THE POWER OF WORK-BASED LEARNING

Nichole Torpey-Saboe, Ph.D.
Elaine W. Leigh, Ph.D.
Dave Clayton, Ph.D.

Strada
EDUCATION NETWORK

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INTRODUCTION

Applied connections between education and work are increasingly a part of undergraduate education in the United States. Among students who have work-based learning experiences, those with paid internships stand out for their increased earning power, confidence in themselves, and recognition of the value of their education. However, less than one-third of recent graduates were able to participate in a paid internship and disparities persist for women, people of color, first-generation, and low-income graduates—even when taking into account their fields of study. As universities, colleges, and employers increase their partnership to improve the post-graduation outcomes of students, the evidence points to the value of increasing access to paid internships.

KEY FINDINGS

01 Paid internships are linked to getting paid more after graduation.

College students who completed a paid internship during their undergraduate education have higher-paying first jobs a year after graduation—even when accounting for differences in pay based on field of study, gender, and race/ethnicity. Other work-based learning experiences—unpaid internships, practicums, and cooperative learning—are not associated with an earnings benefit one year after graduation.

02 Work-based learning is tied to noneconomic post-graduation success.

Bachelor's degree holders who had a work-based learning experience report greater career satisfaction and are more likely to say their education helped them to achieve their goals and was worth the cost.

03 Among current students, paid internships are linked with greater confidence they will be successful in the job market and confidence in the value of their education.

Students who have a paid internship report higher levels of knowledge and confidence about their career, feel more supported by their college or university, are more likely to feel their education was worth the cost and helped them to achieve their goals, and are more likely to recommend their college or university to others.

04 Access to paid internships is uneven.

Black and Latino students, women, low-income, and first-generation students are less likely to experience a paid internship. Even when controlling for variation across majors, these disparities remain.

These findings add new knowledge about the noneconomic post-graduation benefits of work-based learning and provide a nuanced exploration of the benefits of paid internships and the access gaps that remain. Work-based learning models, including internships, apprenticeships, and cooperative education programs (or co-ops), are lauded as "high-impact" practices for student success.[1] Despite imprecise language defining work-based learning[2] and internships,[3] work-based learning opportunities ideally allow students to gain academic, technical, and workplace skills as part of their overall education, sometimes on-site with employer partners, and with active engagement from academic and employer mentors. Multiple pieces of federal legislation recognize the importance of work-based learning in preparing for future education and workforce needs,[4] and more states are beginning to develop frameworks and policy agendas to support these opportunities for their constituents.[5]

These real-world experiences help students learn new skills, build networks, and gain clarity on their future goals.

At least in the short-term, evidence has shown that holding internships can increase academic performance, confidence in career-planning decisions, employability, and career satisfaction.[6] Holding an internship also can help employers more readily recognize that a job candidate has valuable skills.[7] Participating in other types of work-based learning activities, such as apprenticeships and co-ops, also have positive benefits on academic success and college enrollment,[8] as well as job placement and starting salaries.[9,10]

Researchers have identified several features of internships that may factor into student outcomes: compensation, coordination between educators and employers, supervisor roles and relationships, internship duration, intern autonomy in learning, clarity of tasks and activities, and feedback mechanisms for students.[11]

In this paper, we focus on how compensation in internships influences students' confidence and their outcomes after completing a degree.

To better understand whether paid internship and other work-based learning experiences influence the experiences of current college students and the post-graduation outcomes of alumni, our report draws unique insights from three nationally representative surveys. The U.S. Department of Education's Baccalaureate and Beyond Longitudinal Survey[12] provides the opportunity to examine the differences in economic outcomes for alumni who had work-based learning experiences—paid internships, unpaid internships, practicum, co-ops—during their undergraduate education. Two new nationally representative surveys—the 2021 Strada-Gallup Education Survey and the 2021 Strada-College Pulse Survey—provide previously unexamined data on the economic and non-economic differences between those who experience work-based learning and those who do not.

Taken together, the pattern of findings indicate there are unique benefits associated with paid internships relative to other work-based learning opportunities. We also note that participation in these highly valuable paid internships is not representatively distributed across all populations of college students.

PAID INTERNSHIPS ARE ASSOCIATED WITH HIGHER EARNINGS

Bachelor's degree recipients who held paid internships are earning an average of $4,755 more than those who did not. In order to account for gaps in internship participation by race, ethnicity, gender, and field of study, we created a linear regression model.[13] The results show that participating in a paid internship as an undergraduate is associated with a predicted increase in annual wages of $3,096 one year after graduation. (See Table 2 in appendix.) This predicted wage differential is larger than predicted gaps associated with gender or race and ethnicity,[14] though still significantly smaller than the predicted earnings gaps associated with field of study, which are nearly $28,000 between computer science and humanities majors, for example.

The predicted payoff is evident only for paid internships, while unpaid internships, cooperative experiences, and practicums are not associated with a statistically significant increase in post-graduation earnings.

Predicted annual increase in earnings associated with participating in a paid internship as an undergraduate

ONE YEAR AFTER GRADUATION

+$3,096

WORK-BASED LEARNING IS ASSOCIATED WITH HIGHER SATISFACTION WITH EDUCATION AND CAREER

The Strada-Gallup Education Survey gives us the opportunity to get even closer to isolating the effect of work-based learning[15] by comparing matched groups of individuals who are demographically similar on key variables but differ in whether or not they had a work-based learning experience.[16]

Among bachelor's degree completers ages 21 to 65, the influence of work-based learning on four post-completion outcomes was examined:

01 Annual personal income

02 Career satisfaction

03 The belief their education helped them achieve their goals

04 Feeling their education was worth the cost

The matching variables for comparing those with work-based learning experiences to those without were:

- Race/ethnicity
- Gender
- Field of study
- Age

In addition, cost-of-living adjustments in the state of residence were included for the examination of annual personal income.[17]

Estimated effects of work-based learning on bachelor's degree recipients

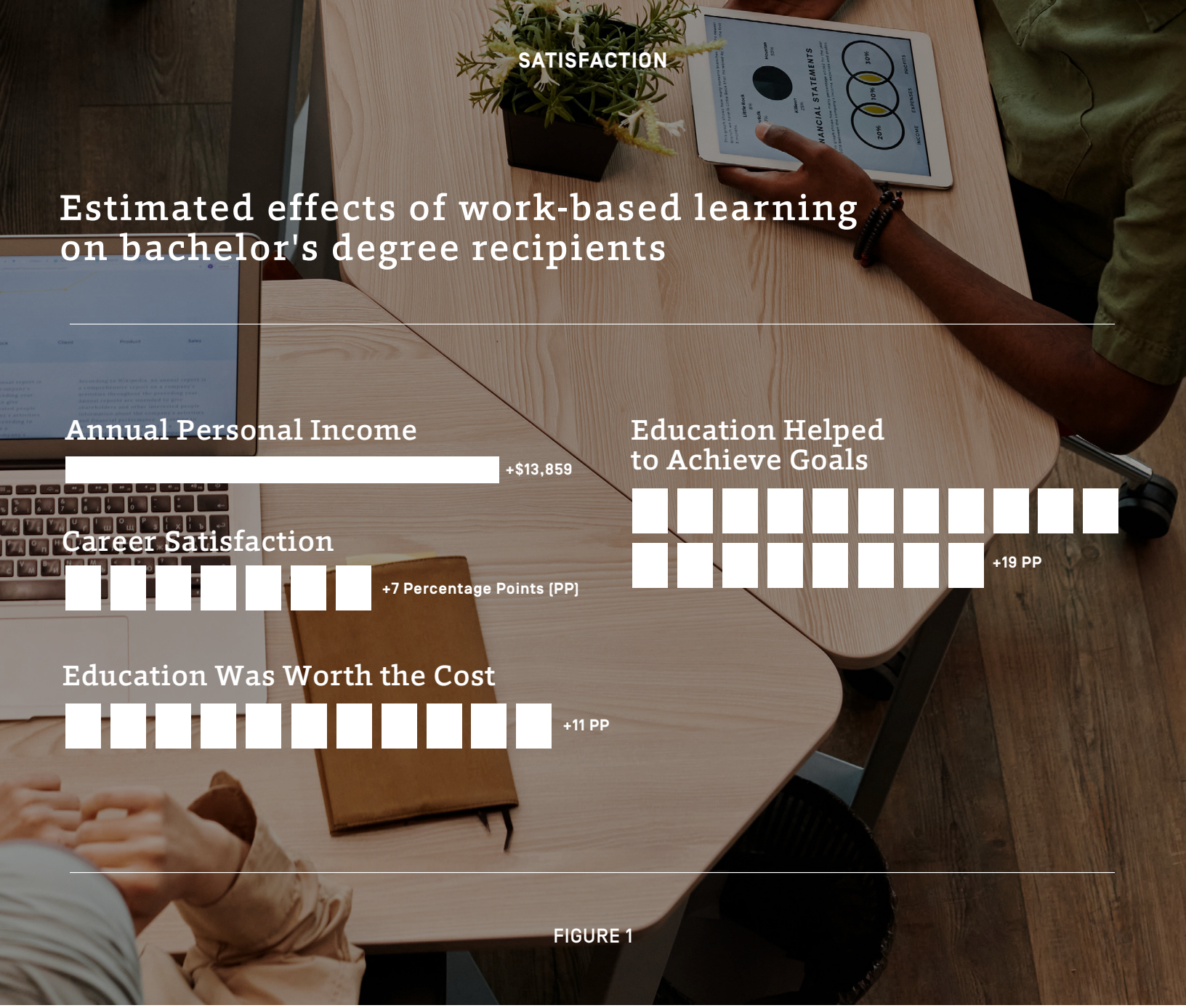


FIGURE 1

Participating in work-based learning had a positive predicted effect on annual personal income. (See Figure 1 above for main results and Tables 3-12 in the appendix for more detail.)

Work-based learning also was associated with better outcomes on the three subjective experiences with greater:

- Belief that education helped them achieve their goals.
- Career satisfaction.
- Agreement their education was worth the cost.

The biggest boost was in feelings that education was helpful in achieving one's goals as the estimated effect for those who participated in work-based learning was 19 percentage points for all bachelor's degree holders and a notable 39 percentage point increase in achieving their goals for those recent college graduates who experienced work-based learning.

Further, we found no statistically significant differences in the impact of work-based learning on post-completion outcomes based on race, gender, or socioeconomic status, suggesting that the benefit from such experiences is strong across demographic groups.[18]

PAID INTERNSHIPS INCREASE STUDENTS' CONFIDENCE IN THEMSELVES AND IN THE VALUE OF THEIR EDUCATION

In line with prior research,[19] we find that current students who have participated in an internship—paid or unpaid—report higher levels of self-confidence. However, those students who participate in a paid internship report higher levels of knowledge and confidence about career opportunities and feel more supported by their college or university compared to their peers who have unpaid internships, those with no internship, and those who have held a job related to their field of study. (See Figure 2.)

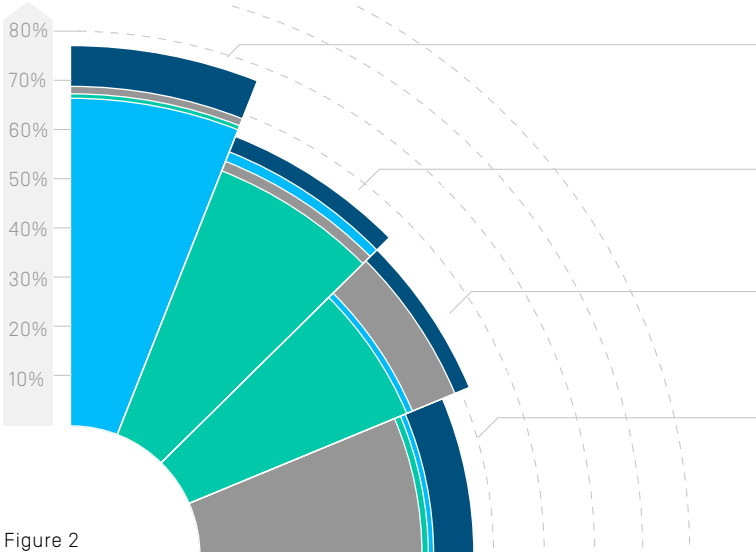
Students with paid internships also report:

- Higher confidence in the value of their education, believing it will be worth the cost and will help them to achieve their goals.
- They are more likely to recommend their school to others compared to students who have held an unpaid internship, no internship, or a job related to their field of study. (See Figure 3.)

WORK-BASED LEARNING

Paid | Unpaid | No Internship | Job related to field of study

Students with paid internships feel more confident and knowledgeable about career opportunities



Confidence in knowledge and skills to be successful in the job market

77% **66%** **67%** **69%**

I know people like me doing what I'm interested in for work

66% **62%** **58%** **60%**

Good understanding of the job market and career opportunities related to field of study

62% **50%** **49%** **59%**

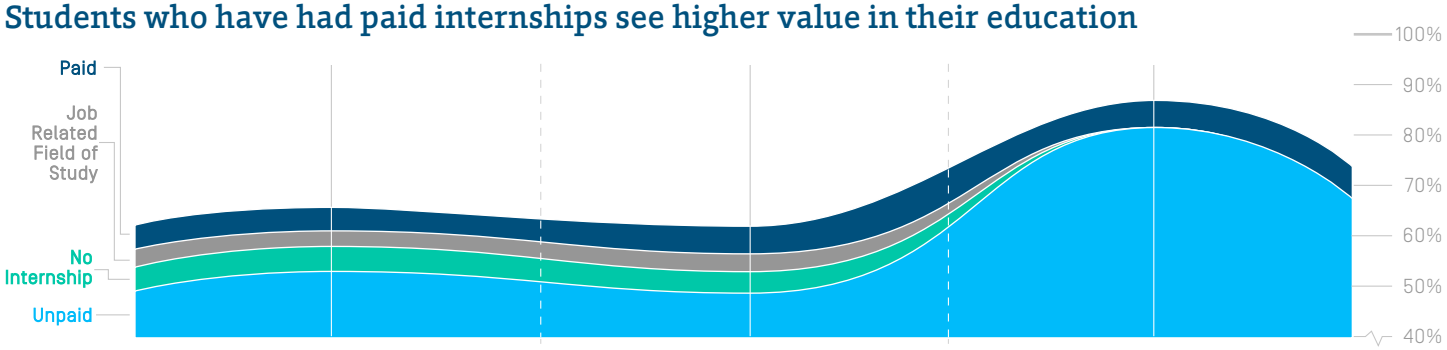
School's support for connecting education to a meaningful career

56% **48%** **47%** **46%**

Figure 2

Source: Strada-College Pulse Survey (December 2021), n=3,542

Students who have had paid internships see higher value in their education



"I am likely to recommend school"

63% **59%** **56%** **53%**

"My education will be worth the cost"

61% **56%** **52%** **49%**

"Education will help me achieve my goals"

86% **80%** **80%** **80%**

Figure 3

ACCESS TO WORK-BASED LEARNING OPPORTUNITIES

Significant differences exist among racial/ethnic groups of college graduates when it comes to having a paid internship—even when accounting for differences related to the field of study.

While the benefits of work-based learning opportunities are evident, the opportunity to have a high-quality work-based learning experience is relatively rare. According to the Department of Education's Baccalaureate and Beyond longitudinal survey, among the graduating class of 2016, 29 percent of bachelor's degree recipients held a paid internship, 31 percent held an unpaid internship, 10 percent participated in a cooperative experience, and 15 percent participated in a practicum. (See Figure 4.)

Students of color were typically less likely to hold internship opportunities, and participation varies by discipline. Black and Latino graduates, particularly women, were least likely to have held a paid internship. (See Figure 5.) Those who studied engineering, computer and information sciences , or business—fields in which students of color and women have been historically underrepresented—were most likely to have held a paid internship. (See Figure 6.)

First-generation and Federal Pell Grant recipients were also less likely to have held a paid internship compared to continuing generation or those who did not receive Pell grants. (See Figure 7.)

Less than one-third of bachelor's degree recipients report having had a paid internship as an undergraduate

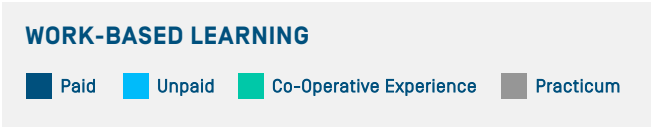


Figure 4

Source: Strada analysis of U.S. Department of Education, National Center for Education Statistics, Baccalaureate and Beyond: 2016/2017 (B&B), n=19,490, computation by NCES PowerStats.

White men are most likely to have had a paid internship

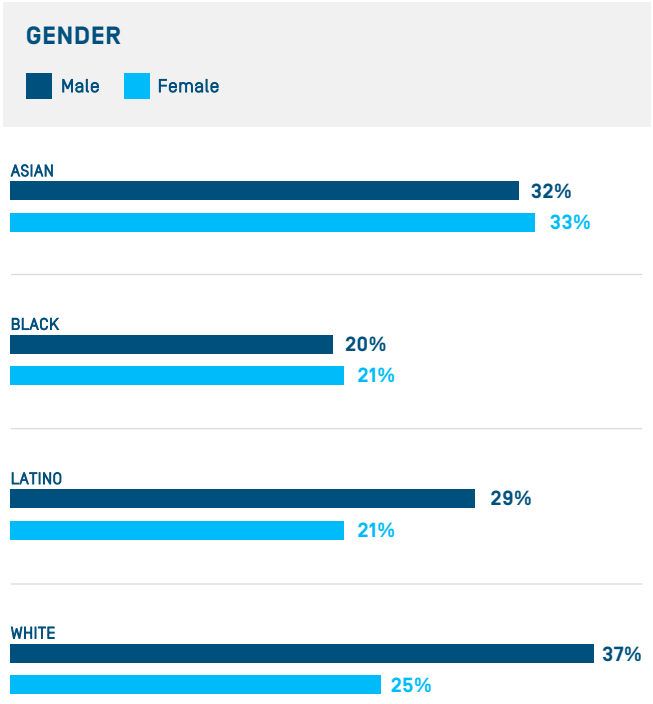


Figure 5

Source: Strada analysis of U.S. Department of Education, National Center for Education Statistics, Baccalaureate and Beyond: 2016/2017 (B&B), n=19,490, computation by NCES PowerStats.

To disentangle whether access gaps have more to do with field of study compared to race or gender, we ran a logistic regression model looking at the likelihood of participation in a paid internship, controlling for field of study. (See Table 1 in the appendix.) In this model, the remaining gender differences are small, though statistically significant. (Men are about 2 percentage points more likely to have held a paid internship compared to women.)

Differences by race and ethnicity remain larger, with Black or African American graduates about 13 percentage points less likely than white graduates to have held a paid internship, and Hispanic or Latino graduates about 8 percentage points less likely than white graduates to have held a paid internship.

Differences between white graduates and Asian, American Indian or Alaskan Native, and Native Hawaiian or Pacific Islander graduates were not statistically significant.

Unpaid internships paint a somewhat different story. Social science and humanities graduates were most likely to report having participated in an unpaid internship. After controlling for field of study, men are significantly less likely than women to have participated in unpaid internships (9 percentage points, see Table 2). Racial and ethnic differences in participation were not significant for Black and Latino graduates, while Asian graduates were 6 percentage points more likely than white graduates to have held an unpaid internship. (See Table 2.)

Participation in paid internships varies widely by major

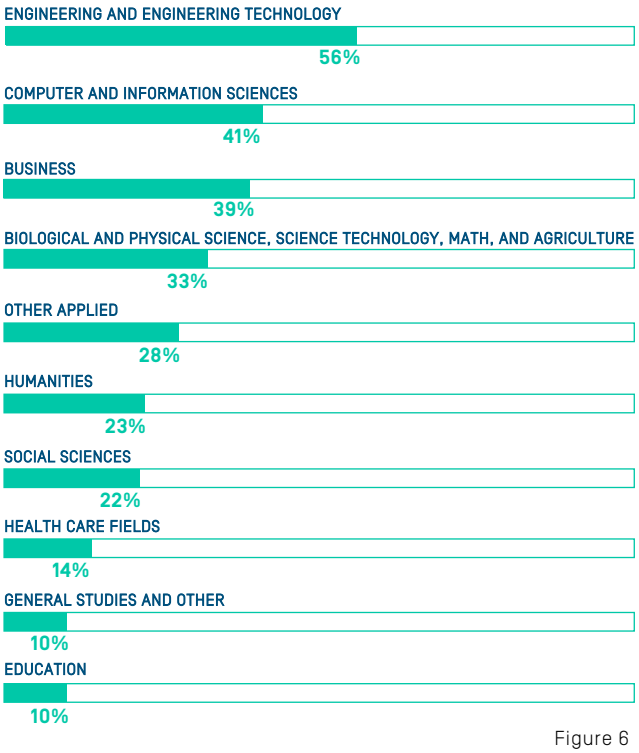


Figure 6

Source: Strada analysis of U.S. Department of Education, National Center for Education Statistics, Baccalaureate and Beyond: 2016/2017 (B&B), n=19,490, computation by NCES PowerStats.

Low income and first-generation students are less likely to have had a paid internship

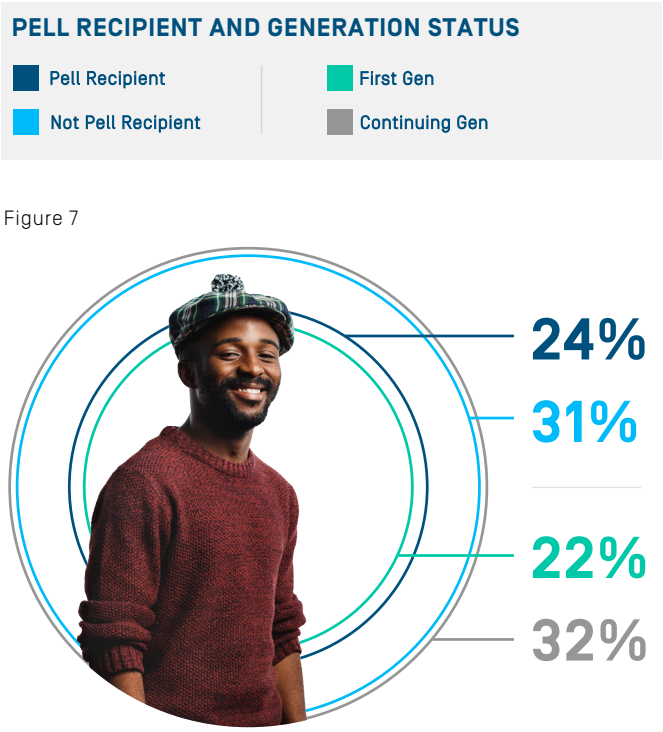


Figure 7

Source: Strada analysis of U.S. Department of Education, National Center for Education Statistics, Baccalaureate and Beyond: 2016/2017 (B&B), n=19,490, computation by NCES PowerStats.

THE FUTURE OF WORK-BASED LEARNING

Our findings add to the evidence base that work-based learning, and particularly paid internships, can help students gain confidence in themselves and secure better post-graduation economic outcomes, such as higher incomes.

We also find that work-based learning experiences are associated with noneconomic benefits, including:

- More positive perceptions about the value of education.
- Higher career satisfaction.
- Stronger feelings of goal achievement.

Yet we also find disparities in work-based learning experiences, with students of color, low-income students, first-generation students, and female students less likely to participate—even when controlling for fields of study. Prior Strada research also has found significant disparities in post-graduation outcomes for these populations, as well as positive impacts when students have experiences that help them connect their education to career.[20,21]

Given the evidence for the multiple benefits of work-based learning, how can these experiences be scaled and made accessible to more students? For one, to tackle disparities between paid and unpaid internships, institutions can ensure students in non-STEM majors have similar access to high-quality, paid internships as students in STEM disciplines.[22] Employers, institutions, and other government or philanthropic funders also need to develop revenue streams to help subsidize internship payment and target students who are women, low-income, first-generation, and/or students of color in receiving those opportunities.[23]

Emerging models of work-based learning, such as micro-internships and virtual internships, are also promising ideas, but our understanding of these experiences is still relatively new.[24] What is known is that quality work-based learning experiences provide a combination of compensation, training, and exposure to relevant and meaningful tasks, strong mentorship and career supports, and quality feedback on performance and learning.[25] To produce the desired outcomes for student success post-graduation, in the form of higher earnings, career confidence, or satisfaction, evolving models of work-based learning likely still need the core features of quality work-based learning experiences.[26,27] Expanding access to such high-quality experiences is a promising way to improve equitable outcomes for students in their career and personal development.

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[4]U.S. Department of Education, "Work-Based Learning Toolkit," 2017.

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[7]Ibid.

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[11]Matthew T. Hora., Matthew Wolfgram, and Samantha Thompson, "Research Brief #2: What Do We Know About the Impact of Internships on Student Outcomes? Results from a Preliminary Review of the Scholarly and Practitioner Literatures," Center for Research on College-Workforce Transitions, University of Wisconsin-Madison, September 2017.

[12]See https://nces.ed.gov/pubs2020/2020441.pdf for full documentation.

[13]See appendix for regression tables.

[14]Differences by race and ethnicity are no longer statistically significant for Black or Latino students in this model.

[15]The Strada-Gallup Education Survey asks a broader question: Did you participate in work-based learning, such as an internship or apprenticeship, during your [highest level of education]?

[16]The idea of matching is to simulate experimental conditions by pairing each observation in a "treatment" group (someone who participated in work-based learning) with an observation in the "control" group (someone who did not participate in work-based learning) that is identical or as close as possible across other characteristics. After matching, an estimation is conducted as to whether any differences in the outcome variable across the two groups are statistically significant. This estimated value is called the average treatment effect, that is, the average difference in the outcome metric compared to what the metric would have been without participating in work-based learning. Mahalanobis nearest neighbor matching, rather than propensity score matching, was chosen per guidelines in King, Gary, and Richard Nielsen. "Why propensity scores should not be used for matching." Political Analysis 27, no. 4 (2019): 435-454. See Tables 6-13 for covariate balancing summaries.

[17]Cost of living was measured by the Bureau of Economic Analysis' personal consumption expenditures by state.

[18]To test whether the relationship between work-based learning and post-completion outcomes is conditional on demographic factors, we ran regression models with interaction terms. These models did not reveal any significant differences in the marginal effects of work-based learning based on demographic variables.

[19]Iseult Gillespie, Jiahong Zhang, and Matthew Wolfgram, "Psychosocial Factors and Outcomes of College Internships: An Integrative Review," Center for Research on College-Workforce Transitions, University of Wisconsin–Madison, 2020.

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[24]Matthew T. Hora, Brian Vivona, Zi Chen, Jiahong Zhang, Mindi Thompson, and Rachell Brown, "What Do We Know about Online Internships? A Review of the Academic and Practitioner Literatures," Research Brief #10, Center for Research on College-Workforce Transitions, University of Wisconsin-Madison, May 2020.

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APPENDIX

Table 1. Probability of participating in a paid internship

Dependent variable: participated in a paid internship during undergraduate education	b (logistic regression coefficient)	Standard Error	t	p-value
Intercept	-0.3537**	0.1072	-3.298	0.0012
Male	0.089*	0.0506	1.76	0.0799
Black or African American	-0.5041***	0.0756	-6.6664	0
Hispanic or Latino	-0.303***	0.0789	-3.8424	0.0002
Asian	-0.0212	0.0858	-0.2475	0.8048
American Indian or Alaska Native	-0.2911	0.3952	-0.7367	0.4622
Native Hawaiian/other Pacific Islander	-1.0997	2.5378	-0.4333	0.6652
More than one race	0.1041	0.1508	0.6903	0.4908
Reference Group: Computer and information sciences				
Engineering and engineering technology	0.5807***	0.1258	4.6139	0
Biological and physical science, science technology, math, and agriculture	-0.3486**	0.1283	-2.7162	0.0072
General studies and other	-1.7585***	0.2566	-6.852	0
Social sciences	-0.8188***	0.1166	-7.0215	0
Humanities	-0.8148***	0.1163	-7.0074	0
Health care fields	-1.4048***	0.1327	-10.5867	0
Business	-0.0468	0.116	-0.4035	0.687
Education	-1.8598***	0.1739	-10.6942	0
Other applied	-0.518***	0.1118	-4.6322	0

*=p<.1, **=p<.05, ***=p<.01 | Negative log-likelihood (Pseudo R2): 0.061 | Probability F: 0.000

Table 2. Probability of participating in an unpaid internship

Dependent variable: participated in a paid internship during undergraduate education	b (logistic regression coefficient)	Standard Error	t	p-value
Intercept	-1.6014***	0.1656	-9.6700	0
Male	-0.3605***	0.0596	-6.0493	0
Black or African American	-0.0603	0.0741	-0.8136	0.4169
Hispanic or Latino	0.0724	0.0652	1.1102	0.2682
Asian	0.2483***	0.0927	2.6786	0.0080
American Indian or Alaska Native	-0.0816	0.4146	-0.1969	0.8441
Native Hawaiian/other Pacific Islander	0.0748	0.4391	0.1703	0.8649
More than one race	0.1384	0.1114	1.2424	0.2155
Reference Group: Computer and information sciences				

Engineering and engineering technology	0.0944	0.1905	0.4954	0.6209
Biological and physical science, science technology, math, and agriculture	0.8865***	0.1742	5.0883	0
General studies and other	0.4972*	0.2732	1.8203	0.0702
Social sciences	1.1005***	0.1671	6.5845	0
Humanities	1.0982***	0.1711	6.4200	0
Health care fields	0.5872***	0.1734	3.3870	0.0009
Business	0.5646***	0.1655	3.4121	0.0008
Education	1.0700***	0.1707	6.2668	0
Other applied	1.6201***	0.1628	9.9519	0

*=p<.1, **=p<.05, ***=p<.01 | Negative log-likelihood (Pseudo R2): 0.0398 | Probability F: 0.000

Table 3. Paid internships and post-completion annual earnings

Dependent variable: Most recent job, within 12 months after BA completion: Annualized salary based on month 12	b (linear regression coefficient)	Standard Error	t	p-value
Intercept	52,788.66***	2,014.12	26.2093	0
Participated in a paid internship during undergraduate education	3,096.27***	516.9428	5.9896	0
Male	3,038.81***	463.6226	6.5545	0
Black or African American	-1,076.40	811.6746	-1.3261	0.1863
Hispanic or Latino	-469.0979	669.2637	-0.7009	0.4842
Asian	2,304.78*	1,277.71	1.8038	0.0728
American Indian or Alaska Native	1,042.18	2,642.81	0.3943	0.6937
Native Hawaiian/other Pacific Islander	1,374.51	2,985.06	0.4605	0.6457
More than one race	-1,381.32	1,124.47	-1.2284	0.2207
Reference Group: Computer and information sciences				
Engineering and engineering technology	-3,794.25*	2,144.22	-1.7695	0.0783
Biological and physical science, science technology, math, and agriculture	-25,236.26***	2,128.99	-11.8536	0
General studies and other	-20,744.87***	2,620.88	-7.9152	0
Social sciences	-24,428.27***	2,096.85	11.65	0
Humanities	-27,909.31***	2,131.47	-13.0939	0
Health care fields	-7,660.81***	2,141.17	-3.5779	0.0004
Business	-16,068.87***	2,162.55	-7.4305	0
Education	-22,625.40***	2,063.75	-10.9633	0
Other applied	-23,822.86***	2,051.30	-11.6135	0

*=p<.1, **=p<.05, ***=p<.01 | R2: 0.1723 | Probability F: 0.000

Table 4. Estimated effects of work-based learning

	Bachelor's degree recipients recipients since 2016	Bachelor's degree
Annual personal income	+$13,859*** [4,587]	+$18,889** [7,256]
Career satisfaction	+7 pp*** [.025]	+11 pp* [.067]
Education was worth the cost	+11 pp*** [.021]	+8 pp [.063]
Education helped me to achieve my goals	+19 pp*** [.022]	+39 pp*** [.069]
n	2,475	310

*=p<.1, **=p<.05, ***=p<.01

Table 5. Covariate balance summary, Bachelor's degree holders, estimated income

	Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched
Hispanic	-0.02	-0.02	0.95	0.95
Black	-0.04	0.00	0.88	1.00
male	-0.09	-0.02	1.00	1.00
age	-0.40	-0.06	1.00	0.99
cost of living index	0.14	0.03	1.27	1.03
Education	0.23	0.00	2.10	1.00
Social sciences	0.08	0.00	1.42	1.00
Engineering	0.16	0.00	1.50	1.00
Computer Science and IT	-0.02	0.00	0.93	1.00
Communications	0.12	0.00	1.68	1.00
Psychology	-0.14	0.00	0.55	1.00
Visual and performing arts	0.01	0.00	1.04	1.00
Biology	-0.01	0.00	0.96	1.00
English	-0.09	0.00	0.67	1.00
History	-0.07	0.00	0.66	1.00
Protective services	-0.01	0.00	0.93	1.00
Agriculture	0.08	0.00	2.36	1.00
Math and statistics	0.02	0.00	1.13	1.00
Physical sciences	-0.08	0.00	0.58	1.00
Legal studies	0.03	0.00	1.38	1.00
Architecture	0.01	0.00	1.15	1.00

Health	0.03	0.00	1.09	1.00
Construction	0.00	0.00	0.99	1.00
Liberal arts	-0.10	0.00	0.63	1.00
Mechanic/repair	-0.05	-0.04	0.0	0.00
Public administration	0.09	0.00	2.94	1.00
Philosophy/theology	-0.04	0.00	0.68	1.00
Parks, recreation	0.06	0.00	1.89	1.00

Table 6. Covariate balance summary, bachelor's degree holders, career satisfaction

	Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched
Hispanic	-0.01	-0.02	0.96	0.94
Black	-0.04	-0.01	0.88	0.98
male	-0.09	-0.01	1.00	1.00
age	-0.43	-0.05	1.01	0.98
Education	0.22	0.00	2.15	1.00
Social sciences	0.08	0.00	1.51	1.00
Engineering	0.18	0.00	1.56	1.00
Computer Science and IT	-0.03	0.00	0.90	1.00
Communications	0.09	0.00	1.50	1.00
Psychology	-0.15	0.00	0.53	1.00
Visual and performing arts	0.02	0.00	.09	1.00
Biology	-0.01	0.00	0.98	1.00
English	-0.10	0.00	0.65	1.00
History	-0.07	0.00	0.63	1.00
Protective services	-0.04	0.00	0.68	1.00
Agriculture	0.08	0.00	2.58	1.00
Math and statistics	-0.02	0.00	0.89	1.00
Physical sciences	-0.08	0.00	0.60	1.00
Legal studies	0.01	0.00	1.16	1.00
Architecture	0.02	0.00	1.38	1.00
Health	0.02	0.00	1.05	1.00
Construction	0.00	0.00	1.00	1.00
Liberal arts	-0.07	0.00	0.72	1.00
Mechanic/repair	-0.05	-0.04	0.00	0.00
Public administration	0.10	0.00	3.28	1.00
Philosophy/theology	-0.04	0.00	0.65	1.00
Parks, recreation	0.08	0.00	2.58	1.00

Table 7. Covariate balance summary, bachelor's degree holders, education worth the cost

	Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched
Hispanic	-0.02	-0.02	0.94	0.95
Black	-0.03	0.01	0.91	1.02
male	-0.09	-0.01	1.00	1.00
age	-0.40	-0.04	1.00	0.99
Education	0.23	0.00	2.08	1.00
Social sciences	0.08	0.00	1.42	1.00
Engineering	0.17	0.00	1.53	1.00
Computer Science and IT	-0.04	0.00	0.88	1.00
Communications	0.12	0.00	1.67	1.00
Psychology	-0.14	0.00	0.56	1.00
Visual and performing arts	-0.01	0.00	0.96	1.00
Biology	-0.01	0.00	0.94	1.00
English	-0.08	0.00	0.69	1.00
History	-0.07	0.00	0.64	1.00
Protective services	-0.03	0.00	0.82	1.00
Agriculture	0.08	0.00	2.31	1.00
Math and statistics	0.02	0.00	1.13	1.00
Physical sciences	-0.07	0.00	0.65	1.00
Legal studies	0.01	0.00	1.16	1.00
Architecture	0.01	0.00	1.16	1.00
Health	0.02	0.00	1.07	1.00
Construction	0.00	0.00	0.98	1.00
Liberal arts	-0.09	0.00	0.65	1.00
Mechanic/repair	-0.03	-0.03	0.00	0.00
Public administration	0.09	0.00	2.97	1.00
Philosophy/theology	-0.04	0.00	0.65	1.00
Parks, recreation	0.06	0.00	1.91	1.00

Table 8. Covariate balance summary, bachelor's degree holders, education helped achieve goals

	Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched
Hispanic	0.00	-0.02	1.00	0.94
Black	-0.03	0.01	0.92	1.03
male	-0.09	-0.01	1.00	1.00
age	-0.36	-0.04	1.02	0.99

Education	0.23	0.00	2.08	1.00
Social sciences	0.08	0.00	1.49	1.00
Engineering	0.18	0.00	1.54	1.00
Computer Science and IT	-0.03	0.00	0.91	1.00
Communications	0.12	0.00	1.67	1.00
Psychology	-0.13	0.00	0.57	1.00
Visual and performing arts	-0.01	0.00	0.96	1.00
Biology	-0.02	0.00	0.90	1.00
English	-0.08	0.00	0.71	1.00
History	-0.07	0.00	0.62	1.00
Protective services	-0.02	0.00	0.88	1.00
Agriculture	0.08	0.00	2.47	1.00
Math and statistics	0.00	0.00	1.00	1.00
Physical sciences	-0.08	0.00	0.57	1.00
Legal studies	0.02	0.00	1.20	1.00
Architecture	0.02	0.00	1.35	1.00
Health	0.05	0.00	1.16	1.00
Construction	-0.01	0.00	0.91	1.00
Liberal arts	-0.10	0.00	0.62	1.00
Mechanic/repair	-0.04	-0.03	0.00	0.00
Public administration	0.07	0.00	2.31	1.00
Philosophy/theology	-0.05	0.00	0.57	1.00
Parks, recreation	0.06	0.00	2.00	1.00

Table 9. Covariate balance summary, bachelor's degree holders since 2016, estimated income

	Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched
Hispanic	-0.08	-0.07	0.82	0.83
Black	-0.21	-0.09	0.53	0.71
male	-0.05	-0.17	1.00	1.00
age	-0.45	-0.24	0.48	0.58
cost of living index	0.13	0.17	1.30	1.16
Education	0.27	0.00	3.93	1.00
Social sciences	0.02	0.00	1.05	1.00
Engineering	0.30	0.01	2.06	1.02
Computer Science and IT	0.14	0.00	1.43	1.00
Communications	0.30	0.00	9.46	1.00
Psychology	-0.36	0.00	0.22	1.00

Visual and performing arts	0.03	0.00	1.24	1.00
Biology	-0.04	0.00	0.84	1.00
English	-0.06	0.00	0.63	1.00
History	0.03	0.00	1.24	1.00
Protective services	-0.02	0.00	0.83	1.00
Agriculture	-0.05	0.00	0.63	1.00
Math and statistics	0.18	0.00	2.81	1.00
Physical sciences	-0.22	-0.16	0.00	0.00
Legal studies	-0.05	0.00	0.63	1.00
Health	-0.08	0.00	0.81	1.00
Construction	-0.02	0.00	0.83	1.00
Liberal arts	-0.09	0.00	0.64	1.00
Public administration	0.11	0.00	1.83	1.00
Philosophy/theology	0.12	0.08	.	.
Parks, recreation	0.12	0.08	.	.

Table 10. Covariate balance summary, bachelor's degree holders since 2016, career satisfaction

	Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched
Hispanic	-0.06	0.05	0.84	1.16
Black	-0.18	-0.07	0.59	0.76
male	-0.12	-0.20	1.02	1.03
age	-0.56	-0.04	0.41	0.99
Education	0.31	0.00	5.23	1.00
Social sciences	0.00	0.00	1.01	1.00
Engineering	0.32	0.00	2.05	1.00
Computer Science and IT	0.11	0.00	1.29	1.00
Communications	0.18	0.00	4.36	1.00
Psychology	-0.45	-0.02	0.08	0.94
Visual and performing arts	-0.04	0.00	0.75	1.00
Biology	-0.06	0.00	0.75	1.00
English	-0.04	0.00	0.75	1.00
History	0.02	0.00	1.12	1.00
Protective services	-0.04	0.00	0.75	1.00
Agriculture	0.01	0.00	1.12	1.00
Math and statistics	0.13	0.00	1.90	1.00
Physical sciences	-0.12	-0.09	0.00	0.00

Legal studies	-0.06	0.00	0.56	1.00
Health	-0.09	0.00	0.79	1.00
Construction	0.01	0.00	1.12	1.00
Liberal arts	-0.06	0.00	0.75	1.00
Public administration	0.10	0.00	1.64	1.00
Philosophy/theology	0.13	0.09	.	.
Parks, recreation	0.13	0.09	.	.

Table 11. Covariate balance summary, bachelor's degree holders since 2016, education worth the cost

	Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched
Hispanic	-0.07	-0.03	0.84	0.93
Black	-0.23	-0.09	0.51	0.75
male	-0.05	-0.14	1.00	1.00
age	-0.48	-0.21	0.44	0.63
Education	0.27	0.00	4.08	1.00
Social sciences	0.03	0.00	1.09	1.00
Engineering	0.34	0.01	2.27	1.02
Computer Science and IT	0.13	0.00	1.39	1.00
Communications	0.30	0.00	9.82	1.00
Psychology	-0.35	0.00	0.22	1.00
Visual and performing arts	-0.02	0.00	0.87	1.00
Biology	-0.08	0.00	0.72	1.00
English	-0.06	0.00	0.65	1.00
History	0.04	0.00	1.29	1.00
Protective services	-0.06	0.00	0.65	1.00
Agriculture	-0.04	0.00	0.65	1.00
Math and statistics	0.15	0.00	2.20	1.00
Physical sciences	-0.21	-0.16	0.00	0.00
Legal studies	-0.04	0.00	0.65	1.00
Health	-0.10	0.00	0.77	1.00
Construction	-0.02	0.00	0.87	1.00
Liberal arts	-0.08	0.00	0.66	1.00
Public administration	0.12	0.00	1.90	1.00
Philosophy/theology	0.12	0.08	.	.
Parks, recreation	0.12	0.08	.	.

Table 12. Covariate balance summary, bachelor's degree holders since 2016, education helped achieve goals

	Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched
Hispanic	-0.01	0.00	0.97	1.00
Black	-0.22	-0.11	0.53	0.67
male	-0.03	-0.09	1.00	1.00
age	-0.45	-0.31	0.47	0.53
Education	0.18	0.00	2.72	1.00
Social sciences	0.04	0.00	1.14	1.00
Engineering	0.32	0.01	2.10	1.02
Computer Science and IT	0.17	0.00	1.52	1.00
Communications	0.33	0.21	.	.
Psychology	-0.39	0.00	0.17	1.00
Visual and performing arts	-0.01	0.00	0.94	1.00
Biology	-0.06	0.00	0.79	1.00
English	-0.01	0.00	0.94	1.00
History	0.10	0.00	2.08	1.00
Protective services	-0.05	0.00	0.71	1.00
Agriculture	-0.04	0.00	0.71	1.00
Math and statistics	0.14	0.00	2.05	1.00
Physical sciences	-0.22	-0.17	0.00	0.00
Legal studies	-0.04	0.00	0.71	1.00
Health	0.01	0.00	1.03	1.00
Construction	-0.01	0.00	0.94	1.00
Liberal arts	-0.09	0.00	0.61	1.00
Public administration	0.10	0.00	1.73	1.00
Philosophy/theology	0.13	0.08	.	.
Parks, recreation	0.13	0.08	.	.

SURVEY METHODOLOGY: THIS REPORT USES DATA FROM THE FOLLOWING SOURCES

Baccalaureate and Beyond Longitudinal Study

The Baccalaureate and Beyond Longitudinal Study (B&B) https://nces.ed.gov/surveys/b&b/ is a nationally representative longitudinal study of students who completed the requirements for a bachelor's degree in a given academic year. The study follows graduating seniors one, four, and 10 years after completing their bachelor's degree. The National Postsecondary Student Aid Study serves as the base year for each cohort. Four cohorts have been followed. This report uses data from the cohort who completed their bachelor's degree in 2015–16 and were followed in 2017 and 2020. Data include a student interview, as well as administrative data from the following sources: Central Processing System (FAFSA), National Student Loan Data System (Pell (58 percent), and Student Loans (74 percent)), National Student Clearinghouse (enrollment, degree, certificate), Veterans Benefit Administration.

Strada-College Pulse December 2021 Survey

This survey was conducted by College Pulse. Interviews were conducted in English among a sample of 4542 undergraduate students who are currently enrolled in the U.S. For this study, only undergraduates enrolled at four-year institutions were included (n=3,452).

The sample was drawn from College Pulse's Undergraduate Student Panel that includes over 400,000 verified students representing more than 1000 different colleges and universities in all 50 states. Panel members are recruited by a number of methods to help ensure diversity in the panel population, including web advertising, permission-based email campaigns, and partnerships with university organizations.

To reduce the effects of any non-response bias, a post-stratification adjustment was applied based on demographic distributions from the 2017 Current Population Survey. The post-stratification weight rebalanced the sample based on the following benchmarks: age, race and ethnicity, and gender. The sample weighting was accomplished using an iterative proportional fitting process that simultaneously balances the distributions of all variables. Weights were trimmed to prevent individual interviews from having too much influence on the final results.

The margin of error for this survey is +/- 1.7%. Margins of error are typically calculated on probability-based samples and are not technically correct for non-probability online samples. We supply them here to provide a general assessment of error ranges that may be associated with the data.

This survey was fielded between Dec. 13 and Dec. 18, 2021.

Strada-Gallup Education Survey

Results for the Strada-Gallup Education Survey are based on web and mail surveys conducted from Sept. 15 to Nov. 8, 2021, with a random sample of 9,028 adults ages 18 to 65, living in all 50 states and Washington, D.C. Gallup randomly selected individuals to participate in the study using an address-based sample frame. Respondents had the opportunity to respond to the survey via web or mail. Surveys were conducted in English and Spanish.

Samples were weighted to correct for unequal selection probability and nonresponse. Demographic weighting targets are based on the 2018 American Community Survey figures for the ages 18 to 65 population. The data were weighted to match national demographics of age, education, gender, race, ethnicity, region, labor force participation, and population density.

In addition to sampling error, question wording and practical difficulties in conducting surveys can introduce error or bias into the findings of public opinion polls.

Authors
Nichole Torpey-Saboe, Ph.D.
Elaine W. Leigh, Ph.D.
Dave Clayton, Ph.D.

Strada Education Network is a nonprofit organization dedicated to helping people take advantage of education and training after high school that helps them secure a good job, do meaningful work, contribute to their communities, and lead a fulfilling life. We believe education and training after high school have the potential to be the most powerful and equitable ways to help all people thrive in their careers and lives. To help students succeed beyond completion of a certificate or degree, we conduct research, make charitable grants and social impact investments, and support Strada Collaborative, which directly serves students and workers. Learn more at **stradaeducation.org.**