COURSE REPORT

2014 Programming Bootcamp Graduate Survey

Bootcamp alumni report a 44% increase in post-bootcamp salary

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Key Findings

In our first graduate survey, and the first cross-school study of its kind in the programming bootcamp industry, we find strong evidence of salary growth, with respondents reporting a $25k average increase in their first job after attending a programming bootcamp.

Change in Salary	Before	After	Percent
All Respondents	$52,809	$75,965	44%
Full-time only	$55,837	$80,607	44%

In addition, bootcamp attendees are more likely to work full-time after school.

Change in Employment	Before	After
Employed full-time	48%	63%
Employed part-time	7%	4%
Employed freelance	10%	9%
Self-employed	8%	6%
Student	7%	1%
Unemployed	17%	14%
Other	2%	2%

The report also finds:

- 75% report working in a job requiring the skills learned at bootcamp, compared to 5% working as full-time programmers beforehand.
- The average student paid $10k in tuition.
- The typical attendee is 29, has 6 years of work experience, and has never worked as a programmer.
- 38% of bootcamp attendees are female.

Methodology

We surveyed graduates from 48 qualifying programming schools, commonly referred to as bootcamps. We received 432 responses from graduates that met the criteria described below. The surveys were sent to graduates and all figures are self-reported by the respondents.

Inclusion Criteria

Programming bootcamps: to qualify for inclusion in the survey, a school must (a) offer full-time, in-person instruction of 40 or more hours of classroom time per week, (b) not be associated with an accredited college or university, (c) provide programming-specific curriculum (schools specializing in product development, design, or marketing were excluded), and (d) be based in the United States or Canada. Many schools offer courses at multiple campuses across a wide range of curriculum.

Graduates: To qualify for inclusion in the survey, individuals must have completed a course offered by a programming bootcamp (as defined above) prior to June 1, 2014.

Post-Stratification

Because bootcamps likely varied in the extent to which they distributed and advertised the survey to students, it is unlikely that our raw sample is representative of the overall population of students. To adjust for varying sampling probabilities across schools, we post-stratify the sample on school using the known (2013-2014) bootcamp sizes from a recent Course Report survey. Respondents are weighted such that the in-sample distribution of respondents across camps matches as closely as possible the known distribution of bootcamp sizes. Therefore, our estimates rely on a much weaker assumption than random sampling—we only need to assume that respondents are effectively randomly sampled within school strata.

Missing Data

Some respondents elected not to respond to certain questions (such as salary). Unless this non-response is completely random, dropping these respondents when calculating means would induce bias in the estimates. The current best practice for dealing with missing data is to impute multiple estimates of the missing values using a statistical model and the observed data. We use the multiple imputation algorithm developed in King, Honaker, Joseph and Scheve (2001) and implemented in the Amelia software package for this purpose.

Survey Results

Student Demographic Profile

Respondents self-reported demographic information such as age, gender, and race. The student profile is summarized below in Table 1.

Table 1: Demographic Profile

	Estimate (Mean)	Standard Error	Lower 95% CI	Upper 95% CI	Margin of Error
Age					
Age	29.0	0.7	27.6	30.5	1.5
Gender					
Female	38%	4%	30%	46%	8%
Male	62%	4%	54%	70%	8%
Race					
American Indian	0%	0%	0%	1%	0%
Asian American	18%	3%	11%	24%	6%
Black	1%	0%	0%	2%	1%
Other	17%	4%	10%	25%	7%
White	63%	4%	56%	71%	8%
Citizens					
Yes, born in U.S.	76%	4%	69%	83%	7%
Yes, naturalized	10%	3%	5%	16%	5%
No	14%	3%	7%	20%	6%
Educational Attainment					
High school	0%	0%	0%	1%	1%
Some college	10%	2%	6%	15%	5%
Associate's degree	1%	0%	0%	2%	1%
Bachelor's degree	71%	4%	64%	78%	7%
Master's degree	15%	3%	9%	20%	6%
Professional degree	2%	1%	0%	3%	1%
Doctorate degree	1%	0%	0%	2%	1%

Many programming bootcamps offer scholarships for women, so we compare our findings on gender enrollment to the 2013 Taulbee Survey, an annual survey of computer science programs at accredited universities. The Taulbee study estimated that 14.5% of 2013 bachelor degrees were awarded to females. Our study suggests that bootcamps compare favorably to traditional computer science departments (as well as masters programs) on gender diversity.

Pre-Bootcamp Work Experience

Most respondents were not employed as software developers prior to attending bootcamp, with an estimated 18% reporting developing software at work, and only 5% programming full-time prior to enrolling.

Table 2: Programming Experience

	Estimate (Mean)	Standard Error	Lower 95% CI	Upper 95% CI	Margin of Error
Programming Background					
Full-time at work	5%	2%	1%	8%	4%
Some at work	13%	4%	6%	21%	7%
Some in my free-time	41%	4%	33%	48%	8%
None	37%	4%	29%	45%	8%
Other	5%	2%	1%	8%	4%

The average work experience among students is 6.3 years, although 17% report being unemployed prior to bootcamp enrollment.

Table 3: Work Experience and Salary

	Estimate (Mean)	Standard Error	Lower 95% CI	Upper 95% CI	Margin of Error
Pre-Camp Employment Status					
Employed full-time	48%	4%	41%	56%	8%
Employed part-time	7%	1%	5%	10%	3%
Employed freelance	10%	3%	5%	15%	5%
Self-employed	8%	2%	4%	13%	5%
Student	7%	3%	2%	12%	5%
Unemployed	17%	4%	10%	23%	7%
Other	2%	1%	1%	4%	2%
Work Experience					
Years	6.3	0.7	4.9	7.7	1.4
Salary					
All Respondents	$52,809	$3,022	$46,885	$58,732	$5,923
Those working FT	$55,837	$4,140	$47,722	$63,951	$8,114

Application and Tuition

Most graduates report applying to gain a job as a programmer (74%), although 8% report attending in order to start their own business as a technical cofounder. Less than 1% report attending bootcamp to get a promotion or change jobs with their current employer.

Table 4: Application

	Estimate (Mean)	Standard Error	Lower 95% CI	Upper 95% CI	Margin of Error
Number of Applications					
Num. schools applied	1.6	0.1	1.4	1.8	0.2
Num. accepted	1.3	0.1	1.2	1.5	0.2
Reason for Attending					
Programming job	74%	4%	67%	82%	8%
Start company	8%	2%	4%	13%	4%
Non-technical job	7%	3%	2%	13%	6%
Other	7%	2%	3%	10%	4%
Freelance/contract	2%	2%	-2%	6%	4%
Promotion	1%	0%	0%	2%	1%

Average tuition is $10k, with most students paying for school themselves or with the help of family (79%). Some schools offer tuition reimbursement for students who receive job placement through the school, and 15% of students report receiving such reimbursements.

Table 5: Tuition

	Estimate (Mean)	Standard Error	Lower 95% CI	Upper 95% CI	Margin of Error
Tuition					
Tuition	$10,267	$423	$9,438	$11,096	$829
Source of Funding					
Self	64%	4%	56%	71%	7%
Family	25%	3%	19%	32%	6%
External (Loan)	3%	1%	1%	4%	1%
School (Scholarship)	3%	2%	0%	5%	3%
Employer	1%	1%	0%	3%	1%
Tuition Refund from Job Placement					
Yes	15%	3%	9%	21%	6%
No	85%	3%	79%	91%	6%

School Services, and Satisfaction

Many schools offer services to help prepare students for the job market. Almost all students report receiving some form of assistance.

Table 6: Career Services

	Estimate (Mean)	Standard Error	Lower 95% CI	Upper 95% CI	Margin of Error
Resume Prep Assistance					
Yes	87%	3%	82%	93%	6%
No	13%	3%	7%	18%	6%
Apprenticeship or Internship Placement					
Yes	60%	4%	53%	67%	7%
No	40%	4%	33%	47%	7%
On-Site Interviews					
Yes	42%	3%	36%	48%	6%
No	58%	3%	52%	64%	6%
Job Placement Assistance					
Yes	58%	3%	51%	64%	7%
No	42%	3%	36%	49%	7%

Table 7: School Satisfaction

	Estimate (Mean)	Standard Error	Lower 95% CI	Upper 95% CI	Margin of Error
Overall Program Satisfaction					
Satisfaction (1-10)	8.1	0.2	7.7	8.5	0.4
Recommend? (1-10)	7.9	0.2	7.5	8.4	0.4

Post-Bootcamp Employment

Overall, 75% of graduates report being employed full-time in a job requiring the skills learned at bootcamp. Among those, most (63%) are in salaried position, with others reporting working as an independent contractor or running their own business.

Table 8: Post-Bootcamp Employment

	Estimate (Mean)	Standard Error	Lower 95% CI	Upper 95% CI	Margin of Error
Post-Camp Employment Status					
Employed full-time	63%	4%	56%	70%	7%
Employed part-time	4%	2%	0%	9%	4%
Employed freelance	9%	3%	4%	15%	6%
Self-employed	6%	3%	1%	11%	5%
Student	1%	1%	-2%	4%	3%
Unemployed	14%	3%	8%	20%	6%
Other	2%	1%	0%	4%	2%
Employed in Programming Job					
Yes	75%	4%	67%	83%	8%
No	25%	4%	17%	33%	8%
Salary					
Employed	$75,965	$9,892	$56,577	$95,353	$19,388
Employed FT	$80,607	$13,425	$54,294	$106,921	$26,313

About Course Report

Course Report, founded in 2013 by Adam Lovallo and Liz Eggleston, operates https://www.coursereport.com/, which helps potential students find and research programming bootcamp programs. Course Report offers a directory of schools, course schedules, and interviews with teachers, founders, students, and alumni.