Statistical Report of College Freshmen in Academic Performance

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Introduction

These statistical studies were aimed at college freshmen and comparison was done on college credit earned versus gender, high school GPA versus GPA in the first year of college and lastly, college GPA in the freshman year versus students graduate within six years or non-graduate. This topic focus on how the college freshmen engage in school and give insight of how well the students did in term of academic performance. 5,762 students were randomly selected from 130 colleges. There are three research questions were forms during the statically studies that were conducted.

The first research questions focus on gender proportion to number of credit hours are earned as college freshmen. Is there a significant difference in gender and credit hours that are earned in the first year of college at 95% confidence interval? The null hypothesis (H_o) stated that the population of female earned in student credit hours is equal to population of male earned in student credit hours. The alternative hypothesis (H_1) stated that the population of female earned in student credit hours is not equal to population of male earned in student credit hours.

Some colleges select freshman candidates based on a student's GPA during high school, but this may not be reflective of GPA obtained during their first year of college. Therefore, high school students with lower GPAs may end up with higher GPA in college. This lead to second research questions: is there a significant difference between high school students' GPA and GPA during their first year in college at 95% confidence interval? Null hypothesis stated that high school GPA and College GPA does not differ. The alternative hypothesis stated a student's college GPA during their first year will be significantly different than their high school GPA. Another consideration to look at college freshmen GPA is students graduate within six years. This give insight of students' academic performance and how well the students finished college. This lead to the third research question: is there a significant difference in college freshmen GPA that graduate within six years or non-graduate?

Methods

Data was collected from 130 colleges with 5,762 students' participants. The data obtained was statistically analyzed using SPSS software. Confidence interval was selected to be 95% (α=0.05) in which can be used to accept or reject the null hypothesis when comparing the p-values for all questions. All tests are done in two tails tests. The group statistics provides basic information about the group comparison, including sample size (N), mean, standard deviation (Std. Deviation), and standard error mean (Std. Error Mean). In the independent samples test display the results that are relevant to Independent Samples t Test. Levene's Test for Equality of Variances provided the test statistical of Levene's test (F) and p-value corresponding to the test statistical (Sig.). T-test for Equality of Mean provided information, including, computed test statistic (t), degree of freedom (df), p-value correspond to given test statistic and degree of freedom (Sig (2-tailed)), the difference between the samples means (means difference), and standard error (Std. Error Difference). Confidence interval of the difference show the results of significance test that is part of the t-test output complement. Statistically methods were used in Independent Sample t Test to compares the two means groups: gender and student credit hours that address the first questions. The hypotheses for this studies can be expressed as: H_o: $\mu_o = \mu_{1,}$ H_1: $\mu_o \neq \mu_1$.The variable of gender has the values of either "0" (female) or "1" (male). Paired Samples t Test was used to analyze the two groups being compared was high school students GPA and college students GPA during their first year in which address the second questions. The hypotheses can be expressed as: H_o: $\mu_o = \mu_1$, H_i: $\mu_o \neq \mu_1$. The variables being measured is high school GPA and College GPA (in the first year of college) on a GPA scales of 1-4. The variable of GPA has the values of "GPAC1" (college GPA in the first year) and "GPAHS" (GPA of high schoolers).Independent Sample t Test were also used to compares the two means group: student GPA and graduate and the hypotheses for this studies can be expressed as: H_o: $\mu_o = \mu_{1,}$ H_1: $\mu_o \neq \mu_1$ that address the third questions. The variable of graduate has the values of either "0" (non-graduate) or "1" (graduate).

Results

Table 1. shows the sample size of female student is 2347 and male students is 3415. The mean shown the average of student credit hours earned during the first year of college. Average of female earned in their freshmen colleges year is 27.24 credit hours and the average of male earned during the first year of college is 29.05 credit hours.

Table 1.

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
CreditHr	1.00	3415	27.2431	6.62929	.11344
	.00	2347	29.0495	6.30368	.13012

Table 2. shows the p-value of Levene's test shown 0.003 is very small and the p-values of t-test (0.00) is less than the alpha level of 0.05 ($p < \alpha$) therefore the null hypothesis of Levene's test is reject and concluded that variance in female earned credit hours is significant difference than male. The mean difference between male and female student in credit hours during first year of college is -1.80633. The negative sign in mean difference indicated that female student earned more credit hours than male students.

Table 2.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
CreditHr	Equal variances assumed	9.038	.003	-10.367	5760	.000	-1.80633	.17424	-2.14792	-1.46475
	Equal variances not assumed			-10.464	5202.369	.000	-1.80633	.17263	-2.14475	-1.46791

Table 3. shown the mean of female and male students earned credit hours in 95% confidence interval [28.79, 29.31] and [27.02, 27.46] are not overlapped, this confirm that the null hypothesis is rejected.

Table 3.

Descriptives

	0=female; 1=male			Statistic	Std. Error
credit	.00	Mean		29.049	.1301
		95% Confidence Interval for Mean	Lower Bound	28.794	
			Upper Bound	29.305	
		5% Trimmed Mean		29.284	
		Median		29.300	
		Variance		39.736	
		Std. Deviation		6.3037	
		Minimum		.0	
		Maximum		65.0	
		Range		65.0	
		Interquartile Range		5.0	
		Skewness		-.587	.051
		Kurtosis		4.951	.101
	1.00	Mean		27.243	.1134
		95% Confidence Interval for Mean	Lower Bound	27.021	
			Upper Bound	27.466	
		5% Trimmed Mean		27.580	
		Median		28.000	
		Variance		43.948	
		Std. Deviation		6.6293	
		Minimum		.0	
		Maximum		66.0	
		Range		66.0	
		Interquartile Range		6.0	
		Skewness		-.924	.042
		Kurtosis		3.570	.084

The average high school students' GPA is 2.58 and college freshmen GPA is 3.13 shown in Table 4. The mean difference between high school GPA and college freshmen GPA is -.55901 indicated that college freshmen has higher GPA than high school students. P-values is the 0.00

and the alpha level is 0.05. Since the p-value is less than the alpha level ($p < \alpha$) the null hypothesis is rejected, in conclusion, there is significant difference in high school students' GPA and college freshmen GPA.

Table 4

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	GPAHS	2.5786	5762	.66674	.00878
	GPAC1	3.1296	5762	.58820	.00775

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	GPAHS & GPAC1	5762	.588	.000

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	GPAHS - GPAC1	-.55091	.57407	.00756	-.56574	-.53609	-72.846	5761	.000

Table 5. shows the sample sizes of non-graduates is 2309 and graduate is 3453. The average of non-graduate GPA during the first year of college is 2.30 and the average of graduate GPA is 2.77 during the first year of college. -0.47 is the mean difference between the graduate and non-graduate students' GPA during their college freshmen year. The negative signed indicated that graduated students' GPA during first year of school has higher GPA than non-graduate. The p-values is less than the significant level ($p < \alpha$), therefore the null hypothesis is rejected in which there is significant difference in graduate and non-graduate students GPA during the first year of school.

Table 5.

T-Test

Group Statistics

	GRADUATE	N	Mean	Std. Deviation	Std. Error Mean
ST_GPA1	0	2309	2.2965	.71280	.01483
	1	3453	2.7673	.55976	.00953

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ST_GPA1	Equal variances assumed	62.092	.000	-27.997	5760	.000	-.47084	.01682	-.50381	-.43787
	Equal variances not assumed			-26.708	4133.986	.000	-.47084	.01763	-.50540	-.43628

In Table 6. shown the mean of non-graduate and graduate students GPA during college freshmen in 95% confidence internal [2.27, 2.33] and [2.75, 2.79] are not overlapped, this agree that the null hypothesis is rejected.

Table 6.

Descriptives

	GRADUATE			Statistic	Std. Error
ST_GPA1	0	Mean		2.2965	.01483
		95% Confidence Interval for Mean	Lower Bound	2.2674	
			Upper Bound	2.3256	
		5% Trimmed Mean		2.3148	
		Median		2.2700	
		Variance		.508	
		Std. Deviation		.71280	
		Minimum		.00	
		Maximum		4.00	
		Range		4.00	
		Interquartile Range		.82	
		Skewness		-.364	.051
		Kurtosis		.783	.102
	1	Mean		2.7673	.00953
		95% Confidence Interval for Mean	Lower Bound	2.7486	
			Upper Bound	2.7860	
		5% Trimmed Mean		2.7653	
		Median		2.7500	
		Variance		.313	
		Std. Deviation		.55976	
		Minimum		.92	
		Maximum		4.00	
		Range		3.08	
		Interquartile Range		.82	
		Skewness		.075	.042
		Kurtosis		-.567	.083

Discussion

The statistical studies shown college freshmen academic performance by the amount of credit hours are earned and if students graduated within six years. High school GPA was taken into consideration to compared college freshmen GPA to see student work ethnic and if there is increased academic performance. At 95% confidence level, there is sufficient evidences to claim that there is a difference between genders in credit hours earned during the first year in college. The average of female students earned 1.8 credit hours more than average of male students. This determine that female students taken more classes than male students during freshmen year in college. Additionally, there is sufficient evidences to claim that there is a difference between high school GPA and college freshmen GPA. College freshmen average GPA is 0.55 higher than the average GPA of high school. According to the result, the average college freshmen GPA was B or higher, whereas the average high school GPA was C or higher. This indicated that students have improved their academic performance in college than high school. Lastly, there is sufficient evidences to claim that there is a difference between college freshmen GPA and students graduate within six years or not. Students that graduate college within six years have 0.47 GPA higher than non-graduate students during their first years of college. Evidently shows that students that graduate within six years performance better in academic and work ethnic than non-graduate students. In conclusion, the statistical studies give better understanding of college freshmen in academic performance and work ethic.