



Summer Online Undergraduate Program
Analysis of Time to Graduation, 2013-2018

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Introduction

Confidence in the value of online learning has been growing at Georgia Tech. The introduction of the Canvas learning management system and the associated support it has been given have allowed more and more faculty to come to appreciate the value of using technology to support their instruction. Still, doubts remain among some faculty that online learning programs have value beyond merely being more convenient for students and instructors.

The Summer Online Undergraduate Program (SOUP), administered by Georgia Tech Professional Education, serves as a prime example of the benefit that Georgia Tech can gain from online learning. Designed as a way to allow students who are not necessarily near Atlanta to still take summer courses, SOUP has provided opportunities for summer learning to over 2,600 students since 2013.

However, the question has arisen as to what value – beyond flexibility – SOUP provides to the Georgia Tech community. The following analysis provides evidence that **students who participated in SOUP in the summers from 2013 through 2018 completed their four-year degrees sooner than students who did not participate in SOUP** but still took summer courses.

Analysis

Data provided by Institutional Research and Planning were used to compare all students who took at least one summer course between 2013 and 2018. In total, 25,576 students took summer courses over this period, and of them, 18,410 have graduated. Average (mean) time to graduation was calculated for all graduates, comparing SOUP participants and non-SOUP participants. Independent-samples *t*-tests were calculated to determine whether the differences in means were statistically significant. In addition, Cohen's (1988) effect sizes (*d*) were calculated comparing SOUP to non-SOUP. These analyses were then disaggregated by certain demographic and performance indicators.

Results in Table 1 indicate that students who participated in SOUP averaged 4.23 years to graduation, compared with 4.30 years for students who did not participate in SOUP but participated in other summer courses. This difference is statistically significant at $p \leq 0.05$ and has an effect size of 0.053.¹ While this effect size is small, it does indicate some benefit of participating in SOUP.

Table 1 also includes means, significance tests, and effect sizes comparing SOUP and non-SOUP participation across a range of demographic and performance indicators. Most of these comparisons do not show statistical significance, however, those that are significant show stronger results than the comparison for all students described above.

- Students who were admitted as freshman and participated in SOUP had an average time to graduation of 4.22 years, compared with 4.31 years for freshman-admits who

¹ Cohen (1988) defines effect size as 0.20 = small, 0.50 = moderate, and 0.80 = large. The effect size is a statistical measure of the difference in means between two groups when accounting for sample size.

did not participate in SOUP. This relationship is statistically significant at $p \leq 0.01$ and has an effect size of 0.094.

- Males who participated in SOUP had an average time to graduation of 4.23 years, compared with 4.35 years for those males who did not participate in SOUP. This relationship is statistically significant at $p \leq 0.01$ and has an effect size of 0.084.
- Males who are not Pell grant recipients (a measure of socioeconomic status) had an average time to graduation of 4.21 years, compared with 4.35 years for males without Pell grants who did not participate in SOUP. This relationship is statistically significant at $p \leq 0.01$ and has an effect size of 0.115.
- The median GPA for all students in the sample was calculated to be 3.35. Students with GPAs below this median who participated in SOUP had an average time to graduation of 4.37 years, compared with 4.51 years for such students who did not participate in SOUP. This relationship is statistically significant at $p \leq 0.01$ and has an effect size of 0.091.

These measures indicate a small but visible difference in time to graduation between students who participated in SOUP and those who took non-SOUP summer courses. It is important to note that these relationships do not necessarily imply a causal relationship between SOUP participation and time to graduation. However, this information does demonstrate that there may be value of participating in SOUP not just for all students in general, but also for students admitted as freshman, males (particularly those without Pell grants), and students whose academic performance is subpar (with GPAs below the median).

Table 1: Comparing Mean Years to Graduation between Students who Participated in SOUP and Those Who Took non-SOUP Summer Courses, 2013-2018

	SOUP	N	Mean	Std. dev.	<i>t</i>	Cohen's <i>d</i>
All Students	Yes	1706	4.23	1.274	2.183	0.053
	No	16694	4.30	1.337		
Admitted as Freshman	Yes	1311	4.22	0.824	3.253	0.094
	No	12399	4.31	0.998		
Admitted as Transfer	Yes	100	3.05	0.942	.793	0.037
	No	1194	3.12	1.011		
Underrepresented Minorities	Yes	381	4.35	1.477	.736	0.182
	No	2945	4.29	1.419		
Males	Yes	1030	4.23	1.429	2.619	0.084
	No	11008	4.35	1.453		
Females	Yes	676	4.23	0.993	.683	0.026
	No	5686	4.20	1.072		
Citizens and Resident Aliens	Yes	1572	4.24	1.297	1.985	0.051
	No	15242	4.31	1.357		
Non-Resident Aliens	Yes	134	4.12	0.955	1.244	0.100
	No	1452	4.23	1.104		
In-State Residents	Yes	1037	4.21	1.428	1.879	0.062
	No	11060	4.30	1.410		
Out-of-State Residents	Yes	669	4.26	0.989	.997	0.041
	No	5634	4.31	1.183		
Pell Grant Recipients	Yes	446	4.28	1.722	.432	0.022
	No	4424	4.32	1.637		
Males with Pell Grants	Yes	302	4.29	1.929	.507	0.033
	No	3028	4.35	1.785		
Females with Pell Grants	Yes	144	4.26	1.181	.107	0.009
	No	1396	4.25	1.254		
Males without Pell Grants	Yes	728	4.21	1.161	2.959	0.115
	No	7980	4.35	1.305		
Females without Pell Grants	Yes	532	4.22	0.937	.802	0.035
	No	4290	4.19	1.006		
Underrepresented Minorities with Pell	Yes	160	4.46	2.029	1.307	0.110
	No	1235	4.28	1.559		
Underrepresented Minorities without Pell	Yes	221	4.28	0.882	.299	0.021
	No	1710	4.31	1.310		
Students with GPAs above Median (3.35)	Yes	780	4.07	1.027	.836	0.031
	No	8446	4.10	1.035		
Students with GPAs below Median (3.35)	Yes	926	4.37	1.435	2.794	0.091
	No	8248	4.51	1.562		
Significant at $p \leq 0.05$						
Significant at $p \leq 0.01$						
Cohen (1988) defines effect size as 0.20 = small, 0.50 = moderate, 0.80 = large						

Reference

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Second Edition. Hillsdale, NJ: Lawrence Erlbaum Associates.

Appendix A: Descriptive Statistics and Crosstabulations

The following tables present descriptive statistics (frequencies for categorical variables or measures of central tendency for quantitative variables) for the 25,576 students analyzed in the dataset. Following the descriptives, crosstabulations are included for each of the categorical variables, broken down by SOUP participation. Finally, a table that compares means for quantitative variables (GPA, SAT scores, etc.) is included.

SOUP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	22956	89.8	89.8	89.8
	Yes	2620	10.2	10.2	100.0
	Total	25576	100.0	100.0	

Graduated?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7166	28.0	28.0	28.0
	Yes	18410	72.0	72.0	100.0
	Total	25576	100.0	100.0	

Race/Ethn

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White	13212	51.7	51.7	51.7
	Unknown	483	1.9	1.9	53.5
	Two or more	934	3.7	3.7	57.2
	Native Hawaiian or Other Pacific Islander	16	.1	.1	57.3
	Hispanic or Latino	1913	7.5	7.5	64.7
	Black or African American	1964	7.7	7.7	72.4
	Asian	7030	27.5	27.5	99.9
	American Indian or Alaska Native	24	.1	.1	100.0
	Total	25576	100.0	100.0	

Underrepresented Minorities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	20242	79.1	79.1	79.1
	Yes	5334	20.9	20.9	100.0
	Total	25576	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	9241	36.1	36.1	36.1
	Male	16335	63.9	63.9	100.0
	Total	25576	100.0	100.0	

PELL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	19235	75.2	75.2	75.2
	Yes	6341	24.8	24.8	100.0
	Total	25576	100.0	100.0	

Admit Type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Early Admission	13	.1	.1	.1
	International Freshman	1942	7.6	7.6	7.6
	Readmission- Undergraduate	1884	7.4	7.4	15.0
	Regular Freshman	19545	76.4	76.4	91.4
	Regular Transfer	1573	6.2	6.2	97.6
	RETP-Regents' Engr Xfer Prog	619	2.4	2.4	100.0
	Total	25576	100.0	100.0	

Citizen

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	US Citizen*	22062	86.3	86.3	86.3
	Alien, Resident*	1497	5.9	5.9	92.1
	Alien, Non-Resident*	2017	7.9	7.9	100.0
	Total	25576	100.0	100.0	

Residency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Out-of-State Resident	8598	33.6	33.6	33.6
	In-State Resident	16978	66.4	66.4	100.0
	Total	25576	100.0	100.0	

Statistics

		Grad Time	SAT V	SAT Q	SAT W	Overall GPA
N	Valid	18400	23634	23634	22605	25576
	Missing	7176	1942	1942	2971	0
Mean		4.2975	680.79	714.60	653.50	3.2496
Median		4.3300	690.00	720.00	670.00	3.3500
Mode		3.67	740	800	690	4.00
Std. Deviation		1.33177	83.053	72.438	102.418	.56315
Minimum		1.00	200	330	37	.00
Maximum		19.67	800	800	800	4.00

Crosstab

		SOUP		Total	
		No	Yes		
Graduated?	No	Count	6252	914	7166
		% within SOUP	27.2%	34.9%	28.0%
	Yes	Count	16704	1706	18410
		% within SOUP	72.8%	65.1%	72.0%
Total		Count	22956	2620	25576
		% within SOUP	100.0%	100.0%	100.0%

Crosstab

		SOUP			
		No	Yes	Total	
Race/Ethn	White	Count	11906	1306	13212
		% within SOUP	51.9%	49.8%	51.7%
	Unknown	Count	395	88	483
		% within SOUP	1.7%	3.4%	1.9%
	Two or more	Count	841	93	934
		% within SOUP	3.7%	3.5%	3.7%
	Native Hawaiian or Other Pacific Islander	Count	16	0	16
		% within SOUP	0.1%	0.0%	0.1%
	Hispanic or Latino	Count	1712	201	1913
		% within SOUP	7.5%	7.7%	7.5%
	Black or African American	Count	1712	252	1964
		% within SOUP	7.5%	9.6%	7.7%
	Asian	Count	6350	680	7030
		% within SOUP	27.7%	26.0%	27.5%
	American Indian or Alaska Native	Count	24	0	24
		% within SOUP	0.1%	0.0%	0.1%
Total		Count	22956	2620	25576
		% within SOUP	100.0%	100.0%	100.0%

Crosstab

			SOUP		
			No	Yes	Total
Underrepresented Minorities	No	Count	18256	1986	20242
		% within SOUP	79.5%	75.8%	79.1%
	Yes	Count	4700	634	5334
		% within SOUP	20.5%	24.2%	20.9%
Total		Count	22956	2620	25576
		% within SOUP	100.0%	100.0%	100.0%

Crosstab

			SOUP		
			No	Yes	Total
Gender	Female	Count	8113	1128	9241
		% within SOUP	35.3%	43.1%	36.1%
	Male	Count	14843	1492	16335
		% within SOUP	64.7%	56.9%	63.9%
Total		Count	22956	2620	25576
		% within SOUP	100.0%	100.0%	100.0%

Crosstab

			SOUP		
			No	Yes	Total
PELL	No	Count	17237	1998	19235
		% within SOUP	75.1%	76.3%	75.2%
	Yes	Count	5719	622	6341
		% within SOUP	24.9%	23.7%	24.8%
Total		Count	22956	2620	25576
		% within SOUP	100.0%	100.0%	100.0%

Crosstab

		SOUP			
		No	Yes	Total	
Admit Type	Early Admission	Count	13	0	13
		% within SOUP	0.1%	0.0%	0.1%
	International Freshman	Count	1750	192	1942
		% within SOUP	7.6%	7.3%	7.6%
	Readmission- Undergraduate	Count	1745	139	1884
		% within SOUP	7.6%	5.3%	7.4%
	Regular Freshman	Count	17451	2094	19545
		% within SOUP	76.0%	79.9%	76.4%
	Regular Transfer	Count	1446	127	1573
		% within SOUP	6.3%	4.8%	6.2%
	RETP-Regents' Engr Xfer Prog	Count	551	68	619
		% within SOUP	2.4%	2.6%	2.4%
Total		Count	22956	2620	25576
		% within SOUP	100.0%	100.0%	100.0%

Crosstab

		SOUP			
		No	Yes	Total	
Citizen	US Citizen*	Count	19759	2303	22062
		% within SOUP	86.1%	87.9%	86.3%
	Alien, Resident*	Count	1375	122	1497
		% within SOUP	6.0%	4.7%	5.9%
	Alien, Non-Resident*	Count	1822	195	2017
		% within SOUP	7.9%	7.4%	7.9%
Total		Count	22956	2620	25576
		% within SOUP	100.0%	100.0%	100.0%

Crosstab

		SOUP			
		No	Yes	Total	
Residency	Out-of-State Resident	Count	7576	1022	8598
		% within SOUP	33.0%	39.0%	33.6%
	In-State Resident	Count	15380	1598	16978
		% within SOUP	67.0%	61.0%	66.4%
Total		Count	22956	2620	25576
		% within SOUP	100.0%	100.0%	100.0%

Group Statistics

	SOUP	N	Mean	Std. Deviation	Std. Error
					Mean
Grad Time	Yes	1706	4.2331	1.27377	.03084
	No	16694	4.3041	1.33742	.01035
SAT_V	Yes	2459	687.50	81.740	1.648
	No	21175	680.01	83.171	.572
SAT_Q	Yes	2459	712.85	72.191	1.456
	No	21175	714.81	72.466	.498
SAT_W	Yes	2338	659.81	94.574	1.956
	No	20267	652.78	103.262	.725
Overall GPA	Yes	2620	3.2104	.54175	.01058
	No	22956	3.2541	.56538	.00373