

UNDERGRADUATE RESEARCH AND CONTINUING EDUCATION SUCCESS FALL 2019 AND SPRING 2020

Report prepared by Josh Acosta, MS (Graduate Assistant for Data Analytics) and Katie Boyd, PhD (Director, Academic Assessment)

PURPOSE

The purpose of the current report is to examine how participating in undergraduate research (UR) impacts the likelihood of enrollment into a graduate program for students seeking continuing education opportunities after completing their undergraduate degrees.

The Office of Academic Assessment (OAA) chose to investigate the relationship between UR as a high impact practice and graduate enrollment success because research¹²³ has shown:

1. UR is an experience that may program admission committee set as a criterion for many graduate programs.
2. UR presents an actionable experience that students can participate in during their undergraduate careers that may increase their enrollment chances in graduate school.

PRIMARY FINDINGS

1. UR positively impacts student chances of securing graduate enrollment.
2. UR positively impacts non-white students to a greater extent than white students.

RECOMMENDATIONS

To increase success rates overall at Auburn and for our non-white students, we recommend initiatives to increase participation in UR for our non-white students. Our report strongly suggests that UR is particularly impactful for those non-white students seeking graduate enrollment.

UNDERGRADUATE RESEARCH PARTICIPATION

Self-reported data from the Fall 2019 (N = 1258) and Spring 2020 (N=3184) graduates (approximately 97% of all graduates in those cohorts) was examined. 1279 of these students indicating they were pursuing graduate enrollment. The table below reflects the demographics of these students broken into two groups: 1) having participated in UR and 2) no participation in UR.

	GPA	ACT	FEMALE %	FIRST GEN %	WHITE %	TRANSFER %
UR (N=521)	3.55	28.41	62.6% (N=326)	11.7% (N=61)	77.1% (N=402)	12.7% (N=66)
No UR (N=758)	3.39	26.73	62.0% (N=470)	14.1% (N=107)	74.8% (N=567)	19.1% (N=145)

Note. GPA, ACT, Female %, First Gen%, White%, and Transfer% are broadly representative of Auburn University graduates.

The groups are inequivalent in terms of GPA, ACT, First-Generation Status, and Transfer Status.

- Those who participated in UR tend to have higher GPAs and ACT scores.
 - Differences may be due to: 1) a selection effect where there are GPA or ACT requirements to participate in UR, or 2) a vocational effect, where students with lower GPA and/or ACT may be seeking UR at a lower rate.
- First-generation students and/or transfer students may participate at a lower rate due to factors of accessibility such as availability of time and resources.
 - Undergraduate research is often unpaid; however, Auburn does offer a small number of paid research fellowships at the undergraduate level (acceptance is dependent on ACT and GPA).

¹ Kilgo et al., 2015

² Fecchheimer et al., 2010

³ Kuh, 2008

UNDERGRADUATE RESEARCH AND SUCCESS

Of the 1279 students seeking graduate enrollment at graduation, 839 reported that they had secured graduate enrollment (**65.6%**), whereas 442 students indicated they were still seeking graduate enrollment. There is a slight increase in continuing education success for students participating in Undergraduate Research (~5%).

The table below illustrates the at-graduation success rates of several sub-groups of students by UR participation.

CONTINUING EDUCATION SUCCESS RATES	
At-graduation Success	
UR (N = 521)	68.5%
No UR (N = 758)	63.7%
Overall (N = 1279)	65.6%

	MALE --- FEMALE	FIRST GEN --- NOT FIRST GEN	WHITE --- NON-WHITE	TRANSFER --- FRESHMEN
UR (N=521)	62.2% (122/196)	52.4% (32/61)	68.3% (274/401)	60.6% (40/66)
	72% (234/325)	70.4% (324/460)	68.3% (82/120)	69.8% (298/427)
No UR (N=758)	65.1% (181/278)	58.3% (63/108)	68.0% (385/566)	56.5% (82/145)
	64.2% (301/469)	64.7% (421/651)	51.1% (96/188)	66.7% (361/541)

Note. GPA, ACT, Female %, First Gen%, White%, and Transfer% are broadly representative of Auburn University graduates.

The impact of UR on success rate may depend on the demographics of the student.

- UR appears to be more impactful for females than males seeking graduate enrollment.
- UR appears to be more impactful for non-white students seeking graduate enrollment.*
- UR appears to be more impactful for transfer students seeking graduate enrollment.

Further, the effect of UR on non-white students' success in enrolling in continuing education is evident when examining success 6-months out from graduation. White students may be less successful at the 6-month out from graduation time when seeking continuing education opportunities. Further analysis is needed to tease out this effect, but perhaps many white students are pursuing professional degrees, such as an MD or JD, which are highly reliant on test scores rather than research experience.

	AT-GRADUATION SUCCESS	SIX-MONTHS POST-GRADUATION SUCCESS
	WHITE --- NON-WHITE	WHITE --- NON-WHITE
UR Group (N=521)	68.3% (274/401) 68.3% (82/120)	84% (317/376) 78.8% (93/118)
No UR Group (N=758)	68.0% (385/566) 51.1% (96/188)	87% (462/531) 68.6% (120/175)

To examine these claims further, we ran three logistical regression analyses examining the predictiveness of UR on the non-white sub-group. All coefficients were reported as logits then converted to probabilities for ease of interpretation.

LOGISTIC REGRESSION

- 1) We conducted the first logistic regression to serve as a baseline on all students seeking graduate education (N = 1279), where UR was the single predictor variable, and **at-graduation success** was the binary outcome variable.

Results show that there was a significant effect of UR predicting Success, **at graduation**, at the $\alpha = .10$ level. The initial constant contains an initial log-odd of $B = .557$, $SE = 0.08$, $p < .001$. The predictor, UR, increased the log-odd by $B = 0.211$, $SE = .12$, $p = .079$.

All students' probability of success in securing graduate enrollment, keeping all other factors constant, significantly increases from 63.6% to 68.3% if they participated in undergraduate research.

- 2) The second logistic regression was conducted on only non-white students (N = 312) to examine the impact of UR as a single predictor of **at-graduation success**.

Results indicate that there was a significant effect of UR predicting Success, **at graduation**. The initial constant contains an initial odds ratio of $B = .02$, $SE = 0.14$, $p = .88$. The predictor, UR, increase the log-odd by $B = 0.75$, $SE = .24$, $p < .001$.

Non-white students' probability of success, keeping all other factors constant, significantly increases from 50.5% to 68.3% if they participated in undergraduate research. ⁴

- 3) A third logistic regression was conducted on only non-white students (N = 293) to examine the impact of UR as a single predictor of **success, 6-months after graduation**. *Some cases were excluded due to attrition or a change to seeking employment.*

Results indicate that there was a significant effect of UR predicting Success, **6-months post-graduation**. The initial constant indicates an initial odds ratio of $B = .78$, $SE = 0.16$, $p < .01$. The predictor, UR increases the odds ratio by $B = 0.57$, $SE = .28$, $p = .04$.

Non-white students' probability of success 6-months after graduation, keeping all other factors constant, significantly increases from 68.8% to 79.5% if they participated in undergraduate research.

DISCUSSION

UR is a significant high-impact practice for those seeking graduate enrollment because it exposes students at the undergraduate level to the type of work they will be conducting at the graduate level, research. Graduate enrollment committees likely use this theoretical rationale to use UR as a criterion for admission decisions.

The results indicate that UR may lead to greater chances of success when students seek graduate enrollment. The increased success chance is evident from the changes in success rates and the baseline logistical regression. However, it may be more impactful for certain groups of people.

After further exploration, the results showed that UR is particularly impactful for non-white students seeking graduate enrollment. Further analysis is required to support this claim and rule out the effects of higher ACT scores (traditionally not a strong predictor of post-graduate success), however, these students likely benefit from this experience to a greater degree because UR exposes them to additional benefits than the previously described benefits. These may include mentorship, first-hand experience working through uncertainty, professional development for graduate education, etc.

⁴ Note, the nonsignificant intercept in a logistical regression indicates that the baseline probability is close to 50% when examining non-white students' success-seeking UR.