42.4% Increase in Students Placing into Credited Math Courses!!!!!!

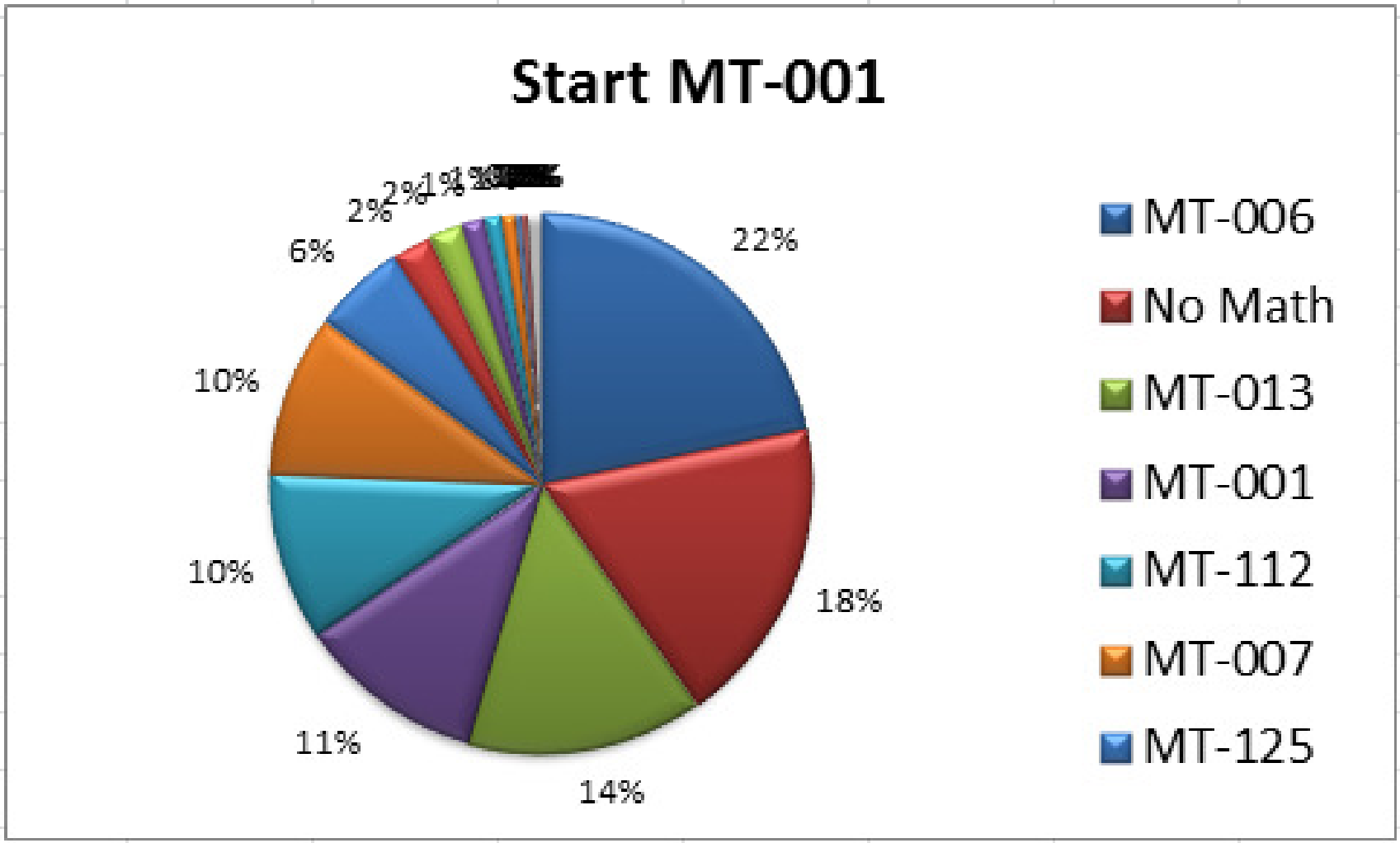
Dave Usinski: usinski@ecc.edu

Lynn Meslinsky: meslinskylc@ecc.edu

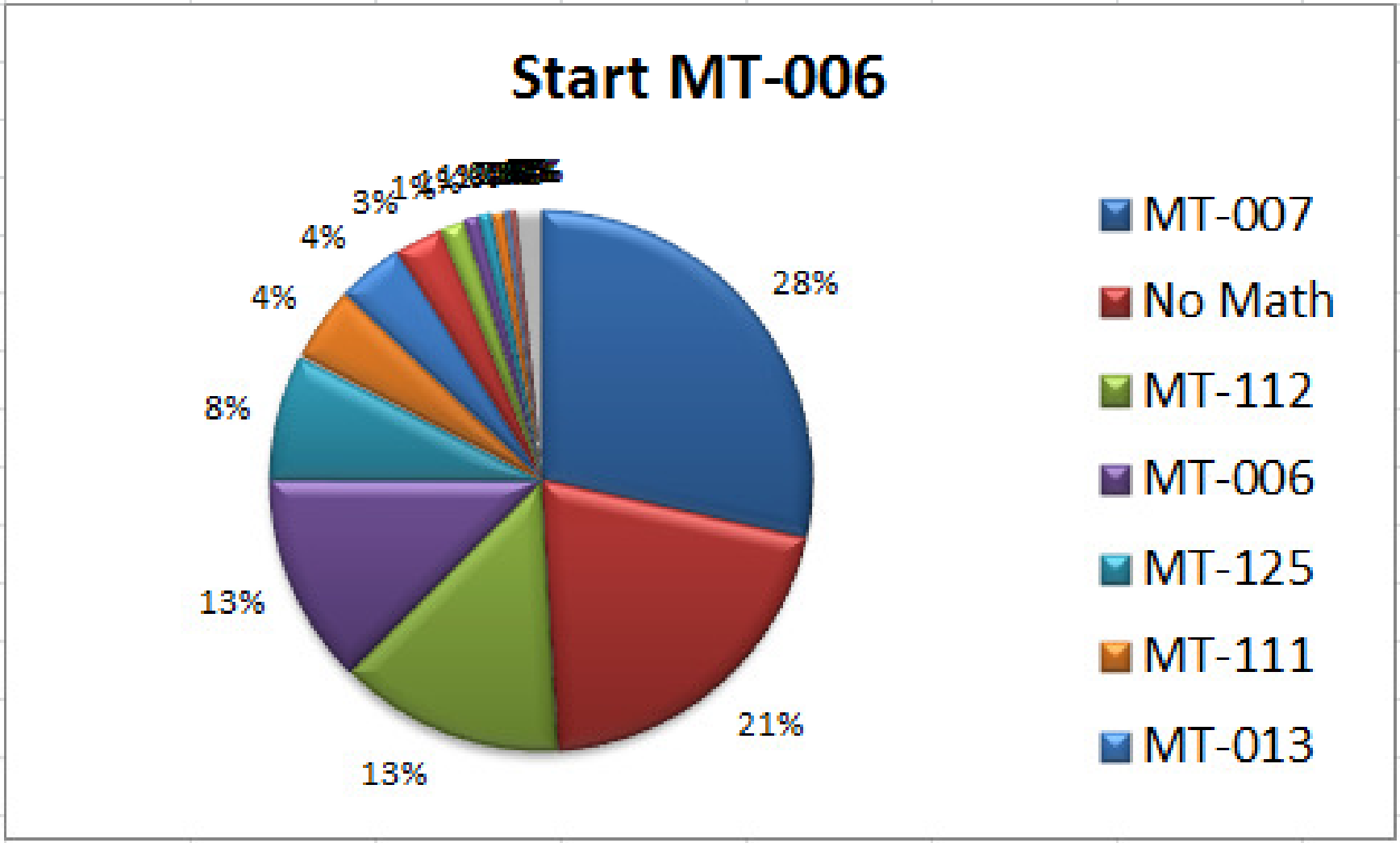
Our Question

At Erie CC, students now take the algebra portion of the placement exam first, which has led to an increase in the number of students placing into credited math courses. Does this seemingly subtle change increase student retention?

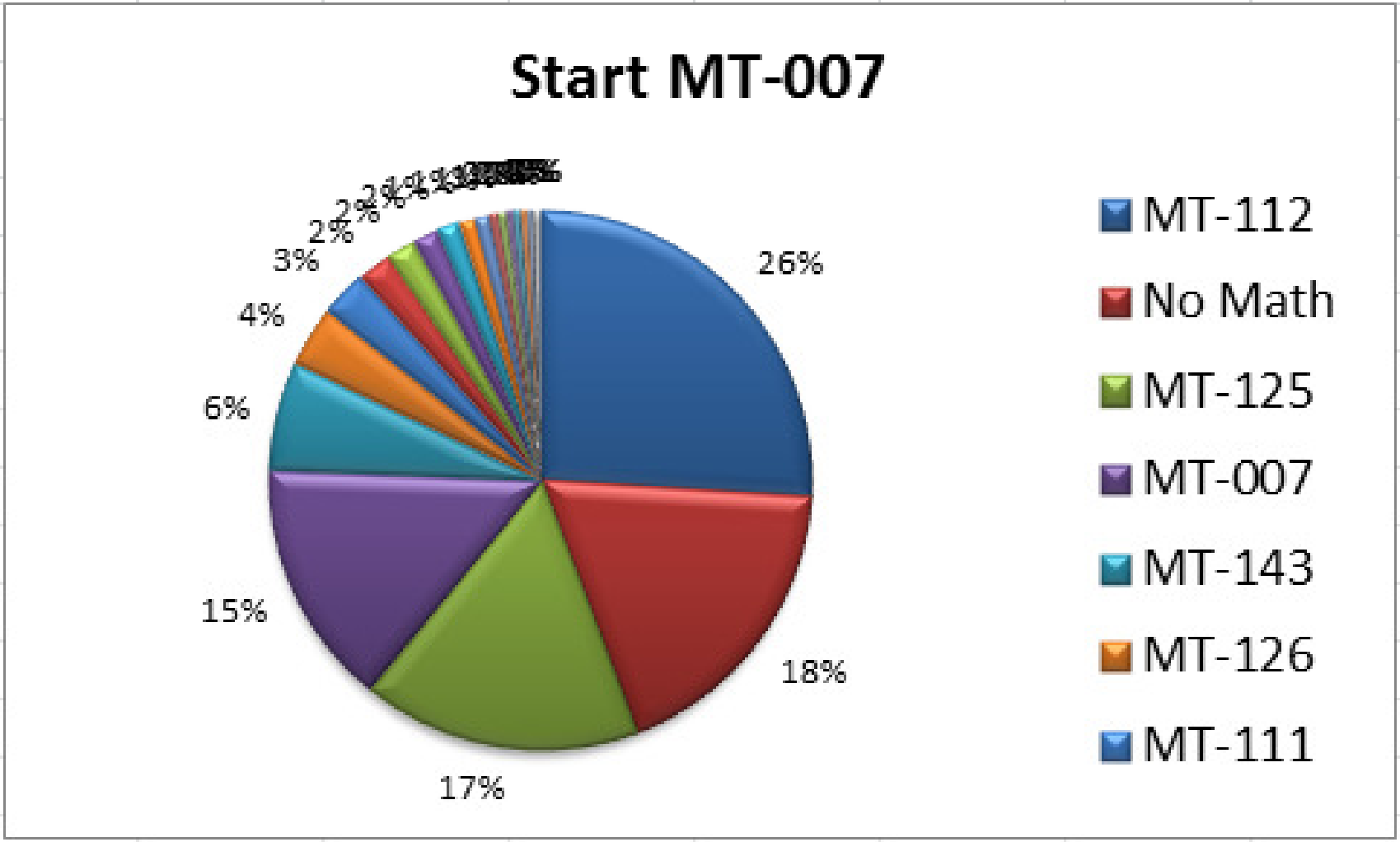
Starting in a Developmental Course Leads to ???



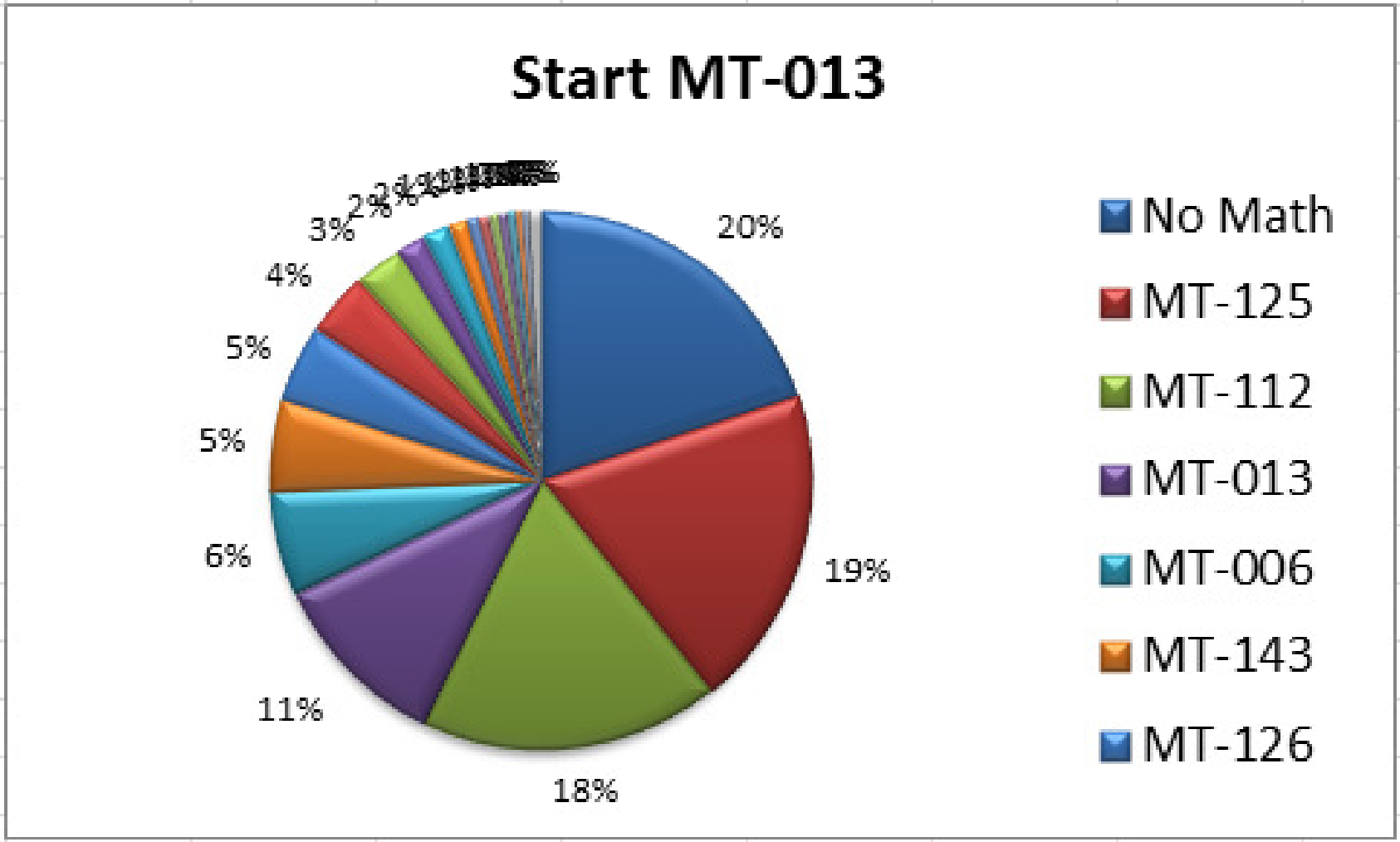
Starting in a Developmental Course Leads to ???



Starting in a Developmental Course Leads to ???



Starting in a Developmental Course Leads to ???



Previous Order:

Pass Arithmetic → Take Algebra

Fail Arithmetic → Done

New Order:

Pass Algebra → Done

Fail Algebra → Take Arithmetic

Our More Recent Question

At Erie CC, students now take the math portion of the placement exam prior to taking English. Has this additional change led to increased number of students testing into credit bearing math courses?

Our Theory

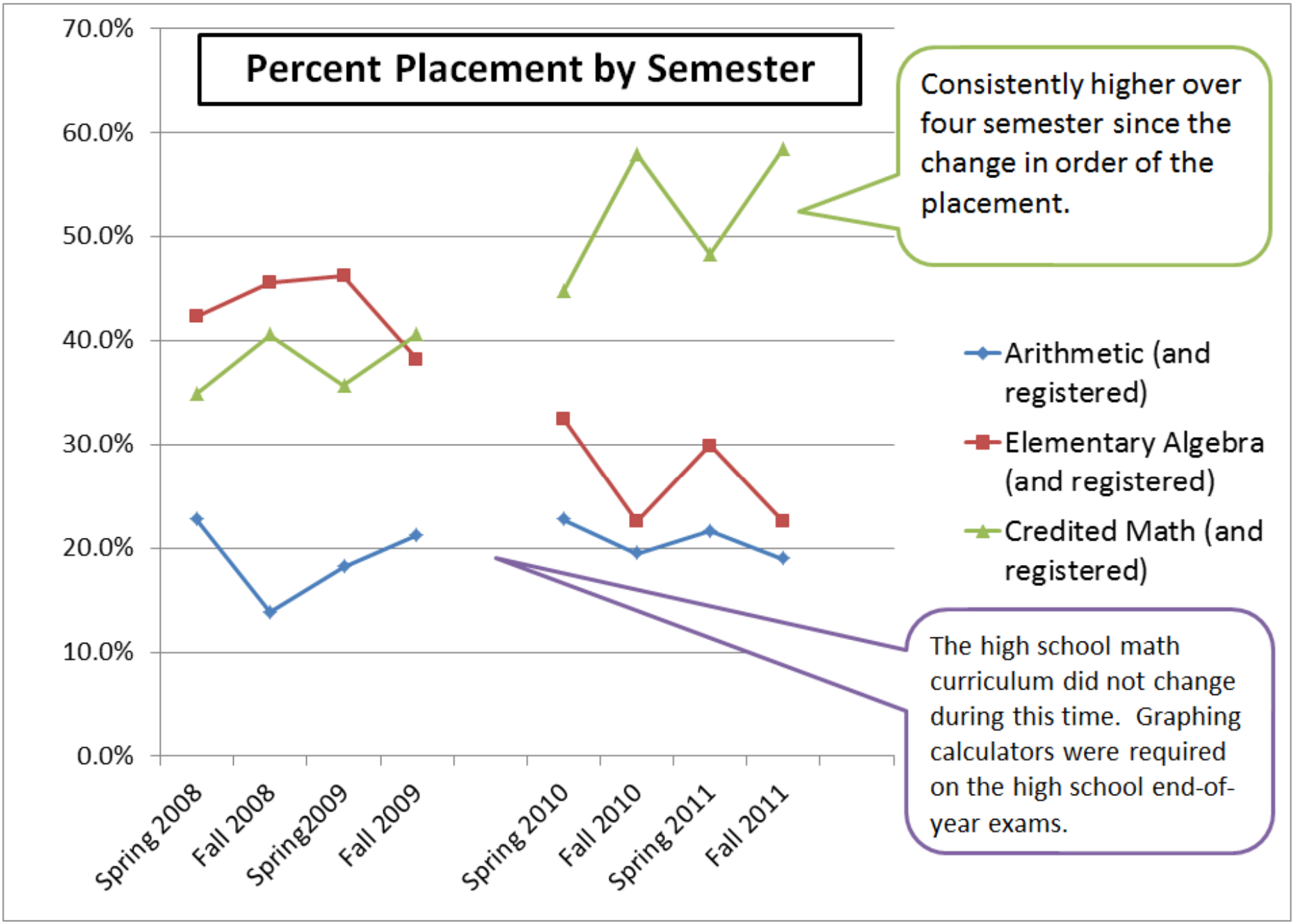
Students' use of calculators throughout high school adversely impacted arithmetic placement test results while not affecting the results of the algebraic portion of the test.

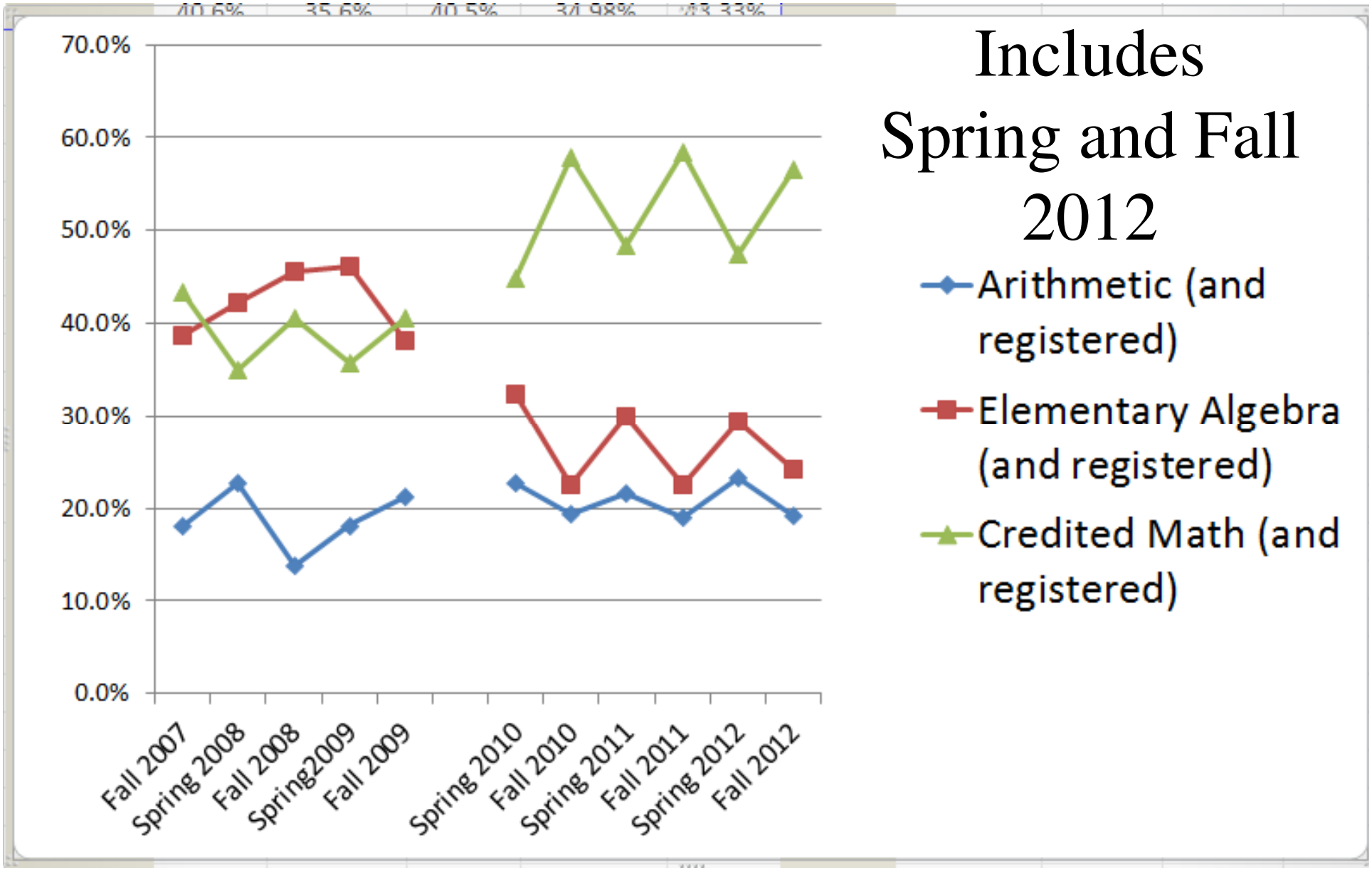
Anecdotal Evidence

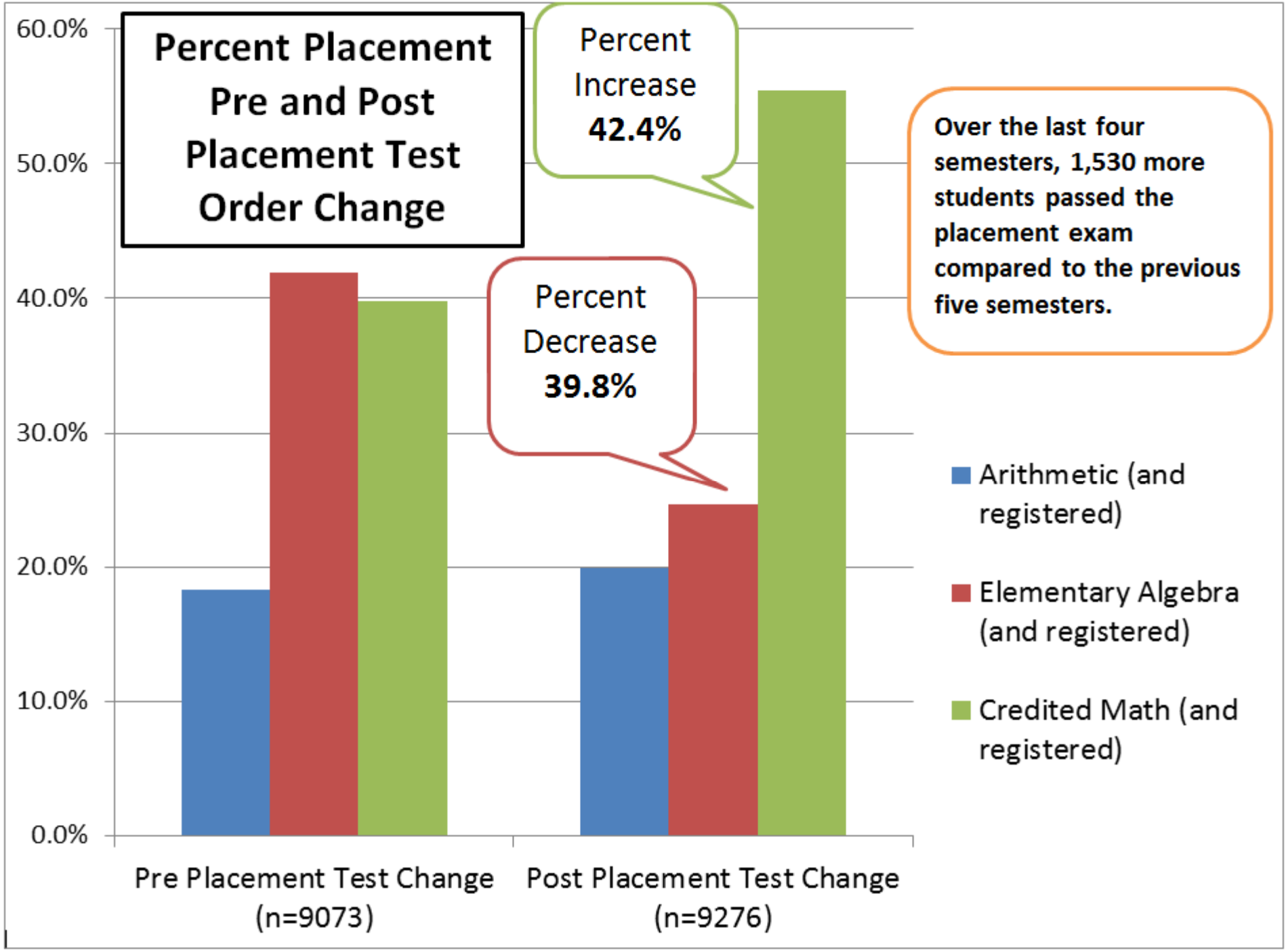
Suggests that students subjected to years of developmental math become frustrated and discouraged. This creates barriers to their learning and their investment in their educational process.

Our Goal

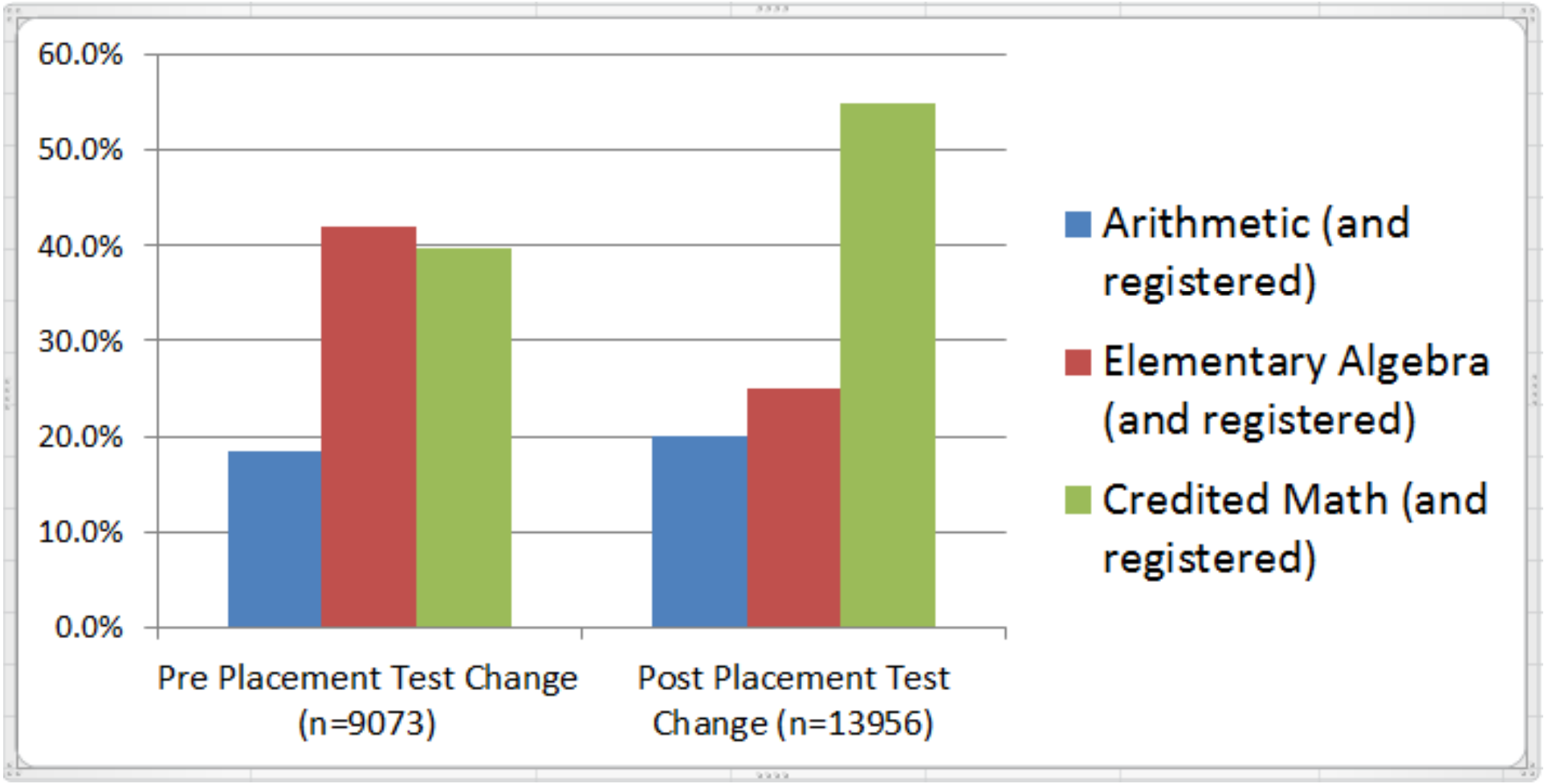
To shorten or eliminate the developmental path to credited mathematics courses and hopefully improve retention.


Percent Placement by Semester
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Spring 2008
Fall 2008
Spring2009
Fall 2009
Spring 2010
Fall 2010
Spring 2011
Fall 2011
Arithmetic (and registered)
Elementary Algebra (and registered)
Credited Math (and registered)
Consistently higher over four semester since the change in order of the placement.
The high school math curriculum did not change during this time. Graphing calculators were required on the high school end-of-year exams.


70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Fall 2007
Spring 2008
Fall 2008
Spring2009
Fall 2009
Spring 2010
Fall 2010
Spring 2011
Fall 2011
Spring 2012
Fall 2012
Includes Spring and Fall 2012
Arithmetic (and registered)
Elementary Algebra (and registered)
Credited Math (and registered)


Percent Placement Pre and Post Placement Test Order Change
Percent Increase 42.4%
Percent Decrease 39.8%
Over the last four semesters, 1,530 more students passed the placement exam compared to the previous five semesters.
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Arithmetic (and registered)
Elementary Algebra (and registered)
Credited Math (and registered)
Pre Placement Test Change (n=9073)
Post Placement Test Change (n=9276)

Includes Spring and Fall 2012



Conclusion 1

Changing the placement testing order decreased the number of students starting in developmental algebra by nearly 40%!!!

Conclusion 2

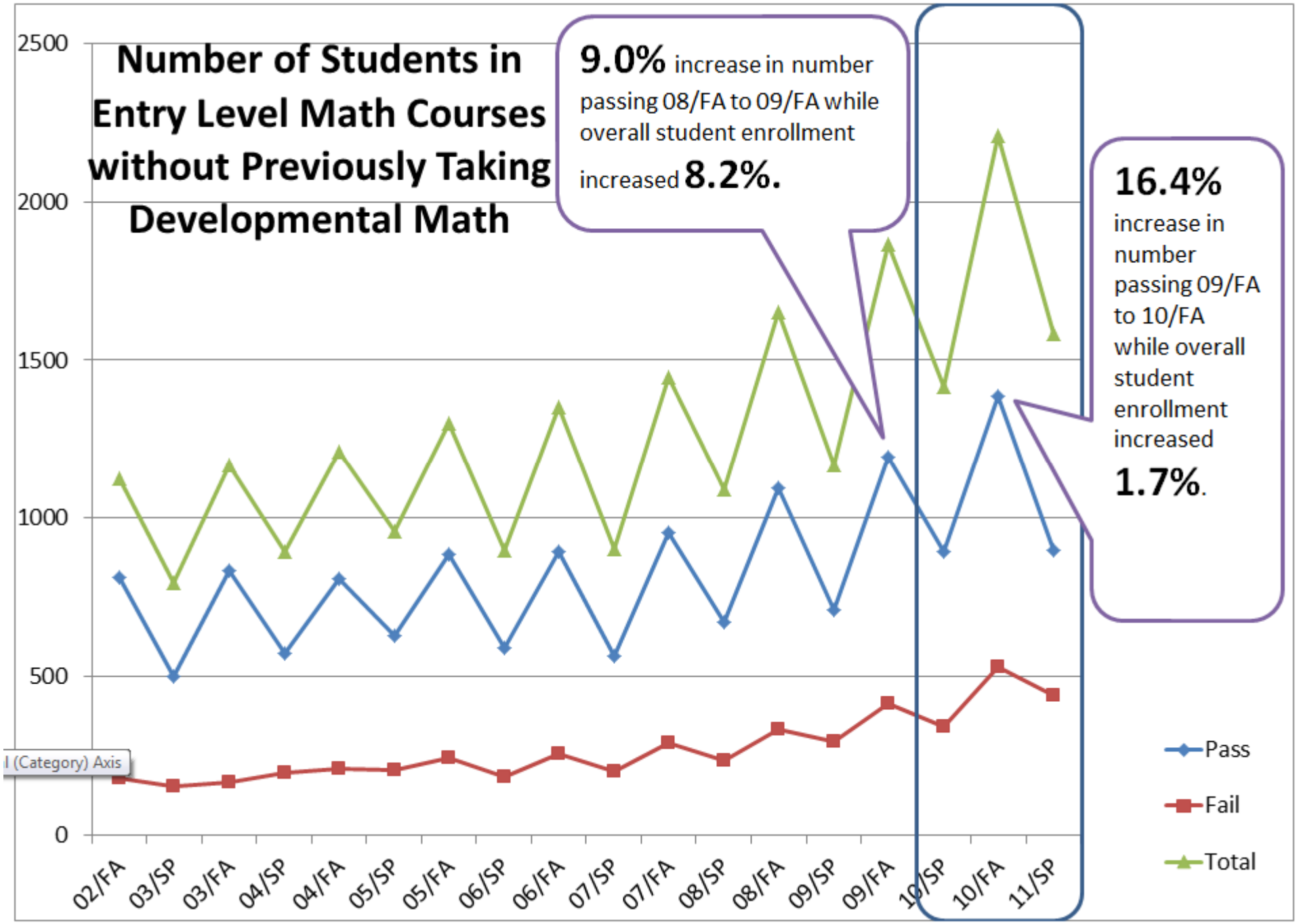
Changing the placement testing order increased the number of students who tested for and registered in a credited math course at ECC by 42.4%.

Conclusion 3

Changing the placement testing order had no significant impact on the number of students testing at the developmental arithmetic level .

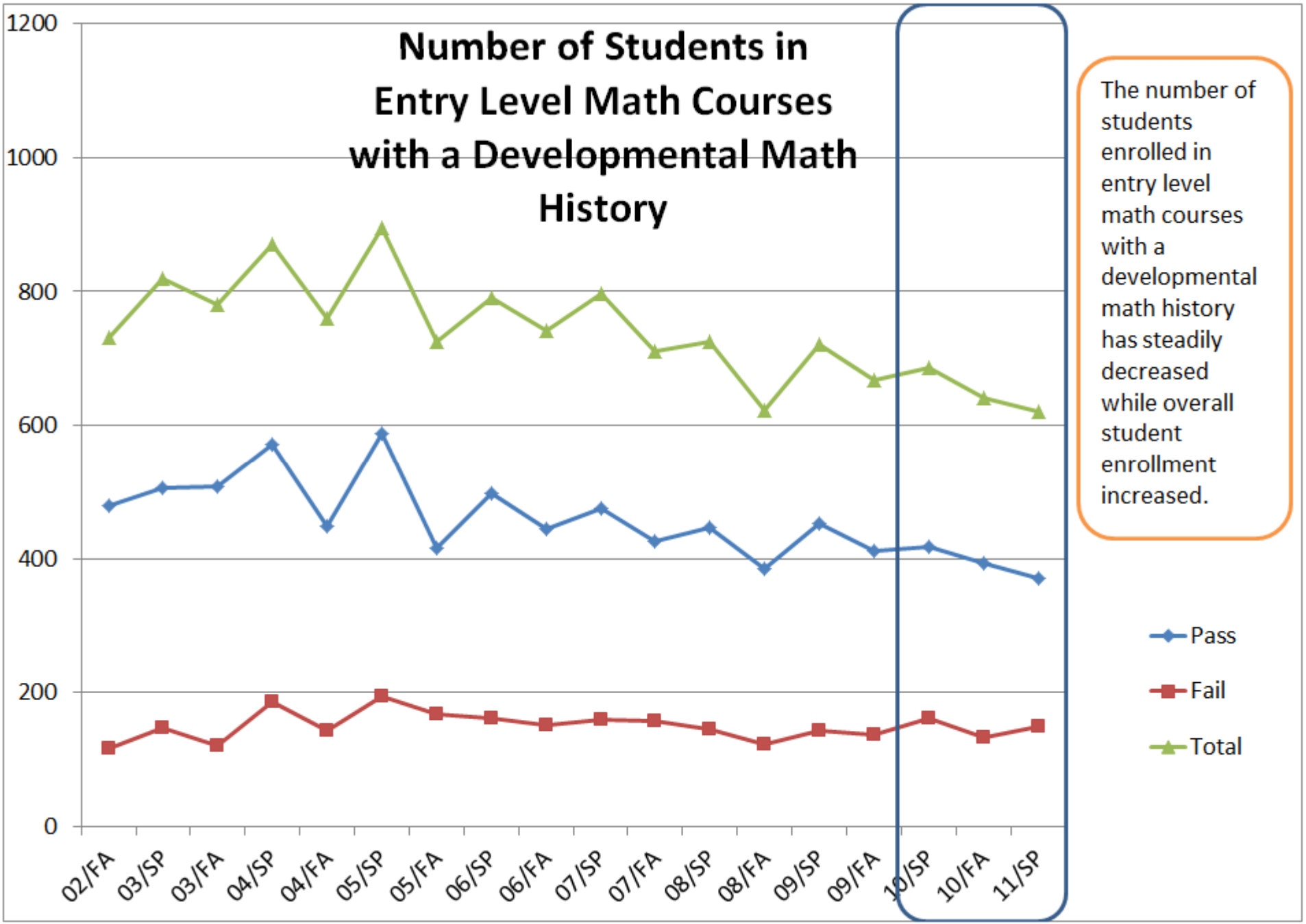
Difficult Part – Validate with Student Data

- How to efficiently sort, filter, and calculate average grades from Fall 2002 through Spring 2011?
  - 1,114,603 courses
  - 62,265 students


Number of Students in Entry Level Math Courses without Previously Taking Developmental Math
9.0% increase in number passing 08/FA to 09/FA while overall student enrollment increased 8.2%.
16.4% increase in number passing 09/FA to 10/FA while overall student enrollment increased 1.7%.
2500
2000
1500
1000
500
0
02/FA
03/SP
03/FA
04/SP
04/FA
05/SP
05/FA
06/SP
06/FA
07/SP
07/FA
08/SP
08/FA
09/SP
09/FA
10/SP
10/FA
11/SP
Pass
Fail
Total

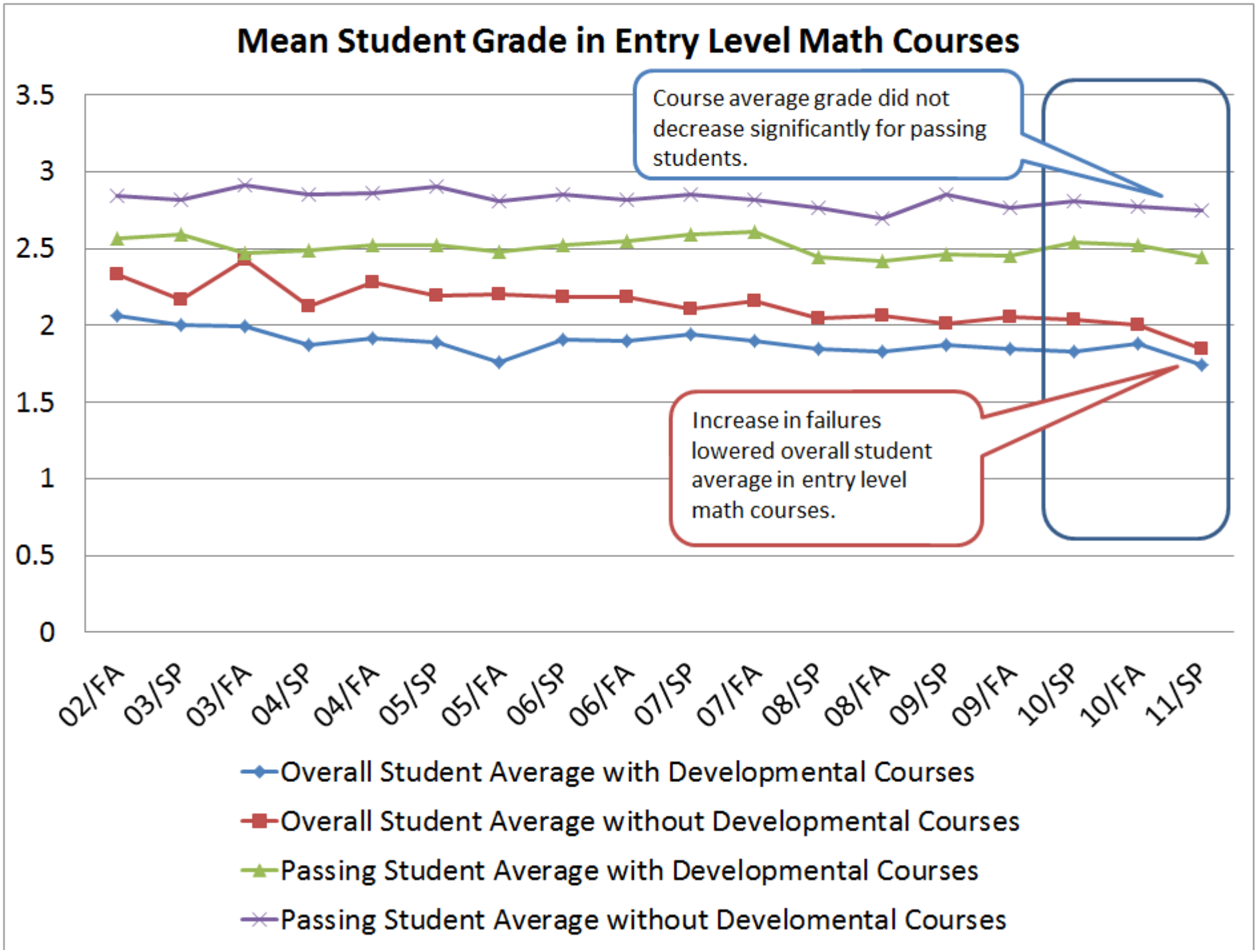
Conclusion 4

The increase in students who passed a credited math course at ECC was not due to an increase in enrollment.


Number of Students in Entry Level Math Courses with a Developmental Math History
1200
1000
800
600
400
200
0
02/FA
03/SP
03/FA
04/SP
04/FA
05/SP
05/FA
06/SP
06/FA
07/SP
07/FA
08/SP
08/FA
09/SP
09/FA
10/SP
10/FA
11/SP
Pass
Fail
Total
The number of students enrolled in entry level math courses with a developmental math history has steadily decreased while overall student enrollment increased.

Conclusion 5

The number of students passing entry level math courses who started with a developmental math background has decreased over this 10 year period while the number of these same students who failed has remained fairly constant.


Mean Student Grade in Entry Level Math Courses
3.5
3
2.5
2
1.5
1
0.5
0
Course average grade did not decrease significantly for passing students.
Increase in failures lowered overall student average in entry level math courses.
02/FA
03/SP
03/FA
04/SP
04/FA
05/SP
05/FA
06/SP
06/FA
07/SP
07/FA
08/SP
08/FA
09/SP
09/FA
10/SP
10/FA
11/SP
Overall Student Average with Developmental Courses
Overall Student Average without Developmental Courses
Passing Student Average with Developmental Courses
Passing Student Average without Develomental Courses

Conclusion 6

Passing student averages in entry level math courses post and pre placement test change did not show a significant difference.

Conclusion 7

Overall student averages (including failures) in entry level math courses decreased slightly post placement test change. This was not unexpected.

Conclusion 8

The placement test change successfully increased retention in that it shortened time needed to complete a degree for a significant number of our students.

Special Thanks

Our Data Miners:

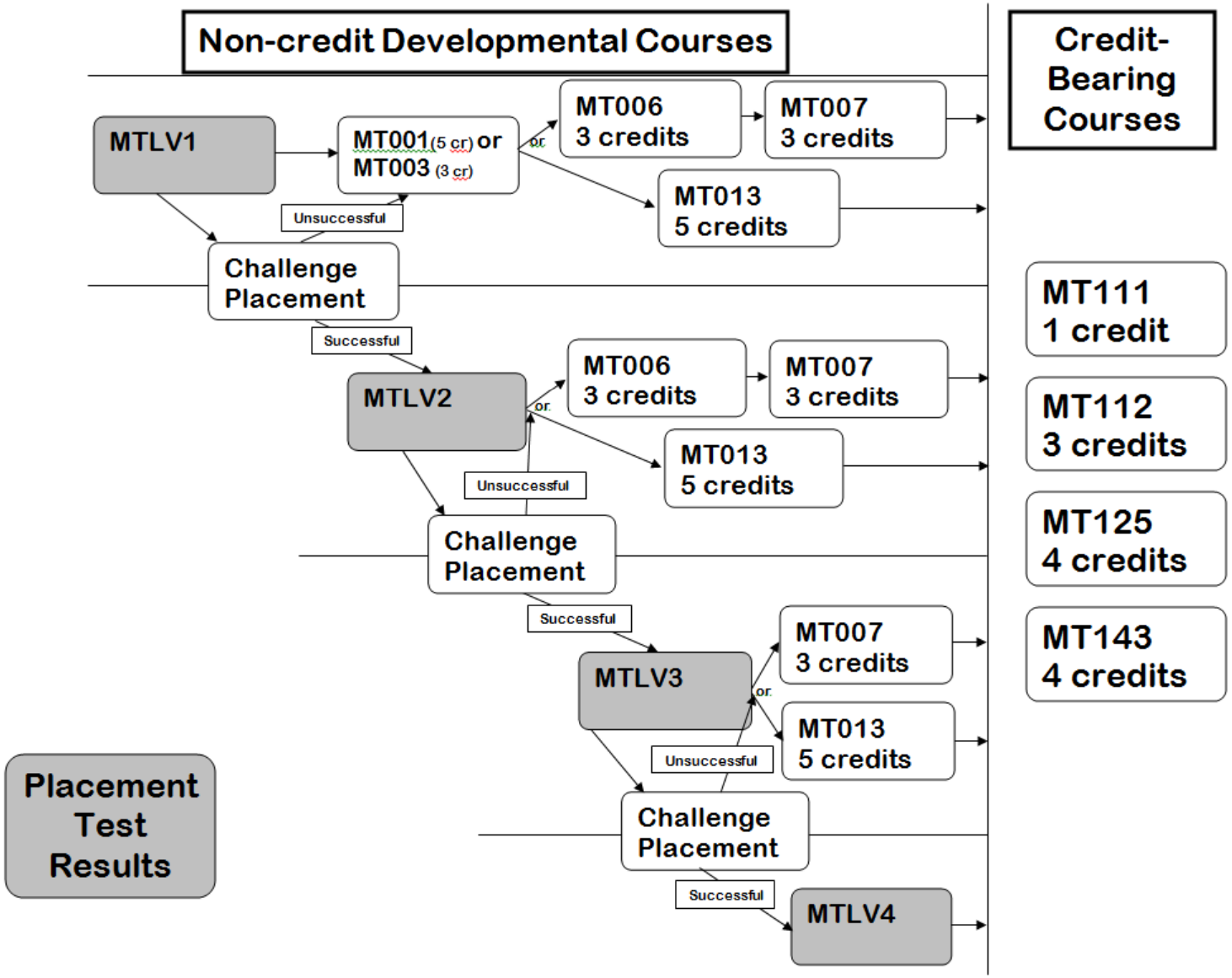
Diane McLaughlin

Marlene Arno

Cheryl Campbell

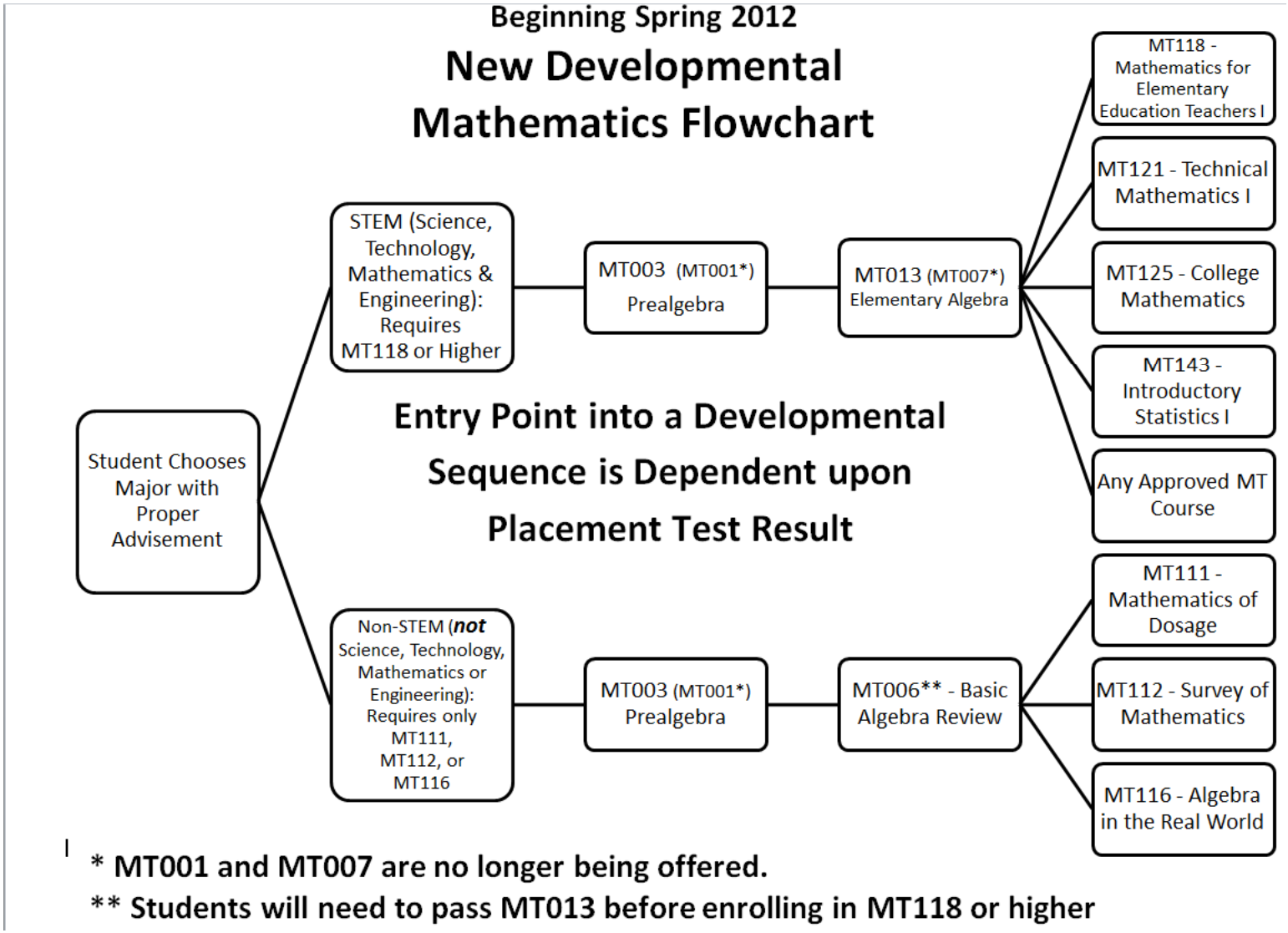
Other Changes to Developmental

Before →



Other Changes to Developmental

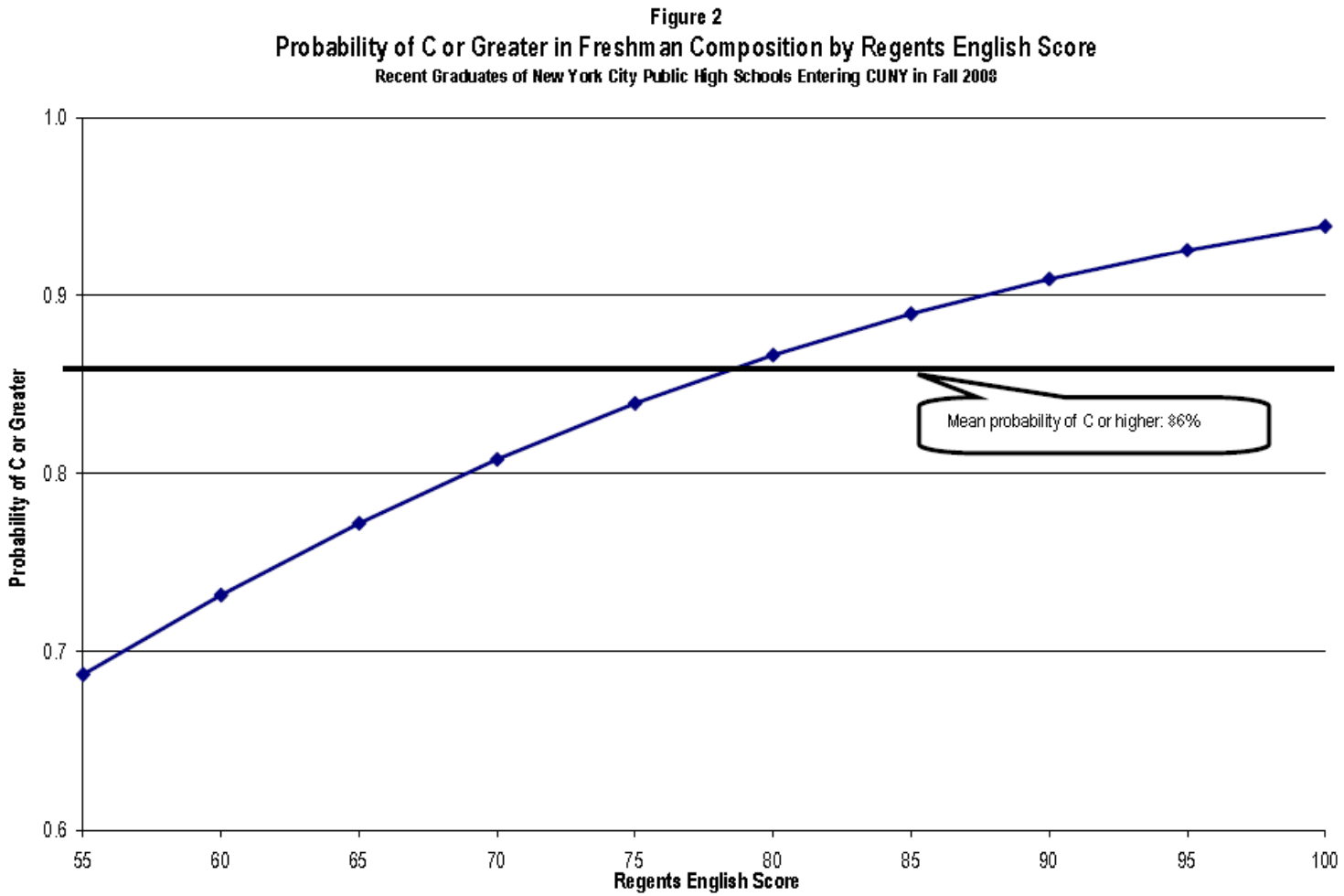
After →



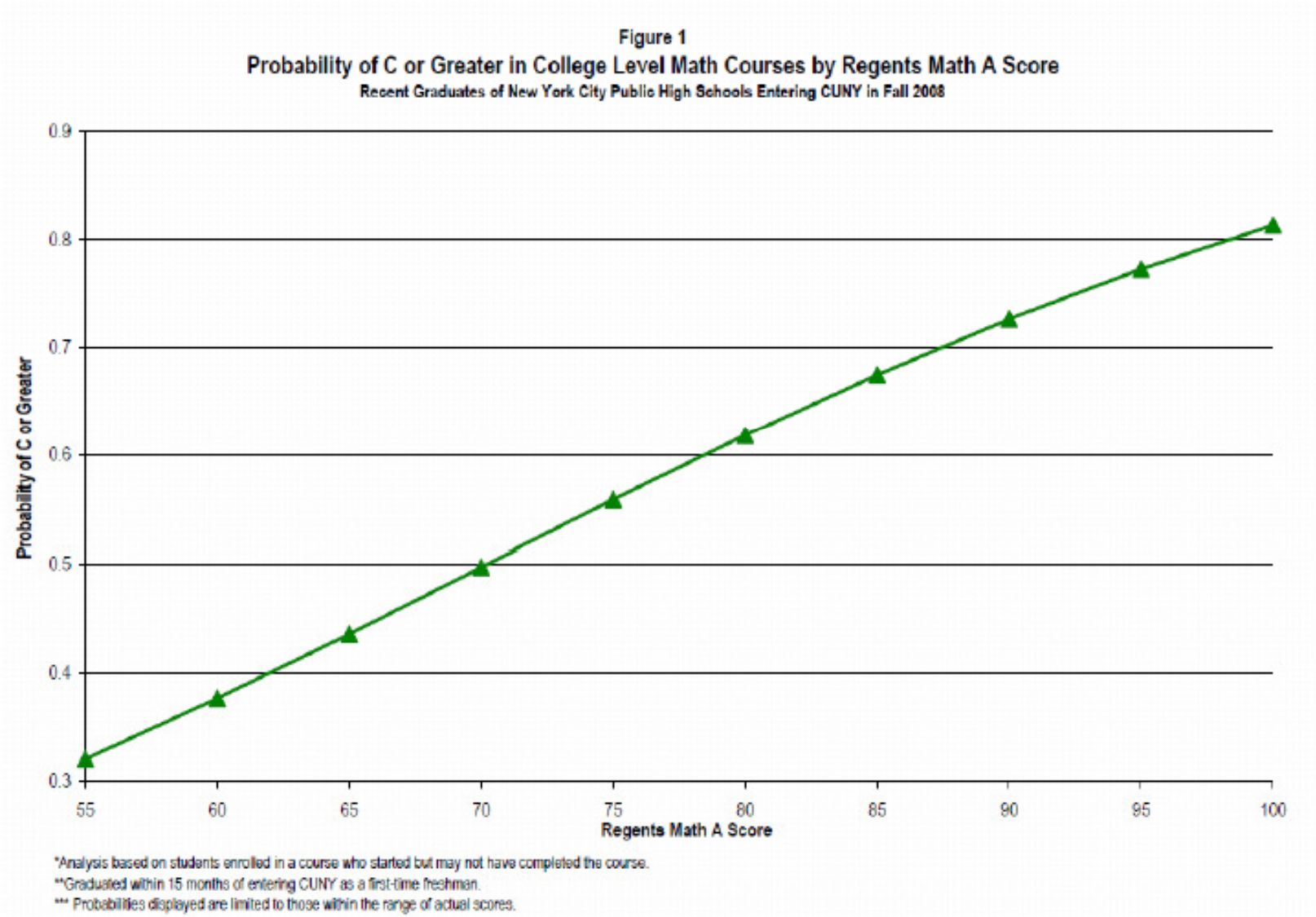
Recent Ideas

- Moved the Math Accuplacer tests ahead of English
  - Data inconclusive at this point
- Explore a stronger connection to high school regents exam scores and placement waivers. I will be working with Albany with Regents Fellows.

Probability of a C or Greater in Freshman Composition by Regents English Score



Students who score above an 80 on their Regents exam have a good chance of earning at least a C in college-level math



Source: CUNY Office of Institutional Research and Assessment; all CUNY 2- and 4-year institutions

Students who score below an 80 on their Math Regents have a much greater likelihood of being placed in a remedial college course

	Arithmetic	Elementary Algebra	Intermediate Algebra**		College Algebra	Pre-Calculus	Calculus
Less than 55	68.3%	29.7%	0.0%	1.4%	0.7%	0.0%	0.0%
55 to 64.9	61.4%	33.7%	0.6%	3.2%	0.8%	0.3%	0.0%
65 to 69.9	38.9%	44.7%	1.8%	8.0%	4.8%	1.8%	0.7%
70 to 79.9	14.7%	24.6%	5.9%	23.5%	21.3%	8.1%	1.8%
80 to 89.9	0.8%	2.8%	4.3%	17.3%	30.6%	32.3%	12.0%
Above 90	0.0%	0.2%	0.5%	3.4%	12.7%	39.2%	44.2%

**Intermediate Algebra is considered a remedial course in some schools in the CUNY system and a credit-bearing course in others.

Totals sum to 100 percent along rows, but not down columns.

Source: CUNY Office of Institutional Research and Assessment, Math A Regents; all CUNY 2- and 4-year institutions

Our Challenge
Graduating *All* Students College & Career Ready

New York's 4-year high school graduation rate is 73.4% for All Students
However, the gaps are disturbing.

June 2010 Graduation Rate

Graduation under Current Requirements

	% Graduating
All Students	73.4
American Indian	59.1
Asian/Pacific Islander	82.6
Black	57.7
Hispanic	57.3
White	84.1
English Language Learners	40.3
Students with Disabilities	44.1

Calculated College and Career Ready*

	% Graduating
All Students	36.7
American Indian	21.4
Asian/Pacific Islander	56.4
Black	12.8
Hispanic	14.9
White	50.6
English Language Learners	6.1
Students with Disabilities	4.7

*Students graduating with at least a score of 75 on Regents English and 80 on a Math Regents, which correlates with success in first-year college courses.

Source: NYSED Office of Information and Reporting Services