who enrolled in developmental math enrolled in MTT4. MTT4 is a four-credit course that requires students to complete at least four units. Only 7 to 10 percent of students enrolled in MTT1. MTT1 is a one-credit course in which students complete one unit of developmental math. These enrollment figures indicate that not only are a high proportion of students arriving underprepared for college-level math each year, but that they are arriving severely underprepared.

Table 6. Enrollment in Developmental Math by Course: Fall 2013 through Fall 2016 Cohorts

Course	Fall 2013 Cohort		Fall 2014 Cohort		Fall 2015 Cohort		Fall 2016 Cohort	
	#	%	#	%	#	%	#	%
MTT1	81	8.4	132	9.9	97	7.3	112	8.6
MTT2	127	13.1	186	13.9	173	13.0	178	13.7
MTT3	148	15.3	194	14.5	236	17.7	246	18.9
MTT4	621	64.0	820	61.3	819	61.5	760	58.4
BSK1	17	1.8	40	3.0	34	2.6	25	1.9
Total Enrolled in Developmental Math	970	100.0	1,337	100.0	1,331	100.0	1,301	100.0

Note: Data contains duplicates as some students enrolled in more than one developmental math course; thus, totals do not sum to 100 percent. Total is based on the unduplicated number of students in developmental math.

Section 2. Outcomes by Compliance with Placement Testing and Developmental Enrollment Policies

A. Success in Developmental Math

- Over the presented time period, MTT4 (4 cr.) had the lowest success rate of all the developmental math courses. Between Fall 2013 and Fall 2016, only 16 to 18 percent of students successfully completed MTT4 in their first semester.
- MTT1 (1 cr.), had the highest success rate in all years, and the success rate increased from 42 percent in Fall 2013 to 59 percent in Fall 2015.

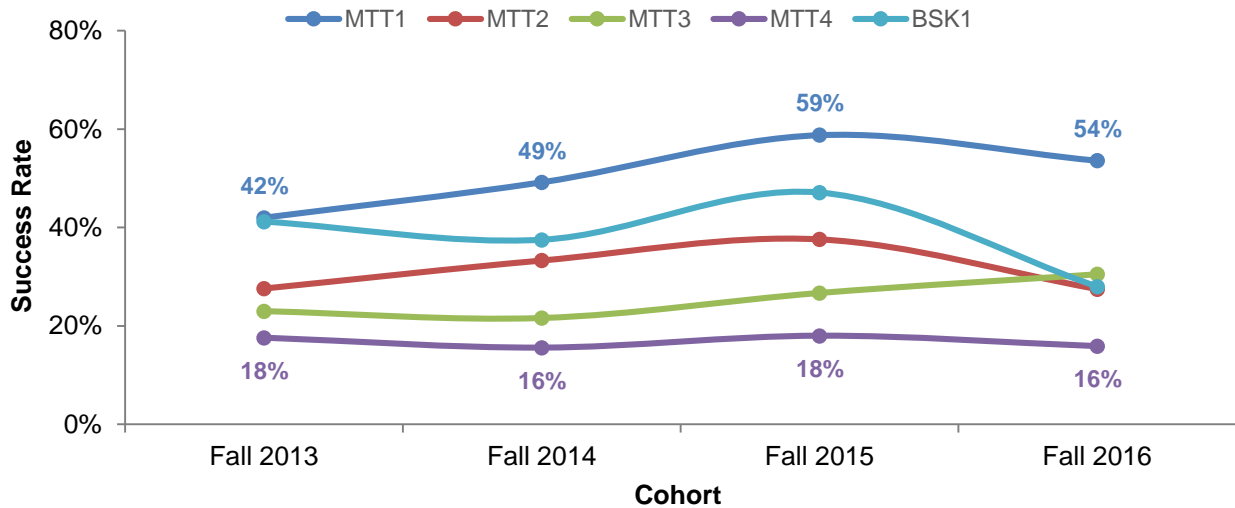
Generally, the more MTT credits a student had to accumulate, the lower their chances of being successful. As stated above, the majority of placed students enrolled in MTT4.

Table 7. Success in Developmental Math by Course: Fall 2013 Through Fall 2016 Cohorts

Developmental Math Course	Fall 2013 Cohort			Fall 2014 Cohort			Fall 2015 Cohort			Fall 2016 Cohort		
	N	Successful		N	Successful		N	Successful		N	Successful	
		#	%		#	%		#	%		#	%
MTT1	81	34	42.0	132	65	49.2	97	57	58.8	110	59	53.6
MTT2	127	35	27.6	186	62	33.3	173	65	37.6	178	49	27.5
MTT3	148	34	23.0	194	42	21.6	236	63	26.7	246	75	30.5
MTT4	620	109	17.6	820	128	15.6	818	147	18.0	759	121	15.9
BSK1	17	7	41.2	40	15	37.5	34	16	47.1	25	7	28.0
Total	993	219	22.1	1,372	312	22.7	1,358	348	25.6	1,318	311	23.6

Note: Total is based on the number of courses students enrolled in, therefore data contains duplicates as some students enrolled in more than one developmental math course.

**Figure 3. Success in Developmental Math by Course:
Fall 2013 Through Fall 2016 Cohorts**



B. Success in Credit Courses

- Students who were placed in developmental math but did not enroll tended to succeed in between 58 to 60 percent of their credit courses.
- Students who enrolled in developmental math succeeded in around 50 to 54 percent of their credit courses.
- The developmental math course with the highest enrollment, MTT 4, had a particularly low success rate, which may have dragged down the overall success rate of students who enrolled in the course.

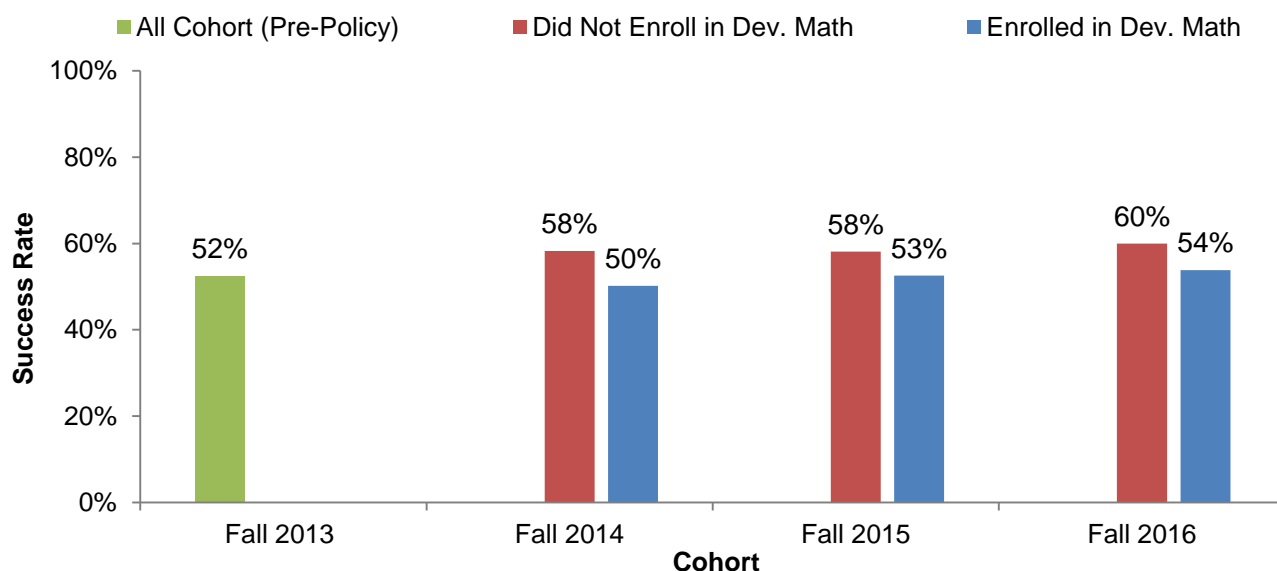
Success in a credit course is defined as earning a grade of C or higher in the course. Table 8 compares students who were placed and enrolled in developmental math to students who were placed but did not enroll in developmental math. In every cohort from Fall 2014 through Fall 2016, students who did not enroll in developmental math during the first semester had higher course success rates than those who enrolled.

Table 8. Success in Credit Courses by Compliance with Developmental Math Enrollment Policy: Fall 2013 through Fall 2016 Cohorts

Course Outcome	Fall 2013 Cohort		Fall 2014 Cohort				Fall 2015 Cohort				Fall 2016 Cohort			
			Did Not Enroll in Dev. Math		Enrolled in Dev. Math		Did Not Enroll in Dev. Math		Enrolled in Dev. Math		Did Not Enroll in Dev. Math		Enrolled in Dev. Math	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Success	3,353	52.4	1,396	58.3	2,909	50.2	1,495	58.2	3,010	52.6	1,509	60.1	3,074	53.9
Fail	3,051	47.6	997	41.7	2,881	49.8	1,072	41.8	2,711	47.4	1,002	39.9	2,634	46.1
Total	6,404	100.0	2,393	100.0	5,790	100.0	2,567	100.0	5,721	100.0	2,511	100.0	5,708	100.0

Notes: Earning a grade of 'C' or higher is considered an indicator of success in credit courses. Students in each cohort who did not enroll in any credit courses in the fall semester are excluded. The totals are duplicated headcounts. Missing/audit courses are not included.

Figure 4. Success in Credit Courses by Compliance with Developmental Math Enrollment Policy: Fall 2013 through Fall 2016 Cohorts



Section 3. Demographics

In order to gain a better understanding of the characteristics of students enrolled in developmental math, this section presents data on the demographics of the Fall 2016 cohort.

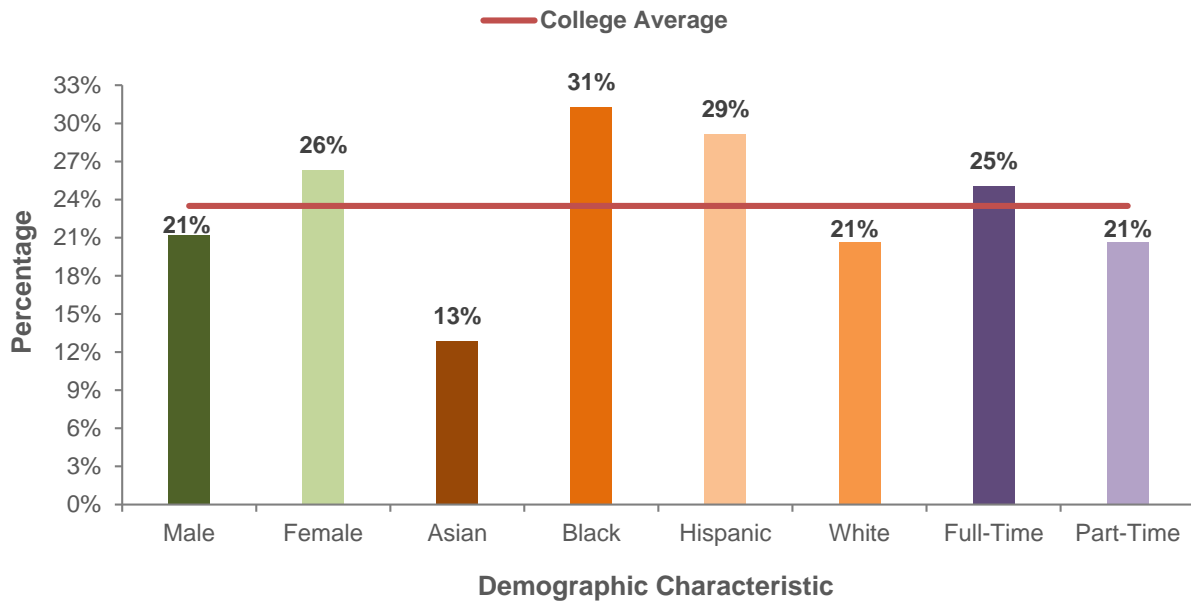
Demographics

- A higher proportion (26 percent) of female students enrolled in developmental math in comparison to male students (21 percent).
- Almost a third of Black students (31 percent) and Hispanic students (29 percent) enrolled in developmental math, while one-fifth (21 percent) of White students and 13 percent of Asian students enrolled in developmental math.

Table 9. Demographics of GPS Students Enrolled in Developmental Math: Fall 2016 Cohort

Demographic Characteristic	Total GPS Cohort	Enrolled in Dev. MTH	
		#	%
Gender			
Male	3,053	647	21.2
Female	2,483	654	26.3
Race/Ethnicity			
Asian	827	107	12.9
Black/African American	836	262	31.3
Hispanic	1,435	419	29.2
White	2,017	417	20.7
Enrollment Status			
Full-time	3,526	885	25.1
Part-time	2,010	416	20.7
Total	5,536	1,301	23.5

Figure 5. Proportion of GPS Students Enrolled in Developmental Math by Various Demographics: Fall 2016

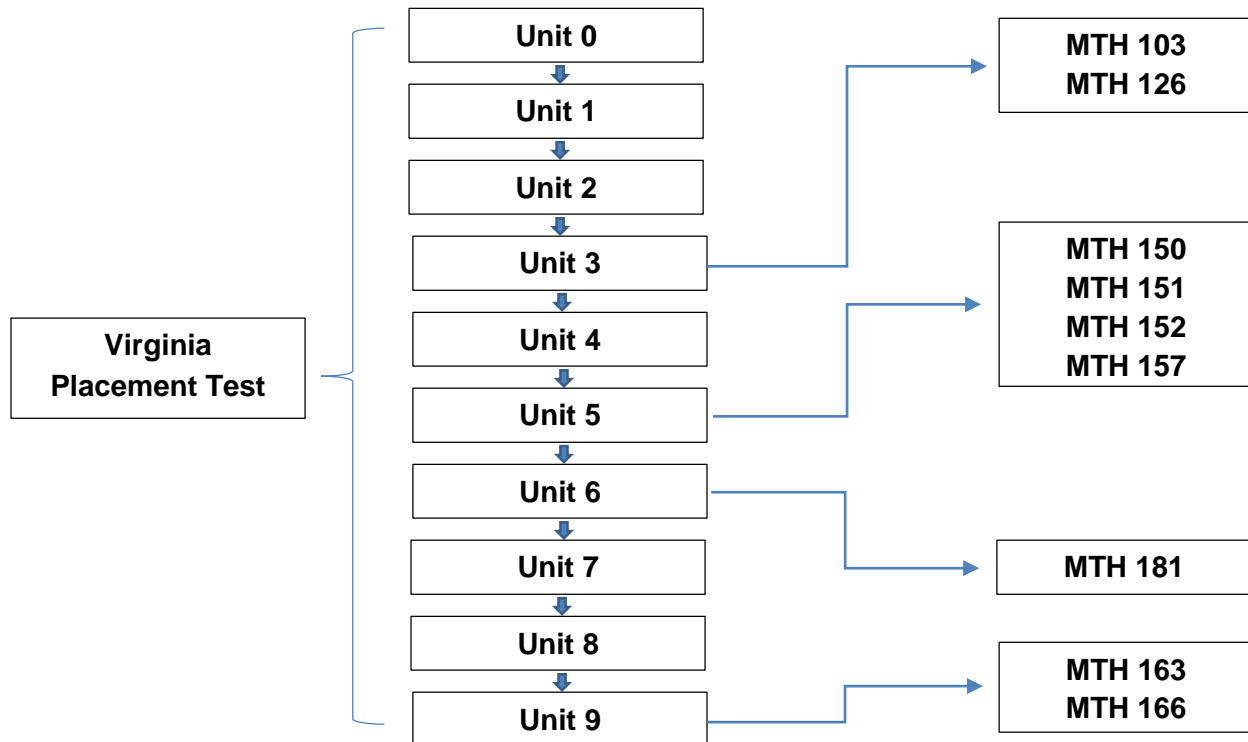


APPENDIX: Progression Through Developmental Courses

Progression Through Developmental Math

Motivating Academic Success Through Effective Redesign (MASTER) Math Courses, otherwise known as MTT courses, develop competency in the skills that are necessary to succeed in college-level mathematics courses. The material in MASTER Math is broken into 10 units. Students work on the units in which they have difficulties, depending on the credit math course needed for their program of study.²

Figure 6. Progression through Developmental Math to College-Level Math



Source: NOVA Developmental Math Program webpage

Table 10. Developmental Math Course Descriptions

Course Name	Students Who Take The Course
MTT 1 (1 CR.)	Students who are required to complete exactly one unit.
MTT 2 (2 CR.)	Students who are required to complete exactly two units.
MTT 3 (3 CR.)	Students who are required to complete exactly three units.
MTT 4 (4 CR.)	Students who are required to complete four or more units.
BSK 1 (1 CR.)	Students who did not pass any units on the VPT and are starting in unit 0.

² Source: NOVA Developmental Math Program webpage. Available at <http://www.nvcc.edu/academics/developmental/math.html>

NOVA Mission and Strategic Goals

Mission

With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.

Strategic Goals

- I. **STUDENT SUCCESS** – Northern Virginia Community College will move into the top tier of community colleges with respect to the college readiness, developmental course completion, retention, graduation, transfer, and career placement of its students.
- II. **ACCESS** – Northern Virginia Community College will increase the number and diversity of students being served to mirror the population growth of the region.
- III. **TEACHING AND LEARNING** – Northern Virginia Community College will focus on student success by creating an environment of world-class teaching and learning.
- IV. **EXCELLENCE** – Northern Virginia Community College will develop ten focal points of excellence in its educational programs and services that will be benchmarked to the best in the nation and strategic to building the College's overall reputation for quality.
- V. **LEADERSHIP** – Northern Virginia Community College will serve as a catalyst and a leader in developing educational and economic opportunities for all Northern Virginians and in maintaining the quality of life and economic competitiveness of the region.
- VI. **PARTNERSHIPS** – Northern Virginia Community College will develop strategic partnerships to create gateways of opportunity and an integrated educational system for Northern Virginians who are pursuing the American Dream.
- VII. **RESOURCES** – Northern Virginia Community College will increase its annual funding by \$100 million and expand its physical facilities by more than one million square feet in new and renovated space. This includes the establishment of two additional campuses at epicenters of the region's population growth, as well as additional education and training facilities in or near established population centers.
- VIII. **EMERGENCY PREPAREDNESS AND CONTINUITY OF OPERATIONS** – Northern Virginia Community College will be recognized as a leader among institutions of higher education in Virginia for its development and testing of emergency response and continuity of operation plans.

NOVA

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