Mission Statement

Citrus College delivers high quality instruction that empowers students to compete globally and to contribute to the economic growth of today's society.

We are dedicated to fostering a diverse educational community and cultural learning environment that supports student success in pursuit of academic excellence, economic opportunity, and personal achievement.

Research Briefs is a publication of the Office of Institutional Research. Questions may be directed to Dr. Lan Hao, director of institutional research, lhao@citruscollege.edu.

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Assessing Student Learning Outcomes for Biology 105

Overview

This analysis examines student learning outcomes after taking Biology 105 and determines whether their general knowledge improved after taking the course. Initial test results show improvement in the test scores. The purpose of the research is to find out whether there is statistical significance in the test score increases and whether there are factors that influence students' performance on both the pre-test and the post-test.

Data

- 540 students were tested.
- Out of 540 students, 281 had both pre-test and post-test scores.
- Each test had six questions.
- The Pre-Test was administered during week 4 of Fall Semester 2007.
- The Post-Test was administered during week 15 of Fall Semester 2007.
- Students were also asked questions about factors that may have an effect on their test scores such as age, gender, and academic backgrounds.

Methodology

The Biology Department provided the Research Office with raw data. The findings are based upon comparing the mean differences in pre-test and post-test scores for Biology 105 students. We used the t-test to determine whether the improvement in students' test scores at the end of the semester was significant. We set the probability level at the 95% confidence interval to reject or accept the hypothesis that **after taking Biology 105, students' general knowledge in the biology field should increase.**

The following pages present student demographics, finding and other relevant data.

Demographics of Students Taking the Pre-Test and the Post-Test

Table 1. Student Age Groups

Age	Students	
18 or younger	34	12.1%
19-24	172	61.2%
25-29	30	10.7%
30-49	34	12.1%
50 or older	1	0.4%
Unknown	10	3.6%
Total	281	100.0%

Table 2. Student Gender

Gender	Students	
Male	108	38.4%
Female	163	58.0%
Unknown	10	3.6%
Total	281	100.0%

Table 3. Student Race/Ethnicity

Ethnicity	Students	
African American/ Black	9	3.2%
Asian American/ Asian/South East Asian/ Pacific Islander	47	16.7%
Hispanic or Latino/a	104	37.0%
White/ Caucasian	95	33.8%
Other	14	5.0%
Unknown	12	4.3%
Total	281	100.0%

Findings

Upon using the t-test, we found that the increase between students' pre-test and post-test scores was statistically significant. The t-score was 21.892 with a p-score less than .001, which means that the score difference is statistically significant; it can be expected that if the test was administered again, the result would be expected to remain the same.

Table 4 contains data pertaining to the data range of pre-score and post-score tests as well as the average for each test. We found that age has a slight effect on students' performance in the pre-test, but not the post-test. Table 5 shows that students in the older age group did not perform as well in the post-test; however, when it comes to correlation to improvements in their performance, age no longer had an effect. Tables 6 and 7 provide average test score for both pre-test and post-test by gender and ethnicity respectively.

Table 4. **Pre-Score & Post-Score**

	Pre-score	Post-score	Score difference
Data Range	0 to 6	0 to 6	-2 to 6
Score Average	2.33	4.32	1.99

Table 5. Score distribution by age groups

	18 or younger	19-24	25-29	30-49	50 or older	Total Mean
Pre-Score Mean	2.6	2.4	2.1	1.8	4.0	2.4
Post-Score Mean	4.5	4.3	4.5	4.2	2.0	4.3

Table 6. Score distribution by gender

	Female	Male	Total Mean
Pre-Score Mean	2.4	2.3	2.4
Post-Score Mean	4.3	4.4	4.3

Table 7. Score distribution by ethnicity

	African American/ Black	Asian American/ Asian/South East Asian/ Pacific Islander	Hispanic or Latino/a	Other	White/ Caucasian	Total Mean
Pre-Score Mean	1.9	2.2	2.4	2.3	2.4	2.4
Post-Score Mean	4.4	4.6	4.4	4.1	4.3	4.4