Planning Objective Report

Objective Report:

Objective ID: 1439
Objective Title: Refined Assessment of Student Performance
Unit Manager: Koupelis, Theo
Planning Unit: 162101 - AA - Mathematics and Science
Obj. Status: Implementing
Obj. Purpose: Operational Outcome
Unit Purpose:

Objective Description:

Once the assessment expansion effort is implemented, the science and math departments will develop information associated with student performance and course (section) performance; this process will yield actionable information for course reform and specific student interventions

Institutional Goals	Objective Types	Planning Priorities
A. Develop a robust program review model	No Objective Types to Display	* Develop and maintain a learning-centered culture
A. Develop a shared understanding, application and accountability of learning-centered culture		
B. Identify and remove barriers		

Tasks

Due Date	Status	Priority	Task	Budget Amount
N/A	Incomplete	High	Retrieve class roster (with ID's) from Registrar (in Excel)	$0
N/A	Incomplete	High	Retrieve 2010-2011 SIR II (and e-sir) scores specific to Math and Science Sections (for baseline purposes)	$0
N/A	Complete	High	Develop a common final for MAC 1105.	$0
N/A	Complete	High	Complete common final exam for MAC 1106 and MAC 1147	$0
N/A	In Progress	High	Develop a common core of final exam questions for MAC 1140.	$0

Assessment Measures

Date	Assessment Measure
08/13/2011	Pretest-posttest scores
08/30/2011	SIR II (and e-sir) scores
08/30/2011	Course success rate reports (from Banner information system)
08/30/2011	Common Final Exam Scores

Intended Results

Date	Intended Results
08/13/2011	By the end of the 2011-2012 academic year, a minimum of 70% of students that complete MAC 1105 and MAC 1140 will answer correctly at least 70% of the common core questions in the corresponding final exam
08/30/2011	By the end of the 2011-2012 academic year, at least 70% of the students that complete ISC 1001C, ISC 1002C, CHM 2025L, CHM 2032L, and BSC 1005 will earn a C or better
08/30/2011	By the end of the 2011-2012 academic year, at least 70% of students that complete MAC 1105 and MAC 1140 will earn a C or better
08/30/2011	By the end of the 2011-2012 academic year, common final exam scores for MAC 1106 and MAC 1147 will indicate that student performance in DE and traditional courses are similar

Status Reports

Report Date	Status Report
1/17/2012	Before 2011-2012 pilot assessments were done for ISC 1001C, ISC 1002C, all physics courses, BSC 1005, CHM 2025L and CHM 2032L. The assessment for the ISC courses is a common final across the district. Pre- and post-tests are given in the physics and chemistry courses. For Spring 2012, these assessments are being repeated, except for BSC 1005, for which the department is moving to a Fall-only assessment using a pre/post test.
1/17/2012	Six versions (Forms A to F) of a full common MAC1105 final exam were developed. It was administered to most dual enrollment classes and some campus classes. A correlation of questions was developed and checked, listing which question from each of the other forms corresponded to the questions on Form A. Whenever possible, we also correlated questions from the post-test given during 2010-11 to Form A of the common final exam. Exams, answer keys, correlations, etc., will be delivered to Institutional Research by 1/20/12.
1/17/2012	A MAC1147 common final was developed in anticipation that the course would be offered as a dual enrollment course; however, that has not happened and there was only one section of the course offered in the fall and one currently being offered in the spring.
1/17/2012	A common core of problems was developed for a MAC1106 final, again in anticipation that the course would be offered as a dual enrollment course; Professor Christy Smith and Professor JoAnn Lewin used a common core of problems for their classes. Results still need to be looked at.
1/17/2012	Data from Spring 2011 has been collected; a preliminary analysis was done and distributed to those who had participated. A new end of course assessment will be developed for MAC1140 and will be administered for the first time at the end of Spring 2012. (See separate report.)

Actual Results

Date	Actual Results
01/17/2012	Results from the pilot BSC 1005 assessment from Fall 2010 are included. Results from the Fall 2011 are currently being analyzed. A preliminary summary of the results is also included.
02/28/2012	Results from the Fall 2011 semi-common final exam have been uploaded (see document entitled MAC 1105 201210 All Summaries 02282012). We considered the performance of all students on the course outcome items. Statistically different test scores between DE and non-De sections were noted, but (on overall test scores) the effect size indicated a very low practical difference. This will be addressed in the general improvement plans (see use of results)
03/15/2012	MAC 1105 Success/Retention Rates: During the Fall 2011, the general success/retention rate was 71.21% (withdrawal rate was 7.58%). Sections that served dual enrollment students exclusively enjoyed substantially higher than average success/retention rates. Edison Online and Lee Campus success rates were slightly below the general average. The highest withdrawal rates were in sections offered via Edison Online and the Charlotte campuses
03/15/2012	BSC 1005 Success/Retention Rates: During the Fall 2011 term, the overall success/retention rate was 69.36% (withdrawal rate was 10.26%). Edison Online had a withdrawal rate that was slightly higher than average; however, Edison Online's success/retention rate was very close to the general average. The success rate for the Hendry/Labelle sections enjoyed the smallest success/retention rate (56.76%)
03/15/2012	MAC 1105 Fall Exam: Grades in course and final exam grades don't seem to be substantially related. There were a number of outcomes where dual enrollment students are doing substantially worse but success/retention rates are much higher. Students have particular difficulty with outcomes 9 and 12.
03/20/2012	SIR II - eSir Comparison for BSC 1005: According to both the SIR II and the eSir, students (in general) express satisfaction with course sections across all components. However, students taking traditional sections consistently express greater satisfaction with their experiences than those who took BSC 1005 online.
03/20/2012	SIR II - eSir Comparison for MAC 1105: According to both the SIR II and the eSir, students (in general) express satisfaction with course sections across all components. However, students taking traditional sections consistently express greater satisfaction with their experiences than those who took MAC 1105 online.

Use of Results

Date	Use of Results
01/17/2012	The pilot data from BSC 1005 resulted in the rewording of certain questions on the test, and the identification of biological concepts that needed more in-depth instruction during the course (which were communicated to all faculty).
01/17/2012	For the 2011-12 assessment cycle, the department has developed a common core final exam for MAC1105. Whenever appropriate, the questions in this final will be correlated with questions from the previous year's post-test results in order to find any statistical evidence that there is improvement. The specific questions of interest on the post-test (version A) are the following: #4, 5, 6, 9, 12, 13, 19, and 20; less than 50% of the students answered these questions correctly on the post-test we used during the 2010-11 cycle. The assessment report for MAC 1105 from the previous year is included.
03/15/2012	MAC 1105 Mid-year application: Refine the exam. Possibly break up to basic skills. Possibly break up outcome 12
03/15/2012	MAC 1105 Mid-year application: Use of departmental exam was not required of all representative populations in the fall semester (For example, Charlotte Dual Enrollment did not participate --- more than half of our DE population.) Use of departmental final has become mandatory for Spring 2012.
03/20/2012	To close satisfaction gaps highlighted by the SIR II and eSIR results, the Math and Science and departmens will work with Edison Online to develop a collaborative strategy (resulting in a 2012-2013 unit plan).

Gap Analysis

SWOT

Units Impacted
No Units Impacted data

Associated Standards

Associated Outcomes

Documents

File Name	File Size	Date Modified
BSC_1005_SIRII_eSIR_Comparison.xlsx	11.513 KB	3/15/2012
BSC1005 Detail Outcomes.doc	25.088 KB	10/20/2011
BSC1005 pre_post.docx	19.555 KB	10/20/2011
BSC1005 Presentation.pptx	129.071 KB	10/20/2011
Fall 2011 MAC 1105 BSC 1005 Success Rates 03072012.pdf	79.521 KB	3/7/2012
MAC 1105 201210 All Summaries 02282012.pdf	126.505 KB	2/28/2012
MAC 1105 201210 prelim analyses 02162012.pdf	116.48 KB	2/17/2012
MAC 1140 Assessment Results Spring 2011.doc	36.864 KB	1/17/2012
MAC_1105_SIRII_eSIR_Comparison.xlsx	12.697 KB	3/15/2012
MAC1105 Assessment Report 201011Final.doc	167.424 KB	1/17/2012
Preliminary BSC 1005 Data Fall 2011.docx	15.817 KB	1/17/2012
Results of Pilot PrePost Test in BSC 1005 Fall 2010.doc	27.136 KB	10/14/2011
summary tables bsc 1005 all parts.pdf	142.324 KB	2/17/2012

Plans biology faculty are considering based upon results of pre/post test for BSC1005:

1. This was the first year pilot study and we recognized that some of our data may have been misrepresented due to the fact that many faculty gave the pre-test late in the beginning of the semester. Because of this, some of the learning outcomes had already been introduced to the students. This could have led to higher pre-test scores than if given before course content was covered in class.

   Along the same line, many faculty gave the post-test a week or two before the end of the course. In this instance, scores on the post-test may have been lower than expected if the post-test had indeed been given after all the learning outcomes had been covered in class.

   Therefore, to ensure more reliable data, we addressed the problem with better instructions for faculty during our current semester. The pre-test will be administered ideally first day of class; absolutely no later than the second day. And the post-test will be administered during finals week.

2. When comparing final letter grades for the course with differences in pre/post differences, results showed that for every grade from A – F, a few students went down from pre to post; but more importantly, the majority of the students in each category had an increase from pre to post.

   This adds support to our conclusions that there was an overall increase in student learning due to the course.

3. After reviewing the Item Difficulties and Discrimination for post-test analysis, we saw that the majority of our test items fell in the Satisfactory or Functional category, while, out of 30 test items, only 3 fell in the Marginal (requiring revision) category, and one question did fall in the Eliminate or Rewrite category.

   This tells us that our test instrument was very reliable, only requiring minimal change or revision.

4. Results from the item analysis revealed 12 of the 30 test items fell into a high difficulty level. Review of each of these questions revealed that several of these questions were negative in fashion. For example, “Which of the following is *false*,” or “What is *not* an example.”

   Based upon this finding, faculty decided to rewrite these questions to eliminate ambiguity or confusion.

   Another factor that was realized from these data was the comparison of the test questions with the least correct responses, was that perhaps the specific learning objective associated with these questions may be difficult topics for the instructors to teach.

Based upon that observation, we decided that once these topics are identified, instructors can be made aware that the students are finding these specific topics hard to conceptualize, and that perhaps more class time needs to be devoted to these topics.

5. Although we expected the Review of the Unweighted Least Squares Factor Analysis of post-test items to show test items would tend to cluster or correlate with learning outcomes, that was not the case. We did notice that those with the highest level of correlation were types of questions, not necessarily due to subject matter. This also gave us in idea of which question types may be ambiguous or confusing for the student.

6. When comparing scores on pre-test with final grades for the course, and also post-test scores with final grades for the course, there was a more positive correlation between post-test /final grades than pre-test/final grades. In addition, on an average, those who made an A in the course had 3.8 more correct answers on their post-test than those who made a B in the course; 5.8 more correct answers than those who made a C; 6.7 more correct answers than those who made a D; and 7.7 more correct answers than those who made an F.

   From this analysis, we see a positive correlation between post-test scores and final grades for the course.

This was a pilot study (Fall 1010) which we're repeating this semester (Fall 2011). The only thing we changed this semester was our instructions to the professors. Once we see the results of our current semester, we can compare those for consistency with our pilot study. If they are consistent, the faculty will begin making the appropriate changes outlined above for the course.

Table 1

Frequency Distribution of Correct Responses out of 30 (Pretest)

Pretest Score	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3	1	0.48%	1	0.48%
5	1	0.48%	2	0.95%
6	4	1.90%	6	2.86%
7	3	1.43%	9	4.29%
8	12	5.71%	21	10.00%
9	14	6.67%	35	16.67%
10	13	6.19%	48	22.86%
11	18	8.57%	66	31.43%
12	27	12.86%	93	44.29%
13	26	12.38%	119	56.67%
14	18	8.57%	137	65.24%
15	9	4.29%	146	69.52%
16	21	10.00%	167	79.52%
17	13	6.19%	180	85.71%
18	10	4.76%	190	90.48%
19	5	2.38%	195	92.86%
20	4	1.90%	199	94.76%
21	3	1.43%	202	96.19%
22	3	1.43%	205	97.62%
23	2	0.95%	207	98.57%
24	3	1.43%	210	100.00%
N	210			

Table 2

Frequency Distribution of Correct Responses out of 30 (Posttest)

Posttest Score	Frequency	Percent	Cumulative Frequency	Cumulative Percent
4	1	0.48%	1	0.48%
6	2	0.95%	3	1.43%
7	1	0.48%	4	1.90%
8	6	2.86%	10	4.76%
9	4	1.90%	14	6.67%
10	11	5.24%	25	11.90%
11	16	7.62%	41	19.52%
12	20	9.52%	61	29.05%
13	12	5.71%	73	34.76%
14	19	9.05%	92	43.81%
15	13	6.19%	105	50.00%
16	15	7.14%	120	57.14%
17	14	6.67%	134	63.81%
18	15	7.14%	149	70.95%
19	10	4.76%	159	75.71%
20	12	5.71%	171	81.43%
21	7	3.33%	178	84.76%
22	11	5.24%	189	90.00%
23	7	3.33%	196	93.33%
24	6	2.86%	202	96.19%
25	3	1.43%	205	97.62%
26	3	1.43%	208	99.05%
27	1	0.48%	209	99.52%
29	1	0.48%	210	100.00%
N	210			

Table 3

Frequency Distribution of Differences in Correct Responses (Posttest - Pretest)

Difference		Frequency	Percent	Cumulative Frequency	Cumulative Percent
	-8	1	0.48%	1	0.48%
	-7	1	0.48%	2	0.95%
	-6	1	0.48%	3	1.43%
	-5	4	1.90%	7	3.33%
	-4	3	1.43%	10	4.76%
	-3	12	5.71%	22	10.48%
	-2	14	6.67%	36	17.14%
	-1	15	7.14%	51	24.29%
	0	16	7.62%	67	31.90%
	1	16	7.62%	83	39.52%
	2	17	8.10%	100	47.62%
	3	26	12.38%	126	60.00%
	4	21	10.00%	147	70.00%
	5	17	8.10%	164	78.10%
	6	16	7.62%	180	85.71%
	7	14	6.67%	194	92.38%
	8	6	2.86%	200	95.24%
	9	3	1.43%	203	96.67%
	10	1	0.48%	204	97.14%
	11	1	0.48%	205	97.62%
	12	2	0.95%	207	98.57%
	13	2	0.95%	209	99.52%
	15	1	0.48%	210	100.00%
N		210			

Table 4

Repeated Measures ANOVA Summary Table (with Omnibus Wilks' Lambda)

Source	*df*	Type III Sums of Squares	Mean Square	F	Pr > F
Test Opportunity	1	186.606	186.606	24.58	<.001
Test Opportunity by Course Grade	4	83.282	20.82	2.74	0.0298
Error	196	1487.842	7.591		

N = 210; Wilks' Lambda = 0.947, f = 2.74, df = 4, Pr > f 0.0298

Table 5

Comparisons of *Mean Number of Correct Responses on Posttest by Course Grade*

Significant Comparisons Only (alpha = 0.05)

Course Grade Comparison	Difference Between Means	Simultaneous 95% Confidence Limits
A to B	3.763	1.81 - 5.71
A to C	5.842	3.68 - 8.01
A to D	6.67	3.65 - 9.69
A to F	7.65	3.21 - 12.09

Table 6

Mean Changes in Number of Correct Responses (Posttest - Pretest) by Course Grade

	N	Mean	Standard Deviation	Minimum	Maximum
Missing Grade	9	2	3.24	-2	7
A	75	3.533	3.8	-4	15
B	60	2.45	4.127	-8	13
C	42	1.42	3.6	-6	8
D	17	1.35	4.06	-7	8
F	7	1	4.28	-5	6

N = 210

Table 7

Item Difficulties and Discrimination for Post Test

Item No.	# Correct (Lower Group)	Prob. Correct (Lower Group)	# Correct (Upper Group)	Prob. Correct (Upper Group)	Item Difficulty	Discrimination Index (D)
1	24	0.39	54	0.88	0.65	0.49
2	20	0.32	43	0.7	0.48	0.38
3	17	0.27	46	0.75	0.53	0.48
4	26	0.43	50	0.82	0.61	0.39
5	39	0.64	60	0.98	0.86	0.34
6***	9	0.15	16	0.26	0.17	0.11
7	23	0.38	47	0.77	0.59	0.39
8	19	0.31	45	0.74	0.52	0.43
9	10	0.16	34	0.56	0.34	0.4
10	33	0.54	53	0.87	0.7	0.33
11	12	0.2	32	0.52	0.33	0.32
12	18	0.29	40	0.66	0.45	0.37
13	10	0.16	36	0.59	0.36	0.43
14	29	0.48	53	0.87	0.64	0.39
15**	8	0.13	23	0.38	0.22	0.25
16	16	0.26	51	0.84	0.53	0.58
17**	31	0.51	48	0.79	0.66	0.28
18**	8	0.13	22	0.36	0.23	0.23
19	20	0.33	47	0.77	0.48	0.44
20	19	0.31	48	0.79	0.55	0.48
21	38	0.62	60	0.98	0.83	0.36
22	27	0.44	51	0.84	0.61	0.4
23	19	0.31	51	0.84	0.57	0.53
24	17	0.28	40	0.66	0.43	0.38
25	9	0.15	40	0.66	0.37	0.51
26	37	0.61	56	0.92	0.8	0.31
27	10	0.16	35	0.57	0.37	0.41
28**	47	0.77	60	0.98	0.9	0.21
29	19	0.31	47	0.77	0.51	0.46
30	19	0.31	45	0.74	0.54	0.43

N (all) = 122 (61 in each group)

Note: *Item Discrimination = Prob.(Upper Group) - Prob.(Lower Group)*

D >= .40 *Satisfactory*

.30<= D <= .39 *Functional*

** *.20<=D<=.29* *Marginal (requiring revision)*

*** *D <= .19* *Eliminate or Re-write*

Interpretations of D index from Crocker & Algina (1986)

Table 8

Item Difficulty Summary of Post Test

Item Number	Item Text	Item Difficulty	# of Correct Responses	# of incorrect Responses
28	The ultimate source of energy flowing into nearly all ecosystems is	0.9	190	20
5	Plasma membranes are selectively permeable. This means:	0.86	182	28
21	All of the offspring of a cross between a black-eyed mendelien and an orange-eyed mendelien have black eyes. This means that the allele for black eyes is . . . The allele for orange eyes.	0.83	174	36
26	A modification that helps equip organism for their way of life is a(n)	0.8	169	41
10	The creation of offspring carrying genetic information from a single parent is called	0.7	147	63
17	How do cells capture the energy released by cellular respiration?	0.66	138	72
1	Which of the following particles is found in the Nucleus of an atom?	0.65	138	72
14	The major organelle involved in photosynthesis is	0.64	135	75
4	. . . cells lack a membrane-bound nucleus	0.61	128	82
22	Homo sapiens is an example of	0.61	128	82
7	The active site of an enzyme	0.59	125	85
23	The discipline of identifying and classifying organisms according to certain rules is known as	0.57	120	90
20	Which of the following statements regarding genotypes and phenotypes is false?	0.55	115	95
30	Currently, the single greatest threat to biodiversity is	0.54	113	97
3	You know the old saying "oil and water don't mix" is true. Why?	0.53	113	97
16	The term anaerobic means	0.53	112	98
8	Osmosis is a special type of diffusion that:	0.52	109	101
29	The maximum number of individuals a habitat can support is called its	0.51	108	102
2	Organic compounds	0.48	100	110
19	Genomics and bioinformatics are both closely associated with	0.48	100	110
12	Which of the following is not a difference between mitosis and meiosis?	0.45	94	116
24	Which of the following is arranged in the correct order of fewer types of organisms to more types of organisms?	0.43	90	120
25	According to evolutionary data, which of the following includes more closely related organisms?	0.37	78	132
27	The ultimate source of all new alleles which contribute to evolution is	0.37	78	132
13	During photosynthesis	0.36	76	134

Table 8

Item Difficulty Summary of Post Test

Item Number	Item Text	Item Difficulty	# of Correct Responses	# of incorrect Responses
9	In an enzymatic reaction, the . . . is acted upon and becomes the . . .	0.34	71	139
11	The process by which the cytoplasm of a eukaryotic cell divides to produce two cells is called	0.33	68	142
18	Which of the following are products of cellular respiration?	0.23	48	162
15	Consider the following statement: "Photosynthesis occurs in eukaryotic cells only." This statement is false because	0.22	47	163
6	Which of the following statements concerning diffusion is false?	0.17	37	173

Notes:

N = 210

Raw Cronbach Alpha = 0.74

Standardized Cronbach Alpha = 0.74

No items, when removed, improve the Alpha estimate

Table 9

Unweighted Least Squares Factor Analysis of Post-test Items (Uncorrelated Factors)

Items		Factor Assignment	Rotated Factor Pattern Matrix					
			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
19	Genomics and bioinformatics are both closely associated with	1	**0.538**	-0.42	0.077	0.135	0.06	0.009
16	The term anaerobic means	1	**0.429**	0.143	0.176	0.144	0.14	0
11	The process by which the cytoplasm of a eukaryotic cell divides to produce two cells is called	1	**0.423**	0.134	0.009	-0.008	-0.018	-0.04
25	According to evolutionary data, which of the following includes more closely related organisms?	1	**0.391**	0.105	-0.041	0.344	-0.077	0.34
7	The active site of an enzyme	1	**0.35**	0.056	0.112	-0.035	0.13	0.066
26	A modification that helps equip organism for their way of life is a(n)	2	-0.697	**0.494**	0.063	0.18	0.102	0.04
21	All of the offspring of a cross between a black-eyed mendelien and an orange-eyed mendelien have black eyes. This means that the allele for black eyes is . . . The allele for orange eyes.	2	0.061	**0.439**	0.07	0.18	0.155	-0.03
8	Osmosis is a special type of diffusion that:	2	0.157	**0.372**	-0.045	0.04	-0.032	0.158
3	You know the old saying "oil and water don't mix" is true. Why?	2	0.147	**0.343**	0.25	0.007	-0.083	0.131
20	Which of the following statements regarding genotypes and phenotypes is false?	2	0.234	**0.289**	0.2	-0.025	0.176	-0.004
15	Consider the following statement: "Photosynthesis occurs in eukaryotic cells only." This statement is false because	2	0.201	**0.281**	0.125	-0.161	-0.106	0.085
30	Currently, the single greatest threat to biodiversity is	3	-0.189	0.009	**0.622**	0.376	-0.022	0.075
1	Which of the following particles is found in the Nucleus of an atom?	3	0.21	0.211	**0.323**	0.053	0.079	0.134
4	. . . cells lack a membrane-bound nucleus	3	0.1	0.264	**0.31**	-0.023	0.076	-0.013
18	Which of the following are products of cellular respiration?	3	0.083	-0.029	**0.257**	0.018	-0.049	0.24
12	Which of the following is not a difference between mitosis and meiosis?	3	0.125	0.512	**0.257**	-0.056	0.04	0.15
2	Organic compounds	3	0.179	0.09	**0.23**	0.082	0.081	0.082
29	The maximum number of individuals a habitat can support is called its	3	0.14	0.05	**0.221**	0.155	0.025	0.185

Table 9

Unweighted Least Squares Factor Analysis of Post-test Items (Uncorrelated Factors)

Items		Factor Assignment	Rotated Factor Pattern Matrix					
			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
10	The creation of offspring carrying genetic information from a single parent is called	4	-0.014	-0.009	0.062	**0.5**	0.067	0.023
5	Plasma membranes are selectively permeable. This means:	4	0.089	0.178	0.081	**0.391**	0.051	0.081
23	The discipline of identifying and classifying organisms according to certain rules is known as	4	0.24	0.128	0.016	**0.367**	0.18	0.0104
14	The major organelle involved in photosynthesis is	5	0.04	0.036	0.021	0.012	**0.7**	0.2
9	In an enzymatic reaction, the . . . is acted upon and becomes the . . .	5	0.17	-0.058	0.195	0.019	**0.309**	0.121
28	The ultimate source of energy flowing into nearly all ecosystems is	5	0.094	0.116	0.023	0.23	**0.3**	0.037
17	How do cells capture the energy released by cellular respiration?	5	0.042	0.103	-0.025	0.157	**0.29**	-0.15
13	During photosynthesis	6	-0.025	0.032	0.2	0.058	0.08	**0.5**
27	The ultimate source of all new alleles which contribute to evolution is	6	0.039	0.126	0.04	0.142	0.043	**0.33**
22	Homo sapiens is an example of	6	-0.007	0.266	-0.202	0.181	0.184	**0.27**
24	Which of the following is arranged in the correct order of fewer types of organisms to more types of organisms?	6	0.1	0.027	0.052	0.093	0.03	**0.2**
6	Which of the following statements concerning diffusion is false?	6	-0.04	0.015	0.03	-0.057	0.027	**0.19**
	Variance Accounted for by each Factor		2.99	0.96	0.88	0.71	0.66	0.58
	Total Variability in Data Accounted for by the Model	6.73						
	Percent of Variability in Data Accounted for by All Factors	22.40%						

Notes:

N = 210

Factor loadings in bold indicate factor assignment

Detailed Topic List to Serve as Guide for BSC 1005 Instructors

DRAFT

Using our Mader textbook, these are the sections and general topics within each section that address our course Learning Outcomes. After analysis of our pre/post exam in Fall 2011, we felt that this detailed list may help our professors teaching the course become more uniform throughout the district with content.

Chapter/Section	Topic
5.3	living vs. nonliving
2.1	atomic structure; periodic table; electrons
2.2	water – structure; properties
3.1	organic (carbon) – [*no functional groups]*
3.2	four types biological molecules – examples; importance
4.2	cells- prokaryotic/eukaryotic; function of plasma membrane, cell wall, mitochondria, chloroplasts, nucleus, endoplasmic reticulum, ribosomes, cilia, flagella
5.3	enzymes – [*no inhibition, ph or temperature];* define passive transport (diffusion, facilitated diffusion, osmosis) active transport, endocytosis (phagocytosis, pinocytosis), and exocytosis; [*no hypotonic , hypertonic, isotonic]*
6.1	photosynthesis – overview
7.1	respiration – overview; define fermentation
8.1	cell reproduction – purpose
8.1,8.2	interphase; mitosis, cytokinesis overview; [*no mitotic phases]*
8.5	cancer section – very general
9.1	meiosis overview (*human life cycle); homologous pairs; chromosomes; overview & importance meiosis I & II*;* crossing over; 2n; n; [*no phases]*
10.1	Mendelien genetics – monohybrid crosses
14.1	natural selection; adaptation
16.3	Linnaean classification; 3-domain system
17.3	prokaryotes

17.4 protists

18.1 plants (examples & ecological and economical importance of nonvascular, vascular, gymnosperms, angiosperms); *[no life cycles]*

18.3 fungi

19.? Animals – 9 major phyla: example & ecological and economical importance

30 (whole chapter) human population growth; MDC's & LDC's; *[no graphs or age structures or math]*

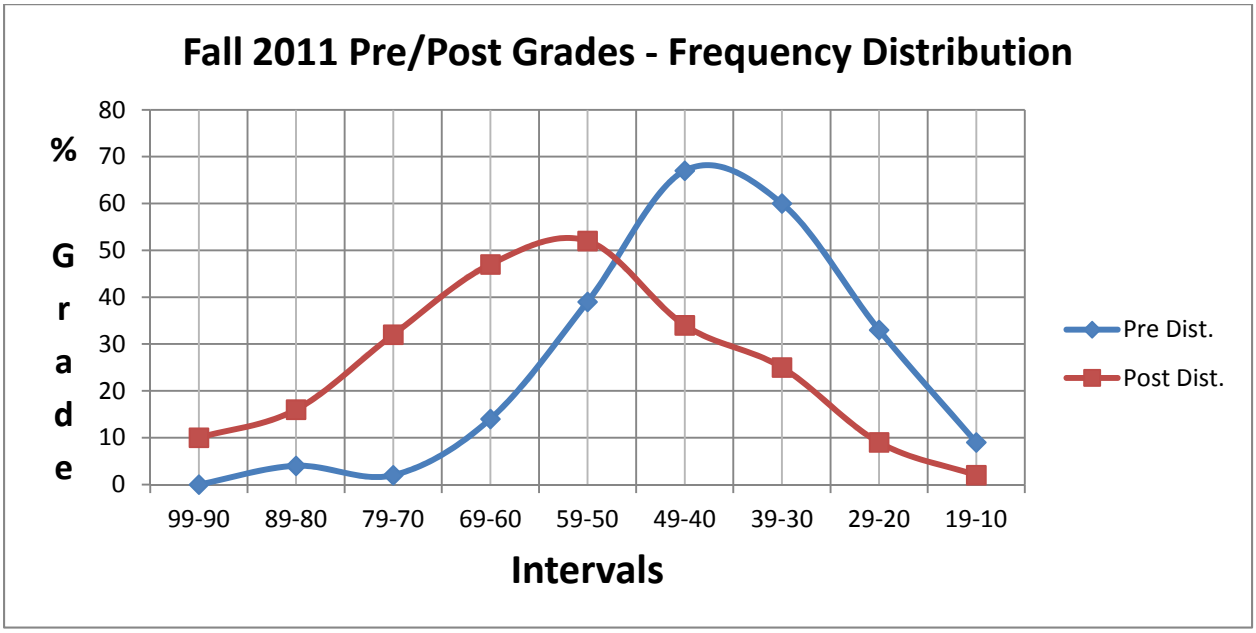
31 community stability; ecology, ecosystems; *[no math, resource partitioning competition; exclusion principle, character displacement, chemical cycling details]*

32 whole chapter

Peggy,

Preliminary data analysis for the fall 2011 pre/post examinations:

	Pre	Post
Mean	40%	57%
Median	40%	57%
Mode	43%	63%
%RSD	34%	31%
N	229	229



Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Pre	228	91.9	0.40307	0.018321
Post	228	129.8	0.569298	0.030742

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	3.150022	1	3.150022	128.4063	2.21E-26	3.862022
Within Groups	11.13738	454	0.024532			
Total	14.2874	455				

BSC1005 Course Assessment

Multiple choice. Choose the one alternative that best completes the statement or answers the question.

1. Which of the following particles is found in the nucleus of an atom?
   a. only neutrons
   b. only electrons
   c. only protons
   d. protons and electrons
   e. protons and neutrons

2. Organic compounds
   a. can be synthesized only in a laboratory.
   b. are synthesized only by animal cells.
   c. always contain nitrogen.
   d. always contain oxygen.
   e. always contain carbon.

3. You know the old saying "oil and water don't mix" is true. Why?
   a. Water exhibits polarity and oil does not.
   b. Water is hydrophobic.
   c. Oil is hydrophilic.
   d. Oil exhibits polarity and water does not.
   e. Oil is an organic compound and water is not.

4. _____ cells lack a membrane-bound nucleus.
   a. Eukaryotic
   b. Plant
   c. Prokaryotic
   d. Fungal
   e. Animal

5. Plasma membranes are selectively permeable. This means that
   a. cholesterol cannot enter the cell.
   b. glucose cannot enter the cell.
   c. the plasma membrane allows some substances to enter or leave the cell more easily than others.
   d. anything can pass into or out of a cell as long as the membrane is intact and the cell is healthy.
   e. plasma membranes must be very thick.

6. Which of the following statements regarding diffusion is *false*?
   a. Diffusion is driven by concentration gradients.
   b. Diffusion occurs even after equilibrium is reached and no net change is apparent.
   c. Diffusion occurs when particles spread from areas where they are more concentrated to areas where they are less concentrated.
   d. Diffusion is a result of the kinetic energy of atoms and molecules.

e. The process of molecules moving by diffusion requires no energy from the cell.

7. The active site of an enzyme
   a. can be used only once.
   b. is the part of the enzyme where its substrate can fit.
   c. is identical to that of any other enzyme.
   d. is not affected by environmental factors such as pH and temperature.
   e. is also used during non-competitive regulation of that enzyme.

8. Osmosis is a special type of diffusion that
   a. involves the movement of water molecules only.
   b. involves the movement of molecules with the help of a protein.
   c. involves the movement of molecules with the aid of energy from the cell.
   d. involves the movement of particles up their concentration gradient.
   e. occurs only in cells without a cell wall.

9. In an enzymatic reaction, the _____ is acted upon and becomes the _____.
   a. inhibitor; substrate
   b. substrate; product
   c. substrate; active site
   d. substrate; enzyme
   e. enzyme; product

10. The creation of offspring carrying genetic information from a single parent is called
    a. asexual reproduction.
    b. sexual reproduction.
    c. spontaneous generation.
    d. regeneration.
    e. a life cycle.

11. The process by which the cytoplasm of a eukaryotic cell divides to produce two cells is called
    a. cytokinesis.
    b. mitosis
    c. binary fission
    d. spindle formation.
    e. telophase.

12. Which of the following is *not* a difference between mitosis and meiosis?
    a. Meiosis involves tetrad formation and crossing over while mitosis does not.
    b. Meiosis has two nuclear divisions but mitosis has only one.
    c. Meiosis occurs in plants only while mitosis occurs in animals only.
    d. In meiosis the daughter cells have half as many chromosomes as the parent cell, while in mitosis the daughter cells have the same number of chromosomes as the parent cell.

13. During photosynthesis
    a. carbon dioxide and water are converted into sugar and oxygen.
    b. carbon dioxide and sugar are converted into water and oxygen.
    c. sugar and oxygen are converted into carbon dioxide and water.

d. sunlight and water are converted into sugar and oxygen.

14. The major organelle involved in photosynthesis is
    a. the mitochondrion.
    b. the stoma.
    c. the nucleus.
    d. the chloroplast.

15. Consider the following statement: "Photosynthesis occurs in eukaryotic cells only." This statement is *false* because:
    a. only green plant can photosynthesize.
    b. both green plants and algae can photosynthesize.
    c. green plants, algae, and some fungi can photosynthesize.
    d. some bacteria are photosynthetic.

16. The term anaerobic means
    a. without O_2
    b. without ATP.
    c. with O_2
    d. without CO_2

17. How do cells capture the energy released by cellular respiration?
    a. The energy is coupled to oxygen.
    b. They produce glucose.
    c. They store it as thermal energy.
    d. They produce ATP.
    e. They store it in molecules of carbon dioxide.

18. Which of the following are products of cellular respiration?
    a. water and carbon dioxide
    b. glucose and carbon dioxide
    c. oxygen and glucose
    d. oxygen and energy to make ATP
    e. oxygen and carbon dioxide

19. Genomics and bioinformatics are both closely associated with
    a. the chemical pathways of cellular respiration.
    b. the latest research pertaining to DNA technology.
    c. the study of environmental changes and their effects on living organisms.
    d. the production of ATP and its use in cells.

20. Which of the following statements regarding genotypes and phenotypes is *false*?
    a. Alleles are alternate forms of a gene.
    b. The genetic makeup of an organism constitutes its genotype.
    c. The expressed physical traits of an organism are called its phenotype.
    d. An organism with two different alleles for a single trait is said to be heterozygous for that trait.
    e. An allele that is fully expressed is referred to as recessive.

21. All of the offspring of a cross between a black-eyed mendelien and an orange-eyed mendelien have black eyes. This means that the allele for black eyes is _____ the allele for orange eyes.
    a. recessive to
    b. more aggressive than
    c. better than
    d. codominant to
    e. dominant to

22. *Homo sapiens* is an example of
    a. the domain Archaea.
    b. the kingdom Protista.
    c. a binomial name.
    d. an evolutionary tree.

23. The discipline of identifying and classifying organisms according to certain rules is known as
    a. evolution.
    b. natural selection.
    c. entomology.
    d. taxonomy.

24. Which of the following is arranged in the correct order of fewer types of organisms to more types of organisms?
    a. class, order, genus, species, kingdom
    b. kingdom, order, class, genus, species
    c. species, genus, family, kingdom, domain
    d. domain, family, genus, kingdom, class

25. According to evolutionary data, which of the following includes more closely related organisms?
    a. kingdom
    b. class
    c. domain
    d. genus
    e. order

26. A modification that helps equip organism for their way of life is a(n)
    a. diversity.
    b. natural selection.
    c. extinction.
    d. adaptation.

27. The ultimate source of all new alleles which contribute to evolution is
    a. adaptations.
    b. genetic drift.
    c. mutations.
    d. DNA replication.

28. The ultimate source of energy flowing into nearly all ecosystems is

a. geothermal vents.
b. underground oil.
c. sunlight.
d. radioactivity.
e. electricity.

29. The maximum number of individuals a habitat can support is called its
    a. density-dependent factor.
    b. community size.
    c. carrying capacity.
    d. population growth.
    e. reproductive potential.

30. Currently, the single greatest threat to biodiversity is
    a. global warming.
    b. habitat destruction due to humans.
    c. the introduction of exotic species.
    d. overexploitation of populations for food.

Answer Key:

1. e
2. e
3. a
4. c
5. c
6. d
7. b
8. a
9. b
10. a
11. a
12. c
13. a
14. d
15. d
16. a
17. d
18. a
19. b
20. e
21. e
22. c
23. d
24. c
25. d
26. d
27. c
28. c
29. c
30. b

BSC 1005 Pre/Post Examination Statistical Data

By

Peggy Romeo and

Fred Posey

Pre Post 1005 Examination Statistics

N = 211	Pre	Post
Mean	45%	53%
Median	43%	53%
Mode	43%	47%
Stdev	13%	16%

Anova: Single Factor analysis rejects the null hypothesis of no difference between Pre and Post data; F is greater than F crit, and P-value is lest than 0.01

Anova: Single Factor

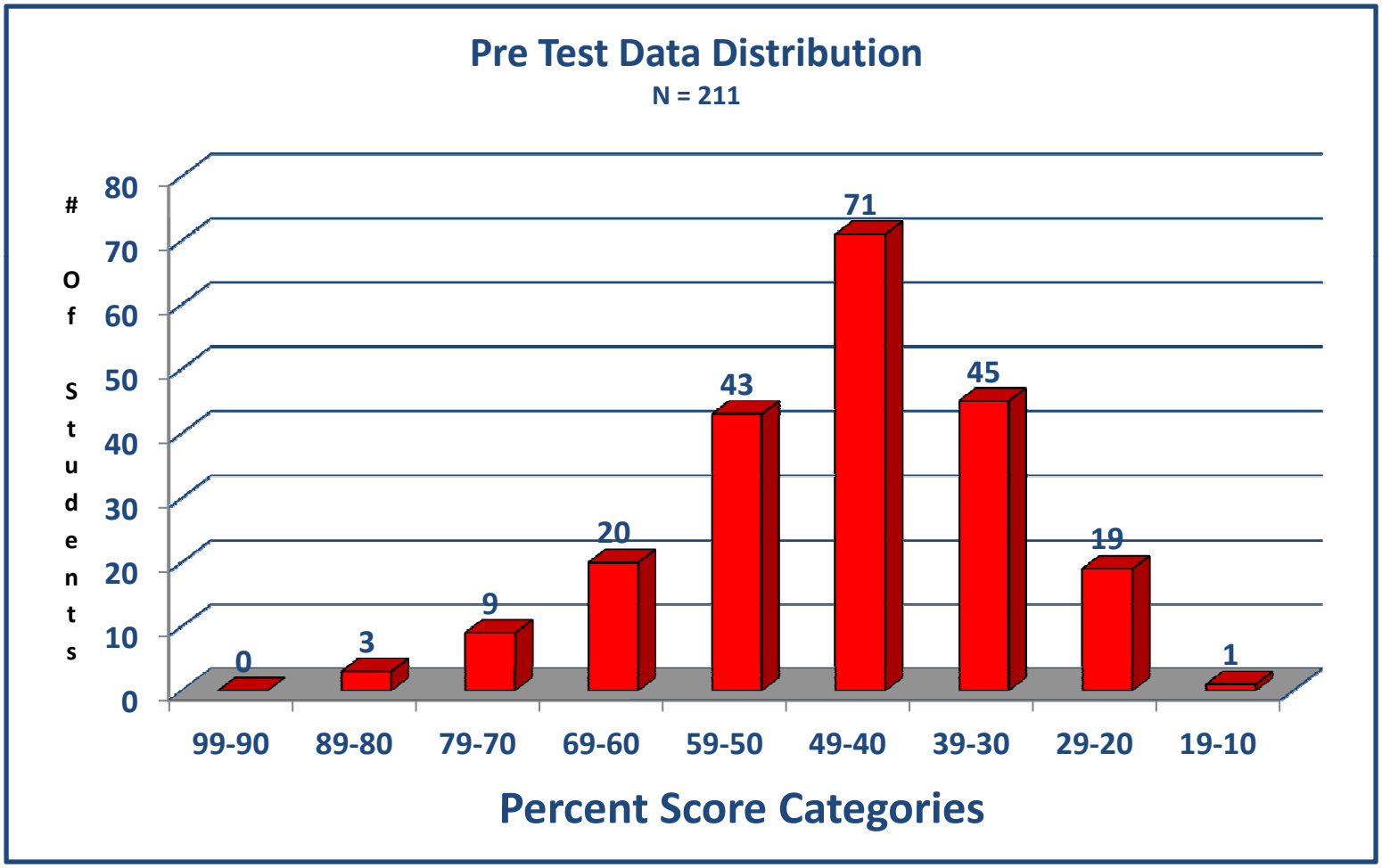
SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Pre	**211**	**94.767**	**0.449**	**0.017**
Post	**211**	**112.500**	**0.533**	**0.026**

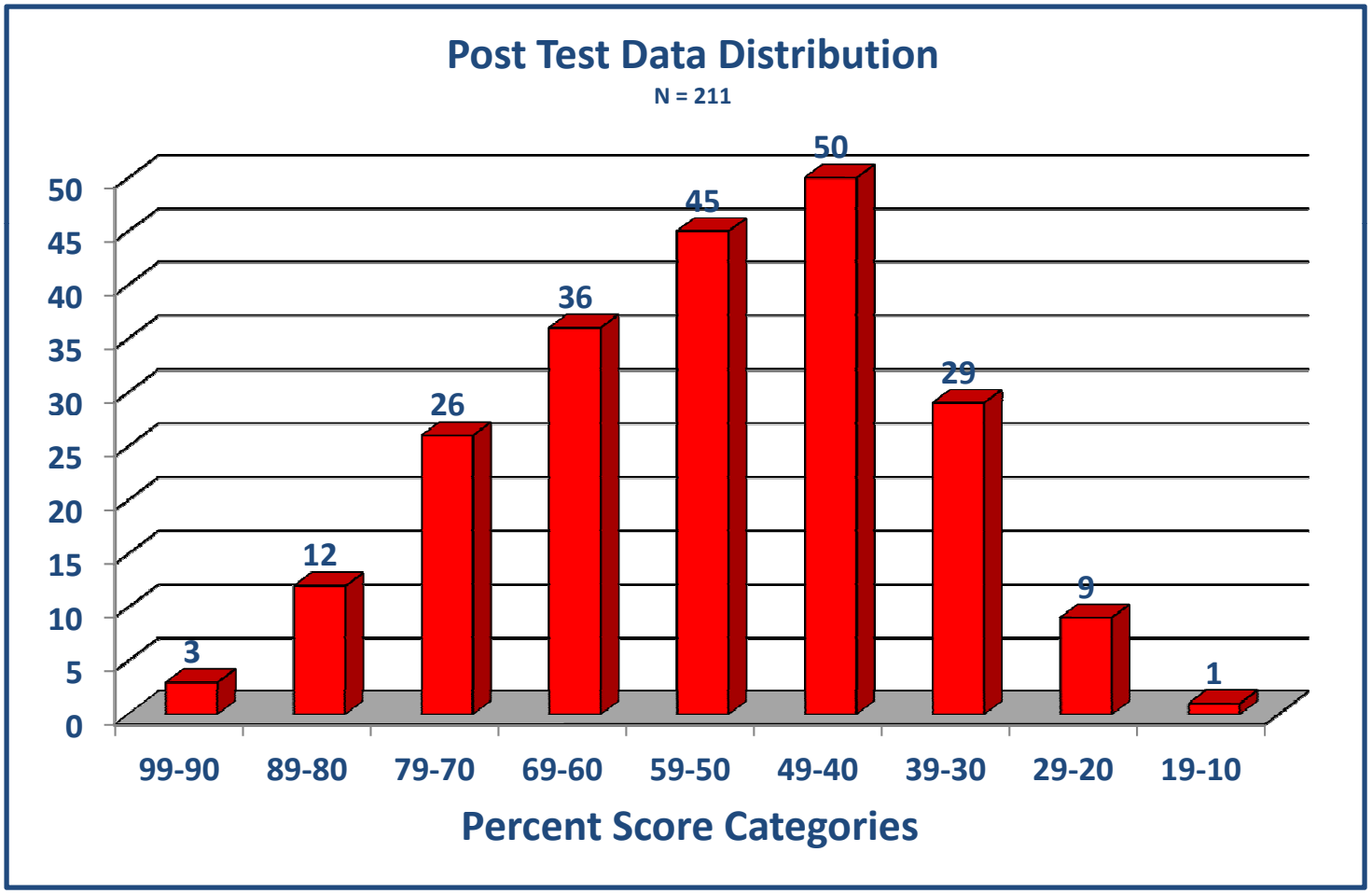
ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	**0.745**	**1**	**0.745**	**34.640**	**8.12E-09**	**6.696**
Within Groups	**9.035**	**420**	**0.022**			
Total	**9.780**	**421**				

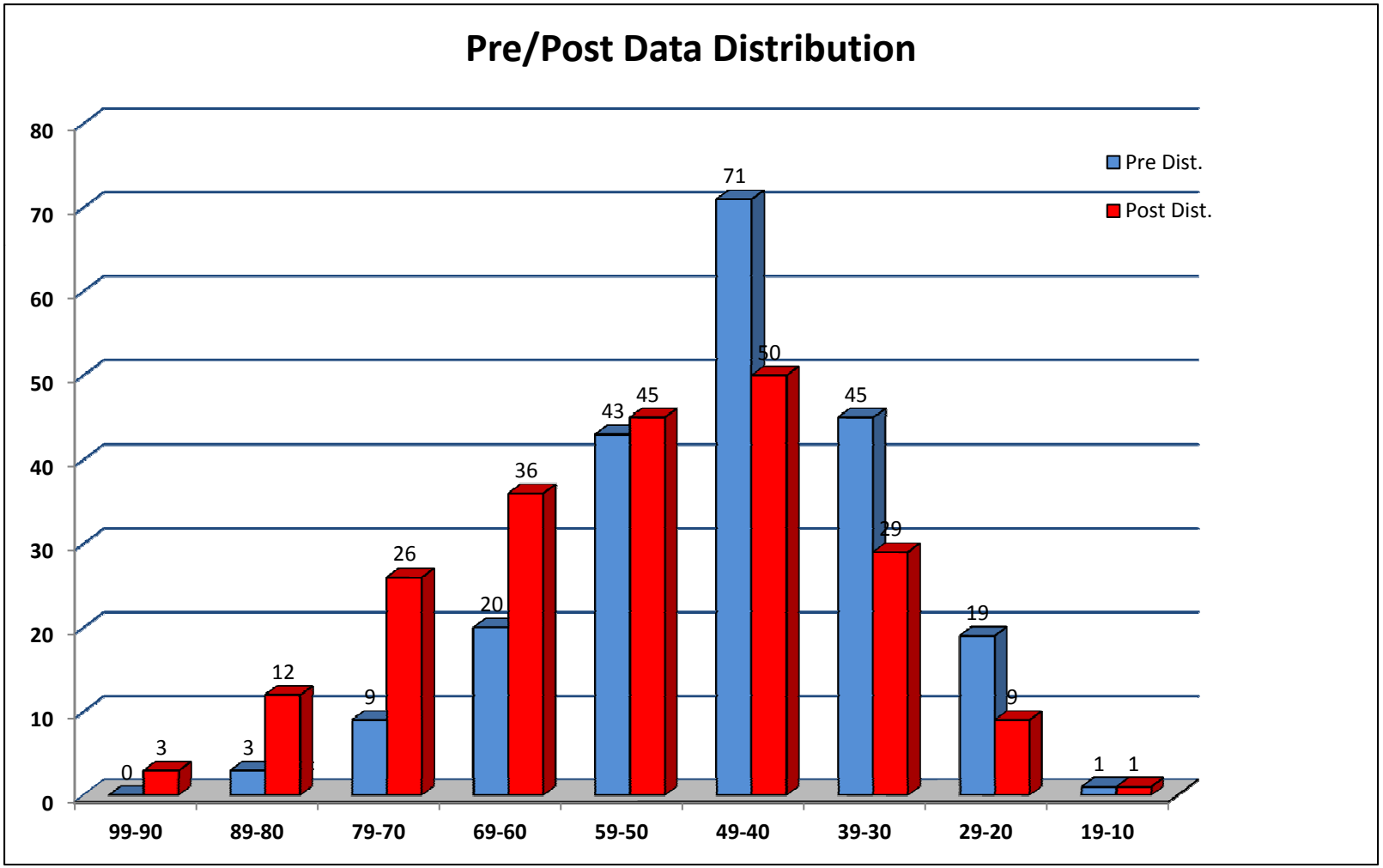
This frequency distribution shows the number of students in the each of the Pre Test score categories. For example there were 0 student score's in the 99% to 90% category, and 43 in the 55% to 50% category.

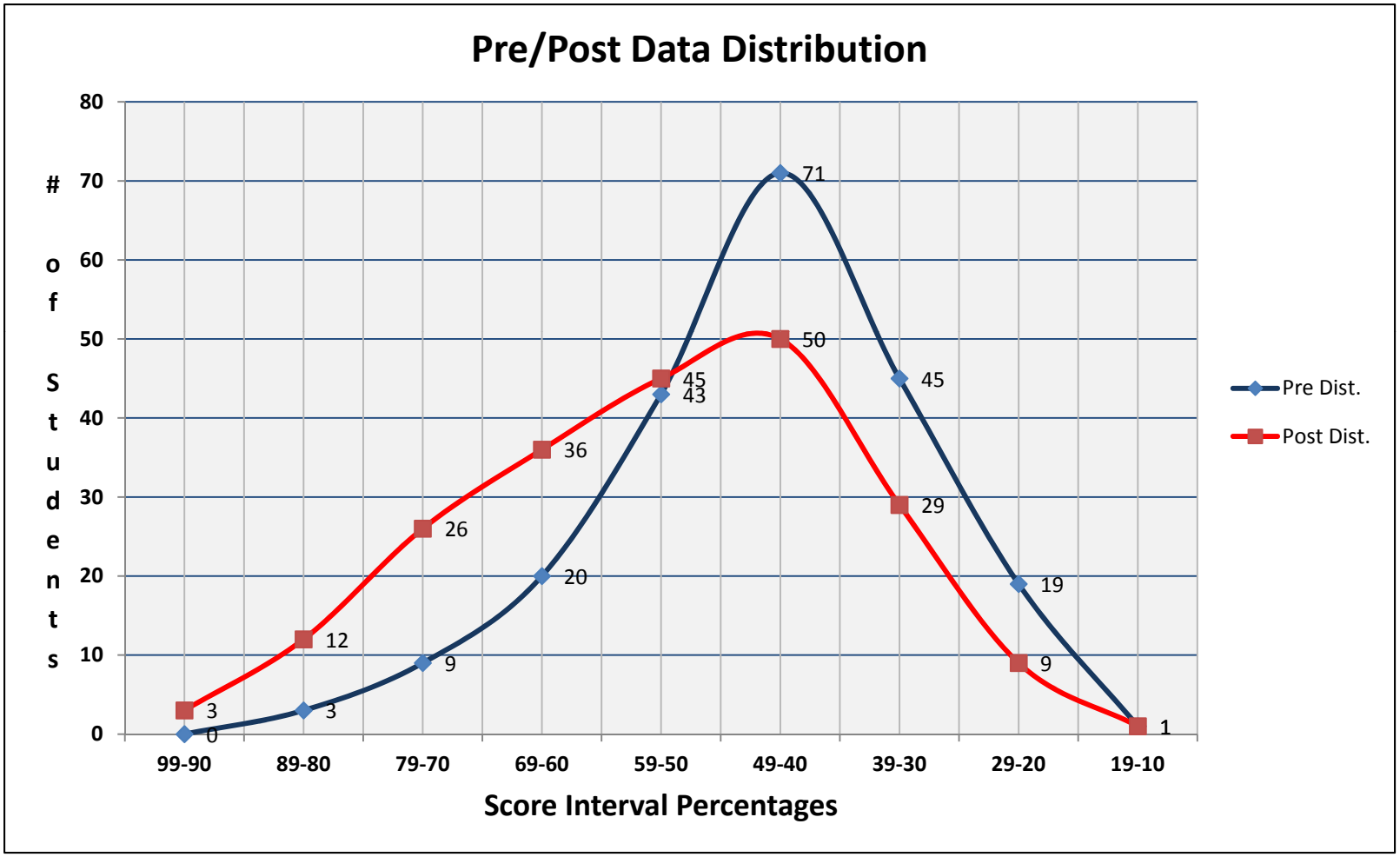


This frequency distribution shows the number of students in the each of the Post Test score categories. For example there were 3 student score's in the 99% to 90% category, and 45 in the 55% to 50% category.

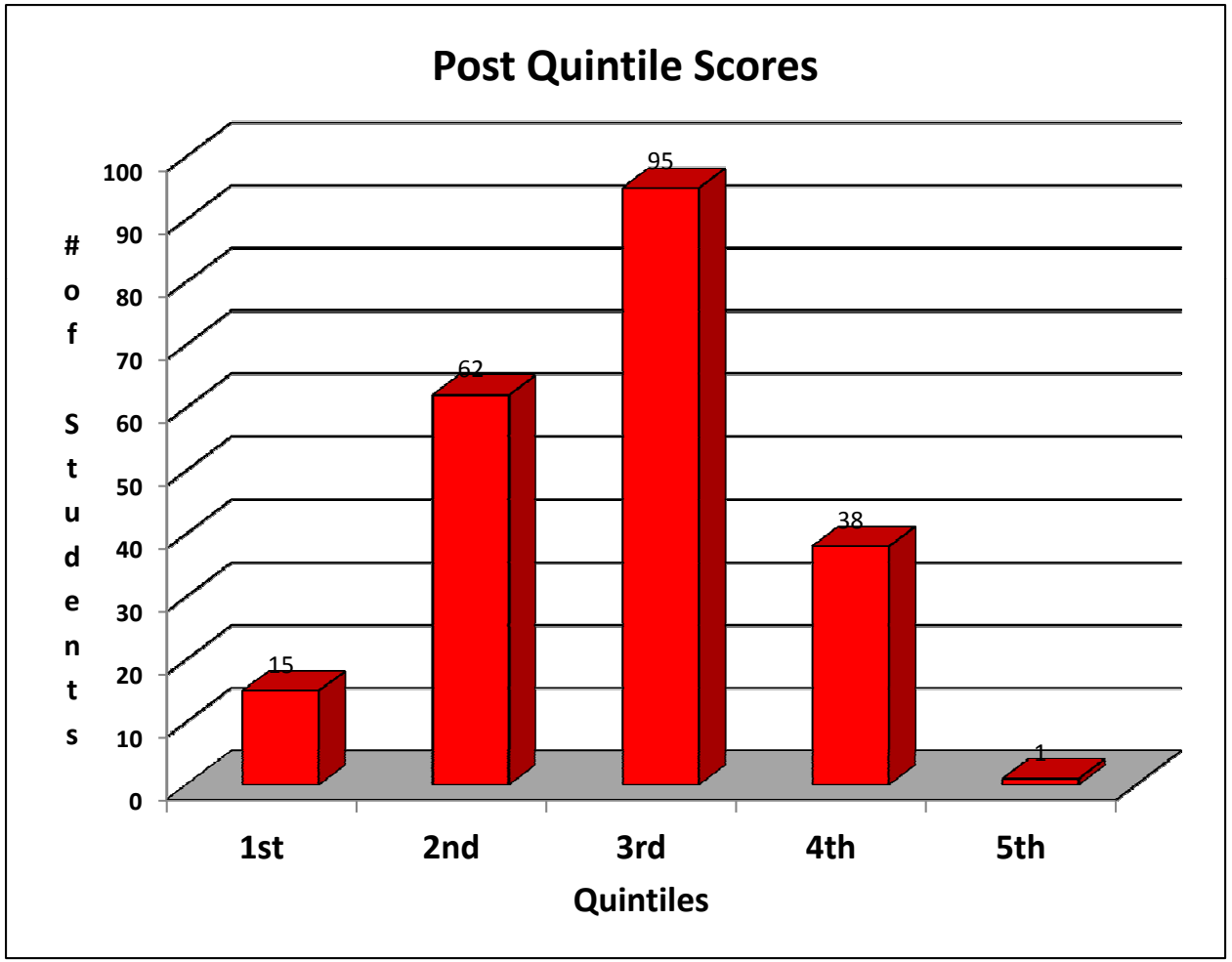


This slide show a comparison of the Pre and Post % score distributions in each of the % score categories. For example, there were 3 scores in the Pre Test 89% to 80% category and 12 in the same Post Test category.

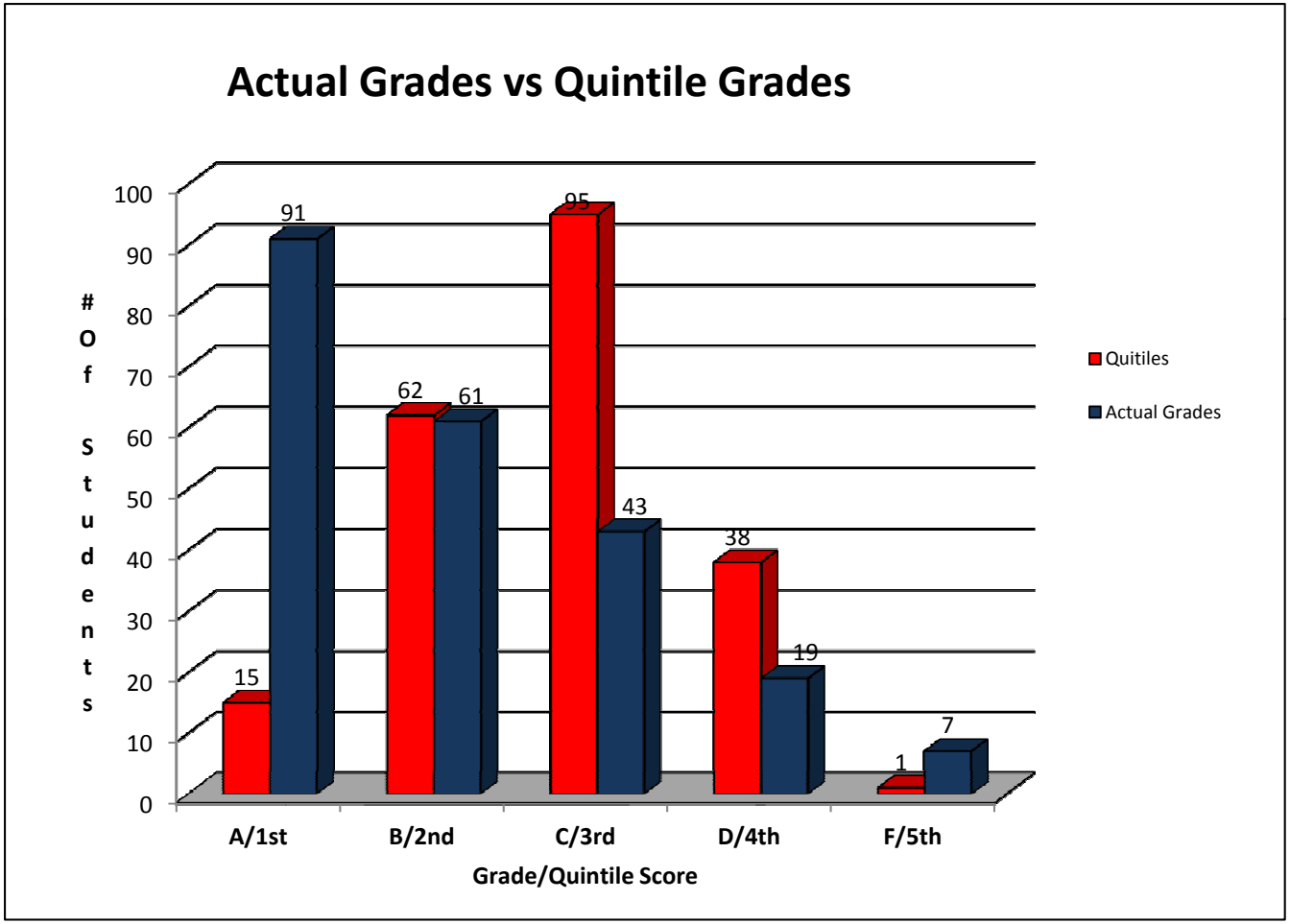



Pre/Post Data Distribution
# of Students
80
70
60
50
40
30
20
10
0
71
50
45
43
45
36
29
26
20
19
12
9
9
3
3
0
1
99-90
89-80
79-70
69-60
59-50
49-40
39-30
29-20
19-10
Score Interval Percentages
Pre Dist.
Post Dist.

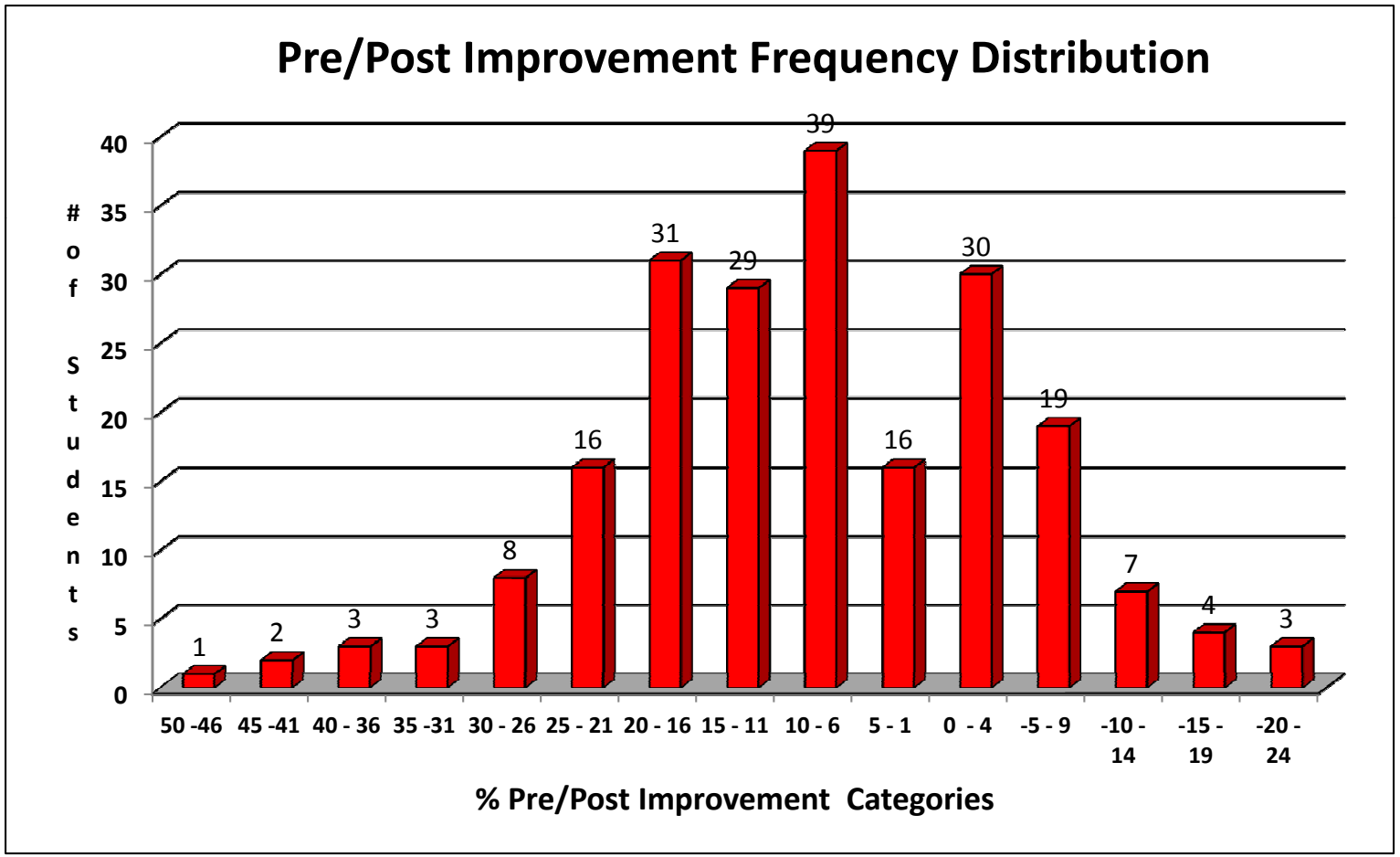
If one breaks the Post Test Scores into quintiles, with to top quintile assigned an A, and the next quintile a B, and the next a C, and the next a D, and the last quintile an F, the grade distribution would look like this:



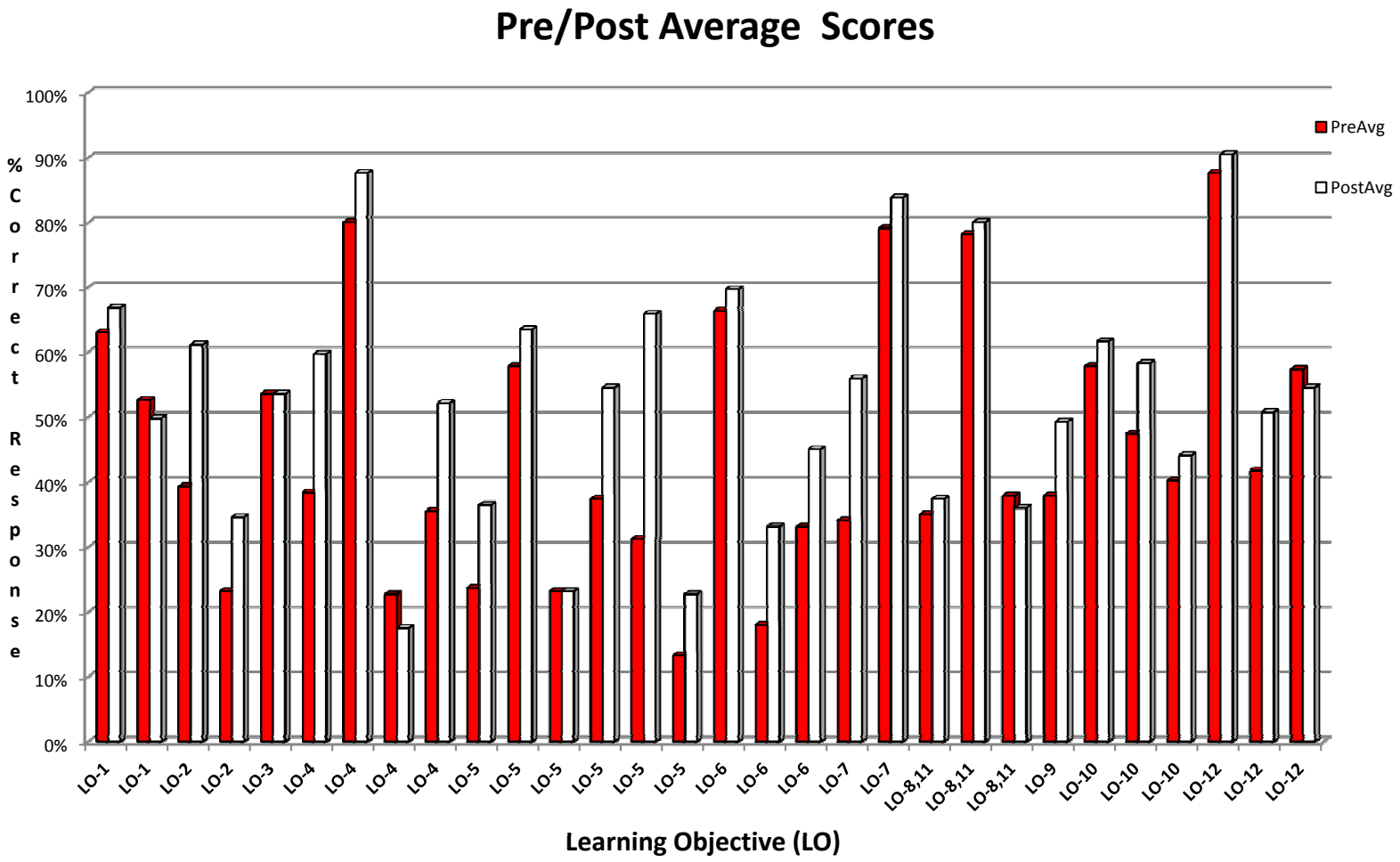
Now, Compare the Actual Grades with the Quintile Scores



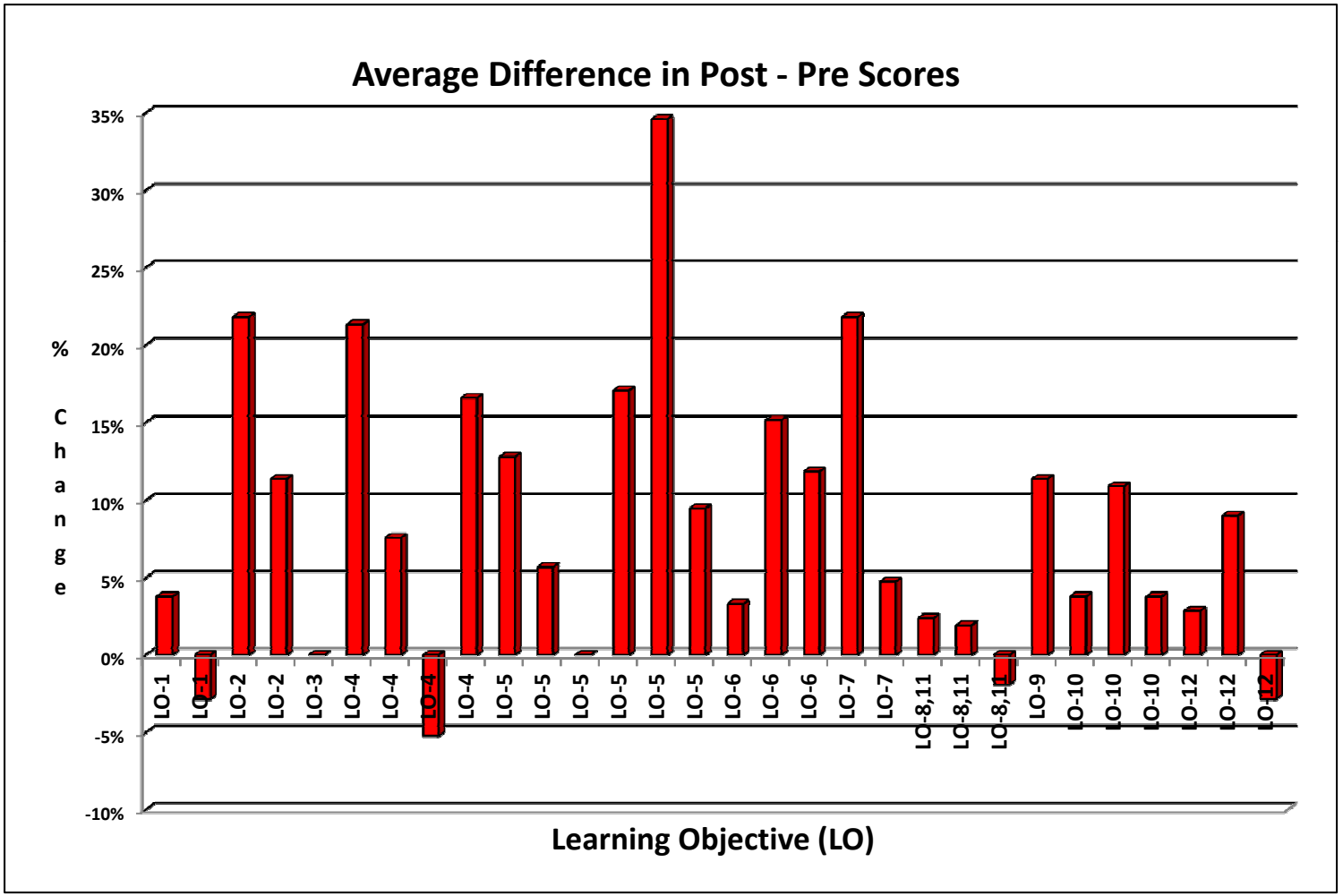
The vertical bars in this chart show the number of students in each improvement category; for example, the number of students who scores increased between 6% and 10% equals 39.



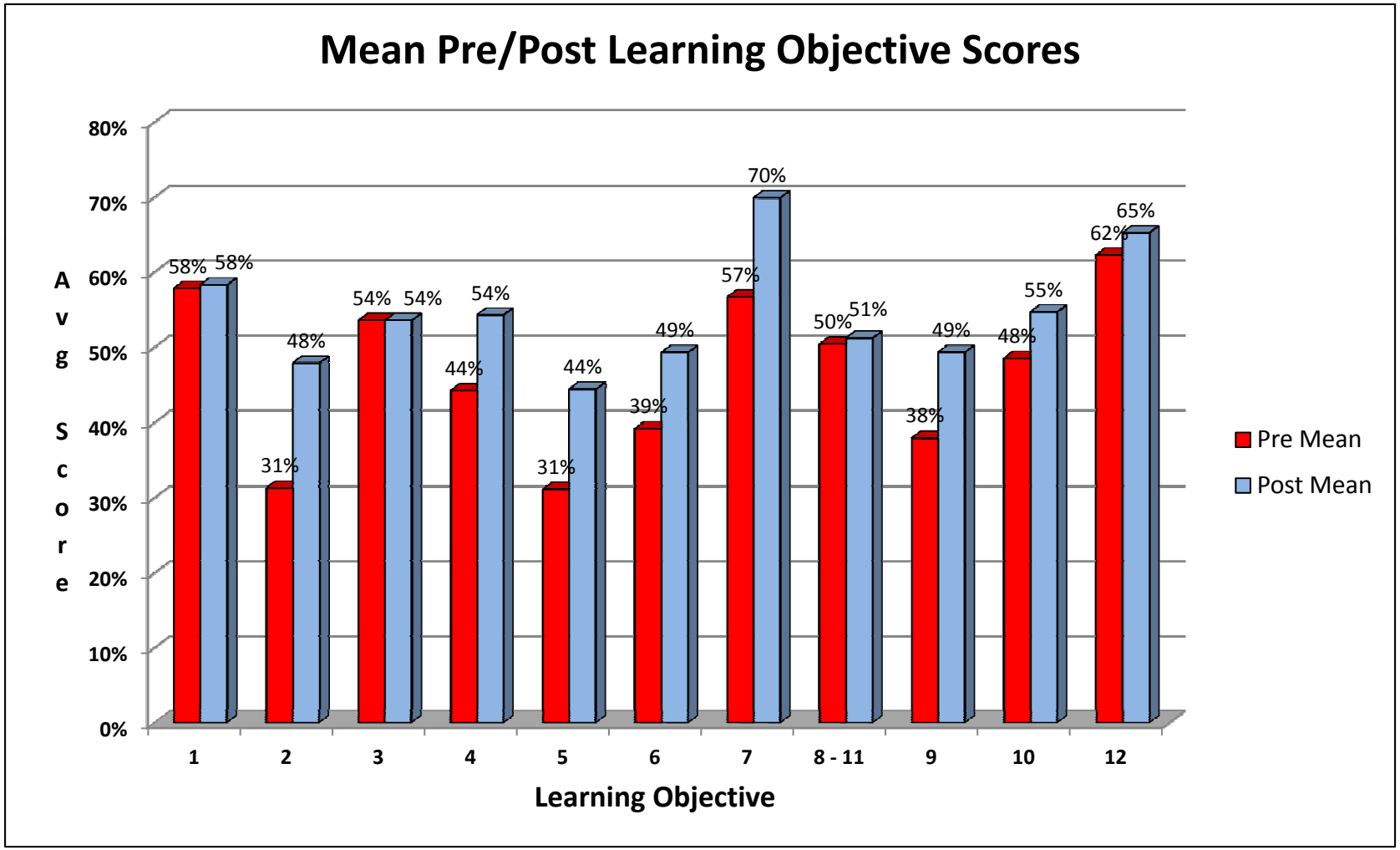
Average Pre Post scores by individual Learning Objective



Average change in Post minus Pre scores for each Learning Objective



Pre/Post Mean Learning Objective Scores



Learning Objectives (LO)

LO1: Atomic Structure & Chemical Bonding

LO2: Roles of pH, temp., & enzymes contribution to metabolism

LO3: Physical & chemical properties of water their effect on metabolism

LO4: Prokaryotic & eukaryotic cell structure and function

LO5: How animal and plants obtain energy for metabolism

LO6: Mitosis and Meiosis

LO7: Mendelian genetics and problem solving

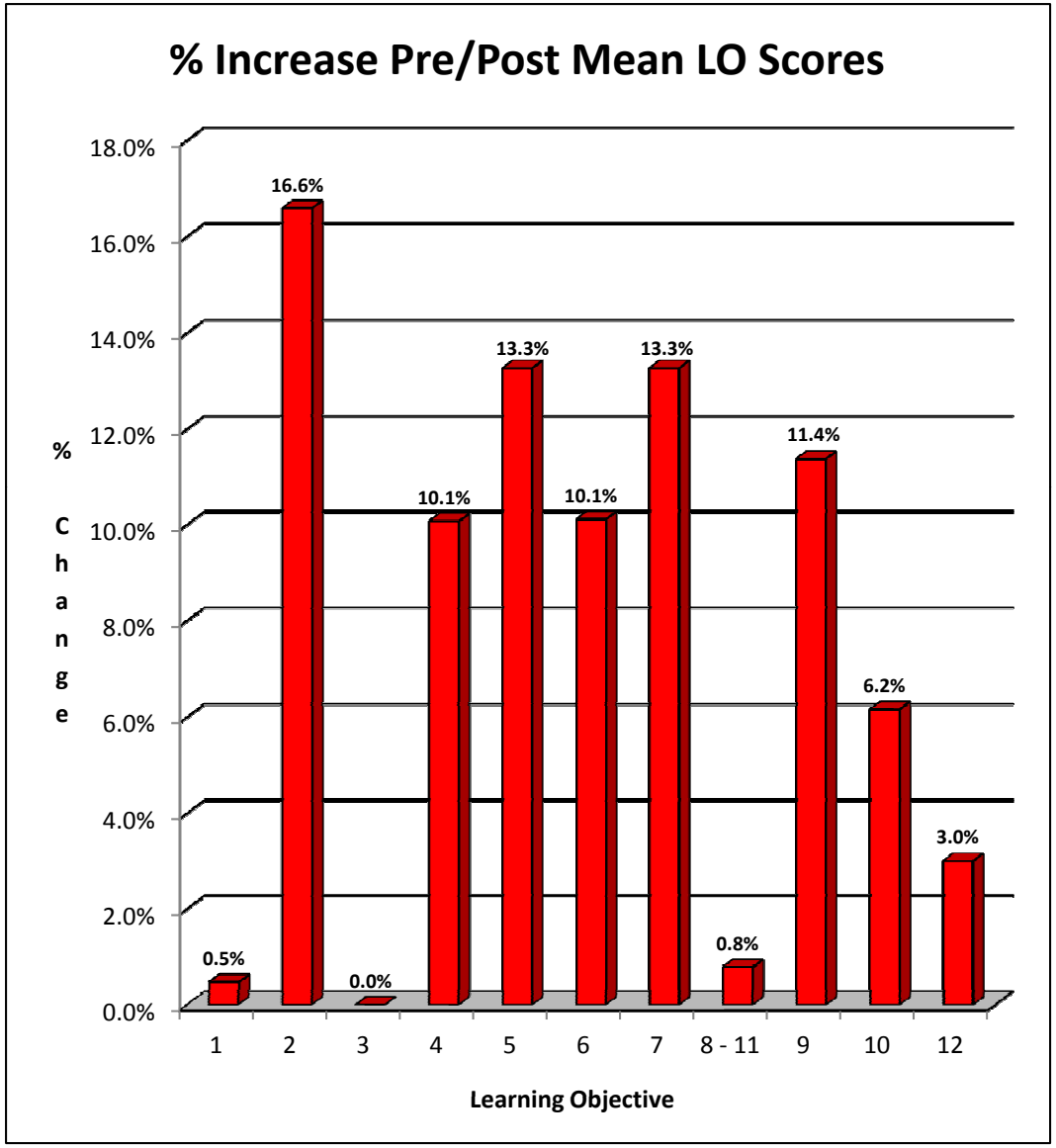
LO8: Role of evolutional theory and its role in uniting biological disciplines

LO9: Advances in genetic technology

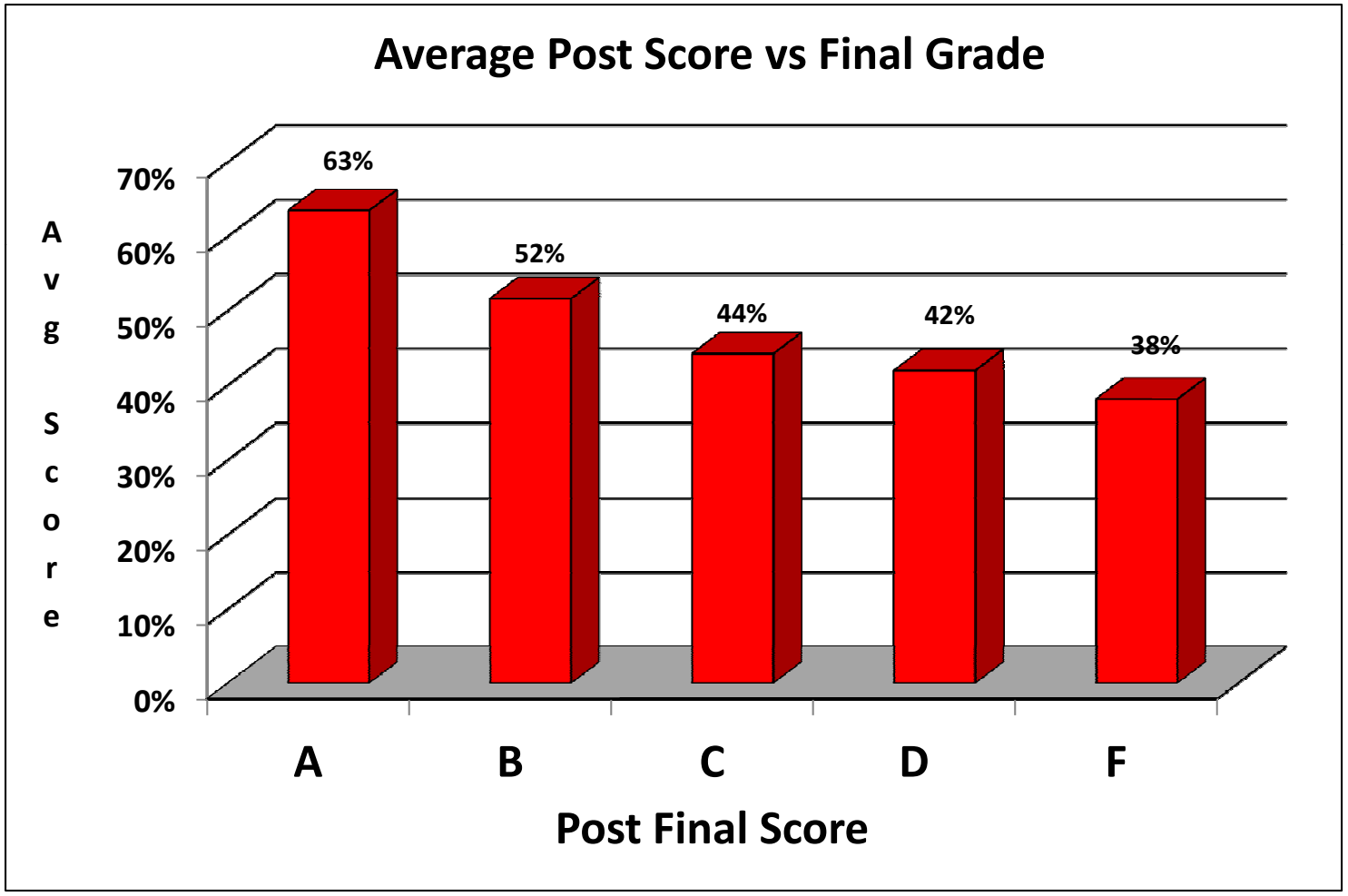
LO10: Phylogenic relationships of organisms

LO11: Adaptation of major taxons to their environment

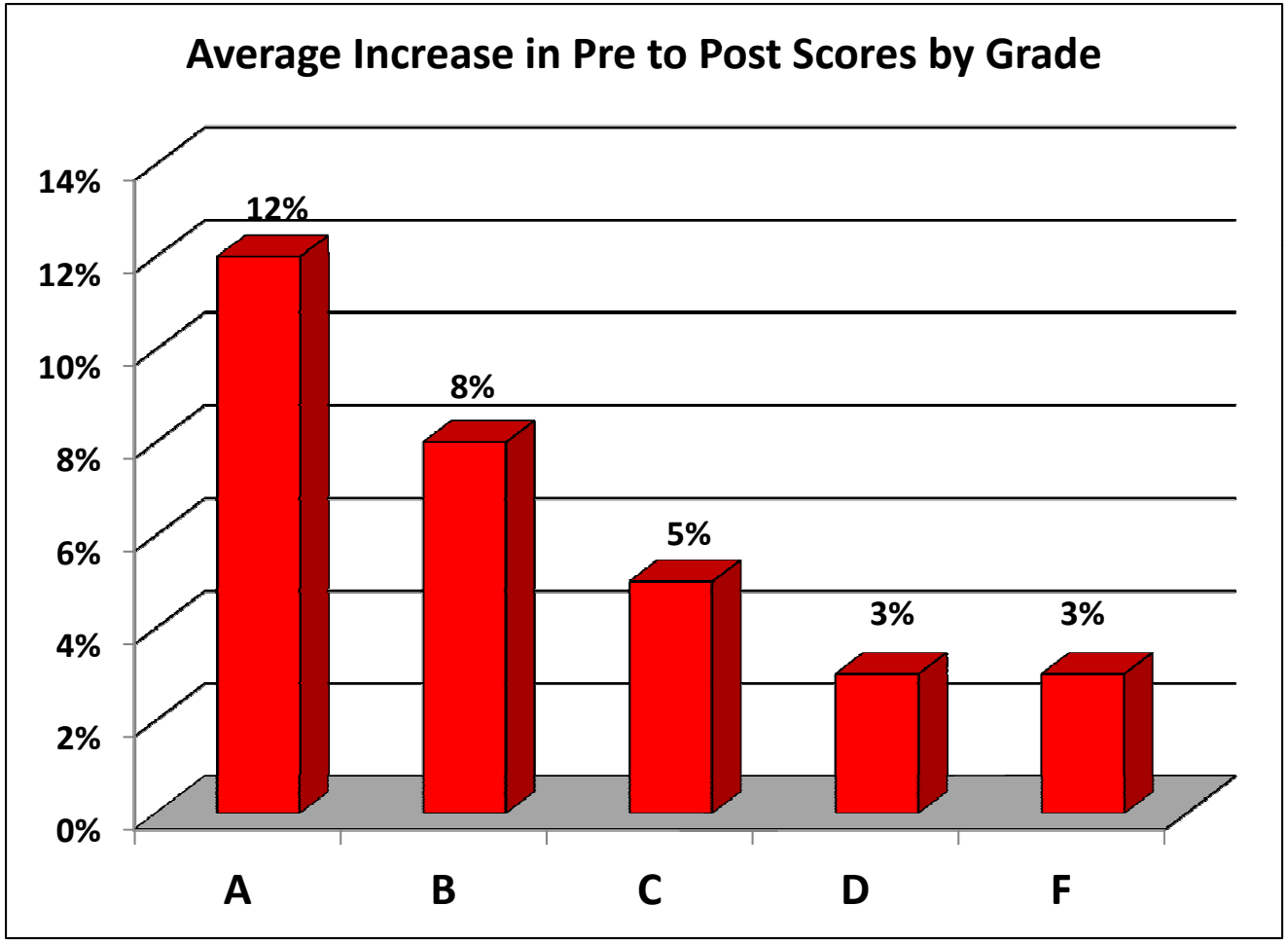
LO12: Relationships and processes within ecosystems



This data shows the average Post Test score by final grade. For example, the average score for the A students was 69%, while the average score for the B students was 52%.



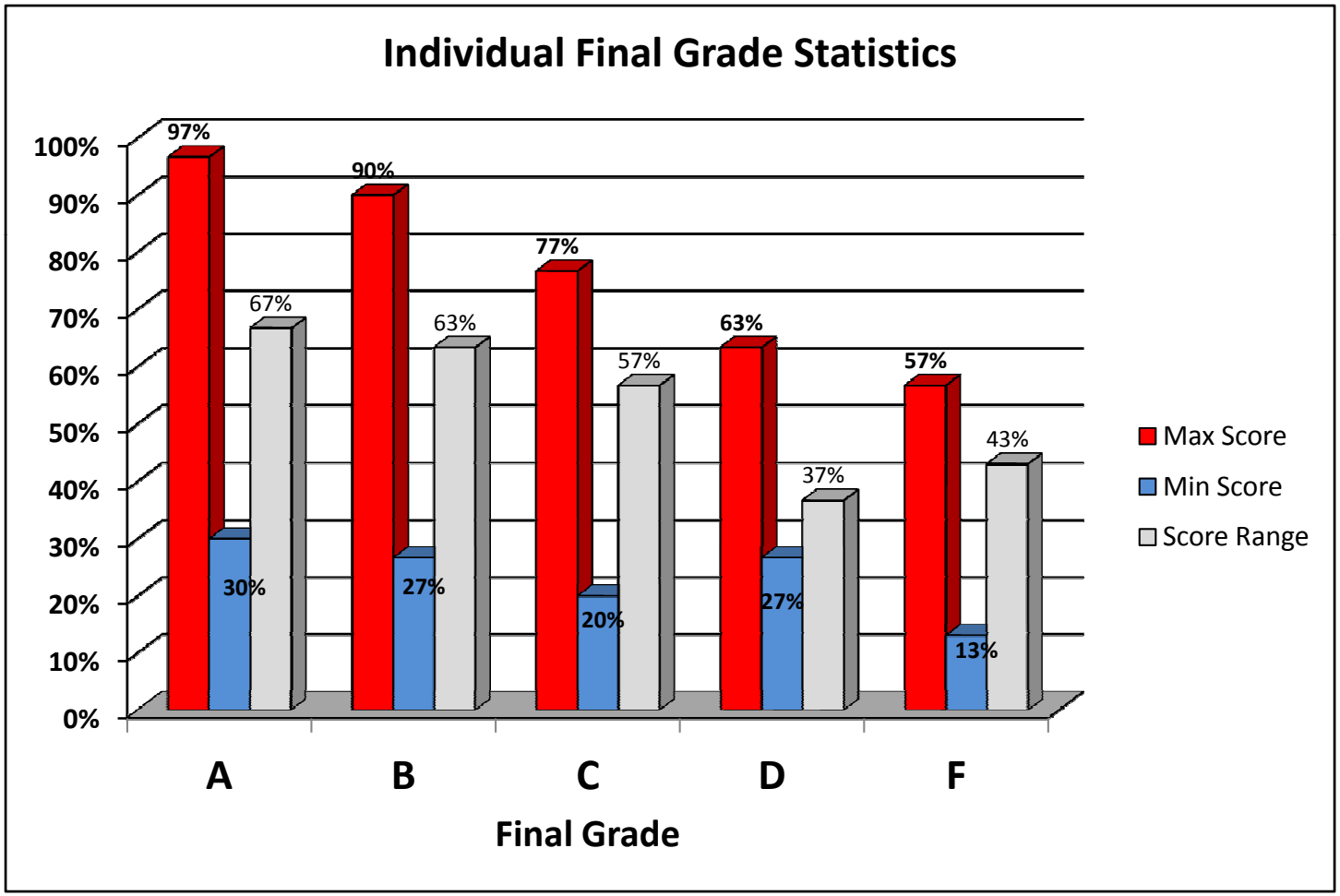
This data shows the average increase in scores from the Pre to Post Test. For example, while students making a final grade of A increased an average of 12 percentage points; the B students increased 8%, and the D and F Students increased 3%.

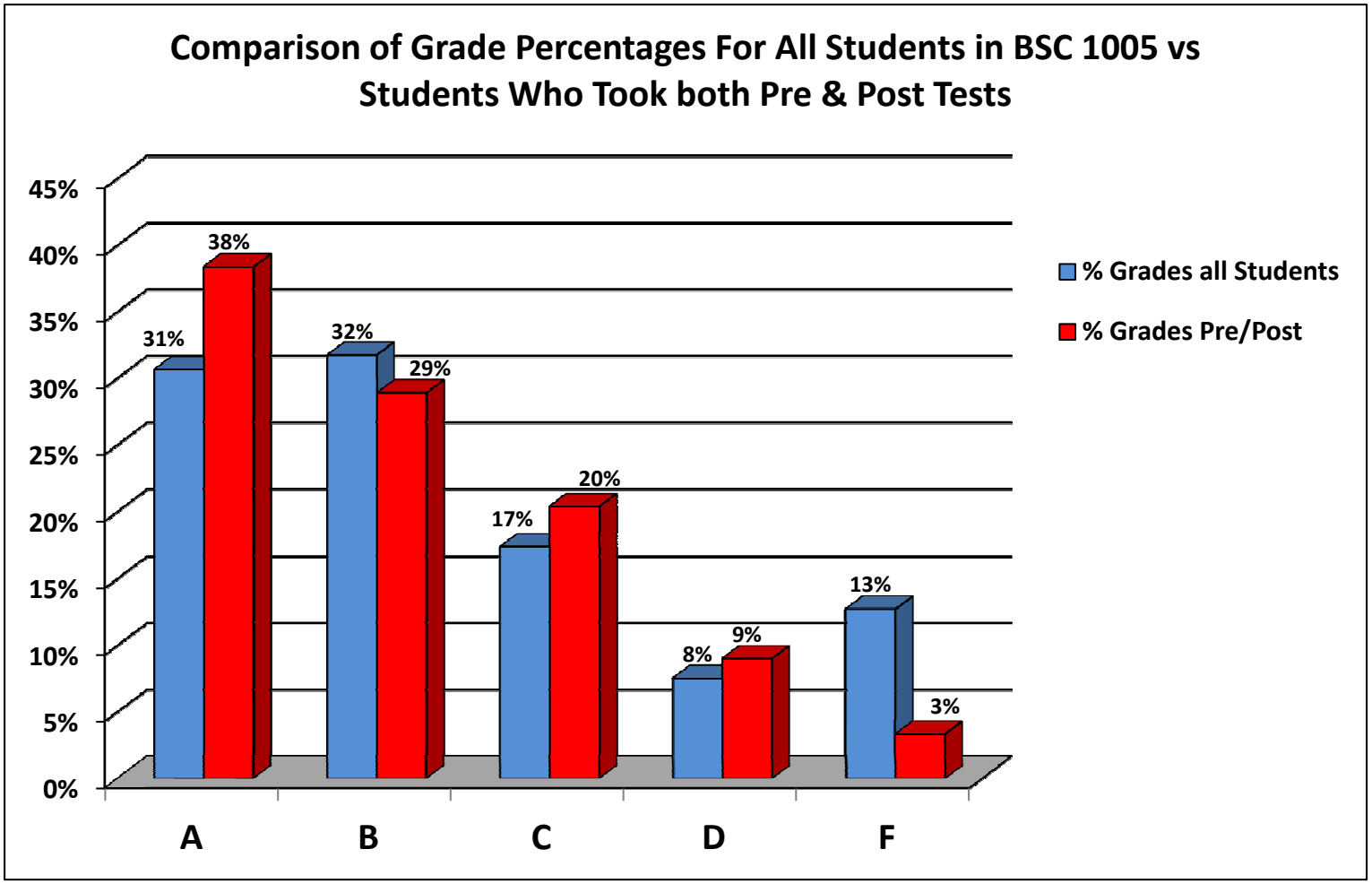


Individual Final Grade Statistics – Post Scores

Grade	Mean	Median	Mode	Stdev	Max Score	Min Score	Score Range	N
A	63%	63%	57%	15%	97%	30%	67%	81
B	52%	50%	50%	13%	90%	27%	63%	61
C	44%	43%	47%	13%	77%	20%	57%	43
D	42%	40%	40%	9%	63%	27%	37%	19
F	38%	40%	-	9%	57%	13%	43%	7

Individual Final Grade Statistics




Comparison of Grade Percentages For All Students in BSC 1005 vs Students Who Took both Pre & Post Tests
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
31%
38%
32%
29%
17%
20%
8%
9%
13%
3%
A
B
C
D
F
% Grades all Students
% Grades Pre/Post

BSC 1005-StudentSatisfaction Fall 2011

	enrollment	Overall mean for COURSE ORGANIZATION AND PLANNING	Overall mean for COMMUNICATION	Overall mean for FACULTY/STUDENT INTERACTION	Overall mean for ASSIGMENTS, EXAMS, AND GRADING	Overall mean for COURSE OUTCOMES
	8	4.18	3.98	4.05	4	3.4
	5	4.2	3.84	3.86	3.84	3.32
	13					
Mean: Online Sections		4.19	3.91	3.96	3.92	3.36
	28	3.93	4.08	4.01	3.6	3.07
	20	4.36	4.31	4.14	3.76	3.2
	28	4.54	4.58	4.43	4.14	3.63
	29	4.63	4.71	4.79	4.65	4.45
	30	4.42	4.25	4.63	4.32	3.87
	29	4.41	4.44	4.61	4.51	3.87
	0	3.69	3.77	3.77	3.62	3.23
	19	4.27	4.38	4.53	4.24	3.71
	0	4.82	4.8	4.92	4.58	4.08
	35	3.81	3.72	3.9	3.79	3.36
	34	4.56	4.43	4.6	4.16	3.53
	35	4.15	4.21	4.34	3.92	3.53
	55	3.71	3.87	4.09	3.33	3.07
	33	4.23	4.37	4.14	3.94	3.15
	34	3.64	3.62	3.71	3.11	2.54
	33	4.5	4.43	4.7	4.52	3.92
	31	4.02	3.92	4.11	3.8	3.24
	34	4.19	4.03	4.17	4.02	3.14
	34	4.3	4.12	4.2	3.81	3.59
	541					

Mean: Traditional Sections	4.22	4.21	4.30	3.99	3.48

Table 1

Fall 2011 Course Success/Retention Rates by Campus and Modality

	MAC 1105			BSC 1005		
Campus	Enrolled	Success Rate	Withdrawal Rate	Enrolled	Success Rate	Withdrawal Rate
All Campuses	1782	71.21%	7.58%	643	69.36%	10.26%
Charlotte	191	70.16%	10.99%	74	74.32%	1.35%
Collier	235	74.47%	5.11%	116	89.66%	4.31%
Edison Online	164	62.20%	10.98%	46	69.57%	10.87%
Hendry Labelle	58	70.69%	8.62%	37	56.76%	8.11%
Lee	784	61.86%	8.80%	370	63.24%	14.05%
Off-site Charlotte	214	98.13%	0.47%			
Off-site Collier	113	88.50%	7.08%			
Off-site Lee	23	95.65%	4.35%			

Note: Success rate is defined as the cumulative percentage of students that earned a grade of C or better

Date Received_____

Assessment Report Form
Edison State College

1. Assessment Project Report:

Program	MAC1105
Department	Mathematics
College	Arts and Sciences
Program Assessment Coordinator	JoAnn Lewin
Academic Year	2010-11
Report Submitted by	JoAnn Lewin
Phone/email	239 489-9429/jlewin@edison.edu
Date Submitted	

2. According to the Assessment Plan, what were the planned assessment activities to be conducted during the Academic Year? You may want to copy and paste from this program's assessment plan.

Which outcomes for this program were measured?	How did you measure the outcomes?	What results did you expect?
MAC1105 learning outcomes that were representative of concepts not specifically covered in prerequisite mathematics courses were selected.	We used a pre/post test. Each test question was tied to a different aspect of one of the selected learning outcomes.	We expected that a significantly higher percentage of students would answer correctly on the post-test than on the pre-test.

3. Results, conclusions, and discoveries. What are the results of the planned activities listed above? What conclusions or discoveries were made from these results. Describe below or attach to the form.

There was statistically significant improvement from the pre-test to the post-test. Since the results were not tied to Banner IDs, we are not able to measure individual improvement. Furthermore the tested populations were different (weaker students had in many cases dropped the course or stopped coming to class and several instructors did not administer the post-test). As a result, we cannot conclude with any certainty that the percentage increases that we are seeing truly reflect learning that took place in MAC1105.
While the improvement was statistically significant, there were only three questions out of twenty for which we achieved a benchmark of 70% of the students answering the question correctly.

We are concerned that students don't perceive themselves as stakeholders in the process we used and therefore, the results that we obtained may not be as reliable as embedding an assessment in a final exam.

4. Use of Results. What program changes are indicated? How will they be implemented? If none, describe why changes were not needed.

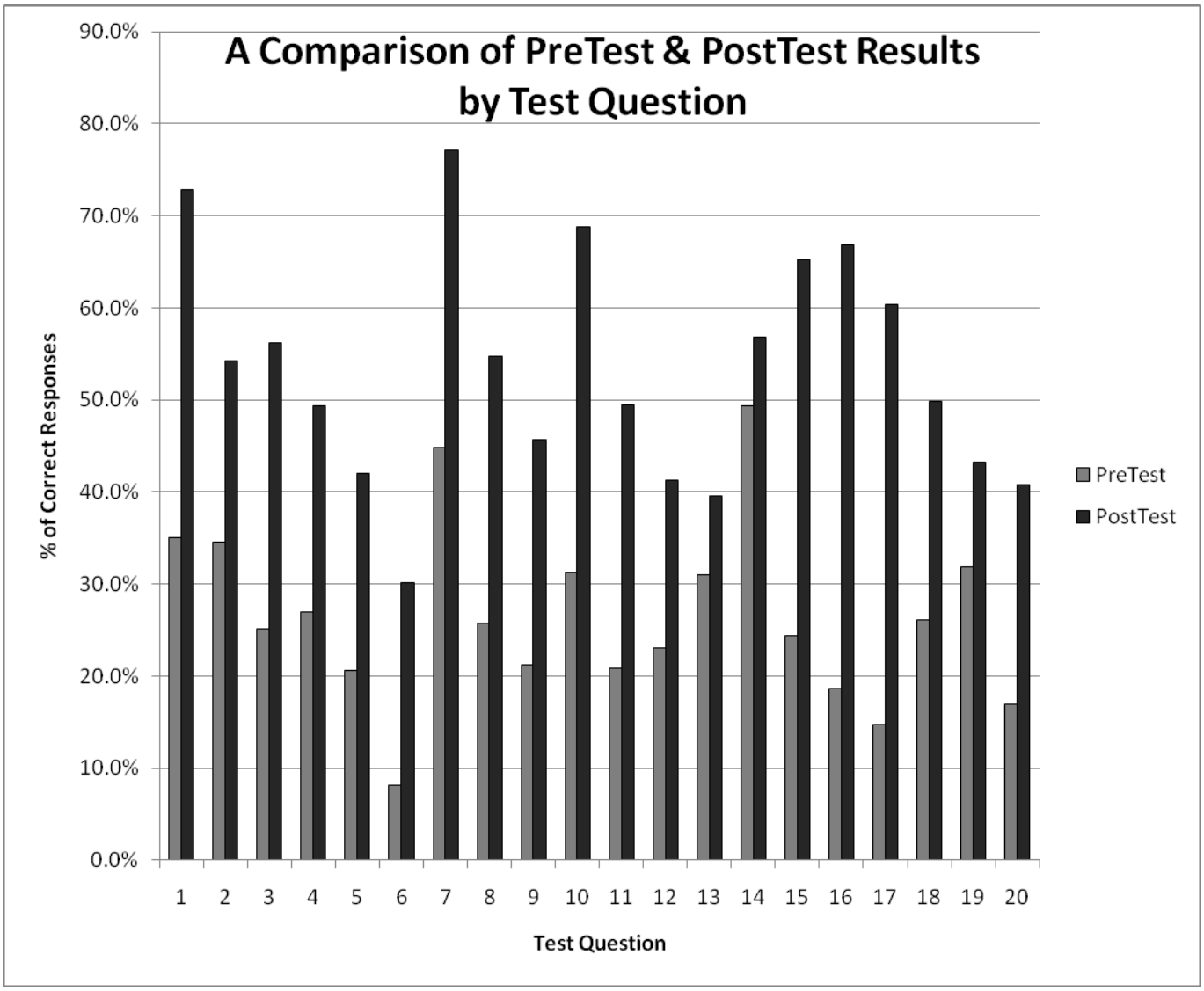
We have been able to identify some topics/concepts for which students continue to be markedly deficient. The department will now look at modifications to the curriculum that may allow more time on those topics and/or develop different pedagogical approaches. Based on the sacrifice of class time and worries about reliability, we recommend that a pre-test not be used and that future assessments only be a part of the final exam.

For the 2011-12 assessment cycle, the department has developed a common core final exam for MAC1105. Whenever appropriate, the questions in this final will be correlated with questions from the previous year's post-test results in order to find any statistical evidence that there is improvement. The specific questions of interest on the post-test (version A) are the following: #4, 5, 6, 9, 12, 13, 19, and 20; less than 50% of the students answered these questions correctly on the post-test we used during the 2010-11 cycle.

For the Fall 2011 semester, the common core final exam is being administered to all dual enrollment MAC1105 classes as well as to selected classes on the College campuses. For the Spring 2012 semester, instructors are being asked to structure their course in a way that provides additional emphasis to the topics/skills related to the specific post-test questions mentioned above; in addition, the common core final exam will be administered to a broader sample of the MAC1105 population and results will be compared with Fall 2011 to see if further modifications are needed.

5. Dissemination of results, conclusions, and discoveries. How and with whom were the results shared?

Results were shared at a district-wide mathematics faculty meeting.


A Comparison of PreTest & PostTest Results by Test Question
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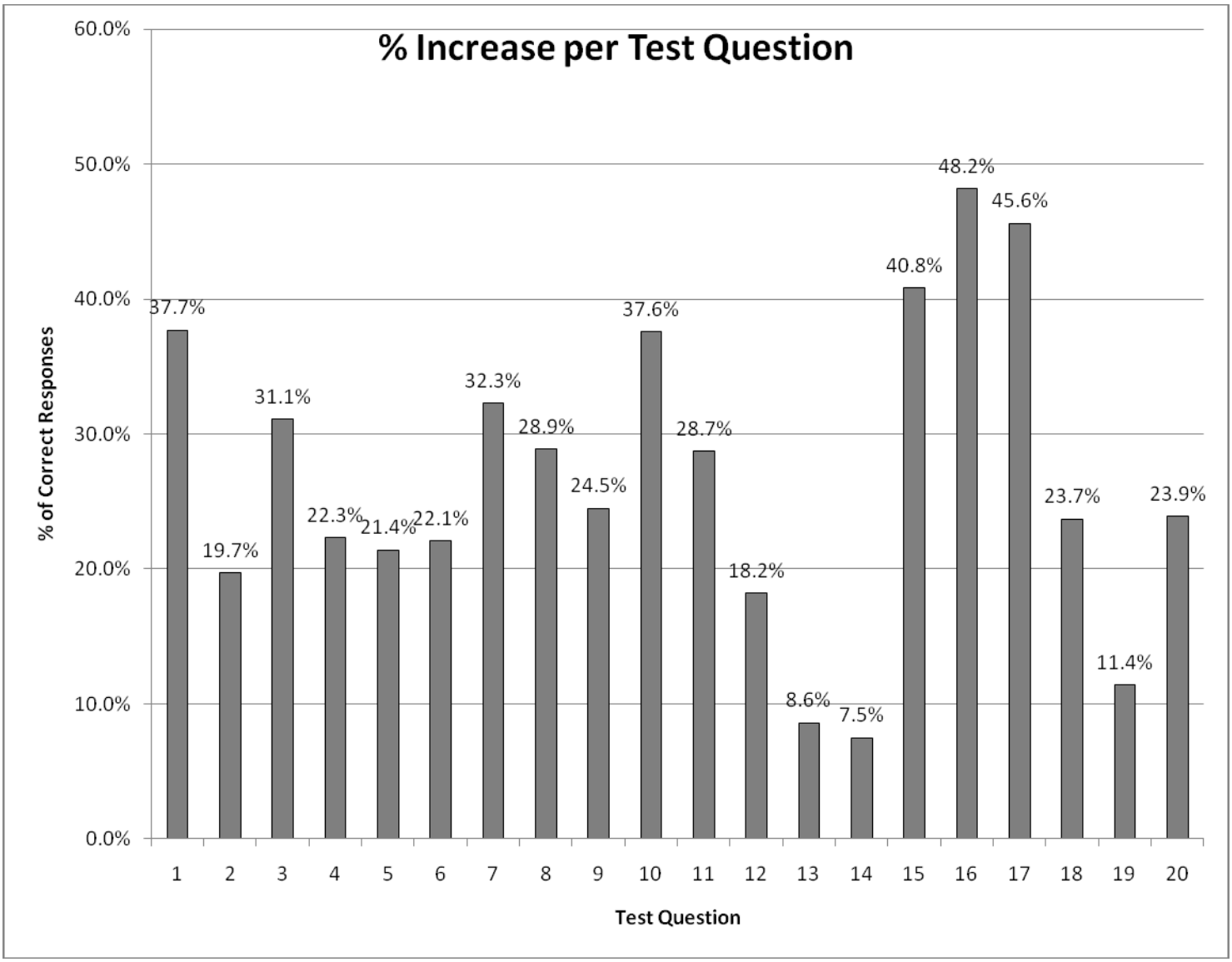
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Table 1

Outcome Score Means for Entire Sample

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	633	0.392	0.355	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	633	0.383	0.300	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	633	0.351	0.380	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	633	0.300	0.342	0.000	1.000
10	Transformation tedchniques on functions	633	0.343	0.320	0.000	1.000
11	Identify One-to-one relations and their inverses	633	0.334	0.327	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	633	0.307	0.273	0.000	1.000
14	Evaluate logarithmic and exponential expressions	633	0.452	0.331	0.000	1.000
15	Solve exponential and logarithmic equations	633	0.326	0.268	0.000	1.000
16	Select and apply techniques to solve systems of equations	633	0.503	0.296	0.000	1.000

Note: Student outcome scores = # of outcome-specific items answered correctly divided by the number of items associated with the outcome

Table 2

Outcome Score Means for Collier Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	25	0.480	0.409	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	25	0.440	0.317	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	25	0.580	0.373	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	25	0.467	0.289	0.000	1.000
10	Transformation tedchniques on functions	25	0.510	0.284	0.000	1.000
11	Identify One-to-one relations and their inverses	25	0.360	0.396	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	25	0.445	0.303	0.000	1.000
14	Evaluate logarithmic and exponential expressions	25	0.613	0.356	0.000	1.000
15	Solve exponential and logarithmic equations	25	0.430	0.284	0.000	1.000
16	Select and apply techniques to solve systems of equations	25	0.547	0.302	0.000	1.000

Table 3

Outcome Score Means for Hendry/Glades (HGL and HNL Combined) Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	50	0.360	0.414	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	50	0.425	0.382	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	50	0.430	0.417	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	50	0.380	0.421	0.000	1.000
10	Transformation tedchniques on functions	50	0.365	0.300	0.000	1.000
11	Identify One-to-one relations and their inverses	50	0.360	0.392	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	50	0.374	0.321	0.000	1.000
14	Evaluate logarithmic and exponential expressions	50	0.440	0.359	0.000	1.000
15	Solve exponential and logarithmic equations	50	0.332	0.319	0.000	1.000
16	Select and apply techniques to solve systems of equations	50	0.453	0.306	0.000	1.000

Table 4

Outcome Score Means for Lee Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	432	0.397	0.354	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	432	0.356	0.309	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	432	0.370	0.371	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	432	0.293	0.348	0.000	1.000
10	Transformation tedchniques on functions	432	0.336	0.334	0.000	1.000
11	Identify One-to-one relations and their inverses	432	0.323	0.324	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	432	0.325	0.269	0.000	1.000
14	Evaluate logarithmic and exponential expressions	432	0.446	0.344	0.000	1.000
15	Solve exponential and logarithmic equations	432	0.342	0.277	0.000	1.000
16	Select and apply techniques to solve systems of equations	432	0.492	0.287	0.000	1.000

Table 5

Outcome Score Means for Off-Campus Collier Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	104	0.333	0.279	0.000	0.667
3	Operations on functions (including compositions and difference quotients)	104	0.411	0.147	0.000	0.500
4	Evaluate and interpret the slope and y-intercept of a line . . .	104	0.091	0.206	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	104	0.199	0.177	0.000	0.667
10	Transformation tedchniques on functions	104	0.281	0.230	0.000	0.750
11	Identify One-to-one relations and their inverses	104	0.356	0.293	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	104	0.124	0.107	0.000	0.571
14	Evaluate logarithmic and exponential expressions	104	0.413	0.220	0.000	1.000
15	Solve exponential and logarithmic equations	104	0.209	0.099	0.000	0.500
16	Select and apply techniques to solve systems of equations	104	0.535	0.320	0.000	1.000

Table 6

Outcome Score Means for Off-Campus Lee Section

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	22	0.545	0.455	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	22	0.602	0.342	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	22	0.750	0.299	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	22	0.530	0.467	0.000	1.000
10	Transformation tedchniques on functions	22	0.545	0.359	0.000	1.000
11	Identify One-to-one relations and their inverses	22	0.364	0.315	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	22	0.500	0.326	0.000	1.000
14	Evaluate logarithmic and exponential expressions	22	0.606	0.335	0.000	1.000
15	Solve exponential and logarithmic equations	22	0.409	0.323	0.000	0.875
16	Select and apply techniques to solve systems of equations	22	0.621	0.296	0.333	1.000

Table 7

Outcome Score Means for All Dual Enrollment Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	126	0.370	0.324	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	126	0.444	0.207	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	126	0.206	0.336	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	126	0.257	0.280	0.000	1.000
10	Transformation tedchniques on functions	126	0.327	0.275	0.000	1.000
11	Identify One-to-one relations and their inverses	126	0.357	0.296	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	126	0.189	0.219	0.000	1.000
14	Evaluate logarithmic and exponential expressions	126	0.447	0.253	0.000	1.000
15	Solve exponential and logarithmic equations	126	0.244	0.177	0.000	1.000
16	Select and apply techniques to solve systems of equations	126	0.550	0.316	0.000	1.000

Table 8

Outcome Score Means for Non-Dual Enrollment Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	457	0.402	0.357	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	457	0.361	0.310	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	457	0.381	0.374	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	457	0.303	0.347	0.000	1.000
10	Transformation tedchniques on functions	457	0.345	0.333	0.000	1.000
11	Identify One-to-one relations and their inverses	457	0.325	0.327	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	457	0.332	0.272	0.000	1.000
14	Evaluate logarithmic and exponential expressions	457	0.455	0.347	0.000	1.000
15	Solve exponential and logarithmic equations	457	0.347	0.278	0.000	1.000
16	Select and apply techniques to solve systems of equations	457	0.495	0.288	0.000	1.000

Table 10

Independent Samples T-test, Satterthwaite Method (Mean Dual Enrollment Scores - Mean Non Dual Enrollment Scores)

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	Difference Between Means	df	t	pr > t	d-est.
2	Graphically and algebraically defined functions	-0.032	216	-0.940	0.346	
3	Operations on functions (including compositions and difference quotients)	0.083	296	3.550	< 0.000	0.316
4	Evaluate and interpret the slope and y-intercept of a line . . .	-0.175	218	-5.060	< 0.001	-0.451
9	Graph relations and functions (Classify which relations are functions)	-0.046	241	-1.550	0.123	
10	Transformation tedchniques on functions	-0.018	237	-0.061	0.540	
11	Identify One-to-one relations and their inverses	0.032	217	1.060	0.292	
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	-0.142	242	-6.110	< 0.001	-0.544
14	Evaluate logarithmic and exponential expressions	-0.008	268	-0.290	0.772	
15	Solve exponential and logarithmic equations	-0.103	312	-5.050	< 0.001	-0.450
16	Select and apply techniques to solve systems of equations	0.055	186	1.760	0.080	

N = 583

Note: Cohen's d of 0.2 represents a small effect size; a d of 0.5 represents a medium effect size, and a d of 0.8 is large

Table 11

Frequency Distribution of Overall Test Score (Number of Correct Responses)

Test Score	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.16	1	0.16
3	3	0.47	4	0.63
4	5	0.79	9	1.42
5	11	1.74	20	3.16
6	30	4.74	50	7.9
7	62	9379	112	17.69
8	77	12.16	189	29.86
9	86	13.59	275	43.44
10	48	7.58	323	51.03
11	48	7.58	371	58.61
12	24	3.79	395	62.4
13	18	2.84	413	65.24
14	22	3.48	435	68.72
15	18	2.84	453	71.56
16	12	1.9	465	73.46
17	10	1.58	475	75.04
18	6	0.95	481	75.99
19	2	0.32	483	76.3
20	7	1.11	490	77.41
21	4	0.63	494	78.08
22	3	0.47	497	78.52
23	10	1.58	507	80.09
24	7	1.11	514	81.2
25	7	1.11	521	82.31
26	5	0.79	526	83.1
27	6	0.95	532	84.04
28	14	2.21	546	86.26
29	12	1.9	558	88.15
30	6	0.95	564	89.1
31	7	1.11	571	90.21
32	6	0.95	577	91.15
33	14	2.21	591	93.36
34	6	0.95	597	94.31
35	8	1.26	605	95.58
36	8	1.26	613	96.84
37	5	0.79	618	97.63
38	7	1.11	625	98.74
39	6	0.95	631	99.68
40	2	0.32	633	100

Table 12

Mean Overall Test Scores by Campuses

Campus	N	Mean	Standard Deviation	Min.	Max.
All Campuses	633	14.513	9.979	0.000	40.000
Collier	25	19.000	9.903	7.000	40.000
Hendry/Glades (HGL)	15	33.400	4.763	25.000	39.000
Hendry/Labelle (HNL)	35	7.829	1.963	4.000	11.000
Lee	432	14.718	9.484	0.000	39.000
Off-Campus Collier	104	10.625	3.038	5.000	18.000
Off-Campus Lee	22	21.454	11.923	6.000	38.000

Table 13

Mean Overall Test Scores by Dual Enrollment Indicator

Indicator Value	N	Mean	Standard Deviation	Min.	Max.
Dual Enrollment (DE)	126	12.516	6.966	5	38
Non Dual Enrollment (Non-DE)	457	14.956	9.548	0	40

Table 14

Independent Samples T-test, Satterthwaite Method (Overall Test Score)

Comparison	Difference Between Means	df	t	pr > t	d-est.
DE minus Non-DE	-2.44	268	-3.19	0.002	-0.321

N = 583

Table 15

Item Difficulties with Item Outcome Assignment

Item No.	Outcome	Item Text	Item Difficulty	Correct Responses	Incorrect Responses
1	11	Use the graph of f to select the graph of its invers function f^{-1}	0.3633	230	403
2	10, 12	Use the graph of $f(x) = 5^x$ to obtain the grpah of $g(x) = 5^{x+3} - 1$	0.3286	208	425
3	10, 12	Use the grpah of log 3x to obtain the graph of f(x) = log3 (x+1)	0.2433	154	479
4	15	Solve the exponential equation. Express the solution set in terms of natural logarithms	0.3318	210	423
5	3	Perform the requested operation or operations	0.3539	224	409
6	15	Solve the logarithmic equation (1 of 2)	0.3855	244	389
7	15	Solve the logarithmic equation (2 of 2)	0.1959	124	509
8		Use the appropriate compound interest formula . . . To solve (round answer to the nearest cent)	0.2875	182	451
9	14, 15	Write the equation in its equivalent logarithmic form	0.3586	227	406
10	3, 9	Given functions f and g, perform the indicated operations	0.2212	140	493
11	3	Find and simplify the difference quotient . . . For the given function	0.4834	306	327
12	9, 11	Find the inveser of the function if it exists	0.3049	193	440
13	16	Solve the system of equations. Give the requested value. Or if the system has no solution or infinitely many solutions, so state	0.8136	515	118
14	2	Use the graph to find the indicated function value	0.2701	171	462
15	17	Graph the solution of the system of inequalities or indicate that the system has no solution	0.2954	187	446
16	8	Solve the problem: A ladder that is 17 feet long is 8 feet from the base of the wall . . .	0.3049	193	440
17	7	Find the distance between the pair of points	0.5245	332	301
18	14, 15	Use properties of logarithms to expand the logarithmic expression as much as possible . . .	0.5008	317	316
19	2	Evaluate the piecewise function at the given value of the independent variable	0.4281	271	362
20	3	For the given functions f and g, find the indicated composition	0.4724	299	334
21	4, 5	Find the average rate of change of the function from x1 to x2	0.4060	257	376
22	16	Solve the system. Give the requested value	0.2859	181	452
23	2	Find the function value	0.4787	303	330

Item No.	Outcome	Item Text	Item Difficulty	Correct Responses	Incorrect Responses
24	12	Find the vertical asymptotes, if any, of the graph of the rational function	0.2859	181	452
25	15	solve the equation by expressing each side as a power of the same base an then equating the exponents	0.2401	152	481
26	14	Use properties of logarithms to condense the logarithmic expression . . .	0.4976	315	318
27	4, 6	Use the given conditions to write an equation for the line in point-slope form	0.2954	187	446
28	12	Find the horizontal asymptote, if any, of the graph of the rational function (1 of 2)	0.2006	127	506
29	12	Find the horizontal asymptote, if any, of the graph of the rational function (1 of 2)	0.4818	305	328
30	10	The figure below shows the graph of a function y = f(x). Use the graph to solve the problem	0.3665	232	401
31	12	Use the graph of the rational function shown t ocomplete the statement (1 of 2)	0.3254	206	427
32	12	Use the graph of the rational function shown t ocomplete the statement (2 of 2)	0.2812	178	455
33	10	Use the graph o fthe function f, plotted with a solid line . . . Determine graph of the given function g	0.4344	275	358
34	9	Determin whether or not the graph is a graph in which y is a function of x	0.3758	239	397
35	1	Use the graph to determine the function's domain and range	0.3870	245	388
36	16	Solve the system of equations. Give the requested value. Or if the system has no solution or infinitely many solutions, so state	0.4092	259	374
37		Identify the intervals where the function is changing as requested	0.3764	239	396
38	13, 18	You have 120 feet of fencing to enclose a ractangular plot the borders a river . . .	0.3302	209	424
39	15	Solve the equation . . .	0.3318	210	423
40	15	Solve the exponential equation. Use a calculator to obtain a decimal approximation . . .	0.2607	165	468
		N	633		
		Cronbach's Alpha (Raw)	0.923		
		Cronbach's Alpha (Standardized)	0.925		

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Table 1

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10	Transformation tedchniques on functions	633	0.343	0.320	0.000	1.000
11	Identify One-to-one relations and their inverses	633	0.334	0.327	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	633	0.307	0.273	0.000	1.000
13	Determine optimum value of a quadratic function	633	0.415	0.394	0.000	1.000
14	Evaluate logarithmic and exponential expressions	633	0.452	0.331	0.000	1.000
15	Solve exponential and logarithmic equations	633	0.326	0.268	0.000	1.000
16	Select and apply techniques to solve systems of equations	633	0.503	0.296	0.000	1.000

Note: Student outcome scores = # of outcome-specific items answered correctly divided by the number of items associated with the outcome

Table 2

Outcome Score Means for Collier Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	25	0.480	0.409	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	25	0.440	0.317	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	25	0.580	0.373	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	25	0.467	0.289	0.000	1.000
10	Transformation tedchniques on functions	25	0.510	0.284	0.000	1.000
11	Identify One-to-one relations and their inverses	25	0.360	0.396	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	25	0.445	0.303	0.000	1.000
13	Determine optimum value of a quadratic function	25	0.460	0.406	0.000	1.000
14	Evaluate logarithmic and exponential expressions	25	0.613	0.356	0.000	1.000
15	Solve exponential and logarithmic equations	25	0.430	0.284	0.000	1.000
16	Select and apply techniques to solve systems of equations	25	0.547	0.302	0.000	1.000

Table 3

Outcome Score Means for Hendry/Glades (HGL) Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	15	0.933	0.138	0.667	1.000
3	Operations on functions (including compositions and difference quotients)	15	0.950	0.103	0.750	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	15	0.967	0.129	0.500	1.000
9	Graph relations and functions (Classify which relations are functions)	15	0.955	0.117	0.667	1.000
10	Transformation tedchniques on functions	15	0.683	0.275	0.250	1.000
11	Identify One-to-one relations and their inverses	15	0.767	0.320	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	15	0.800	0.208	0.428	1.000
13	Determine optimum value of a quadratic function	15	0.933	0.176	0.500	1.000
14	Evaluate logarithmic and exponential expressions	15	0.889	0.206	0.330	1.000
15	Solve exponential and logarithmic equations	15	0.767	0.210	0.250	1.000
16	Select and apply techniques to solve systems of equations	15	0.755	0.294	0.000	1.000

Table 4

Outcome Score Means for Hendry/Labelle (HNL) Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	35	0.114	0.180	0.000	0.667
3	Operations on functions (including compositions and difference quotients)	35	0.200	0.180	0.000	0.500
4	Evaluate and interpret the slope and y-intercept of a line . . .	35	0.200	0.248	0.000	0.500
9	Graph relations and functions (Classify which relations are functions)	35	0.133	0.201	0.000	0.667
10	Transformation tedchniques on functions	35	0.228	0.158	0.000	0.500
11	Identify One-to-one relations and their inverses	35	0.186	0.273	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	35	0.191	0.129	0.000	0.428
13	Determine optimum value of a quadratic function	35	0.071	0.177	0.000	0.500
14	Evaluate logarithmic and exponential expressions	35	0.248	0.204	0.000	0.667
15	Solve exponential and logarithmic equations	35	0.146	0.098	0.000	0.500
16	Select and apply techniques to solve systems of equations	35	0.324	0.205	0.000	0.667

Table 5

Outcome Score Means for Lee Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	432	0.397	0.354	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	432	0.356	0.309	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	432	0.370	0.371	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	432	0.293	0.348	0.000	1.000
10	Transformation tedchniques on functions	432	0.336	0.334	0.000	1.000
11	Identify One-to-one relations and their inverses	432	0.323	0.324	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	432	0.325	0.269	0.000	1.000
13	Determine optimum value of a quadratic function	432	0.410	0.391	0.000	1.000
14	Evaluate logarithmic and exponential expressions	432	0.446	0.344	0.000	1.000
15	Solve exponential and logarithmic equations	432	0.342	0.277	0.000	1.000
16	Select and apply techniques to solve systems of equations	432	0.492	0.287	0.000	1.000

Table 6

Outcome Score Means for Off-Campus Collier Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	104	0.333	0.279	0.000	0.667
3	Operations on functions (including compositions and difference quotients)	104	0.411	0.147	0.000	0.500
4	Evaluate and interpret the slope and y-intercept of a line . . .	104	0.091	0.206	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	104	0.199	0.177	0.000	0.667
10	Transformation tedchniques on functions	104	0.281	0.230	0.000	0.750
11	Identify One-to-one relations and their inverses	104	0.356	0.293	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	104	0.124	0.107	0.000	0.571
13	Determine optimum value of a quadratic function	104	0.476	0.378	0.000	1.000
14	Evaluate logarithmic and exponential expressions	104	0.413	0.220	0.000	1.000
15	Solve exponential and logarithmic equations	104	0.209	0.099	0.000	0.500
16	Select and apply techniques to solve systems of equations	104	0.535	0.320	0.000	1.000

Table 7

Outcome Score Means for Off-Campus Lee Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	22	0.545	0.455	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	22	0.602	0.342	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	22	0.750	0.299	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	22	0.530	0.467	0.000	1.000
10	Transformation tedchniques on functions	22	0.545	0.359	0.000	1.000
11	Identify One-to-one relations and their inverses	22	0.364	0.315	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	22	0.500	0.326	0.000	1.000
13	Determine optimum value of a quadratic function	22	0.386	0.406	0.000	1.000
14	Evaluate logarithmic and exponential expressions	22	0.606	0.335	0.000	1.000
15	Solve exponential and logarithmic equations	22	0.409	0.323	0.000	0.875
16	Select and apply techniques to solve systems of equations	22	0.621	0.296	0.333	1.000

Table 8

Outcome Score Means for Dual Enrollment Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	126	0.370	0.324	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	126	0.444	0.207	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	126	0.206	0.336	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	126	0.257	0.280	0.000	1.000
10	Transformation tedchniques on functions	126	0.327	0.275	0.000	1.000
11	Identify One-to-one relations and their inverses	126	0.357	0.296	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	126	0.189	0.219	0.000	1.000
13	Determine optimum value of a quadratic function	126	0.460	0.382	0.000	1.000
14	Evaluate logarithmic and exponential expressions	126	0.447	0.253	0.000	1.000
15	Solve exponential and logarithmic equations	126	0.244	0.177	0.000	1.000
16	Select and apply techniques to solve systems of equations	126	0.550	0.316	0.000	1.000

Table 9

Outcome Score Means for Non-Dual Enrollment Sections

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	N	Mean	Standard Deviation	Min.	Max.
2	Graphically and algebraically defined functions	457	0.402	0.357	0.000	1.000
3	Operations on functions (including compositions and difference quotients)	457	0.361	0.310	0.000	1.000
4	Evaluate and interpret the slope and y-intercept of a line . . .	457	0.381	0.374	0.000	1.000
9	Graph relations and functions (Classify which relations are functions)	457	0.303	0.347	0.000	1.000
10	Transformation tedchniques on functions	457	0.345	0.333	0.000	1.000
11	Identify One-to-one relations and their inverses	457	0.325	0.327	0.000	1.000
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	457	0.332	0.272	0.000	1.000
13	Determine optimum value of a quadratic function	457	0.402	0.392	0.000	1.000
14	Evaluate logarithmic and exponential expressions	457	0.455	0.347	0.000	1.000
15	Solve exponential and logarithmic equations	457	0.347	0.278	0.000	1.000
16	Select and apply techniques to solve systems of equations	457	0.495	0.288	0.000	1.000

Table 10

Independent Samples T-test, Satterthwaite Method (Mean Dual Enrollment Scores - Mean Non Dual Enrollment Scores)

	Abridged Outcomes Descriptors (Multi-item Outcomes Only)	Difference Between Means	df	t	pr > t	d-est.
2	Graphically and algebraically defined functions	-0.032	216	-0.940	0.346	
3	Operations on functions (including compositions and difference quotients)	0.083	296	3.550	< 0.000	0.316
4	Evaluate and interpret the slope and y-intercept of a line . . .	-0.175	218	-5.060	< 0.001	-0.451
9	Graph relations and functions (Classify which relations are functions)	-0.046	241	-1.550	0.123	
10	Transformation tedchniques on functions	-0.018	237	-0.061	0.540	
11	Identify One-to-one relations and their inverses	0.032	217	1.060	0.292	
12	Graph linear, quadratic, rational, exponential, or logarithmic fuctions	-0.142	242	-6.110	< 0.001	-0.544
13	Determine optimum value of a quadratic function	0.048	203	1.240	0.218	
14	Evaluate logarithmic and exponential expressions	-0.008	268	-0.290	0.772	
15	Solve exponential and logarithmic equations	-0.103	312	-5.050	< 0.001	-0.450
16	Select and apply techniques to solve systems of equations	0.055	186	1.760	0.080	

N = 583

Note: Cohen's d of 0.2 represents a small effect size; a d of 0.5 represents a medium effect size, and a d of 0.8 is large

Table 11

Frequency Distribution of Overall Test Score (Number of Correct Responses)

Test Score	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.16	1	0.16
3	3	0.47	4	0.63
4	5	0.79	9	1.42
5	11	1.74	20	3.16
6	30	4.74	50	7.9
7	62	9379	112	17.69
8	77	12.16	189	29.86
9	86	13.59	275	43.44
10	48	7.58	323	51.03
11	48	7.58	371	58.61
12	24	3.79	395	62.4
13	18	2.84	413	65.24
14	22	3.48	435	68.72
15	18	2.84	453	71.56
16	12	1.9	465	73.46
17	10	1.58	475	75.04
18	6	0.95	481	75.99
19	2	0.32	483	76.3
20	7	1.11	490	77.41
21	4	0.63	494	78.08
22	3	0.47	497	78.52
23	10	1.58	507	80.09
24	7	1.11	514	81.2
25	7	1.11	521	82.31
26	5	0.79	526	83.1
27	6	0.95	532	84.04
28	14	2.21	546	86.26
29	12	1.9	558	88.15
30	6	0.95	564	89.1
31	7	1.11	571	90.21
32	6	0.95	577	91.15
33	14	2.21	591	93.36
34	6	0.95	597	94.31
35	8	1.26	605	95.58
36	8	1.26	613	96.84
37	5	0.79	618	97.63
38	7	1.11	625	98.74
39	6	0.95	631	99.68
40	2	0.32	633	100

Table 12

Mean Overall Test Scores by Campuses

Campus	N	Mean	Standard Deviation	Min.	Max.
All Campuses	633	14.513	9.979	0.000	40.000
Collier	25	19.000	9.903	7.000	40.000
Hendry/Glades (HGL)	15	33.400	4.763	25.000	39.000
Hendry/Labelle (HNL)	35	7.829	1.963	4.000	11.000
Lee	432	14.718	9.484	0.000	39.000
Off-Campus Collier	104	10.625	3.038	5.000	18.000
Off-Campus Lee	22	21.454	11.923	6.000	38.000

Table 13

Mean Overall Test Scores by Dual Enrollment Indicator

Indicator Value	N	Mean	Standard Deviation	Min.	Max.
Dual Enrollment (DE)	126	12.516	6.966	5	38
Non Dual Enrollment (Non-DE)	457	14.956	9.548	0	40

Table 14

Independent Samples T-test, Satterthwaite Method (Overall Test Score)

Comparison	Difference Between Means	df	t	pr > t	d-est.
DE minus Non-DE	-2.44	268	-3.19	0.002	-0.321

N = 583

MAC 1140 Assessment Results (Spring 2011)

Item	Topic	PRE-Test Correct	POST-Test Correct	Remediation Plans
1	Determining continuity of a piecewise-defined function	58 %	68 %	
2	Describing the end behavior of a polynomial function using proper notation	59 %	63 %	
3	Finding complex roots of a polynomial function	39 %	55 %	
4	Finding the coordinates of a removable point of discontinuity for a rational function	23 %	26 %	
5	Identifying a conic section given certain information	26 %	45 %	
6	Finding the determinant of a 2 x 2 matrix	42 %	87 %	
7	Writing a series using sigma notation	37 %	27 %	
8	Evaluating a series using properties of arithmetic sequences	30 %	62 %	

*396 students took the Pre-Test in January 2011
*164 students took the Post-Test in April 2011 (Assessment instruments were not distributed in time for Charlotte dual-enrollment students to participate.)

	"Post" results still below 60%
	Stagnant results
	Well below 60% and decrease in percent correct

MAC 1105-StudentSatisfaction Fall 2011

	enrollment	Overall mean for COURSE ORGANIZATION AND PLANNING	Overall mean for COMMUNICATION	Overall mean for FACULTY/STUDENT INTERACTION	Overall mean for ASSIGMENTS, EXAMS, AND GRADING	Overall mean for COURSE OUTCOMES
	14	4.2	4.07	4.3	4.1	3.87
	10	4.21	4.41	4.53	4.54	3.56
	5	4.04	3.67	4	4.12	3.64
	6	4.63	3.98	4.5	4.37	4.27
	11	4.44	4.32	4.49	4.54	3.8
	11	4.49	4.21	4.37	4.39	3.76
	8	3.46	3.33	3.59	3.53	3.02
	65					
Mean: Online Sections		4.21	4.00	4.25	4.23	3.70
	34	34.00	3.92	4.14	3.37	2.67
	29	4.41	4.6	4.26	4.28	3.1
	30	3.91	3.71	3.54	4.01	3.52
	35	4.65	4.64	4.65	4.4	3.59
	30	4.69	4.81	4.77	4.61	3.69
	34	4.47	4.45	4.46	4.37	3.65
	30	4.17	4.09	4.13	4.25	3.53
	30	3.7	3.68	3.73	4.04	3.38
	30	4.52	4.54	4.66	4.57	4.04
	39	4.33	4.14	4.54	4.27	3.4
	30	4.21	4.16	4.28	4.33	3.7
	30	4.56	4.57	4.66	4.65	4.04
	29	4.34	4.4	4.48	4.47	3.7
	0	4.79	4.86	4.71	4.75	3.84
	29	4.71	4.79	4.63	4.7	4.06
	30	4.78	4.75	4.8	4.62	3.81
	30	4.12	3.72	3.9	3.47	3.15
	32	4.12	4.12	4.3	3.88	3.31

32	3.91	3.79	3.96	3.82	2.86
34	4.25	3.81	4.48	4.33	3.66
33	4.26	4.06	4.49	4.22	3.91
34	4.22	3.75	4.08	4.04	3.44
36	4.85	4.81	4.85	4.57	3.83
35	4.74	4.74	4.7	4.66	3.82
35	4.81	4.86	4.79	4.66	4.07
36	4.33	4.47	4.31	4.26	3.68
35	3.6	3.49	4.4	3.54	3
35	3.57	3.35	3.68	3.27	2.98
34	3.78	3.57	3.94	3.94	2.91
35	3.72	3.4	3.88	3.78	2.75
35	3.63	3.51	3.89	3.8	3.42
28	4.11	4.02	4.44	4.43	3.79
30	4.69	4.71	4.41	4.41	3.77
28	4.6	4.6	4.48	4.47	3.88
35	4.48	4.44	4.58	4.34	3.52
35	3.81	3.64	3.55	3.66	2.8
32	4.34	4.3	4.31	4.23	3.39
34	4.32	4.27	4.37	4.26	3.61
35	4.42	4.53	4.67	4.07	3.78
16	3.35	3.82	3.71	3.37	2.98
21	2.83	3.67	2.94	3.3	2.65
29	2.83	2.94	2.53	3	2.08
31	3.19	3.38	3.04	3.38	2.7
29	3.43	3.25	*	3.21	2.49
31	3.97	3.95	3.59	3.64	3.11
27	4.31	4.37	4.36	4.32	3.65
30	4.4	4.36	4.16	4.11	3.63
26	4.65	4.64	4.63	4.63	4.07
30	4.77	4.82	4.47	4.54	3.98
31	4.4	4.52	3.92	4.41	3.66
26	4.39	4.48	4.3	4.26	3.72
23	4.84	4.83	4.86	4.69	3.66

	1587					
Mean: Traditional Sections		4.77	4.18	4.22	4.13	3.45