Second-year Transformational Experience Program Retention Rates

2017-2018 Cohort

Center for the Study of Student Life

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THE OHIO STATE UNIVERSITY

EXECUTIVE SUMMARY

This report examines the retention rates of students in the Second-year Transformational Experience Program (STEP) at The Ohio State University. This report examines retention rates of students who participated in (STEP) during the 2017-2018 academic year compared to students who did not participate in STEP.

- **99.2%** of students who participate in STEP persist to their third year, compared to **94.7%** of students who do not participate in STEP.

- Compared to students who were not in STEP, **STEP students are 5.0 times more likely to persist to their third year** based on firth logistic regression models.

- Propensity score matching methods, which estimate the effect of participating in STEP versus not after matching students based on demographic background, academic performance (ACT score, first-year GPA) and self-reported motivational factors (receptivity to help, study habits, etc.), find that the **predicted average treatment effect of participating in STEP on retention is 3%.**

- First generation, African American and Latinx students who participate in STEP have statistically significantly higher retention rates than their peers who are not in STEP.

- Among students who participate in STEP, students who are *not* in Honors or Scholars have similar retention rates to Honors or Scholars students.

DATA

Data for this study come from three sources:

1. *Participation in STEP*: Participation in STEP is based on students who completed Autumn semester of STEP during the 2017-2018 academic year.

2. *Student education records*: Information on cumulative GPA at the end of the first year, retention to the second year and student academic or demographic characteristics (gender, race/ethnicity, first generation status) are from the Student Information System.

3. *College Student Inventory*: Data on student self-reported measures of perceived academic success, financial security and family support are from the Ruffalo Noel Levitz College Student Inventory (CSI) administered by the Office of Student Academic Success First Year Experience. The CSI is a survey of incoming first-year, domestic students, administered during orientation, that is used to identify non-cognitive indicators of college student success.

To calculate retention rates, this report examines the cohort of new first-year students on any campus of The Ohio State University during Autumn 2016 who persisted to their second year (Autumn 2017) and were enrolled on the Columbus campus in their second year, and therefore eligible to participate in STEP ($N = 7,445$). Among students who started their second year on the Columbus campus, we calculate the percentage that returned for their third year in Autumn 2018. Analyses that utilize CSI data are restricted to the 6,384 students with available data on the following variables: parental education, educational stress, financial security, study habits, perceived academic difficulty and receptivity to help.

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METHODOLOGY

To determine if there is a relationship between participation in STEP and retention, three analytic strategies were used. First, descriptive statistics examined the association between STEP and retention using chi-square tests of independence. Second, to examine the predictors of the outcome variable, a firth logistic regression analysis was used.

Third, because students may self-select into STEP, propensity score matching was used to estimate the effects of participating in STEP on student retention. It is not possible to randomly assign students to participate in STEP and it is thus challenging to determine the true effects of the program since students who participate may be markedly different than students who do not participate. There may also be unobserved characteristics that effect retention that are correlated with STEP participation (known as endogeneity). For example, students who are more receptive to university assistance may be more likely to participate in STEP and also more likely to persist at the university. By not accounting for receptivity to help, the effect of STEP participation could be overestimated using other descriptive or inferential analyses.

Quasi-experimental methods, such as propensity score matching (hereafter, PSM), control for selection bias and endogeneity. PSM is used to estimate the probability of a student being assigned or participating in a "treatment" (STEP), given a set of observed and measured characteristics. Propensity scores are used to reduce selection bias by producing estimated effects for groups that are similar on all observed characteristics but different in whether they participated in STEP or not. Stated differently, propensity scores are used to estimate the probability that a student will participate in STEP given observed characteristics; then the student is matched to a similar student who chose not to participate in STEP. Because PSM is based on logit or probit models, all outcome variables must be dichotomous. For more information on this method, see Dehejia & Wahba (2002) and Caliendo & Kopeinig (2008).

DEMOGRAPHICS

Table 1: Demographics of Second-year Students Eligible for STEP (2017-2018; *N* = 7,445)

	Total *N*	*N* in STEP	% in STEP	Retention Rate, in STEP	Retention Rate, Not in STEP
All Students	7,445	2,622	35.2%	99.2%	94.7%
Male	3,576	879	24.6%	99.2%	94.4%
Female	3,869	1,743	45.1%	99.2%	95.0%
Demographic Background					
First Generation	1,399	444	31.7%	99.8%	92.5%
Male	609	133	21.8%	100%	90.6%
Female	790	311	39.4%	99.7%	94.4%
African American	306	129	42.2%	100%	87.6%
Male	108	37	34.3%	100%	80.3%
Female	198	92	46.5%	100%	92.5%
Latinx	277	103	37.2%	100%	92.5%
Male	133	33	24.8%	100%	92.0%
Female	144	70	48.6%	100%	93.2%

$+p < .1, *p < .05, **p < .01, ***p < .001$

International Student	802	67	8.4%	98.5%	94.0%
Male	400	24	6.0%	100%	94.2%
Female	402	43	10.7%	97.7%	93.9%
Honors/Scholars Status					
Honors	1,430	630	44.1%	99.5%	97.0%
Scholars	1,182	754	63.8%	99.2%	95.6%
Honors & Scholars	57	43	75.4%	100%	100%
Non-Honors & Scholars	4,776	1,195	25.0%	99.0%	94.0%
First-Year GPA[1]					
0.00 - 1.99	87	4	4.6%	100.0%	55.4%
2.00 - 2.49	277	49	17.7%	98.0%	82.0%
2.50 – 2.99	1,095	291	26.6%	97.6%	92.8%
3.00 – 3.49	2,487	830	33.4%	99.0%	95.9%
3.50 – 4.00	3,498	1,448	41.4%	99.7%	97.4%

[1]First-year GPA includes the cumulative GPA from Autumn 2016 and Spring 2017; one student was not enrolled during Spring 2017 and therefore did not have a full first-year cumulative GPA. The total *N* for GPA = 7,444.

Results from Chi-Square Analyses

The following tables presents the descriptive retention rates of students by demographic background.

Table 2: Retention Rate Second to Third Year, by Demographics and Gender

	All Students	Male	Female
All Students			
STEP Participant	99.2% (*n* = 2,622)	99.2% (*n* = 879)	99.2% (*n* = 1,743)
Non-STEP Participant	94.7% (*n* = 4,823)	94.4% (*n* = 2,697)	95.0% (*n* = 2,126)
Pearson X^2	96.87***	35.86***	56.56***
First Generation Students			
STEP Participant	99.8% (*n* = 444)	100% (*n* = 133)	99.7% (*n* = 311)
Non-STEP Participant	92.5% (*n* = 955)	90.6% (*n* = 476)	94.4% (*n* = 479)
Pearson X^2	32.78***	313.58***	15.58***
Non-First Generation Students			
STEP Participant	99.1% (*n* = 2,178)	99.1% (*n* = 746)	99.1% (*n* = 1,432)
Non-STEP Participant	95.2% (*n* = 3,868)	95.3% (*n* = 2,221)	95.2% (*n* = 1,647)
Pearson X^2	63.53***	22.07***	40.79***
African American Students			
STEP Participant	100% (*n* = 129)	100% (*n* = 37)	100% (*n* = 92)
Non-STEP Participant	87.6% (*n* = 177)	80.3% (*n* = 71)	92.5% (*n* = 106)
Pearson X^2	17.30***	8.38**	7.24**

+p < .1, *p < .05, **p < .01, ***p < .001

Latinx Students			
STEP Participant	100% (*n* = 103)	100% (*n* = 33)	100% (*n* = 70)
Non-STEP Participant	92.5% (*n* = 174)	92.0% (*n* = 100)	93.2% (*n* = 74)
Pearson X^2	8.07**	2.81+	4.90*
International Students			
STEP Participant	98.5% (*n* = 67)	100% (*n* = 24)	97.7% (*n* = 43)
Non-STEP Participant	94.0% (*n* = 735)	94.2% (*n* = 376)	93.9% (*n* = 359)
Pearson X^2	2.34	1.49	1.03

Note. N represents total number of students in each group; not the N retained.

Table 3. Retention Rate Second to Third Year by Honors and Scholars Status

	Honors	Scholars	In Both Honors & Scholars	Non-Honors & Non-Scholars	*Honors v. Non-Honors/Non Scholars X^2*	*Scholars v. Non-Honors/Non Scholars X^2*
STEP Participant	99.5%	99.2%	100.0%	99.0%	1.41	0.22
Non-STEP Participant	97.0%	95.6%	100.0%	94.0%	11.27**	1.65
Pearson X^2	12.12***	17.61***	--	49.13***		

Table 4: Retention Rate Second to Third Year, by First-year GPA

	STEP	**Non-STEP**	**Pearson X^2**
First-year Cumulative GPA			
0.00 - 1.99	100.0% (*n* = 4)	55.4% (*n* = 83)	3.10+
2.00 - 2.49	98.0% (*n* = 49)	82.0% (*n* = 228)	7.97**
2.50 – 2.99	97.6% (*n* = 291)	92.8% (*n* = 804)	8.85**
3.00 – 3.49	99.0% (*n* = 830)	95.9% (*n* = 1,657)	18.4***
3.50 – 4.00	99.7% (*n* = 1,448)	97.4% (*n* = 2,050)	26.1***
Mean GPA*	3.49	3.33	

Note. N represents total number of students in each group; not the N retained.

+*p* < .1, *p* < .05, **p* < .01, ***p* < .001

Results from a Firth Logistic Regression

The following table presents a multivariate firth logistic regression examining the relationship between STEP participation, student demographic characteristics and first-year GPA on third-year retention. Firth logistic regression is used when a dependent variable is binary and a rate event (i.e., low rates of non-retaining to the university). Since retention rates are high among this cohort of students, not retaining is considered a rare event. Results demonstrate that being in STEP is associated with significantly higher retention rates after controlling for gender, race/ethnicity, first generation status, honors/scholars status and first-year GPA.

Compared to students who were not in STEP, STEP students are **5.0** times more likely to persist to their third year.

Table 5: Results of Firth Logistic Regression Predicting Retention (*N* = 7,444)

	Odds Ratio	Coefficient	Standard Error	*Z* statistic
STEP	5.02	1.61	1.18	6.84***
Female	1.01	0.01	0.13	0.07
Honors/Scholars Status (ref. Non-Honors/Scholars)				
Honors	1.04	0.04	0.23	0.19
Scholars	0.89	-0.11	0.20	-0.50
Honors & Scholars	0.92	-0.08	1.32	-0.06
Race/Ethnicity (ref. White)				
African American	0.61	-0.49	0.16	-1.93+
Latinx	0.83	-0.18	0.25	-0.61
Asian	2.24	0.80	0.77	2.35**
International student	0.74	-0.30	0.13	-1.64
Other race/ethnicity	0.68	-0.39	0.16	-1.67+
First Generation Status	0.85		0.13	-1.05
First-year GPA	3.82	-0.16	0.41	12.65***
Intercept	0.28	1.34	0.09	-3.86

Results from Propensity Score Matching

Propensity score matching models with average treatment effect on the treated were run using both an unmatched logit model and nearest neighbor matching techniques using the covariates presented in the table above in addition to the CSI variables (see Appendix A). In all models, the effects of STEP participation on retention were statistically significant, with coefficients ranging from 0.026 to 0.032. The predicted average treatment effect of participating in STEP on retention is **3%**.

Table 6: Robustness of PSM Estimates,
Average Treatment Effect on the Treated (*n* = 6,384)

	Difference	*SE*
Logit Model	0.026	.005***
Nearest Neighbor Matching	0.032	.005***
Nearest Neighbor Matching, Exact Match on Race	0.032	.004***

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+*p* < .1, *p* < .05, **p* < .01, ***p* < .001

APPENDIX A

**Descriptive Statistics of CSI Data (*n* = 6,383*)*

	STEP		Non-STEP		Statistically Significant Difference
	Mean	*SD*	*Mean*	*SD*	
ACT Score	29.58	3.21	28.98	3.63	***
Educational Stress	235.97	87.64	217.61	90.11	***
Study Habits	6.04	6.54	4.40	6.98	***
Academic Difficulty	-36.48	8.56	-35.24	9.12	***
Receptivity to Help	292.86	77.70	272.02	82.88	***

REFERENCES

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