

Data Support for Improving Outcomes on the CUNY Elementary Algebra Final Exam

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CEAFE Collaborative, Faculty Led Design

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- The Math Panel was commissioned in late Spring 2011.
 - ▣ Chaired by a then current math chair
 - ▣ Members were appointed by their math chair from
 - each community and comprehensive college
 - Baruch and York
 - ▣ Participation by CUNY Central OAA and NYC DOE/Regents
- Fall 2011 the Math Panel drafted a set of recommendations including,
 - ▣ CEAFE learning objectives
 - ▣ Structure of the exam
 - ▣ Criteria to achieve *Elementary Algebra* Proficiency
 - ▣ Post-Course Intervention guidelines
- EVC Logue accepted the recommendations in an April 16, 2012 memo.

CEAFE Overview

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- The CUNY Elementary Algebra Final Exam (CEAFE) is the Elementary Algebra Common Departmental Final (CDF).
- CUNY policy requires all Elementary Algebra students to take the CEAFE during the finals week of Elementary Algebra.
- Currently, to earn a passing course grade, students must meet **both** of the following criteria. Students must earn:
 1. 60% or higher on the CEAFE[†], **and**
 2. 70%^{††} class average with the CEAFE accounting for 35% of the final average.

[†]CUNY Developmental Education Taskforce has recommended eliminating this requirement.

^{††}Prior to Fall 2015, a 74% was required.

Structure of the CEAFE

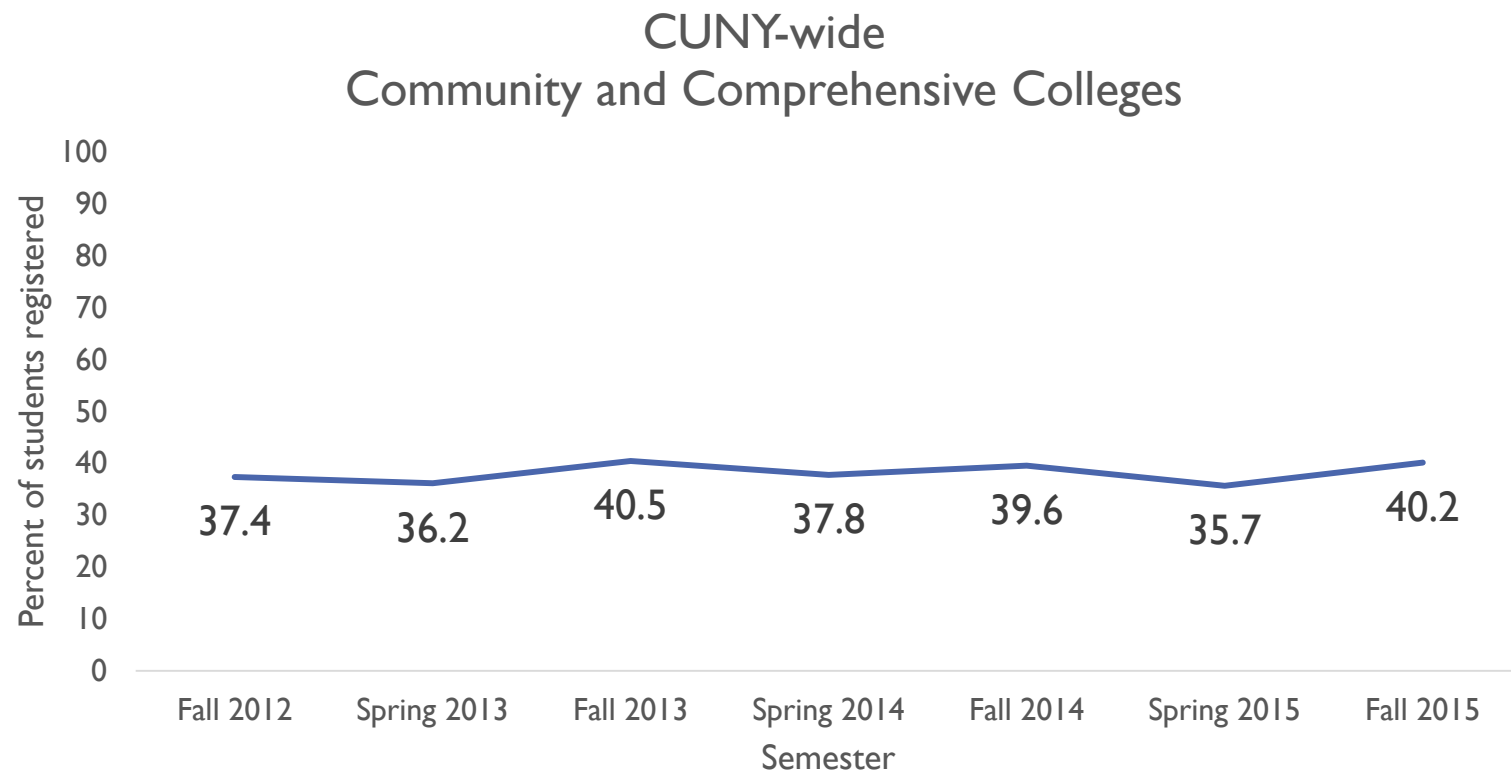
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- The exam is completed online (using Maple T.A.) with a printed version available for those who need it.
- 25 multiple choice questions. Each student receives one question from each of 25 question groups.
 - There are multiple algorithms in most question groups. For example, some students may be asked to multiply, and others may be asked to divide.
 - Within each algorithm, there are multiple instances of each item. For example, some students may be required to multiply 3×5 , and others may be required to multiply 4×6 .
 - The wrong answers are based on likely student errors.
- Each question is worth 4 points with no partial credit. There is no penalty for wrong answers.
- 100 minutes are allowed to complete the exam (more for SSD accommodations).
- Calculators are NOT currently allowed[†].

[†]CUNY Developmental Education Taskforce has recommended allowing scientific calculators.

CEAFE CUNY-wide Passing Trends

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*Of students who enrolled in an Elementary Algebra course, between 28% and 32% of students in each term withdrew before taking the exam. Pass rates for students who took the exam were between 51% and 57%.

CEAFE CUNY-wide Testing and Passing Trends

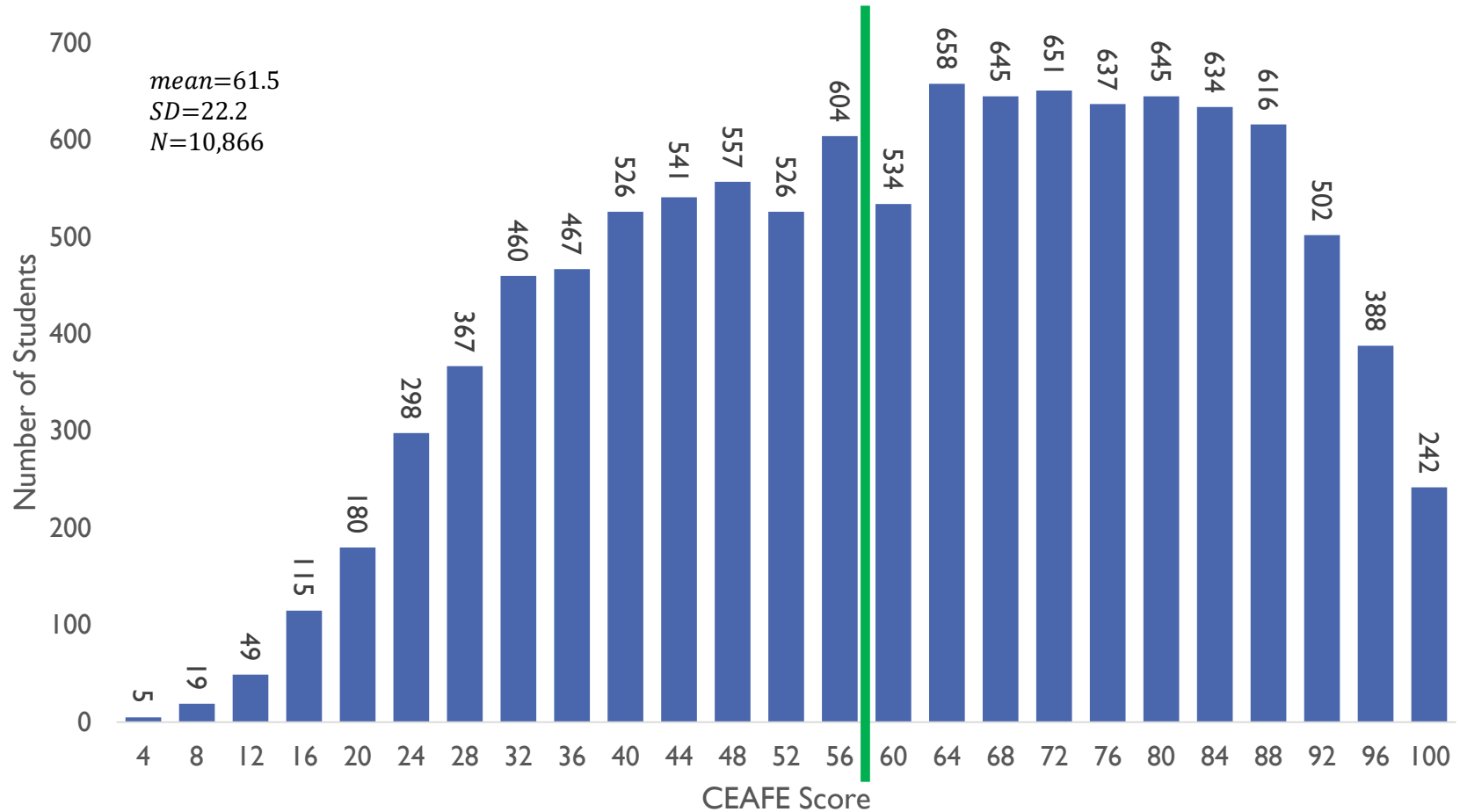
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CUNY Elementary Algebra Final Exam (CEAFE)						
Semester	Registered in Elementary Algebra	Tested		Scored 60+		
	N	N	Percent of Registered	N	Percent of Tested	Percent of Registered
2012-Fall	14,577	10,449	72%	5,447	52%	37%
2013-Spring	14,751	10,400	71%	5,343	51%	36%
2013-Fall	16,048	11,498	72%	6,495	56%	40%
2014-Spring	14,917	10,122	68%	5,633	56%	38%
2014-Fall	15,780	10,985	70%	6,251	57%	40%
2015-Spring	12,706	8,339	66%	4,535	54%	36%
2015-Fall	14,001	9,581	68%	5,628	59%	40%

CEAFE Score Distribution

Fall 2014

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CUNY-wide mean and SD Trends

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Semester [†]	Mean	SD	N
Fall 2012	59.07	21.47	10,474
Fall 2013	61.32	21.78	11,384
Fall 2014	61.55	22.22	10,866
Fall 2015	62.47	22.44	9,581

Note that the mean score and the shape of the curve indicates that a significant number of students

1. could potentially pass the exam with only small changes in the exam or instruction.
2. barely pass the exam and could perhaps benefit from additional support in a subsequent math course.

[†]Similar values observed for spring semesters.

Opportunities to Use Data for Assessment

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- Data available at multiple levels
 - ▣ Instructor/Section Level
 - ▣ College level
 - ▣ Over time
- “Easily” linkable to other Institutional Data
 - ▣ Identify students for future support
 - ▣ Identify populations who may do well in different formats

<http://cuny.edu/CEAFE-Results>

Comparisons Across Campuses

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Fall 2015 CUNY Elementary Algebra Final Exam (CEAFE)

College Type	College	Registered in Elementary Algebra	Tested		Scored 60+		
		N	N	Percent of Registered	N	Percent of Tested	Percent of Registered
Comprehensive	Medgar Evers	474	298	63%	171	57%	36%
	NYCCT	1,836	1,305	71%	809	62%	44%
	Staten Island	814	604	74%	377	62%	46%
	Total	3,124	2,207	71%	1,357	61%	43%
Community	BMCC	4,048	2,645	65%	1,302	49%	32%
	Bronx	1,571	1,028	65%	602	59%	38%
	Hostos	516	311	60%	193	62%	37%
	Kingsborough	1,301	1,088	84%	740	68%	57%
	LaGuardia	832	560	67%	374	67%	45%
	Queensborough	2,609	1,742	67%	1,060	61%	41%
	Total	10,877	7,374	68%	4,271	58%	39%
All		14,001	9,581	68%	5,628	59%	40%

CEAFE Item Performance by Question Group

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College Level Item Outcomes available online

Representative Sample Exams and topic outlines online

<http://cuny.edu/CEAFE-Results>

Question Group	BMCC	Bronx	...	Queensborough	Staten Island
1	60%	59%	...	67%	71%
2	51%	52%	...	52%	53%
3	45%	50%	...	48%	43%
4	48%	48%	...	52%	53%
⋮	⋮	⋮	...	⋮	⋮
23	51%	60%	...	59%	53%
24	81%	82%	...	83%	88%
25	59%	52%	...	56%	59%

Instructor Level Overview for Chairs

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Name	Percentile "Rank"	Course History					
Faculty Name	98.2%	Fall 2012 MAT 51 XX 52.0% of 25	Fall 2013 MAT 51 XX 45.8% of 24	Fall 2013 MAT 51 XX 52.0% of 25	Spring 2014 MAT 51 XX 52.0% of 25	Spring 2014 MAT 51 XX 53.8% of 26	Fall 2014 MAT 12 XX 63.0% of 27
Faculty Name	97.7%	Fall 2012 MAT 12 XX 48.0% of 25	Spring 2014 MAT 51 XX 50.0% of 28				
Faculty Name	97.3%	Fall 2012 MAT 51 XX 50.0% of 26	Spring 2013 MAT 51 XX 37.0% of 27	Fall 2013 MAT 51 XX 56.0% of 25			
Faculty Name	96.8%	Fall 2012 MAT 51 XX 45.8% of 24	Spring 2013 MAT 51 XX 40.7% of 27	Spring 2014 MAT 51 XX 47.8% of 23			
Faculty Name	96.4%	Fall 2012 MAT 51 XX 46.2% of 26	Fall 2013 MAT 51 XX 55.0% of 20	Fall 2013 MAT 51 XX 44.4% of 27			
Faculty Name	95.9%	Fall 2012 MAT 51 XX 40.7% of 27	Spring 2013 MAT 51 XX 40.7% of 27	Fall 2013 MAT 51 XX 40.9% of 22	Spring 2014 MAT 51 XX 48.0% of 25	Fall 2014 MAT 51 XX 68.0% of 25	
Faculty Name	14.0%	Fall 2012 MAT 12 XX 16.7% of 24	Spring 2013 MAT 12 XX 19.2% of 26	Fall 2013 MAT 12 XX 12.0% of 25	Spring 2014 MAT 12 XX 8.7% of 23	Fall 2014 MAT 12 XX 29.2% of 24	
Faculty Name	13.1%	Fall 2012 MAT 51 XX 16.0% of 25	Fall 2013 MAT 51 XX 24.0% of 25	Fall 2014 MAT 12 XX 17.2% of 29			
Faculty Name	12.7%	Fall 2012 MAT 51 XX 19.2% of 26	Spring 2013 MAT 51 XX 19.2% of 26	Fall 2013 MAT 51 XX 8.0% of 25	Spring 2014 MAT 51 XX 20.8% of 24		
Faculty Name	12.2%	Spring 2013 MAT 51 XX 15.4% of 26	Spring 2014 MAT 12 XX 20.0% of 20				
Faculty Name	11.8%	Fall 2012 MAT 12 XX 20.8% of 24	Spring 2013 MAT 12 XX 16.0% of 25	Fall 2013 MAT 12 XX 20.0% of 25	Spring 2014 MAT 12 XX 20.8% of 24	Fall 2014 MAT 12 XX 15.4% of 26	

Instructor Record at College

Name XXX

P of AP* 30.3%

* P of AP is the percentile of the average Semester Percentile at College. To calculate this, we assigned every instructor the average of their percentile scores which are reported below. We then created a percentile for each instructor based on this average.

Instructor Report

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		Fall 2012 MAT 51 xx	Spring 2013 MAT 51 xx	Spring 2013 MAT 51 xx	Fall 2013 MAT 51 xx	Spring 2014 MAT 51 xx	Fall 2014 MAT 51 xx
Registered	N	25	24	27	21	23	25
	N	9	13	19	10	13	15
Tested	Percent of Registered	36%	54%	70%	48%	57%	60%
	N	4	5	6	7	8	4
Scored 60+	Percent of Tested	44%	38%	32%	70%	62%	27%
	Percent of Registered	16%	21%	22%	33%	35%	16%
Semester Percentile at College**		21%	27%	33%	54%	66%	7%

** Each semester at your college, the "Percent of Registered" was assigned a percentile based on your college's results that semester.

Question Group							
1	N	0.538	0.421▼	0.600	0.615	0.400▼	
2	O	0.231▼	0.316	0.500	0.385	0.333	
3	T	0.154	0.105▼	0.300	0.385	0.267▼	
4		0.692	0.526	0.600	0.692▲	0.333▼	
5	A	0.846▲	0.526	0.600	0.692	0.533▼	
6	V	0.769	0.579	0.700	0.846	0.667	
7	A	0.538	0.316▼	0.900▲	0.923▲	0.533▼	
8	I	0.538	0.474	0.600	0.769	0.400▼	
9	L	0.692▲	0.474	0.500	0.462	0.333▼	
10	A	0.308▼	0.368	0.700	0.615	0.200▼	
11	B	0.385▼	0.632	0.700	0.769	0.533▼	
12	L	0.692	0.579	0.600	0.769	0.600	
13	E	0.538	0.421	0.800▲	0.692	0.400	
14		0.692	0.684	0.800	0.846	0.600	
15		0.538	0.526	0.600	0.615	0.267▼	
16		0.462	0.368	0.400	0.692	0.400▼	
17		0.462	0.368▼	0.700	0.692	0.467▼	
18		0.308	0.421	0.700▲	0.769▲	0.400	
19		0.692	0.737	0.800	0.846	0.533▼	
20		0.692▲	0.421	0.600	0.769▲	0.533	
21		0.538	0.526	0.500	0.538	0.467	
22		0.231	0.316	0.500	0.538	0.000▼	
23		0.308▼	0.211▼	0.700	0.538	0.400▼	
24		0.846	0.789	1.000▲	0.846	0.800	
25		0.385	0.632	0.700	0.769▲	0.533	

▼ indicates less than or equal to 1.25 standard deviations below the CUNY-wide mean

▲ indicates greater than or equal to 1.25 standard deviations above the CUNY-wide mean

Departments Get Summary Data with Grades

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Summary of Included Scores

Class	Number Registered	Number Tested	Number Scored 60+	Percent of Registered Tested	Percent of Tested Scored 60+	Percent of Registered Scored 60+	Q1	Q2	Q3	...	Q22	Q23	Q24	Q25
Grand Total	324	214	122	66.0%	57.0%	37.7%	66%	53%	40%		50%	58%	86%	56%
ClassName	28	21	11	75.0%	52.4%	39.3%	76%	43%	33%		33%	57%	71%	67%
ClassName	26	15	9	57.7%	60.0%	34.6%	60%	60%	40%		80%	60%	80%	60%
ClassName	26	15	11	57.7%	73.3%	42.3%	73%	67%	53%		67%	80%	80%	67%
ClassName	27	17	12	63.0%	70.6%	44.4%	76%	53%	47%		59%	76%	88%	65%
ClassName	25	14	9	56.0%	64.3%	36.0%	64%	50%	21%		50%	64%	93%	50%
ClassName	28	20	9	71.4%	45.0%	32.1%	55%	30%	25%		50%	45%	90%	50%
ClassName	28	20	14	71.4%	70.0%	50.0%	90%	60%	30%		45%	80%	95%	65%
ClassName	26	16	6	61.5%	37.5%	23.1%	50%	50%	19%		50%	38%	88%	38%
ClassName	28	17	8	60.7%	47.1%	28.6%	65%	41%	41%		41%	47%	82%	47%
ClassName	28	23	14	82.1%	60.9%	50.0%	65%	43%	43%		48%	61%	83%	48%
ClassName	26	18	11	69.2%	61.1%	42.3%	72%	94%	72%		39%	61%	94%	61%
ClassName	28	18	8	64.3%	44.4%	28.6%	44%	50%	56%		56%	33%	89%	56%

Instructors Get Item Data with Grade Reports

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Class Name CEAFE Scores

Class	Last Name	First Name	ID	Email	Test Date	CEAFE Score
Class Name	Student	Name	EMPLID	EmailAddress	5/18/2015 10:31	32
Class Name	Student	Name	EMPLID	EmailAddress		
Class Name	Student	Name	EMPLID	EmailAddress	5/15/2015 15:53	72
Class Name	Student	Name	EMPLID	EmailAddress	5/20/2015 12:08	76
Class Name	Student	Name	EMPLID	EmailAddress		
Class Name	Student	Name	EMPLID	EmailAddress	5/20/2015 15:08	60
Class Name	Student	Name	EMPLID	EmailAddress		
Class	Number Registered	Number Tested	Number Scored 60+	Percent of Registered Tested	Percent of Tested Scored 60+	Percent of Registered Scored 60+
Class Name	28	17	8	60.7%	47.1%	28.6%
Item Stats	See http://cuny.edu/CEAFE-Results for additional information					
Q1: 65%	Q6: 65%	Q11: 76%	Q16: 47%	Q21: 35%		
Q2: 41%	Q7: 65%	Q12: 59%	Q17: 65%	Q22: 41%		
Q3: 41%	Q8: 59%	Q13: 59%	Q18: 71%	Q23: 47%		
Q4: 47%	Q9: 53%	Q14: 47%	Q19: 71%	Q24: 82%		
Q5: 53%	Q10: 35%	Q15: 53%	Q20: 59%	Q25: 47%		

Customized Data Available

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- Link to institutional data and look at local outcomes
- CEAFE score is a reasonable continuous indicator of learning (normally class grades for these courses are only pass/fail)
- Previous Requests
 - ▣ Research (CUNY Start evaluation, SOTL, etc)
 - ▣ Colleges wanting to compare their outcomes to determine potential impacts of local decisions
 - ▣ Revise the CEAFE

We'll give you almost anything if you ask!