

# Achieving the Dream Report Series



December 21, 2009

## College Math Tutoring Center Results Spring 2009

The new College Math Tutoring Center at Northern Essex Community College opened its doors to students for the Spring 2009 semester. A total of 940 students enrolled in one or more college level math courses during the term, 128 of which sought math tutoring services through the Center.

The 128 students who participated in math tutoring averaged 8 total contacts with the Center, 771 contact minutes, and 13 contact hours (see Table 1).

**Table 1.**

Tutoring Activity		
# of Contacts	N	128
	Mean	8
	Median	5
	Mode	1
	Sum	1,040
Contact Minutes	N	103
	Mean	771
	Median	390
	Mode	60
	Sum	79,455
Contact Hours	N	103
	Mean	13
	Median	7
	Mode	1
	Sum	1,324

### College Math Student Profile

Although more males than females enrolled in college math courses, a slightly larger percentage of females than males accessed math tutoring services (see Table 2).

**Table 2.**

Gender	Received Tutoring		No Tutoring		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Female	65	50.8%	388	47.8%	453	48.2%
Male	62	48.4%	424	52.2%	486	51.7%
Unknown	1	0.8%	0	0.0%	1	0.1%
Total	128	100.0%	812	100.0%	940	100.0%

20.3% of students who sought math tutoring were Hispanic and 5.5% were Black, non-Hispanic. The ethnic makeup of all students enrolled in college math courses included 18.5% Hispanic and 2.8% Black, non-Hispanic (see Table 3).

**Table 3.**

Ethnicity	Received Tutoring		No Tutoring		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
American Indian	0	0.0%	5	0.6%	5	0.5%
Asian	3	2.3%	22	2.7%	25	2.7%
Black, non-Hispanic	7	5.5%	19	2.3%	26	2.8%
Hispanic	26	20.3%	148	18.2%	174	18.5%
Non-Resident Alien	2	1.6%	3	0.4%	5	0.5%
White, non-Hispanic	79	61.7%	537	66.1%	616	65.5%
Unknown	11	8.6%	78	9.6%	89	9.5%
<b>Total</b>	<b>128</b>	<b>100.0%</b>	<b>812</b>	<b>100.0%</b>	<b>940</b>	<b>100.0%</b>

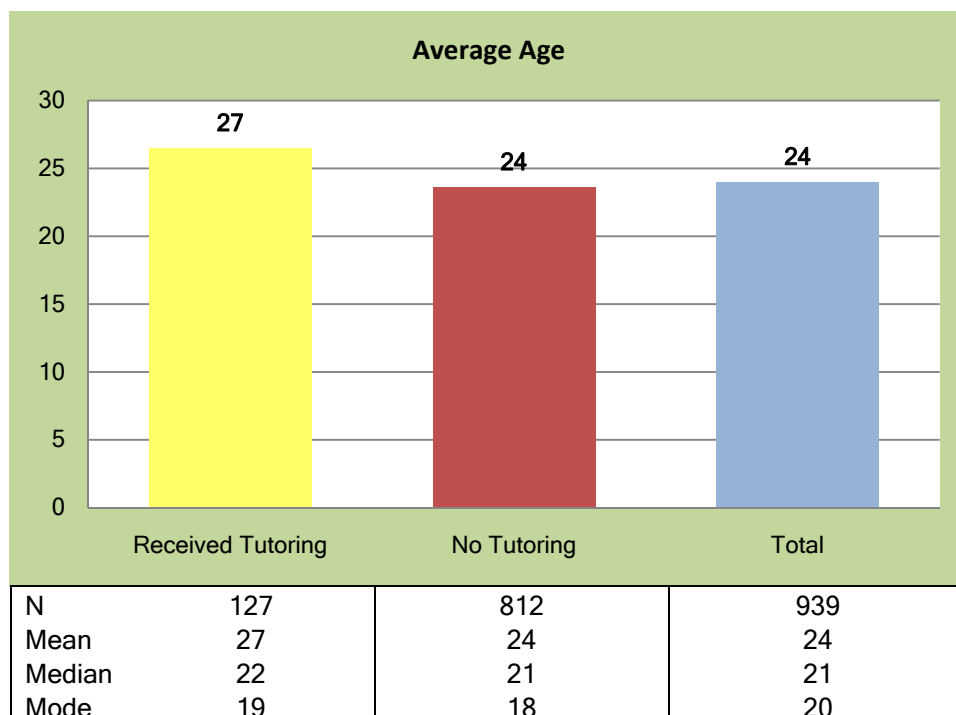
The vast majority of students accessing math tutoring services were continuing students, consistent with the overall composition of students enrolled in college math (see Table 4).

**Table 4.**

Student Status	Received Tutoring		No Tutoring		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Continuing	113	88.3%	688	84.7%	801	85.2%
New	4	3.1%	51	6.3%	55	5.9%
Readmit	10	7.8%	46	5.7%	56	6.0%
Readmit Grad NECC	0	0.0%	1	0.1%	1	0.1%
Transfer	0	0.0%	17	2.1%	17	1.8%
Unknown	1	0.8%	9	1.1%	10	1.1%
<b>Total</b>	<b>128</b>	<b>100.0%</b>	<b>812</b>	<b>100.0%</b>	<b>940</b>	<b>100.0%</b>

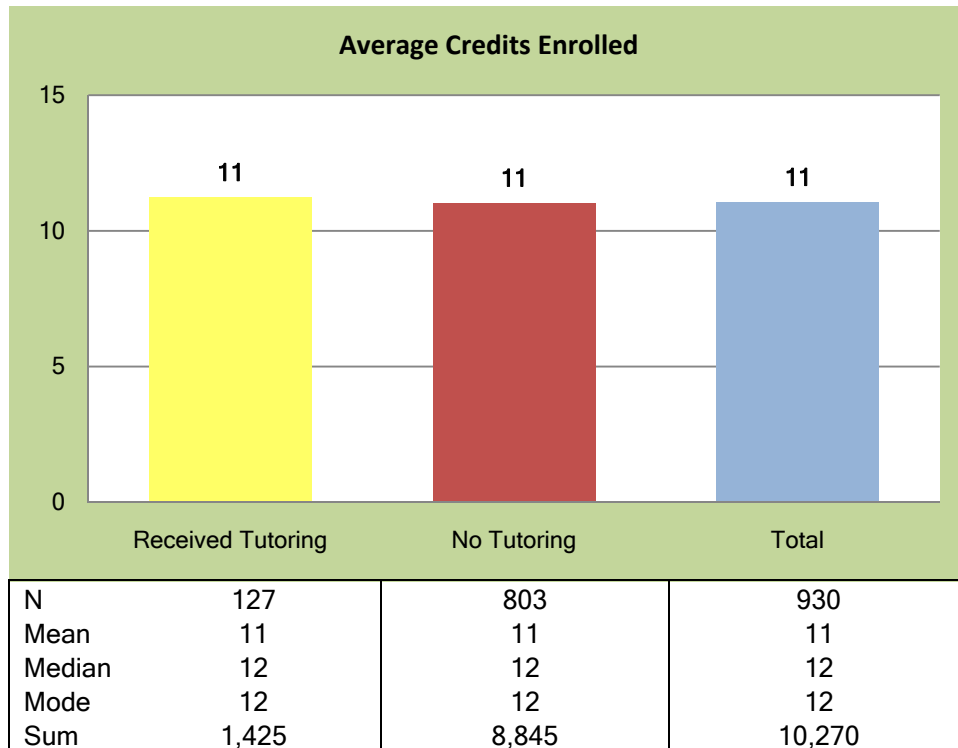
On average, students seeking math tutoring services were older than who did not (see Chart 1).

**Chart 1.**



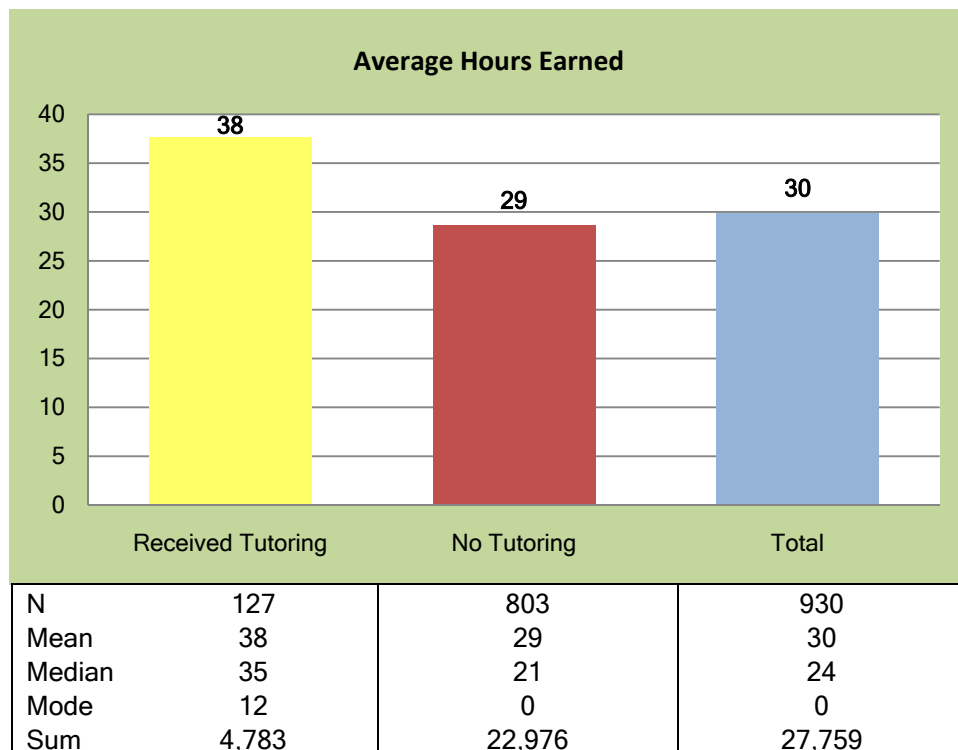
College math students were enrolled for an average of 11 credits (see Chart 2).

**Chart 2.**



Students who participated in math tutoring had earned, on average, more credit hours than those who did not seek tutoring (see Chart 3).

**Chart 3.**

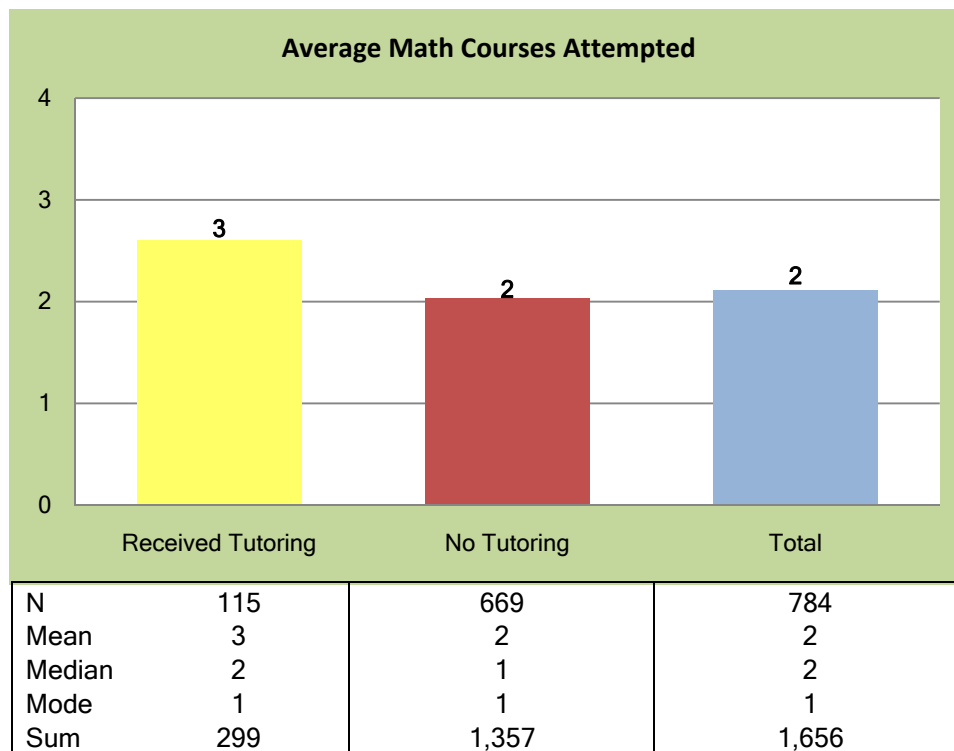


Nearly 90% of students who participated in math tutoring during Spring 2009 had attempted an average of 3 math courses at NECC prior to the Spring 2009 semester, either at the developmental or college level (see Table 5 and Chart 4).

**Table 5.**

Math Experience Prior to Spring 2009	Received Tutoring		No Tutoring		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Any Math Attempted	115	89.8%	669	82.4%	784	83.4%
No Math Attempted	13	10.2%	143	17.6%	156	16.6%
<b>Total</b>	<b>128</b>	<b>100.0%</b>	<b>812</b>	<b>100.0%</b>	<b>940</b>	<b>100.0%</b>

**Chart 4.**



61.7% of students participating in math tutoring at the college level during Spring 2009 had initially assessed into developmental math (see Table 6).

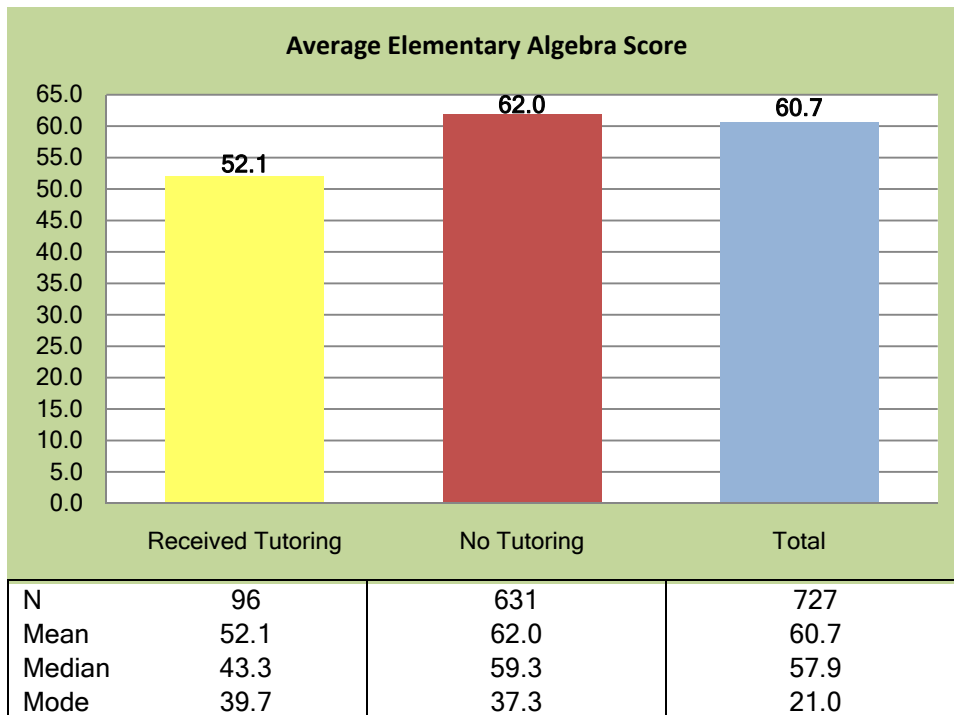
**Table 6.**

Math Placement Test Results	Received Tutoring		No Tutoring		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Assessed into Developmental	79	61.7%	474	58.4%	553	58.8%
Assessed into College Level	17	13.3%	158	19.5%	175	18.6%
Unknown	32	25.0%	180	22.2%	212	22.6%
<b>Total</b>	<b>128</b>	<b>100.0%</b>	<b>812</b>	<b>100.0%</b>	<b>940</b>	<b>100.0%</b>

Note: For students who tested more than once, results from the most recent test were used.

Students who participated in college math tutoring had received a lower average Elementary Algebra test score than those who did not seek tutoring (see Chart 5).

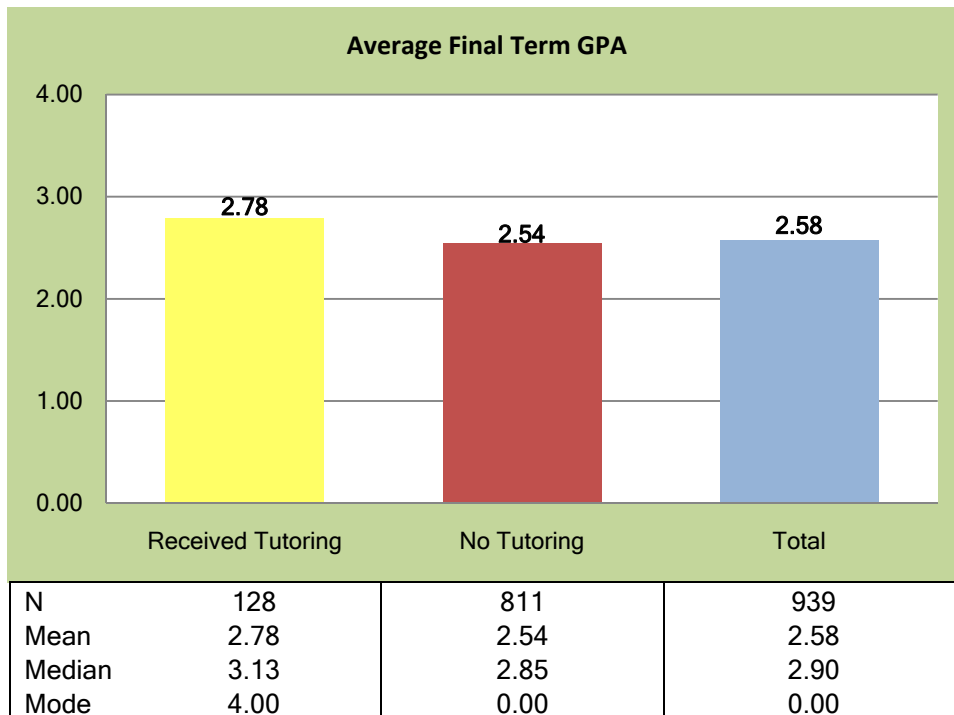
**Chart 5.**



**College Math Outcomes**

The final GPA for the Spring 2009 term was, on average, higher for college math students who accessed tutoring services than for those who did not (see Chart 6).

**Chart 6.**



A total of 964 college math grades were distributed among 940 individual students during the Spring 2009 semester. Students seeking tutoring achieved notably higher A-C and A-D completion rates in college math than those who did not seek tutoring (see Table 7).

**Table 7.**

Final College Math Grade Distribution	Received Tutoring		No Tutoring		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
A	34	25.0%	149	18.0%	183	19.0%
A-	10	7.4%	46	5.6%	56	5.8%
B+	10	7.4%	50	6.0%	60	6.2%
B	12	8.8%	75	9.1%	87	9.0%
B-	8	5.9%	49	5.9%	57	5.9%
C+	7	5.1%	33	4.0%	40	4.1%
C	12	8.8%	60	7.2%	72	7.5%
C-	7	5.1%	20	2.4%	27	2.8%
D+	2	1.5%	24	2.9%	26	2.7%
D	4	2.9%	46	5.6%	50	5.2%
F	10	7.4%	40	4.8%	50	5.2%
FN	1	0.7%	24	2.9%	25	2.6%
FW	5	3.7%	25	3.0%	30	3.1%
I	2	1.5%	23	2.8%	25	2.6%
NW	10	7.4%	112	13.5%	122	12.7%
W	2	1.5%	52	6.3%	54	5.6%
Total	136	100.0%	828	100.0%	964	100.0%
A-C Completion	93	68.4%	462	55.8%	555	57.6%
A-D Completion	106	77.9%	552	66.7%	658	68.3%

### Correlation Analysis

A correlation exists when two variables are linked closely enough that knowing the values for one variable lets us predict with some accuracy the values for the second variable. Correlation does not prove causation, only that there is a relationship. While a correlation coefficient with an absolute value of 1 (-1 or +1) indicates a perfect association, an absolute value of .2 or higher is usually worth noting.

Correlation analysis was utilized to determine whether tutoring, the independent variable, influenced final college math grade, the dependent variable. The result showed a very weak tendency (.263) for students who participated in tutoring to complete college level math with a grade of A-C, and for students who did not participate in tutoring to achieve a grade lower than C, or not successfully complete college math. No association was revealed between the number of visits made to the College Math Tutoring Center and the final course grade (.093), or between the total time spent at the Center and the final course grade (.079). Students who initially assessed into college level math strengthened the relationship between math tutoring and successful course completion from very weak to moderate (.585). The association between tutoring and A-C completion endured, but did not increase, for students who placed into developmental math (.237).

Controlling for gender, the relationship between math tutoring and A-C completion increased from very weak to weak for females only (.442). Males did not influence (.106) the relationship between tutoring and completion.

The association between tutoring and college math course completion increased from very weak to weak for students over age 25 (.429). Students age 25 or younger had no influence (.199) on the relationship between the tutoring and completion.

For full-time students the relationship between math tutoring and A-C course completion increased from very weak to weak (.320). Though the strength of association endured for part-time students (.202), it did not increase.

Controlling for ethnicity, the strength of association endured in both Majority (White non-Hispanic) and Minority (American Indian, Asian, Black non-Hispanic, and Hispanic) sub-groups without increasing appreciably in either (.275 and .297 respectively). This provides further evidence that tutoring and course completion are related, but ethnicity is not a factor.

## Summary

College math students who accessed tutoring services tended to be slightly older, had earned more credit hours, and had attempted more math courses prior to Spring 2009 than those who did not seek tutoring. Students who participated in tutoring had also achieved, on average, a lower Elementary Algebra score at the time of assessment than those who did not seek tutoring.

There were positive outcomes for college math students who sought tutoring. Those students achieved a higher average term GPA and higher course completion rates in college math than students who did not seek tutoring. An association between math tutoring and successful course completion was revealed through higher level analysis; the association increased for students who assessed into college level math, females, students over age 25, and students enrolled full-time.

Further study might include the calculation of retention rates from Spring 2009 to Fall 2009 for college math students who participated in tutoring versus those who did not. In addition, the development of regression models would reveal whether certain combinations of independent variables help predict and/or explain college math outcomes.

*Interpretations of these findings as well as suggestions for further analysis are always welcome. Please direct questions and comments to Thomas Fallon, Dean of Institutional Research and Planning, via phone at 978-556-3866 or email at [tfallon@necc.mass.edu](mailto:tfallon@necc.mass.edu).*



<http://www.necc.mass.edu/irp/planning/dream.php>