



# **Report on the Assessment of Scientific Reasoning**

**FALL 2013**

*Report prepared by Byron Javier, MXC Office of Research and Planning*

## Summary

### Report on the Fall 2013 Assessment on Scientific Reasoning Ability

During the fall 2013 semester, the College implemented the Classroom Test of Scientific Reasoning (CTSR) in Interdisciplinary courses and high level science courses.

This assessment was conducted under the leadership of the Assessment Committee and the support of the Offices of Instruction and Institutional Research. The project was coordinated by Jane Reynolds, Assessment Committee Chair, and director of the Respiratory Care program.

The instrument was designed to measure students' ability to apply aspects of scientific and mathematical reasoning to analyze a situation to make a prediction or solve a problem. The test was developed by Anton E. Lawson from Arizona State University.

The purpose of the research was to compare the performance of two groups of students at different levels of their college education. The data consisted of 418 students enrolled in the College Success seminar and 760 students enrolled in higher level courses. The total enrollment at the College during fall 2013 semester was 5,316 students. The data represented 22% of that total enrollment. After blank surveys and duplicates were eliminated from the returns, valid and usable surveys remained for a return rate of 55 percent. The demographic profile of the respondents closely matched that of the full student body with respect to gender, academic status, etc.

The following question guided the study:

- Is there a difference between the score of students enrolled in College Success seminar and students enrolled in higher level courses?
- Do students in higher level courses have a positive effect on overall test scores?

The results showed a significant, positive correlation for thirteen of the questions.

We expect that the results from this assessment will provide evidence to support the efforts to identify the areas where students have a strong understanding of concepts and where to concentrate more resources to ensure student success.

# **A Comparison of Student Performance in Scientific Reasoning Ability**

## **Background**

As part of the colleges' on-going effort to provide and maintain high quality instruction to students, the assessment committee implemented the test of Classroom Test of Scientific Reasoning was administered during the fall 2013 semester.

The timing of this effort was prompted by five-year assessment plan established at the district level. Therefore, the assessment committee in consultation with the Office of Academic Affairs and the Office of Institutional Research and Planning, implemented the test, which was designed to measure students' ability to apply aspects of scientific and mathematical reasoning to analyze a situation to make a prediction or solve a problem. The results from this test are supposed to help faculty determine where students have a strong understanding of concepts and where they may need help.

The purpose of the research was to compare the performance of two groups of students at different levels of their college education: students who have enrolled less than one semester at the college and have not taken any science course, and students who have been enrolled at the college at least 2 semesters and have taken the necessary requirements to complete higher level science courses.

## **Methodology**

### **Instrumentation**

The test was developed by Anton E. Lawson from Arizona State University, and it contains 24 multiple-choice questions.

This multiple-choice test includes questions on conservation, proportional thinking, identification of variables, probabilistic thinking, and hypothetico-deductive reasoning.

The answer sheet contained two parts: (1) Demographic Questions – questions referring to age, gender, ethnic background, (2) 24-multiple choice questions – questions developed to measure the students' ability to understand key scientific and mathematical concepts.

A copy of the test is provided in Appendix A.

### **Procedure**

To quantify the level of Scientific Reasoning ability by our students, we designed the study to compare the distribution of correct answers by students enrolled in the College Success seminar (Group 1) and those enrolled in higher level courses (Group 2).

To implement the assessment, the assessment committee determined that all sections of College Success Seminar (INTDSP 101) were to administer the test. A total of 27 sections with an approximate enrollment of 843 students were selected. We received 418 complete responses, a almost 50% response rate.

Students from the higher level courses were selected from students enrolled in Biology courses (122, 130, 131, 209, 226, and 227), Chemistry courses (201, 203, 205, and 207), Physics courses (131 and 201), Physical Sciences courses (101, 107 and 111), and Microbiology courses (233). Appendix 2 shows tables with the number of students for each course and their corresponding number of responses.

### **Data Collection**

Using the class size report, the institutional researcher extracted the courses and sections to be used during the assessment. Appendix 2 provides a detailed description of the selected courses.

### **Demographic Questions**

Students were requested to complete the demographic section in the survey to make sure we had a representative sample. Thus, the distribution of demographic characteristics described in this section reflects the overall enrollment at the College.

Responses to the demographic questions were tabulated and comparisons were made with the overall student population. In general, gender, ethnicity, and age distributions of the respondents reflected demographic characteristics of our student population. Appendix 3 shows overall enrollment at the college for the fall 2013 semester.

## RESULTS FROM DEMOGRAPHIC SECTION

The following tables describe the participants' characteristics.

**Table 1: What is your gender?**

Category	Group 1	Group 2
Male	31.8%	23.9%
Female	64.8%	73.3%
No response	3.3%	2.8%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 2: What is your age?**

Category	Group 1	Group 2
Under 18	0.5%	0.1%
18 – 20	56.0%	10.1%
21 – 25	16.3%	34.6%
26 – 30	8.1%	22.1%
31 – 36	4.5%	16.4%
37 – 40	3.3%	6.3%
40 and above	7.9%	7.9%
No response	3.3%	2.4%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 3: Are you Latino/Hispanic?**

Category	Group 1	Group 2
Yes	28.5%	27.4%
No	65.1%	66.4%
Prefer not to disclose	2.9%	3.4%
No response	3.6%	2.8%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 4: Race (Choose all that apply)**

Category	Group 1	Group 2
American Indian or Alaska Native	3.8%	2.0%
Native Hawaiian or Other Pacific Islander	1.7%	0.8%
Asian	2.6%	9.7%
White	11.5%	25.1%
Black or African American	59.3%	42.6%
No response	21.1%	19.7%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 5: Including the current term, how many semesters have you been enrolled at MXC?**

Category	Group 1	Group 2
1 semester (new student)	84.9%	25.7%
3 semesters	8.1%	33.3%
4 semesters	1.0%	15.1%
5 semesters	0.7%	8.9%
6 semesters or more	1.4%	13.7%
No response	4.3%	3.3%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 6: What is your current enrollment status?**

Category	Group 1	Group 2
Full-time	79.4%	53.6%
Part-time	17.5%	43.9%
No response	3.1%	2.5%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 7: How many hours in a typical week are you employed?**

Category	Group 1	Group 2
I do not work	50.0%	24.7%
Less than 28	19.9%	21.1%
29 to 34	10.5%	12.4%
35 to 40	9.8%	26.3%
More than 40	6.5%	12.8%
No response	3.3%	2.8%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 8: What is the highest level of education you have completed?**

Category	Group 1	Group 2
Less than High School	1.7%	0.1%
High School/GED	58.4%	13.2%
Some College	31.1%	44.5%
2-Year College Degree (Associates Degree)	2.6%	13.7%
Other:	3.3%	25.9%
No response	2.9%	2.6%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 9: What is the highest level of education you intend to complete?**

Category	Group 1	Group 2
2-Year College Degree (Associate's)	23.0%	10.8%
4-Year College Degree (BA, BS)	40.0%	31.6%
Master's Degree (M.S., M.A.)	18.9%	31.7%
Doctoral Degree (EdD, PhD)	7.7%	12.6%
Professional Degree (MD, JD)	5.3%	8.9%
No response	5.3%	4.3%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 10: What is your marital status?**

Category	Group 1	Group 2
Single	84.2%	75.9%
Married	6.2%	13.9%
Divorced	2.6%	3.3%
Widowed	0.5%	0.5%
Other	3.6%	3.7%
No response	2.9%	2.6%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 11: Do you have any children?**

Category	Group 1	Group 2
Yes	32.8%	35.7%
No	64.3%	61.7%
No response	2.9%	2.6%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 12: If you answered YES to the previous questions, how many children do you have?**

Category	Group 1	Group 2
1	17.0%	16.4%
2	5.7%	10.3%
3	5.7%	5.3%
4	2.4%	3.2%
More than 5	2.6%	0.7%
No response	66.5%	64.2%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 13: What is the relevance of science to your future career?**

<b>Category</b>	<b>Group 1</b>	<b>Group 2</b>
Very high	31.6%	62.0%
High	25.1%	19.9%
Medium	22.2%	10.9%
Low	6.5%	1.8%
Very low	5.7%	0.5%
Not relevant at all	5.5%	2.1%
No response	3.3%	2.8%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>



**Table 14****ANSWERS PROVIDED BY STUDENTS IN GROUP 1**

This table provides the number of students from group 1 and their choices by question. For example, question 1 was answered correctly by 291 students. The correct answer for that particular question is B. Question 2 was answered correctly by 263 students.

	A	B	C	D	E	Blank	Total
Question 1	27	291	97	3	0	0	418
Question 2	23	40	78	263	13	1	418
Question 3	120	237	55	4	1	1	418
Question 4	36	30	222	29	100	1	418
Question 5	240	59	36	29	53	1	418
Question 6	49	215	72	58	24	0	418
Question 7	53	223	31	51	57	3	418
Question 8	105	56	60	143	54	0	418
Question 9	28	136	53	85	115	1	418
Question 10	28	124	132	101	32	1	418
Question 11	115	87	158	47	8	3	418
Question 12	61	74	110	109	60	4	418
Question 13	115	84	157	51	9	2	418
Question 14	66	102	99	94	53	4	418
Question 15	118	141	105	29	23	2	418
Question 16	215	35	80	37	50	1	418
Question 17	87	130	116	72	10	3	418
Question 18	35	80	86	96	117	4	418
Question 19	182	90	119	17	6	4	418
Question 20	98	134	44	109	27	6	418
Question 21	54	141	102	40	72	9	418
Question 22	114	130	95	58	13	8	418
Question 23	107	142	121	37	4	7	418
Question 24	97	149	109	45	11	7	418

**Table 15****Percent of Answers – Group 1**

This table provides the percent of students from group 1 and their choices by question. For example, question 1 was answered correctly by 70% students, while 30% of them provided an incorrect answer. Most of the incorrect answers were given to the option C (23%). The correct answer for that particular question is B. Question 2 was answered correctly by 63% students. Options B and C received respectively 10% and 19% of the incorrect answers.

	A	B	C	D	E	Blank	Total
Question 1	6%	70%	23%	1%	0%	0%	100%
Question 2	6%	10%	19%	63%	3%	0%	100%
Question 3	29%	57%	13%	1%	0%	0%	100%
Question 4	9%	7%	53%	7%	24%	0%	100%
Question 5	57%	14%	9%	7%	13%	0%	100%
Question 6	12%	51%	17%	14%	6%	0%	100%
Question 7	13%	53%	7%	12%	14%	1%	100%
Question 8	25%	13%	14%	34%	13%	0%	100%
Question 9	7%	33%	13%	20%	28%	0%	100%
Question 10	7%	30%	32%	24%	8%	0%	100%
Question 11	28%	21%	38%	11%	2%	1%	100%
Question 12	15%	18%	26%	26%	14%	1%	100%
Question 13	28%	20%	38%	12%	2%	0%	100%
Question 14	16%	24%	24%	22%	13%	1%	100%
Question 15	28%	34%	25%	7%	6%	0%	100%
Question 16	51%	8%	19%	9%	12%	0%	100%
Question 17	21%	31%	28%	17%	2%	1%	100%
Question 18	8%	19%	21%	23%	28%	1%	100%
Question 19	44%	22%	28%	4%	1%	1%	100%
Question 20	23%	32%	11%	26%	6%	1%	100%
Question 21	13%	34%	24%	10%	17%	2%	100%
Question 22	27%	31%	23%	14%	3%	2%	100%
Question 23	26%	34%	29%	9%	1%	2%	100%
Question 24	23%	36%	26%	11%	3%	2%	100%

**Table 16****ANSWERS PROVIDED BY STUDENTS IN GROUP 2**

This table provides the number of students from group 1 and their choices by question. For example, question 1 was answered correctly by 633 students. The correct answer for that particular question is B. Question 2 was answered correctly by 605 students.

	A	B	C	D	E	Blank	Total
Question 1	42	<b>633</b>	82	1	0	2	760
Question 2	31	34	68	<b>605</b>	19	3	760
Question 3	<b>271</b>	421	61	6	0	1	760
Question 4	39	37	393	50	<b>240</b>	1	760
Question 5	442	<b>167</b>	48	40	62	1	760
Question 6	39	378	<b>199</b>	106	36	2	760
Question 7	73	398	66	<b>119</b>	102	2	760
Question 8	<b>297</b>	68	56	258	80	1	760
Question 9	26	190	78	105	<b>356</b>	5	760
Question 10	39	169	<b>359</b>	158	29	6	760
Question 11	183	<b>213</b>	278	68	15	3	760
Question 12	<b>136</b>	159	145	239	77	4	760
Question 13	199	120	<b>354</b>	70	10	7	760
Question 14	87	155	142	<b>260</b>	109	7	760
Question 15	165	245	<b>297</b>	26	21	6	760
Question 16	<b>504</b>	47	122	40	42	5	760
Question 17	90	<b>377</b>	163	109	16	5	760
Question 18	36	139	105	149	<b>323</b>	8	760
Question 19	<b>432</b>	123	159	31	6	9	760
Question 20	140	211	69	<b>300</b>	34	6	760
Question 21	<b>174</b>	197	142	98	138	11	760
Question 22	<b>227</b>	266	143	96	20	8	760
Question 23	<b>209</b>	278	210	48	7	8	760
Question 24	127	359	<b>181</b>	62	22	9	760

**Table 17****Percent of Answers – Group 2**

This table provides the percent of students from group 1 and their choices by question. For example, question 1 was answered correctly by 83% students, while 17% of them provided an incorrect answer. Most of the incorrect answers were given to the option C (23%). These results were consistent with the results from group 1. Question 2 was answered correctly by 80% students. Options A, B and C received respectively 4, 4% and 9% of the incorrect answers.

	A	B	C	D	E	Blank	Total
Question 1	6%	83%	11%	0%	0%	0%	100%
Question 2	4%	4%	9%	80%	3%	0%	100%
Question 3	36%	55%	8%	1%	0%	0%	100%
Question 4	5%	5%	52%	7%	32%	0%	100%
Question 5	58%	22%	6%	5%	8%	0%	100%
Question 6	5%	50%	26%	14%	5%	0%	100%
Question 7	10%	52%	9%	16%	13%	0%	100%
Question 8	39%	9%	7%	34%	11%	0%	100%
Question 9	3%	25%	10%	14%	47%	1%	100%
Question 10	5%	22%	47%	21%	4%	1%	100%
Question 11	24%	28%	37%	9%	2%	0%	100%
Question 12	18%	21%	19%	31%	10%	1%	100%
Question 13	26%	16%	47%	9%	1%	1%	100%
Question 14	11%	20%	19%	34%	14%	1%	100%
Question 15	22%	32%	39%	3%	3%	1%	100%
Question 16	66%	6%	16%	5%	6%	1%	100%
Question 17	12%	50%	21%	14%	2%	1%	100%
Question 18	5%	18%	14%	20%	43%	1%	100%
Question 19	57%	16%	21%	4%	1%	1%	100%
Question 20	18%	28%	9%	39%	4%	1%	100%
Question 21	23%	26%	19%	13%	18%	1%	100%
Question 22	30%	35%	19%	13%	3%	1%	100%
Question 23	28%	37%	28%	6%	1%	1%	100%
Question 24	17%	47%	24%	8%	3%	1%	100%

**Table 18**

**Number of Correct Answers**

The following tables provide the distribution of the number of correct answers obtained by students.

In group 1, only one student obtained an almost perfect score (21 correct answers)

**Group 1**

Correct	count	percent
0	1	0.2%
1	8	1.9%
2	14	3.3%
3	30	7.2%
4	35	8.4%
5	60	14.4%
6	52	12.4%
7	52	12.4%
8	47	11.2%
9	39	9.3%
10	29	6.9%
11	19	4.5%
12	8	1.9%
13	3	0.7%
14	4	1.0%
15	4	1.0%
16	3	0.7%
17	5	1.2%
18	1	0.2%
19	2	0.5%
20	1	0.2%
21	1	0.2%
<b>Total</b>	<b>418</b>	<b>100.0%</b>

**Group 2**

Correct	count	percent
0	2	0.3%
1	5	0.7%
2	10	1.3%
3	35	4.6%
4	51	6.7%
5	62	8.2%
6	70	9.2%
7	76	10.0%
8	79	10.4%
9	56	7.4%
10	53	7.0%
11	36	4.7%
12	36	4.7%
13	29	3.8%
14	32	4.2%
15	19	2.5%
16	14	1.8%
17	27	3.6%
18	17	2.2%
19	15	2.0%
20	15	2.0%
21	8	1.1%
22	8	1.1%
23	5	0.7%
<b>Total</b>	<b>760</b>	<b>100.0%</b>

**Table 19**

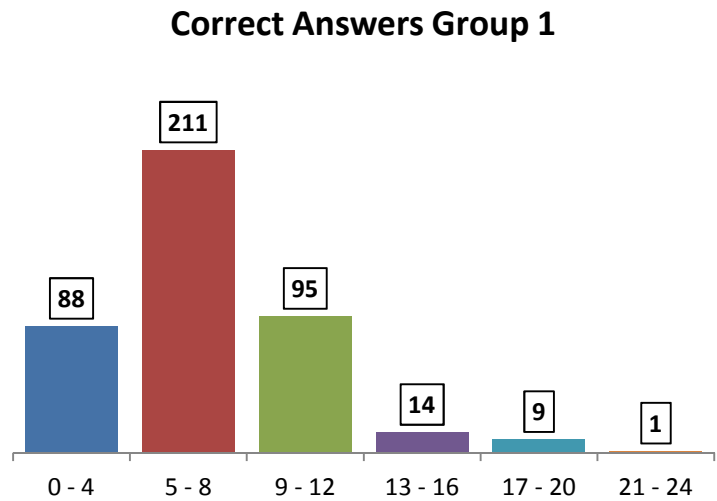
**Comparing the Number of Correct Answers by Group**

The following tables and graphs provide a distribution of the number of correct answers provided by students.

**Group 1**

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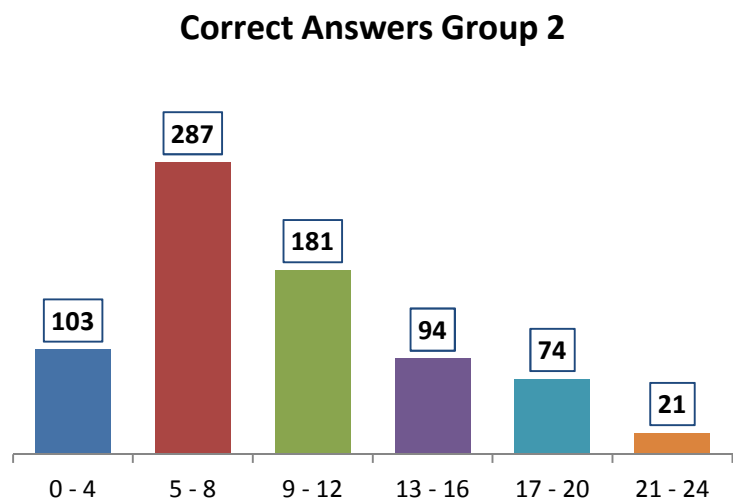
range	count	percent
0 - 4	88	21.1%
5 - 8	211	50.5%
9 - 12	95	22.7%
13 - 16	14	3.3%
17 - 20	9	2.2%
21 - 24	1	0.2%
<b>Total</b>	<b>418</b>	<b>100.0%</b>



**Group 2**

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range	count	percent
0 - 4	103	13.6%
5 - 8	287	37.8%
9 - 12	181	23.8%
13 - 16	94	12.4%
17 - 20	74	9.7%
21 - 24	21	2.8%
<b>Total</b>	<b>760</b>	<b>100.0%</b>



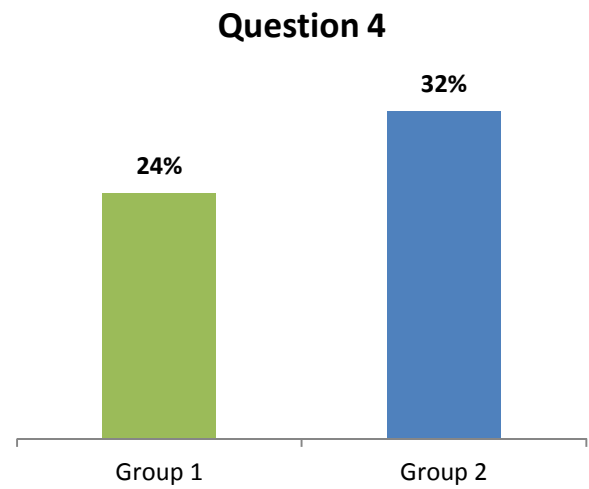
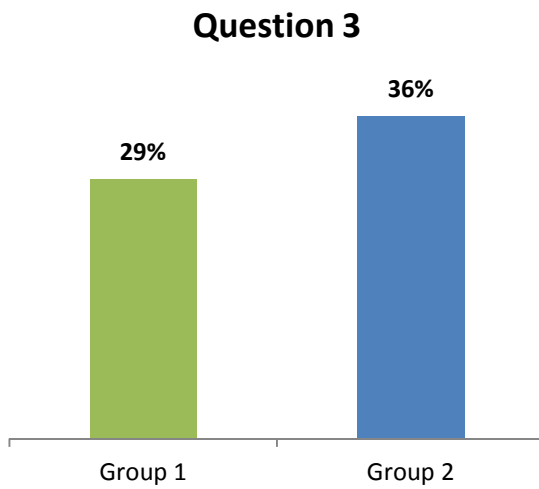
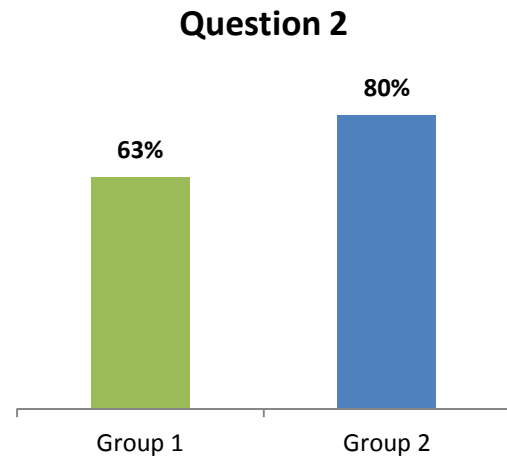
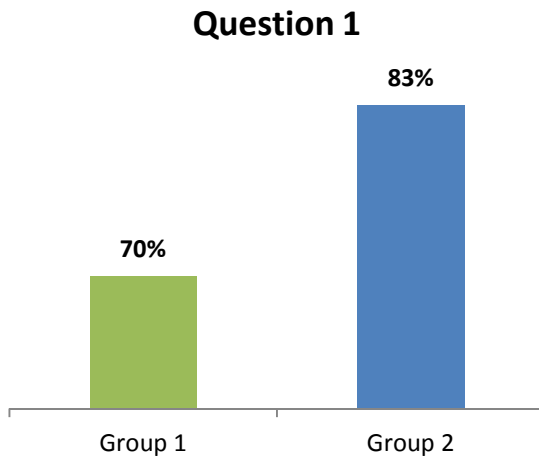
**Table 20****Comparing the Answers from the Two Groups**

Questions	Group 1	Group 2	Answer	% Change	
Question 1	70%	83%	B	16%	↓
Question 2	63%	80%	D	21%	↓
Question 3	29%	36%	A	19%	↓
Question 4	24%	32%	E	25%	↓
Question 5	14%	22%	B	36%	↑
Question 6	17%	26%	C	35%	↑
Question 7	12%	16%	D	25%	↓
Question 8	25%	39%	A	36%	↑
Question 9	28%	47%	E	40%	↑
Question 10	32%	47%	C	32%	↑
Question 11	21%	28%	B	25%	↓
Question 12	15%	18%	A	17%	↓
Question 13	38%	47%	C	19%	↓
Question 14	22%	34%	D	35%	↑
Question 15	25%	39%	C	36%	↑
Question 16	51%	66%	A	23%	↓
Question 17	31%	50%	B	38%	↑
Question 18	28%	43%	E	35%	↑
Question 19	44%	57%	A	23%	↓
Question 20	26%	39%	D	33%	↑
Question 21	13%	23%	A	43%	↑
Question 22	27%	30%	A	10%	↓
Question 23	26%	28%	A	7%	↓
Question 24	26%	24%	C	-8%	↓

This table provides a comparison between the two groups and the number of correct answers by question. The percent change provides how large the difference between the two groups is.

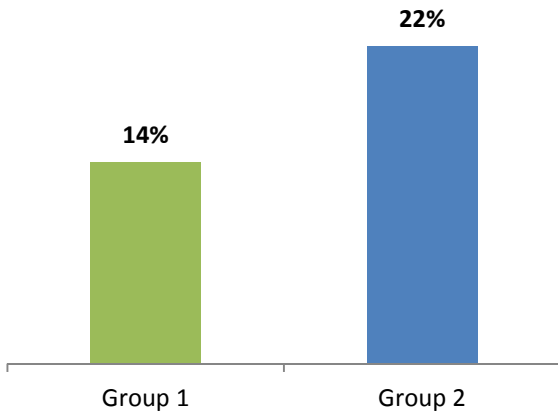
## Comparing Answers to each Question by Group

These graphs offer a visual aid to compare the percent of correct responses by each group to each question.

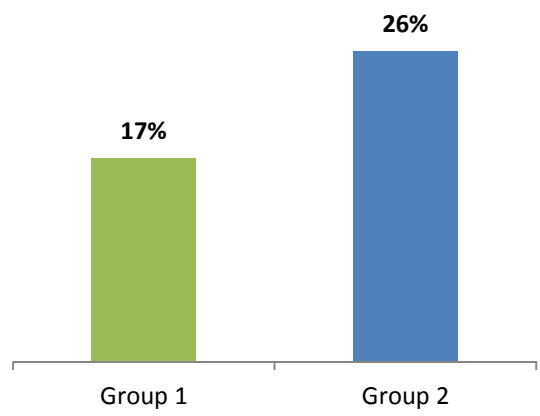




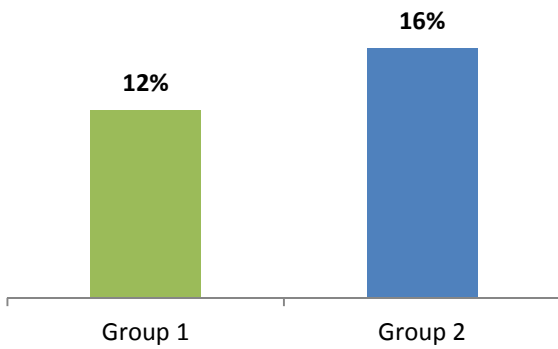
**Question 5**



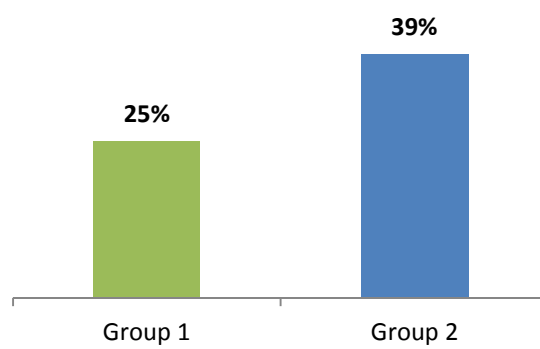
**Question 6**



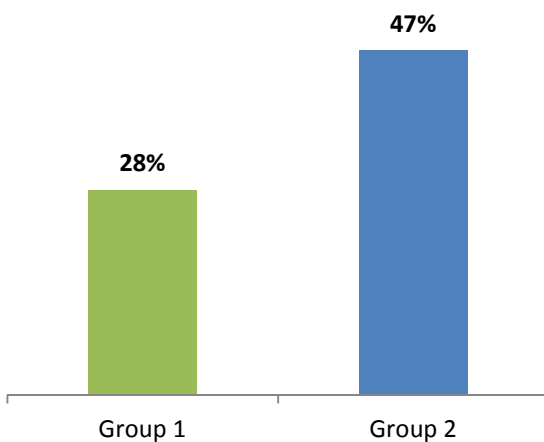
**Question 7**



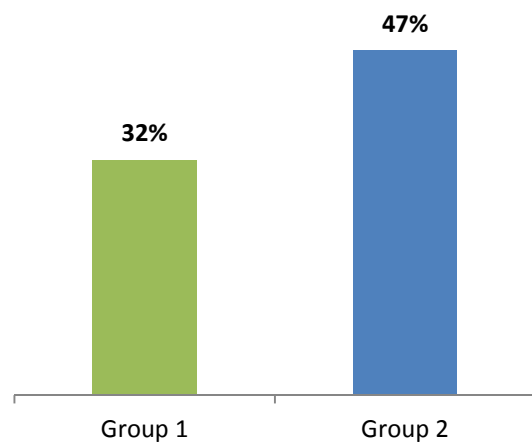
**Question 8**

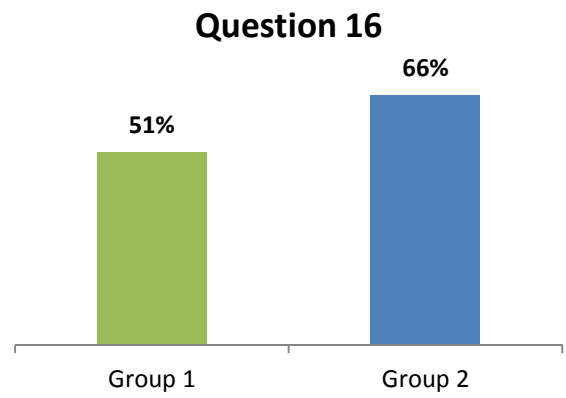
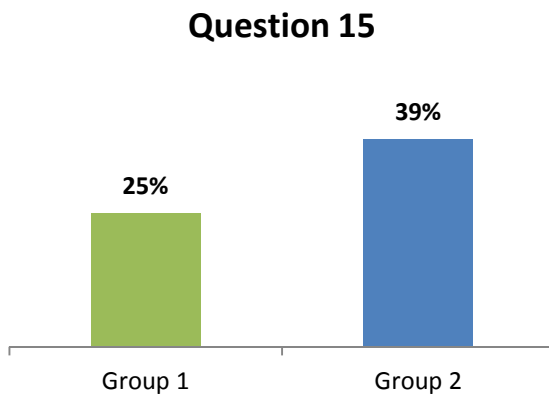
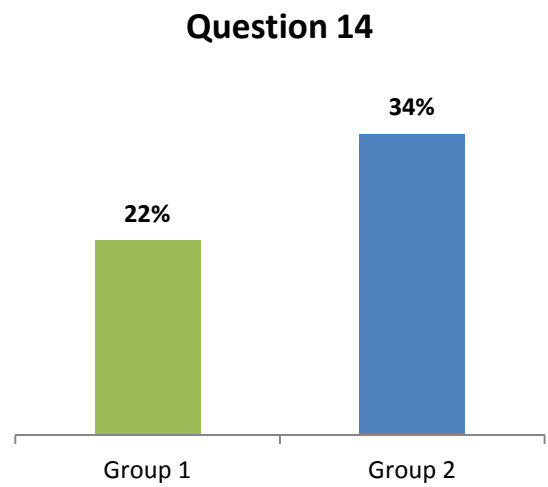
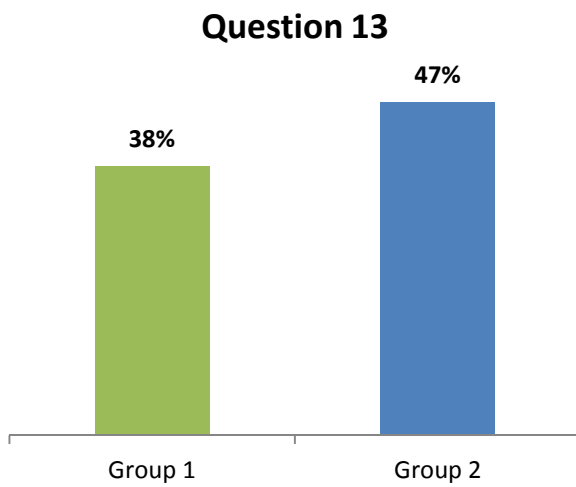
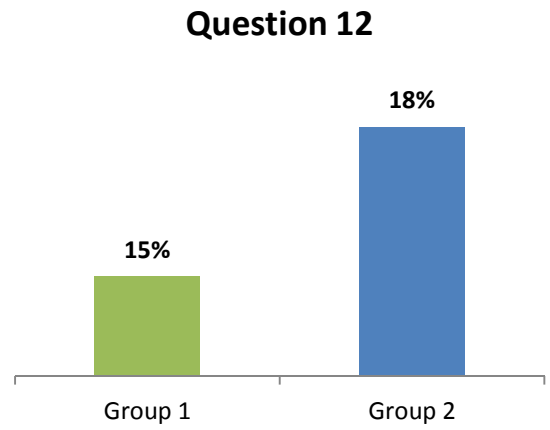
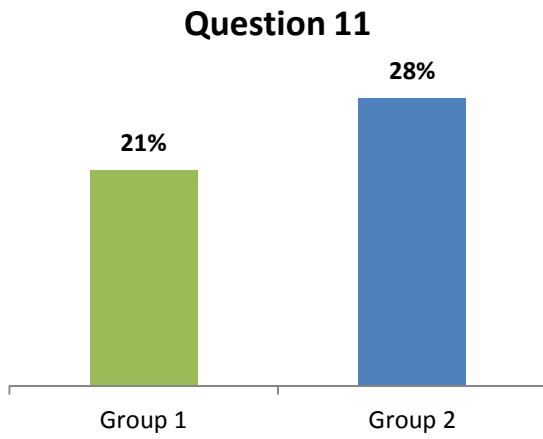


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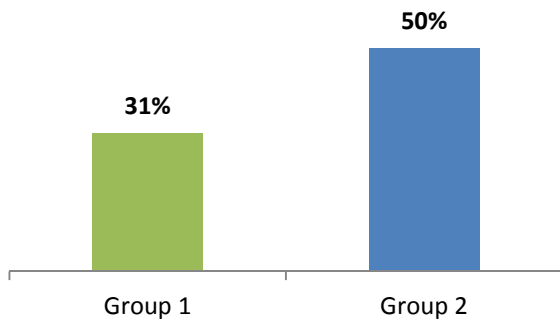


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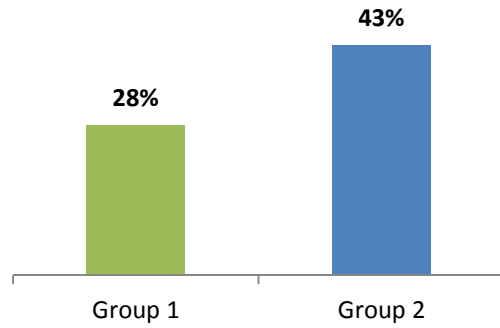




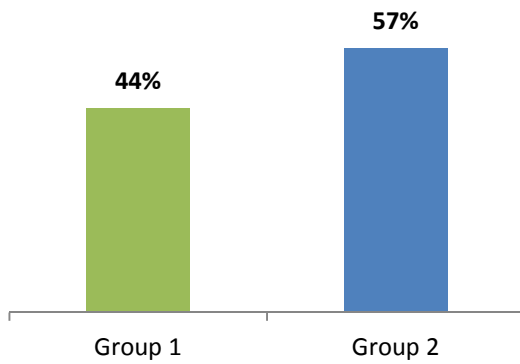
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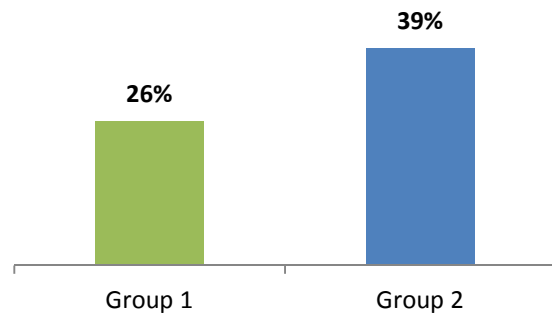
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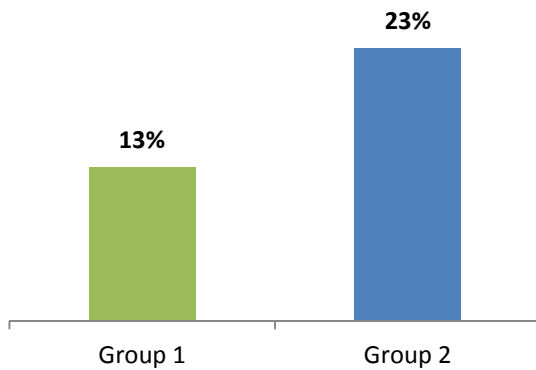
**Question 19**



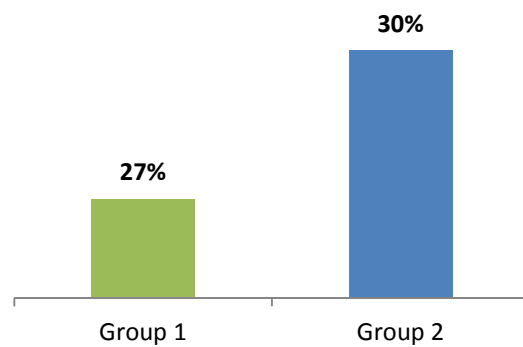
**Question 20**



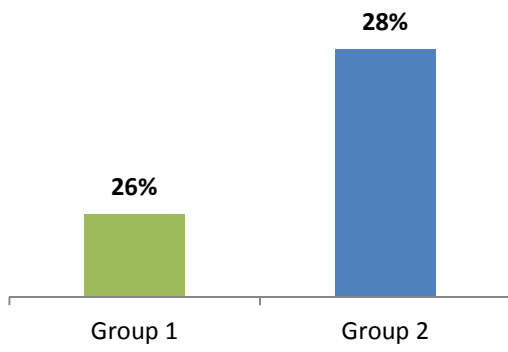
**Question 21**



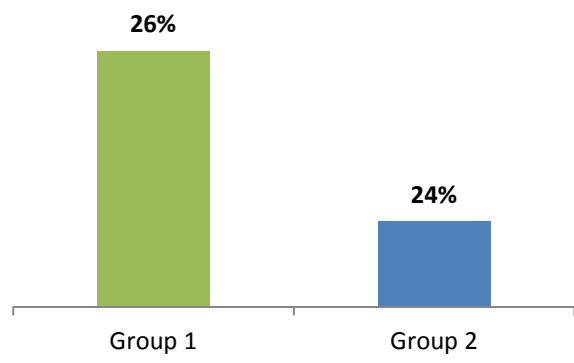
**Question 22**



### Question 23



### Question 24



## ANALYSIS OF RESULTS AND DISCUSSION

### Independent Samples T-tests for Scientific Reasoning Assessment Test

The purpose of the research was to compare the performance of two groups of students at different levels of their college education: students who have enrolled less than one semester at the college and have not taken any science course, and students who have been enrolled at the college at least 2 semesters and have taken the necessary requirements to complete higher level science courses.

The research questions were determined by the need to explore what students know when they reach higher level courses compared to what students bring with them when they enroll in college.

The following questions guided the study:

- Is there a difference between the score of students enrolled in College Success seminar and students enrolled in higher level courses?
- Do students in higher level courses have a positive effect on overall test scores?

**Null hypothesis:** there is **NO** difference between the mean score of psychology students and law students.

$$h_0: \mu_1 = \mu_2$$

**Alternative hypothesis:** there is difference between the mean score of psychology students and law students.

$$h_a: \mu_1 \neq \mu_2$$

The independent t-tests indicated that international first-year students scored higher than their American counterparts on level of academic challenge, active and collaborative learning, student-faculty interaction, and technology use

**Table 21****Results**

	Group 1			Group 2			Sig. (2-tailed)
	N	Mean	Std Dev	N	Mean	Std Dev	
Question 1	418	2.18	.541	758	2.06	.407	.000
Question 2	417	3.49	.915	757	3.72	.766	.000
Question 3	417	1.87	.681	759	1.74	.634	.001
Question 4	417	3.30	1.165	759	3.55	1.135	.001
Question 5	417	2.03	1.445	759	1.83	1.251	.013
Question 6	418	2.50	1.053	758	2.63	.949	.033
Question 7	415	2.60	1.252	758	2.71	1.234	.172
Question 8	418	2.96	1.415	759	2.68	1.522	.002
Question 9	417	3.29	1.349	755	3.76	1.355	.000
Question 10	417	2.96	1.057	754	2.96	.891	.930
Question 11	415	2.39	1.066	757	2.36	1.007	.710
Question 12	414	3.08	1.268	756	2.95	1.286	.097
Question 13	416	2.41	1.083	753	2.43	1.020	.747
Question 14	414	2.92	1.273	753	3.20	1.247	.000
Question 15	416	2.27	1.114	754	2.33	.946	.385
Question 16	417	2.21	1.449	755	1.77	1.220	.000
Question 17	415	2.49	1.079	755	2.45	.950	.510
Question 18	414	3.43	1.307	752	3.78	1.301	.000
Question 19	414	1.97	1.012	751	1.74	.979	.000
Question 20	412	2.59	1.282	754	2.84	1.255	.002
Question 21	409	2.84	1.286	749	2.77	1.418	.411
Question 22	410	2.33	1.120	752	2.22	1.093	.110
Question 23	411	2.24	.972	752	2.16	.934	.138
Question 24	411	2.33	1.037	751	2.32	.948	.953

The following questions Q1,Q2,Q3,Q4,Q5,Q6,Q8, Q09,Q14,Q16,Q18,Q19,Q20 had a p-value less than 0.05; therefore, we have to reject the null hypothesis and conclude that there is a difference between the mean score of students in group 1 and students in group 2 at a 5% significance level.

That is, in 13 out of 24 questions, or 54.17%, group 2 performed statistically different that group 1.

## **APPENDIX 1**

Copy of Test

## APPENDIX 2

The following table shows the number of students enrolled in the College Success seminar course and the number of students that participated.

Subject	Respondents	Total Enrollment	percent
INTDSP	418	843	49.6%

In total, 27 sections from the College Success seminar participated in the assessment. We had 17 regular sessions and 10 mini sessions. Overall almost 50% of the sampled students participated in the test.

### Higher Level Courses Selection

The following tables show the number of sections and enrollment. This is the pool used for group 2.

#### Biology Courses

Courses	# Sections	Class Size
122	3	43
130	1	20
131	1	20
209	1	18
226	10	319
227	7	211
<b>Total</b>	<b>23</b>	<b>631</b>

#### Chemistry Courses

Course	# Sections	Class Size
201	4	108
203	1	21
205	1	22
207	1	10
<b>Total</b>	<b>16</b>	<b>215</b>

#### Physics Courses

Course	# Sections	Class Size
131	2	29
201	1	23
<b>Total</b>	<b>3</b>	<b>52</b>

#### Physical Sciences Courses

Course	# Sections	Class Size
101	3	80
107	1	8
111	1	20
<b>Total</b>	<b>5</b>	<b>108</b>

#### Microbiology Courses

Course	# Sections	Class Size
233	7	178
<b>Total</b>	<b>7</b>	<b>178</b>



These tables show the number of participants by discipline and the rate of return.

<b>SUBJECT</b>	<b>count</b>	<b>total</b>	<b>rate of return</b>
Biology	435	631	69%
Chemistry	52	215	24%
Microbiology	115	178	65%
Physics		52	56%
Physical Sciences		108	
<b>Total</b>	<b>691</b>	<b>1184</b>	<b>58%</b>

In addition of the general education courses, we also had participation from the following programs:

<b>SUBJECT</b>	<b>count</b>	<b>total</b>	<b>rate of return</b>
Physician Assistant	13	21	62%
Respiratory Therapy	25	56	27%
Mortuary Science	18	24	75%
Renal Tech	13	15	92%
<b>Total</b>	<b>69</b>	<b>126</b>	<b>55%</b>

In total, we had the following selection, the number of responses, and the rate of return.

<b>Level</b>	<b>Returned</b>	<b>Distributed</b>	<b>rate of return</b>
INTDSP	418	843	50%
Higher Level courses	760	1310	58%
<b>Total</b>	<b>1178</b>	<b>2153</b>	<b>55%</b>

## APPENDIX 3

### College Enrollment during Fall 2013

#### Headcount Enrollment by Race/Ethnicity

	Asian	Native American	Black/African American	Hispanic	White	Total
Credit	4%	<1%	63%	23%	7%	5,316

#### Headcount by Gender

	Male	Female	Total
Credit	29%	71%	5,316

#### Headcount Enrollment by Age

	<21	21 - 30	31 - 39	>40	Total
Credit	32%	41%	15%	12%	5,316

#### Headcount Enrollment by Employment Status

	Full time	Part time	Not Employed	Other	Total
Credit	21%	18%	47%	13%	5,316

*Other includes homemaker, no responses, and other*

#### Headcount Enrollment by Semester Hours Enrolled

	1 - 3	4 - 6	7 - 11	>12	Total
Credit	7%	16%	21%	57%	5,316

#### Headcount Enrollment for New and Continuing Students

	Total	Percent
Continuing Students	1,701	68%
New Students	3,615	32%