

Achievement Gap Analysis Report 5

**Success in Developmental Math
by Enrollment Status
(Fall 2011 through Fall 2013 Cohorts)**

Research Report No. 12-16

Office of Institutional Effectiveness and Student Success Initiatives

MARCH 2016

NORTHERN VIRGINIA COMMUNITY COLLEGE

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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Developmental Math Success Rates of First-Time to NOVA Students by Enrollment Status and Demographics: Fall 2011 through Fall 2013 Cohorts

Introduction

NOVA's commitment to student success is supported by the College's participation in the Achieving the Dream (ATD) National Reform Network. ATD is a comprehensive nationwide, non-governmental reform movement for student success in which NOVA has been a member since 2007 and a Leader College since 2010.¹ NOVA's participation in ATD encourages continuous monitoring of student outcomes in order to identify areas for improvement and pursue research-based methods of increasing student success and closing achievement gaps. To support this endeavor, this Report is part of a series examining recent trends among first-time to NOVA students across the following indicators of student success:

- Four-Year Graduation Rates
- Fall-to-Fall and Fall-to-Spring Retention
- Success in Developmental Education Courses
- Developmental Student Success in College-Level Courses
- Success in Gatekeeper Courses
- Successful Course Completion (All Courses)

This report analyzes data on success in developmental math. The success rates are presented for first-time to NOVA students, in the Fall 2011 through Fall 2013 cohorts, who enrolled in developmental math during their first term. Success in developmental math is defined as the rate at which students who enrolled in developmental math in their first term received a grade of "S" (Satisfactory) within two years.²

Various structural and curricula changes made to developmental math were implemented between Fall 2011 and Fall 2013. A new statewide placement test was also introduced during this time period. Please see Appendix A for more information.

In consideration of the College's commitment to closing achievement gaps, the data in this Report are disaggregated and analyzed by student demographics: enrollment status (full-time or part-time), gender, age, race/ethnicity, and program placement.³ However, the analysis in this report excludes sub-groups of small size (e.g., among racial/ethnic groups, only the outcomes of White, Black, Asian and Hispanic students are discussed). For complete data on all sub-groups, please see Appendix B.

¹ Leader Colleges have demonstrated commitment to and progress on the five principles of Achieving the Dream and have shown at least three years of improvement on at least one of the Achieving the Dream measures of student success. For more information see <http://achievingthedream.org>

² S (Satisfactory) is an assignment used to indicate satisfactory completion of developmental courses. These grades are not included in grade point average calculations.

³ All demographics are as of the student's first term.

Executive Summary

This report analyzes data on success in developmental math. 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. The following points represent the main findings in this report.

- The overall success rate decreased from 55 percent in Fall 2011 to 40 percent in Fall 2013.

Enrollment Status

- Across cohorts, the success rates of full-time students (43 percent in Fall 2013) were 7 to 10 percentage points above those of part-time students (33 percent in Fall 2013).

Gender

- The success rates for female full-time students (48 percent in Fall 2013) were higher than those of males in the comparative cohort (38 percent in Fall 2013). This was also true for part-time students (38 percent for females compared to 27 percent for males in Fall 2013).
- The spread between the success rates of female full-time students and male full-time students increased from two to 10 percentage points between the Fall 2011 and Fall 2012 cohorts.

Age

- Full-time students ages 18-21 had success rates that mirrored the overall full-time success rates, while part-time students ages 18-21 had success rates slightly below the overall part-time success rate.

Race/Ethnicity

- Among full-time students, Asian students had the highest success rates but also experienced a notable decrease in success rates, going from 72 percent in the Fall 2011 cohort to 48 percent in Fall 2013 cohort.
- In the Fall 2013 cohort, success rates for part-time students were 26 percent for Hispanic students, 28 percent for Black students and 38 percent for White students.

Program Placement

- Full-time students in A.A. programs had the highest completion rate in the Fall 2013 cohort (46 percent) while students in A.A.S. programs had the lowest (35 percent).
- Part-time students in A.A.S. programs had the lowest success rate (26 percent) among the sizable program-placement groups in the Fall 2013 cohort.

Developmental Math Success Rates of First-Time to NOVA Students by Enrollment Status and Demographics: Fall 2011 through Fall 2013 Cohorts

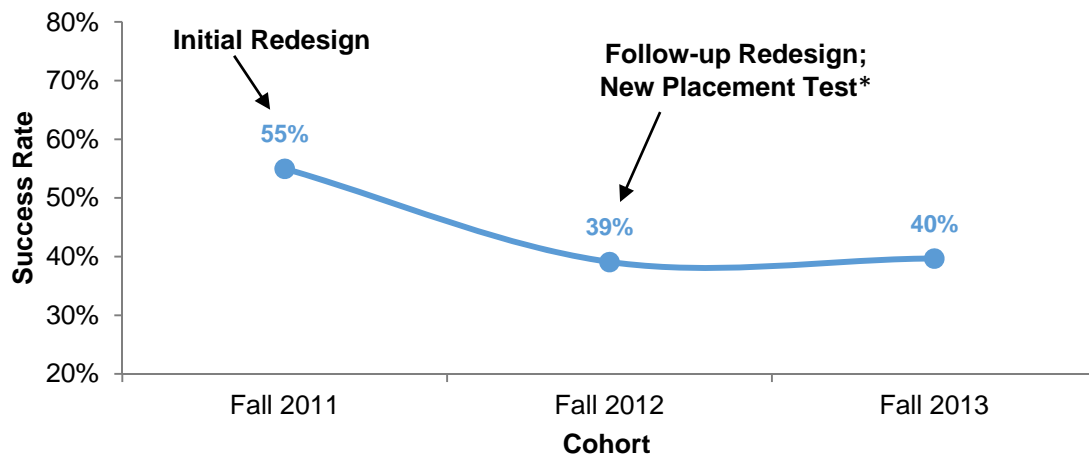
NOVA began teaching a redesigned developmental math curriculum in Fall 2011. In mid-Fall of the same year, a new statewide test for developmental math placement was introduced: the Virginia Placement Test Math (VPT-math). Fall 2012 was the first Fall semester in which most students were placed using the VPT-math. Furthermore, in Spring 2012 a once again revised developmental math format was adopted.⁴

- The overall cohort size decreased by 17 percent between the Fall 2011 cohort and Fall 2013 cohort.
- The decrease in enrollment was only seen among full-time students (-25 percent) while the size of the part-time group increased by 9 percent.
- The overall success rates for the cohort decreased from 55 percent in Fall 2011 to 40 percent in Fall 2013.

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

Status	Fall 2011 Cohort			Fall 2012 Cohort			Fall 2013 Cohort		
	N	Successful		N	Successful		N	Successful	
		#	%		#	%		#	%
Full-Time	1,645	934	56.8	1,258	518	41.2	1,239	528	42.6
Part-Time	480	234	48.8	534	183	34.3	523	172	32.9
Total	2,125	1,168	55.0	1,792	701	39.1	1,762	700	39.7

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



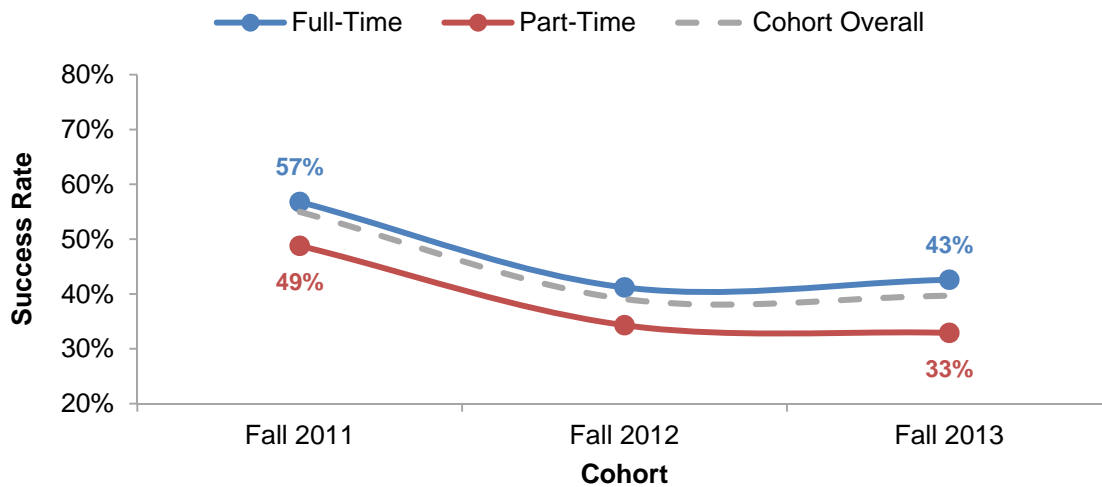
*The VPT-math was introduced in October 2011; however the Fall 2012 cohort was the first fall cohort in which most students were placed using the VPT-math.

⁴ See Appendix B for more details

Success in Developmental Math by Enrollment Status (Figure 2)

- Overall, successful developmental math course completion rates decreased for both full-time and part-time students from the Fall 2011 to Fall 2013 cohorts.
- Between Fall 2011 and Fall 2013, the success rates of full-time students decreased from 57 to 43 percent and success rates of part-time students decreased from 49 to 33 percent.
- Across the cohorts, the success rates of full-time students were 7 to 10 percentage points above those of part-time students.

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



Success in Developmental Math by Gender (Figures 3 and 4)

- Success rates in developmental math decreased from the Fall 2011 to Fall 2013 cohorts regardless of gender and enrollment status.
- Female full-time and part-time students had higher rates than males in the comparative cohorts.
- The spread between the success rates of female full-time students and male full-time students increased from two to 10 percentage points between the Fall 2011 and Fall 2012 cohorts.
- Male part-time students in the Fall 2013 cohort had the lowest success rate (27 percent).

Figure 3. Successful Developmental Math Completion Rates of Full-Time Students by Gender: Fall 2011 through Fall 2013 Cohorts

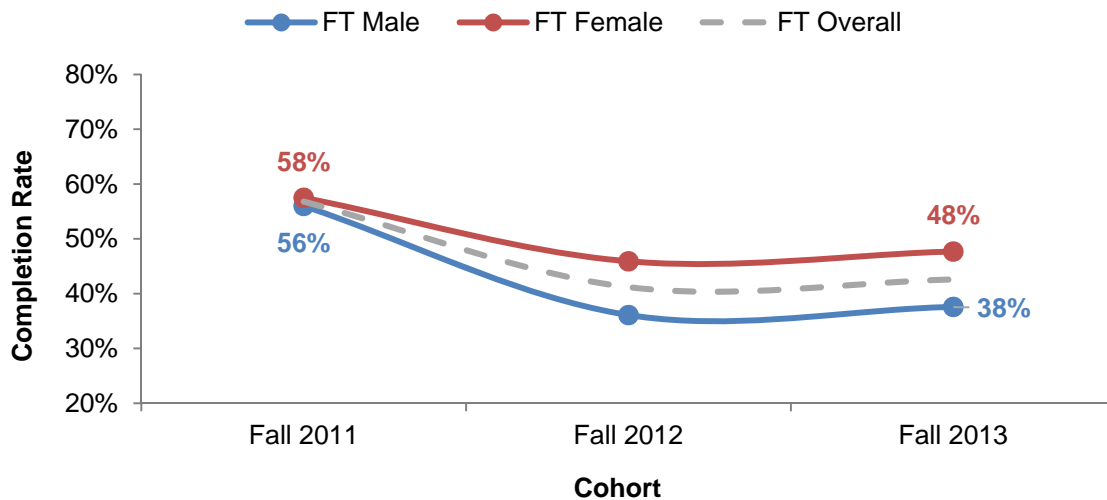
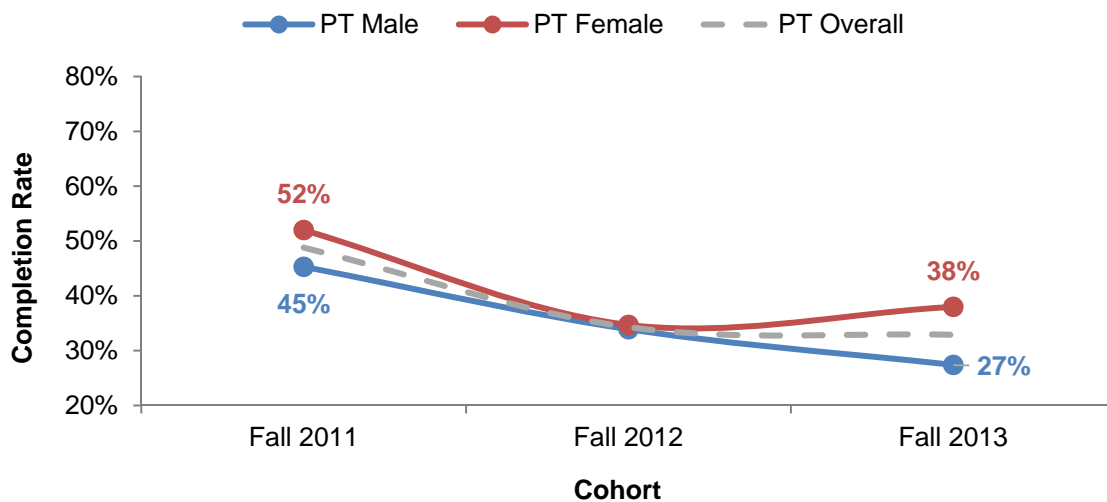


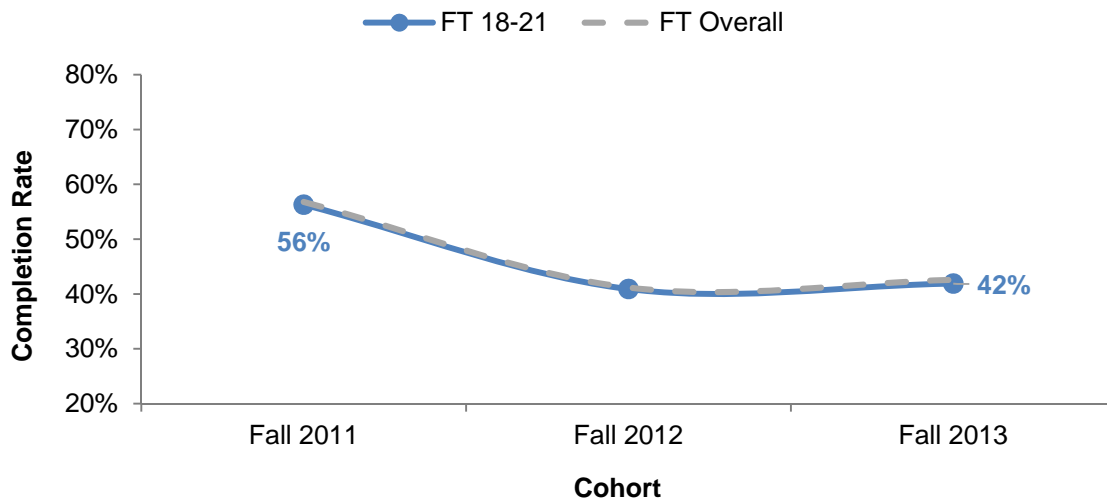
Figure 4. Successful Developmental Math Completion Rates of Part-Time Students by Gender: Fall 2011 through Fall 2013 Cohorts



Success in Developmental Math by Age (Figures 5 and 6)

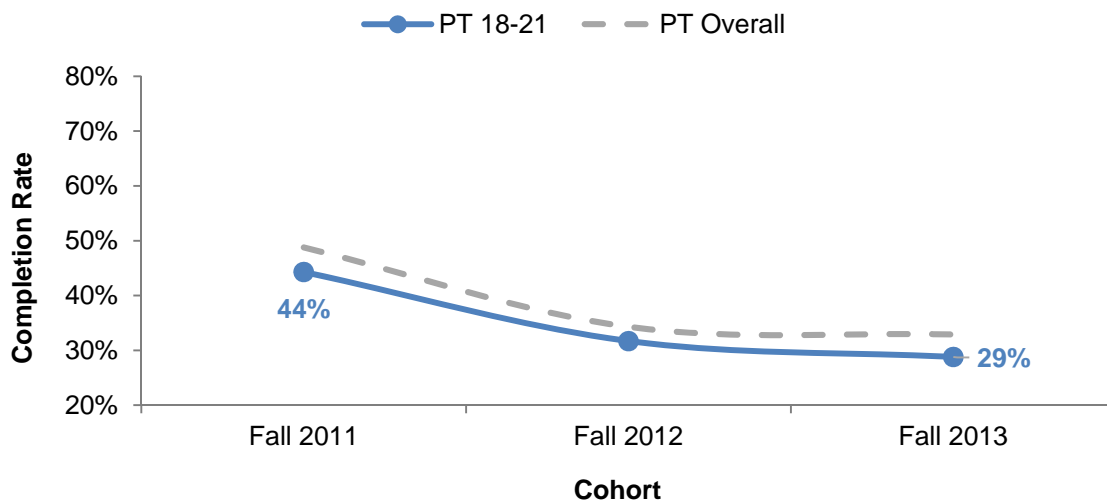
- Over 85 percent of the population of interest fell into the 18 to 21 age group.
- Full-time students ages 18-21 had success rates that mirrored the overall full-time success rates, decreasing from 56 percent in Fall 2011 to 42 percent in Fall 2013.
- The success rates of part-time students ages 18-21 decreased from 44 percent in Fall 2011 to 29 percent in Fall 2013. In comparison the overall part-time success rates were slightly higher, increasing from 49 percent in Fall 2011 to 33 percent in Fall 2013.

Figure 5. Successful Developmental Math Completion Rates of Full-Time Students by Age: Fall 2011 through Fall 2013 Cohorts



Note: The figure excludes sub-groups of small size. Data for all sub-groups can be found in Appendix B.

Figure 6. Successful Developmental Math Completion Rates of Part-Time Students by Age: Fall 2011 through Fall 2013 Cohorts



Note: The figure excludes sub-groups of small size. Data for all sub-groups can be found in Appendix B.

Success in Developmental Math by Race/Ethnicity (Figures 7 and 8)

- Among full-time students, Asian students had the highest success rates but also experienced a large decrease in success rates, going from 72 percent in the Fall 2011 cohort to 48 percent in the Fall 2013 cohort.
- The number of Black students enrolled in developmental math increased by 4 percent from the Fall 2011 to Fall 2013 cohorts; however, enrollment among the other large race/ethnicity groups decreased: White (-32 percent), Asian (-37 percent), and Hispanic (-7 percent). See Appendix B.
- In the Fall 2013 cohort, success rates for part-time students were 26 percent for Hispanic students, 28 percent for Black students and 38 percent for White students. The size of Asian part-time students was too small to analyze reliably.

Figure 7. Successful Developmental Math Completion Rates of Full-Time Students by Race/Ethnicity: Fall 2011 through Fall 2013 Cohorts

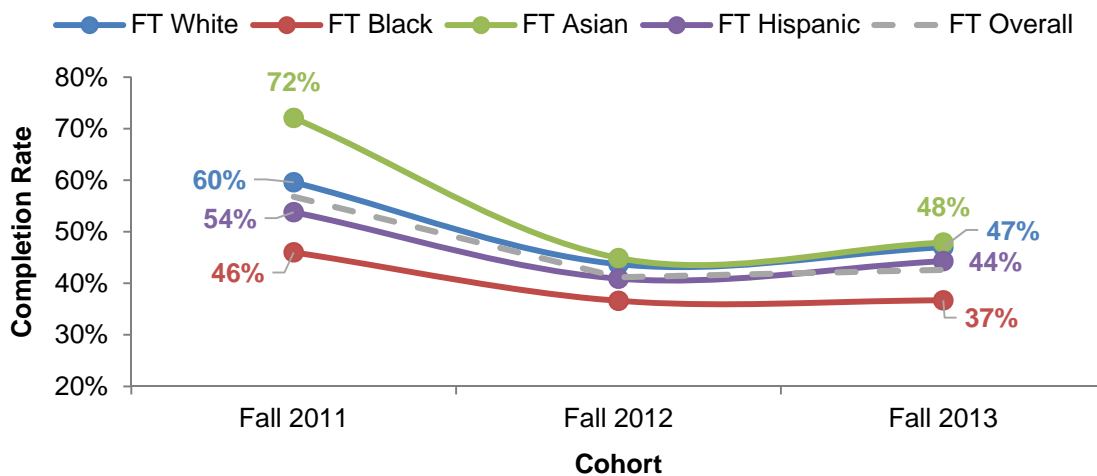
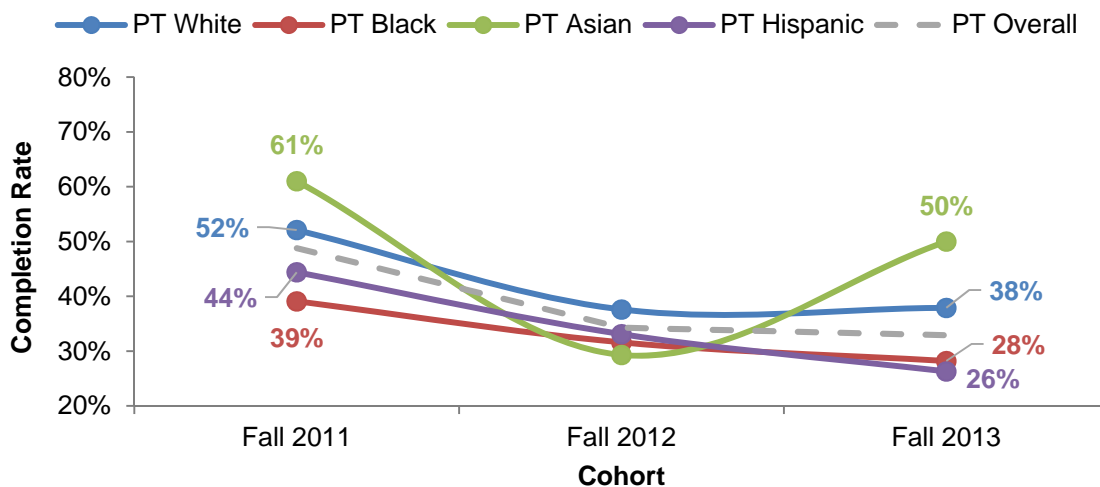


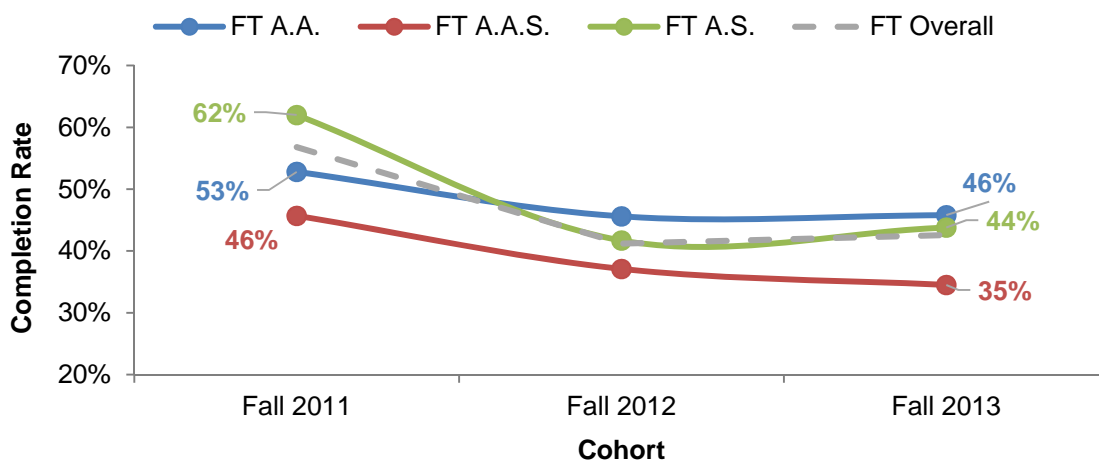
Figure 8. Successful Developmental Math Completion Rates of Part-Time Students by Race/Ethnicity: Fall 2011 through Fall 2013 Cohorts



Success in Developmental Math by Program Placement (Figures 9 and 10)

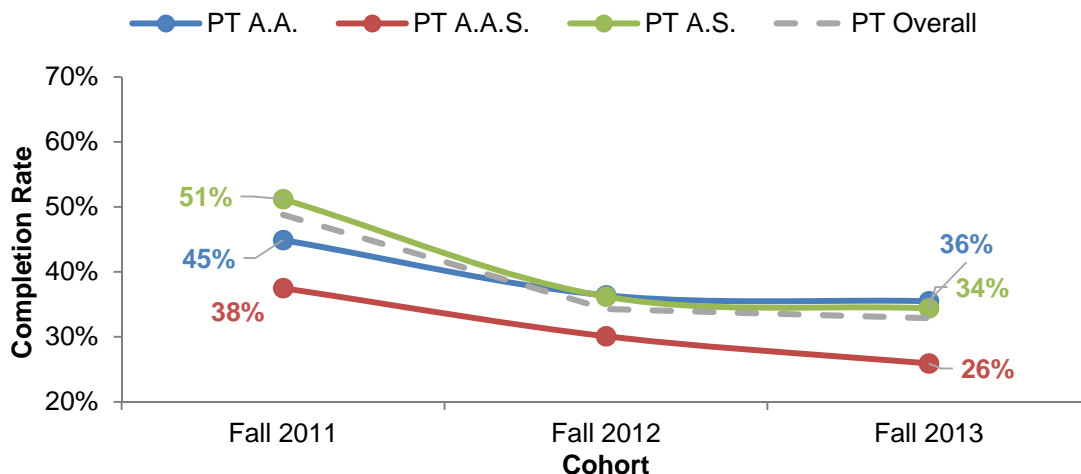
- Success rates in developmental math decreased for all programs, regardless of enrollment status.
- The proportion of full-time students placed in A.S. programs increased from 64 percent in the Fall 2011 cohort to 76 percent in the Fall 2013 cohort. See Appendix B.
- Full-time students in A.A. programs had the highest completion rate in the Fall 2013 cohort (46 percent) while A.A.S. students had the lowest (35 percent).
- Part-time students placed in A.A.S. programs had the lowest success rate (26 percent) in the Fall 2013 cohort.

Figure 9. Successful Developmental Math Completion Rates of Full-Time Students by Program Placement: Fall 2011 through Fall 2013 Cohorts



Note: The figure excludes sub-groups of small size. Data for all sub-groups can be found in Appendix B.

Figure 10. Successful Developmental Math Completion Rates of Part-Time Students by Program Placement: Fall 2011 through Fall 2013 Cohorts



Note: The figure excludes sub-groups of small size. Data for all sub-groups can be found in Appendix B

Appendix A: Information on Developmental Math Redesign

Implementation of Developmental Math Redesign

Developmental math courses were Redesigned and fully implemented in Fall 2011. As a result of the developmental math redesign, the traditional developmental math courses were replaced by a unified, interactive computerized course that combines computer-based learning with personalized on-demand assistance for the students. In Fall 2011 the redesigned course was offered in the form of a single MTH1 course, which was a four credit course that all the developmental math students enrolled in. However, from Spring 2012 onwards a new, MTT format was adopted, which led to creation of four MTT courses (MTT courses are 'shell' courses that loosely represent the underlying units—see Table A.1). The redesigned developmental math courses are known as Motivating Academic Success Through Effective Redesign (MASTER) Math Courses.

The COMPASS placement test served as a placement tool until early Fall 2011. In mid Fall 2011 (October 2011) the Virginia Placement Test for math (VPT-math) was introduced as part of the redesign process and students were tested for their developmental math placement using the VPT-math from then on. However, redesigned developmental math was fully implemented in Fall 2011, before the VPT-math came into place. Thus, most of the Fall 2011 students tested into developmental math via COMPASS placement test. Fall 2012 was the first Fall semester where most of the first-time in college (FTIC) students tested into developmental math through VPT instead of COMPASS.

How Do Students Progress to College-level Math?

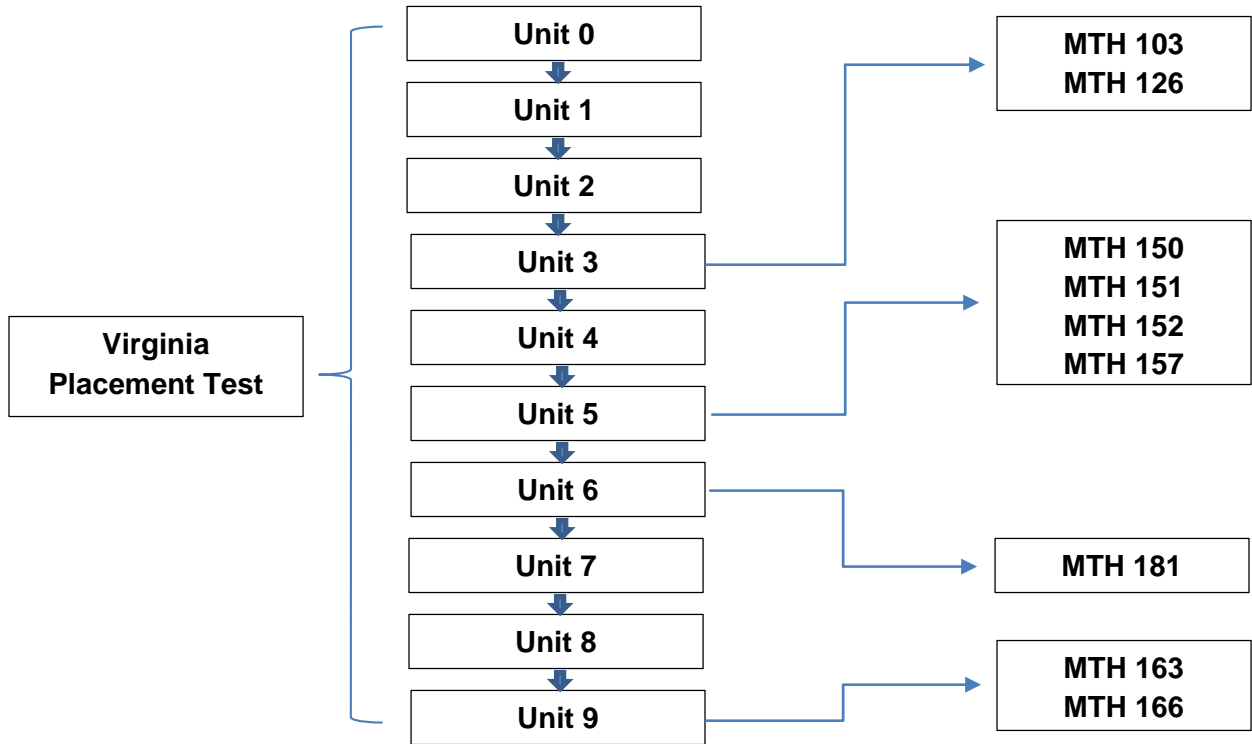
The material in MASTER Math is broken into 10 units. Students work on the units in which they have difficulties, depending on the credit math course needed for their program of study.

Table A.1. MASTER Math: Course Descriptions

Course Name	Students Who Take the Course
BSK 1: Whole Numbers	Students who did not pass any units on the VPT and are starting in unit 0.
MTT 1: Developmental Mathematics (Technology-Based) I	Students who are required to complete exactly one unit.
MTT 2: Developmental Mathematics (Technology-Based) II	Students who are required to complete exactly two units.
MTT 3: Developmental Mathematics (Technology-Based) III	Students who are required to complete exactly three units.
MTT 4: Developmental Mathematics (Technology-Based) IV	Students who are required to complete four or more units.

Source: NOVA Developmental Math Program webpage

Figure A.1. Progression through Developmental Math to College-Level Math



Source: NOVA Developmental Math Program webpage

Appendix B: Data Tables

Table B.1. Successful Developmental Math Completion by Enrollment Status and Gender: Fall 2011 through Fall 2013 Cohorts

Status	Gender	Fall 2011 Cohort			Fall 2012 Cohort			Fall 2013 Cohort		
		N	Successful		N	Successful		N	Successful	
			#	%		#	%		#	%
Full-Time	Male	861	483	56.1	609	220	36.1	620	233	37.6
	Female	784	451	57.5	649	298	45.9	619	295	47.7
	Subtotal	1,645	934	56.8	1,258	518	41.2	1,239	528	42.6
Part-Time	Male	232	105	45.3	257	87	33.9	252	69	27.4
	Female	248	129	52.0	277	96	34.7	271	103	38.0
	Subtotal	480	234	48.8	534	183	34.3	523	172	32.9
Total		2,125	1,168	55.0	1,792	701	39.1	1,762	700	39.7

Table B.2. Successful Developmental Math Completion by Enrollment Status and Age: Fall 2011 through Fall 2013 Cohorts

Status	Age	Fall 2011 Cohort			Fall 2012 Cohort			Fall 2013 Cohort		
		N	Successful		N	Successful		N	Successful	
			#	%		#	%		#	%
Full-Time	Under 18	23	16	69.6	20	10	50.0	14	8	57.1
	18-21	1,506	848	56.3	1,101	450	40.9	1,103	462	41.9
	22-24	46	29	63.0	41	15	36.6	43	22	51.2
	25-29	42	25	59.5	48	20	41.7	42	17	40.5
	30-44	26	15	57.7	46	22	47.8	30	16	53.3
	45-59	2	1	50.0	2	1	50.0	6	3	50.0
	60 & Over	0	0	-	0	0	-	1	0	0.0
	Subtotal	1,645	934	56.8	1,258	518	41.2	1,239	528	42.6
Part-Time	Under 18	3	1	33.3	3	0	0.0	8	4	50.0
	18-21	348	154	44.3	410	130	31.7	420	121	28.8
	22-24	29	14	48.3	39	21	53.8	26	10	38.5
	25-29	43	27	62.8	30	14	46.7	28	13	46.4
	30-44	48	32	66.7	42	14	33.3	31	19	61.3
	45-59	9	6	66.7	10	4	40.0	9	5	55.6
	60 & Over	0	0	-	0	0	-	1	0	0.0
	Subtotal	480	234	48.8	534	183	34.3	523	172	32.9
Total		2,125	1,168	55.0	1,792	701	39.1	1,762	700	39.7

Table B.3. Successful Developmental Math Completion by Enrollment Status and Race/Ethnicity: Fall 2011 through Fall 2013 Cohorts

Status	Race/Ethnicity	Fall 2011 Cohort			Fall 2012 Cohort			Fall 2013 Cohort		
		N	Successful		N	Successful		N	Successful	
			#	%		#	%		#	%
Full-Time	White	574	342	59.6	414	181	43.7	355	167	47.0
	Black	308	142	46.1	279	102	36.6	300	110	36.7
	Asian	204	147	72.1	118	53	44.9	119	57	47.9
	Hispanic	439	236	53.8	357	146	40.9	366	162	44.3
	American Indian	3	1	33.3	4	2	50.0	2	2	100.0
	Native Hawaiian	11	6	54.5	7	3	42.9	8	2	25.0
	Two or More Races	82	45	54.9	59	22	37.3	69	18	26.1
	Not Specified	6	4	66.7	1	0	0.0	2	0	0.0
	Unknown	18	11	61.1	19	9	47.4	18	10	55.6
Subtotal	1,645	934	56.8	1,258	518	41.2	1,239	528	42.6	
Part-Time	White	194	101	52.1	221	83	37.6	169	64	37.9
	Black	92	36	39.1	114	36	31.6	117	33	28.2
	Asian	41	25	61.0	41	12	29.3	36	18	50.0
	Hispanic	126	56	44.4	127	42	33.1	160	42	26.3
	American Indian	2	1	50.0	1	0	0.0	5	1	20.0
	Native Hawaiian	3	2	66.7	3	0	0.0	3	0	0.0
	Two or More Races	15	10	66.7	21	7	33.3	26	10	38.5
	Not Specified	2	1	50.0	0	0	-	0	0	-
	Unknown	5	2	40.0	6	3	50.0	7	4	57.1
Subtotal	480	234	48.8	534	183	34.3	523	172	32.9	
Total	2,125	1,168	55.0	1,792	701	39.1	1,762	700	39.7	

Table B.4. Successful Developmental Math Completion by Enrollment Status and Program Placement: Fall 2011 through Fall 2013 Cohorts

Status	Age	Fall 2011 Cohort			Fall 2012 Cohort			Fall 2013 Cohort		
		N	Successful		N	Successful		N	Successful	
			#	%		#	%		#	%
Full-Time	A.A.	214	113	52.8	169	77	45.6	144	66	45.8
	A.A.A.	13	4	30.8	6	4	66.7	6	3	50.0
	A.A.S.	243	111	45.7	170	63	37.1	113	39	34.5
	A.S.	1,051	652	62.0	853	356	41.7	945	414	43.8
	Certificate	49	16	32.7	32	11	34.4	20	3	15.0
	Not Placed	75	38	50.7	28	7	25.0	11	3	27.3
	Subtotal	1,645	934	56.8	1,258	518	41.2	1,239	528	42.6
Part-Time	A.A.	49	22	44.9	66	24	36.4	62	22	35.5
	A.A.A.	5	1	20.0	3	0	0.0	4	1	25.0
	A.A.S.	72	27	37.5	83	25	30.1	81	21	25.9
	A.S.	289	148	51.2	315	114	36.2	349	120	34.4
	Certificate	20	8	40.0	33	4	12.1	13	4	30.8
	Not Placed	45	28	62.2	34	16	47.1	14	4	28.6
Subtotal	480	234	48.8	534	183	34.3	523	172	32.9	
Total	2,125	1,168	55.0	1,792	701	39.1	1,762	700	39.7	

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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