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Do Students in Upward Bound have an Increase in Grade Point Average?

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Abstract: TRiO Programs were established by President Johnson in the 1960s and aim to serve at-risk students by increasing their educational opportunities (See[1]). This investigation looks to determine if there is a change in GPA between the fall semester and spring semester for students in Upward Bound. It also analyzes if the average difference in GPA between the two semesters is different between the three schools that the Hope College Upward Bound Program targets. Using a student t-test, the average differences in GPA (spring-fall) for the 88 students participating in Upward Bound during the 2012-2013 school year was analyzed. The results were found to be insignificant as student t-test produced a t-statistic of -0.971 and a corresponding p-value of 0.365. A simulation based multiple means test was also used to analyze the average difference in GPA between the three target schools. These results were also insignificant as the MAD statistic was 0.19 with a corresponding p-value of 0.611. The analysis is very limited as it only looks over a short time frame and does not account for changes in GPA that occur over the four years the students are enrolled in Upward Bound.

Introduction:

- In 2010, median gap in annual earning between a high school and college graduate was \$19,550 (See[2]).
- TRiO programs established 1964-1968 as part of President Johnson's War on Poverty.
- Upward Bound provides, "academic tutoring, personal counseling, mentoring, financial guidance, and other supports necessary for educational access and retention (See [1])."
- How can I as a future teacher better understand how to bridge the gap for at-risk students?

Methods:

- 88 students 2012-2013 Hope College UB Program
- Data consisted of the fall semester GPA and spring semester GPA and school attended
- Difference in GPA calculated by spring-fall



Figure 1: Hope College Upward Bound graduates

Results (difference in GPA):

- Difference in average GPA between semesters
- Mean difference of -0.019, standard deviation 0.194.
- Heavily concentrated around zero, potential outlier at 1.2
- Conducted a 2 sided student t-test

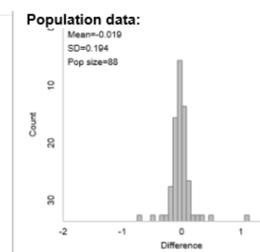


Figure 2: Difference of GPA between semesters

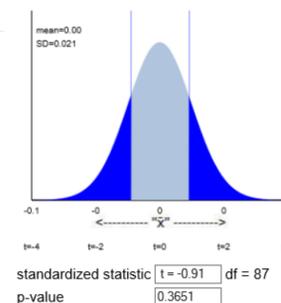


Figure 3: Theoretical distribution of difference of GPA

- T-statistic of -0.971
- Degrees of freedom=87
- P-value= 0.365
- 95% confidence interval for the true difference of GPA is equal to -.399, .362.

Results (GPA difference between schools):

- All schools do not meet validity conditions (12, 31, 45)
- Conducted a simulation based multiple means tests

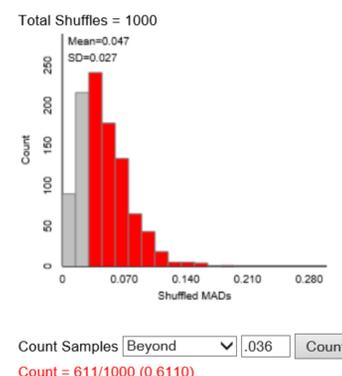


Figure 4: Simulation based MAD distribution between the three target schools

- Observed MAD statistic of 0.036.
- Simulation p-value of 0.611

Discussion:

- My data shows no statistically significant difference in true average GPA between fall and spring semesters as p-value is greater than 0.05.
- Supported by the confidence interval which includes zero.
- My data shows there is no statistically significant difference in average change in GPA between the three target schools as p-value is greater than 0.05.

Limitations:

- No random assignment, so I cannot conclude that any difference in GPA is caused by participation in Upward Bound.
- Cannot generalize my findings to the Hope College Upward Bound Program as I looked at data solely from the 2012-2013 school year.
- Analysis is very limited as I look over such a short time frame. My investigation does not account for changes in GPA that occur over the four years students are enrolled in Upward Bound.

Further Implications:

- Upward Bound Program has six specific benchmarks that they must meet every year in order to continue to receive funding from the government. A closer statistical look at the data from each benchmark would be a more accurate way of evaluating the success of the whole program.
- It would be informative to compare average GPA of Upward Bound students to the average GPA of students from similar demographics from the same three target high schools that are not enrolled in the Upward Bound Program.

Conclusion:

- There is most likely no real difference in average GPA between semesters for the Hope College Upward Bound Program.
- There is most likely no real difference in the average difference of GPA between the three target schools in the Hope College Upward Bound program.
- Further, more in-depth analysis should be done

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Citations:

1. *TRIO Upward Bound*. Hope College, n.d. Web. 26 Nov. 2013. *Hope College*
2. "Is College Worth It?" *Pew Social Demographic Trends RSS*. Pew Research, 15 May 2011. Web. 24 Nov. 2013.