



NYC  
Tech Talent  
Pipeline

KEY PRACTICES FOR

# Accelerated Tech Training

Attracting and Supporting a Broader  
Student Body and Improving Job  
Outcomes for All Graduates

**NYC**  
Small Business  
Services

careers  
businesses  
neighborhoods

# Table of Contents

<b><u>Executive Summary</u></b>	4		
<b><u>Context &amp; Goals</u></b>	7		
<b><u>Key Practices</u></b>	10 — 39		
<b>Continuously Engage Industry To Improve Job Outcomes</b>	12 — 17		
PRACTICE 1	13		
Engage Local Industry Through Multiple Channels To Develop and Continuously Update Training			
PRACTICE 2	15		
Use Industry-Informed Screening That Includes Non-Technical Skills			
PRACTICE 3	17		
Invest in a Team To Proactively Connect Students to Jobs			
<b>Attract and Support an Expanded Pool of Students</b>	18 — 32		
PRACTICE 4	19		
Expand Student Pool Through Community-Based Recruitment Partners			
PRACTICE 5	21		
Offer Student-Friendly Financing Options and Guidance			
		PRACTICE 6	24
		Provide Clear Up-Front Information on All Requirements	
		PRACTICE 7	27
		Deploy Trained Staff To Help Students Manage Non-Technical Challenges	
		PRACTICE 8	29
		Cultivate a Supportive Community Through Cohorts	
		PRACTICE 9	31
		Conduct Assessments Frequently and Provide Targeted Support	
		<b>Integrate “Real World” Preparation and Experience Throughout Training</b>	33 — 39
		PRACTICE 10	
		Provide Early, Frequent Tech-Specific Professional Development	34
		PRACTICE 11	
		Require Industry-Informed Projects That Involve Real-World Applications and Demonstrations	36
		PRACTICE 12	
		Help Students Gain Experience, Including Through Paid Internships	38
		<b><u>Conclusion</u></b>	40
		<b><u>Appendix</u></b>	42

# [Executive Summary]

The New York City tech ecosystem is thriving. Diverse companies integrated throughout every sector and borough support more than 320,000 jobs and \$30 billion in wages annually. These businesses rely on technical talent to help their companies start, grow, and succeed. Yet companies within, and beyond, NYC cannot find enough qualified candidates to keep up with their ever-evolving demand for talent.

In response to this demand, educational institutions have stepped in to equip and deliver talent to meet industry's needs and prepare residents for 21st century jobs. This includes tech bootcamps – non-degree granting organizations that offer accelerated tech education – which have grown dramatically in size and popularity since 2012. Bootcamps offer intensive programs that usually span from 12 to 22 weeks with an emphasis on in-demand specialties. In New York City, the number of tech bootcamps has more than doubled in the past two years from nine schools in 2015 to 22 in 2017, making NYC home to the most bootcamps of any U.S. city.

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**In this crowded field, accelerated training bootcamps that focus on effectively delivering the diverse talent currently sitting on the sidelines into jobs at eager employers will thrive.**

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In this crowded field, accelerated training bootcamps that focus on effectively delivering the diverse talent currently sitting on the sidelines into jobs at eager employers will thrive.

Differentiating themselves from the pack, these providers will establish themselves as reliable sources of talent not just today, but time and again in this ever-changing industry.

In order to realize this success, New York City needs bootcamps that are prepared to reliably serve a broader pool of students. To help them achieve this goal, the NYC Tech Talent Pipeline is sharing the practices that can help tech training participants successfully master skills and connect to jobs in an accelerated timeframe. They include strategies for continuously engaging employers to improve job outcomes, attracting and supporting an expanded pool of students, and integrating “real world” preparation and experience throughout training.

These insights were collected through six programs TTP has launched together with NYC accelerated training providers and employers. The presence of each practice, and the examples provided, do not guarantee that a program as a whole will successfully deliver people into jobs. However, adopted together, they promise to improve connections to tech careers for a broader student body, delivering successful results for bootcamps, students, and employers alike.

As these practices are meant to support private, as well as non-profit, programs, it is important to note that the effort to make for-profit education available to a wider audience is not a new solution. Companies have pursued this goal in the past to the detriment of students they claim to serve. In the case of tech bootcamps, government and the private sector have a chance to work together from the start to encourage the growth of organizations that deliver positive outcomes for people and businesses alike. In doing so, they might hope to avoid the predatory and punitive practices of the past.

TTP looks forward to highlighting educators that commit to adopting these practices and improving job outcomes for students. We celebrate the many companies that already have found the qualified talent they need as a result of these new sources. And we eagerly await the creative, diverse, exceptional New Yorkers who are going to fuel the success of the city's neighborhood, economy, and tech ecosystem for years to come.

## Continuously Engage Industry To Improve Job Outcomes

## Attract and Support an Expanded Pool of Students

## Integrate “Real World” Preparation and Experience Throughout Training

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## Key Practices

### **PRACTICE 1 Engage Local Industry Through Multiple Channels To Develop and Continuously Update Training**

Convene employers to define target jobs, skills, and curriculum, and re-engage partners through multiple channels to regularly update needs

### **PRACTICE 2 Use Industry-Informed Screening That Includes Non-Technical Skills**

Work with local companies to identify non-technical skills candidates need to succeed in the target career, and screen for them before admission

### **PRACTICE 3 Invest in a Team To Proactively Connect Students to Jobs**

Develop targeted job opportunities, work closely with graduates through candidate process, and use employer feedback to help students improve

### **PRACTICE 4 Expand Student Pool Through Community-Based Recruitment Partners**

Engage community-based organizations as recruitment partners, and provide information on what students need to enter and succeed in training

### **PRACTICE 5 Offer Student-Friendly Financing Options and Guidance**

Provide financing options that expand access without unreasonable debt – and staff to help students assess options

### **PRACTICE 6 Provide Clear Up-Front Information on All Requirements**

Provide accessible data on time commitment (and cost) of training and job search, pre-requisites, outcomes, and bootcamp role in connecting to jobs

### **PRACTICE 7 Deploy Trained Staff To Help Students Manage Non-Technical Challenges**

Hire staff or partner with organizations that can coach students through non-technical challenges, and coordinate support through case conferencing

### **PRACTICE 8 Cultivate a Supportive Community Through Cohorts**

Implement cohort-based training and supportive programming to build a community, support system, and a future network amongst students

### **PRACTICE 9 Conduct Assessments Frequently and Provide Targeted Support**

Assess students' progress regularly and provide targeted support where they fall short

### **PRACTICE 10 Provide Early, Frequent Tech-Specific Professional Development**

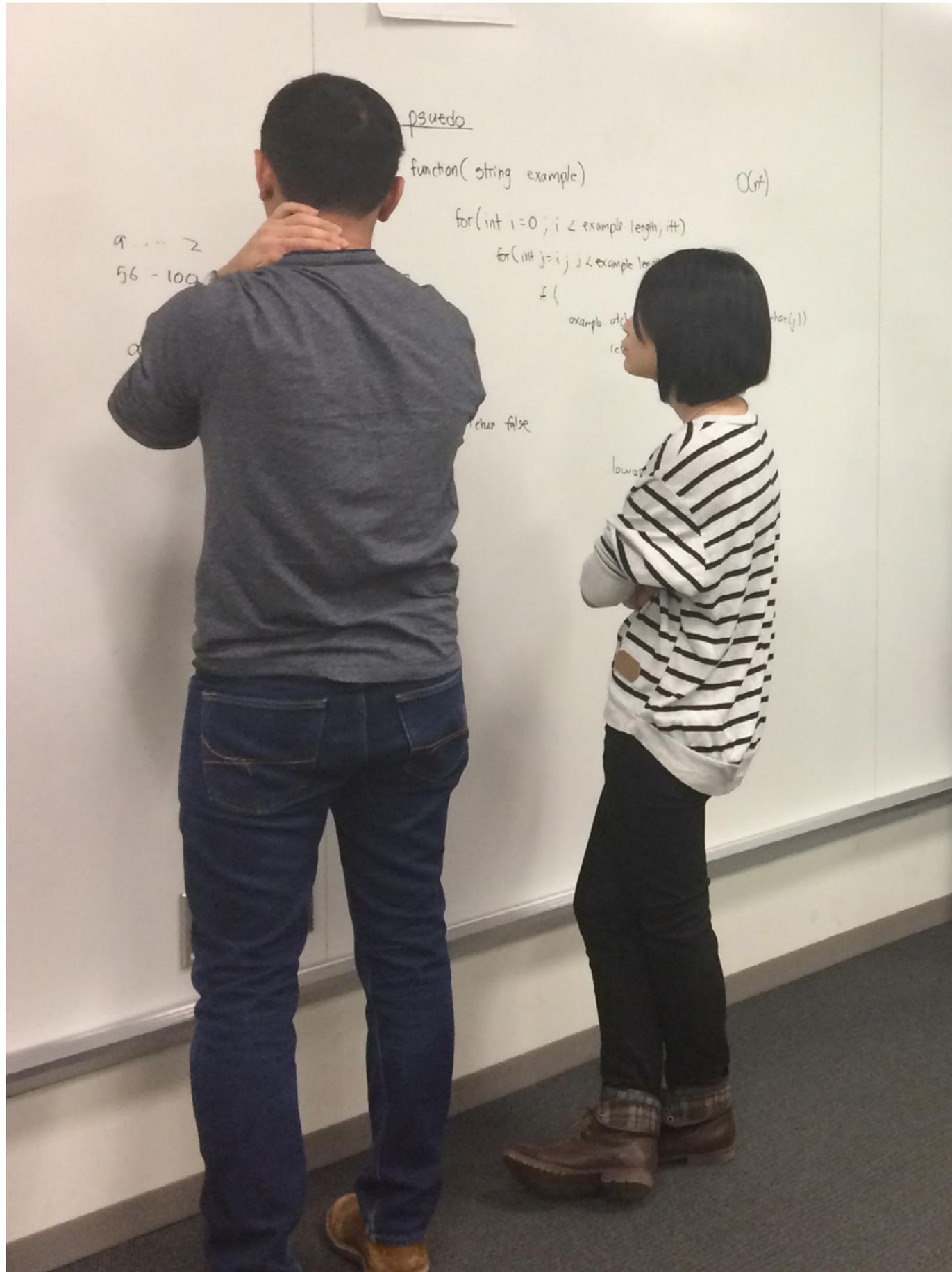
Begin preparing students for the job hunt early. Build areas of common professional knowledge and provide opportunities to practice tech-specific interview techniques

### **PRACTICE 11 Require Industry-Informed Projects That Involve Real-World Applications and Demonstrations**

Incorporate project-based work informed by industry that requires students to apply their knowledge and present their work publicly

### **PRACTICE 12 Help Students Gain Experience, Including Through Paid Internships**

Simulate the experience of working in tech through training and include on-the-job learning for those that need relevant experience regardless of skill



# Context & Goals;

## The Rise of Tech Bootcamp Training/

Across the United States, there is a strong and immediate demand for skilled technical talent. By 2020, 1.4 million job openings will require tech skills, and only 400,000 people will have the knowledge needed to fill them.<sup>i</sup>

In New York City, the tech ecosystem is thriving, supporting more than 320,000 jobs and \$30 billion in wages annually. Across the city, 125 higher education institutions, 1.1 million public school students, and a \$500 million workforce system are poised to equip residents of the five boroughs with the skills they need to succeed in 21st century jobs. Yet, despite high employer demand and infrastructure to meet it, businesses are struggling to fill openings and tech jobs remain out of reach for New Yorkers.

In New York City alone between June 2016 and May 2017, there were approximately 88,000 job postings in tech fields,<sup>ii</sup> including jobs in emerging fields like mobile development and UX/UI, as well as occupations that traditionally do not require a four year degree – e.g. web development.

Fueled by this demand, the number of non-degree granting tech training providers has grown rapidly in recent years. Since the first training bootcamp opened its doors in San Francisco in 2012, the market for privately-owned accelerated tech schools—or bootcamps – has expanded nationwide. From 2016 to 2017, the number of students served by these schools was projected to grow by over 50%, from 15,077 to 22,949.<sup>iii</sup> As of 2017, New York is home to the largest number of tech bootcamps in the U.S. – 22 – followed by San Francisco with 14.<sup>iv</sup>

Bootcamps seek to replicate the tech workplace setting by delivering training in

the latest, rapidly evolving technical skills at an intensive pace. Bootcamp programs typically require at least 40 hours per week – often much more given practice, projects, and other activities – and last an average of 14 weeks. Many programs focus on in-demand fields like software engineering. With an average tuition of \$11,498, the programs are not easily accessible to all.<sup>vi</sup>

## The Opportunity & the Challenge/

The growth of tech training providers in NYC has created a tremendous opportunity for both companies in need of talent and individuals looking for an accelerated path to rewarding careers. For instance, as private, non-accredited institutions, bootcamps can often pivot more quickly than traditional colleges when new language or tools are demanded by industry. This ability has put bootcamps at an advantage when it comes to delivering qualified talent in emerging or applied fields.

Though accelerated training is not sufficient preparation for all in-demand tech occupations, recent graduates of Tech Talent Pipeline accelerated programs have secured jobs at companies that have historically focused on recruiting graduates of traditional computer science degree programs, including Google, Spotify, Viacom, and Goldman Sachs. These and many other employers have begun to recognize the potential of a broadened recruitment funnel and expanded entry points for bootcamp grads.

However, with the rise of for-profit education, cities have a responsibility to ensure that bootcamps can thrive and grow to the benefit, not at the expense, of the people they serve. Supporting the inclusive growth of the NYC tech ecosystem is essential to the success of the city's overall



Mayor Bill de Blasio at the Tech Talent Pipeline Advisory Board Meeting, February 2016.

economy and is a keystone of Mayor de Blasio's economic development strategy. To realize this goal, in May 2014, Mayor de Blasio launched the NYC Tech Talent Pipeline (TTP), the City's tech Industry Partnership, to deliver quality jobs for New Yorkers and quality tech talent for NYC businesses.

Since then, TTP has worked with over 225 industry partners to define workforce needs, develop and test industry-informed tech education solutions, and bring what works to scale across the city's public schools, colleges, and workforce system. This includes working with the City's training infrastructure to connect hundreds of New Yorkers to jobs, including through bootcamps.

### Goal: Support Providers in Delivering Improved Job Outcomes For a Broad Group of Students

TTP is publishing this briefing to share what we have learned and help accelerated training providers to thrive by delivering improved job outcomes. The presence of each individual practice does not guarantee

that a program will deliver successful job outcomes. Similarly, the examples that are provided throughout do not indicate an endorsement of the entire program that they refer to. However, when adopted together, these practices can help bootcamps thrive by improving job outcomes for a student body that is more representative of all of NYC's potential tech talent.

Over the past three years, TTP has demonstrated that the key practices included here can help to deliver a broader audience into jobs. As compared to bootcamp students overall, participants in TTP's programs generally:

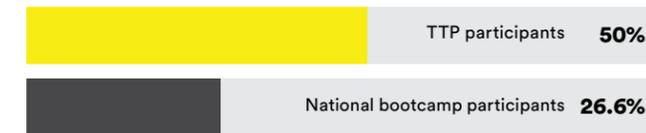
- > Earned a lower salary before training;
- > Are less likely to have completed a bachelor's degree;
- > Are more racially and ethnically diverse; and
- > Reflect a gender makeup of about 40% female, consistent with the proportion of women at national bootcamps.

## TTP Training Demographics<sup>1</sup>

### Salary Before Training<sup>2</sup>

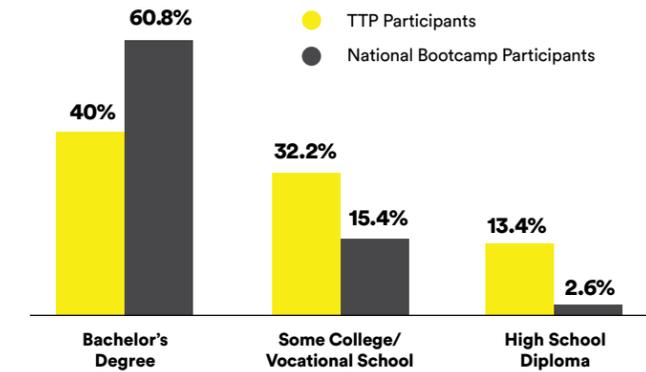


ANNUAL SALARY <\$25,000 BEFORE TRAINING



As compared to national bootcamp participants, TTP participants in full-time bootcamps have a lower average pre-training salary.

### Highest Level of Educational Attainment Before Training



TTP participants are less likely to have completed a bachelor's degree before training

### Gender



FEMALE TTP PARTICIPANTS AND FEMALE NATIONAL BOOTCAMP PARTICIPANTS

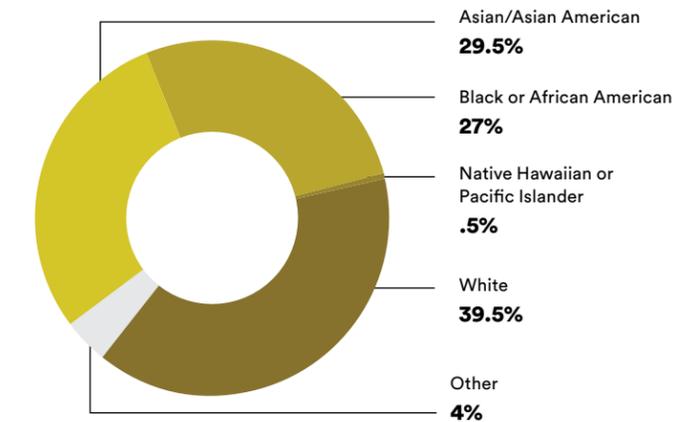
**40%+**

TTP's gender balance is on par with bootcamps nationwide

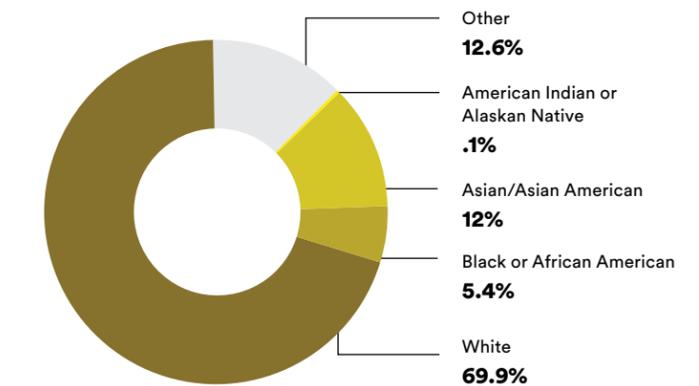
### Race & Ethnicity



TTP PARTICIPANTS<sup>3</sup>



NATIONAL BOOTCAMP PARTICIPANTS



HISPANIC/LATINO-LATINA



More of TTP's participants have different racial and ethnic backgrounds, as compared to the "average" bootcamp participant

<sup>1</sup> All National Bootcamp Participant statistics are drawn from Course Report, 2016 Coding Bootcamp Alumni Outcomes + Demographics Study. Accessed at [coursereport.com/reports/2016-coding-bootcamp-job-placement-demographics-report](http://coursereport.com/reports/2016-coding-bootcamp-job-placement-demographics-report)

<sup>2</sup> Based on answers from people who responded to this question (approx. 80% of all participants); salary is annualized, based on wage and hour data as reported by participants.

<sup>3</sup> Based on answers of people who answered this voluntary question (approximately 77% of participants).

<sup>4</sup> Based on answers of people who answered this voluntary question (approximately 44% of participants).

# Key Practices

This section lays out the practices we have found to be collectively promising in improving job outcomes for graduates of accelerated tech training. They describe strategies to:

- 1 Continuously engage industry to improve job outcomes,
- 2 Attract and support an expanded pool of students, and
- 3 Integrate “real world” preparation and experience throughout training.





# Continuously Engage Industry To Improve Job Outcomes

## PRACTICE 1

### Engage Local Industry Through Multiple Channels To Develop and Continuously Update Training

Convene employers to define target jobs, skills, and curriculum, and re-engage partners through multiple channels to regularly update needs.

#### The Challenge/

Technology evolves constantly and rapidly. Without significant, regular input from industry professionals, tech training can fail to incorporate skills required by employers and become quickly outdated. Furthermore, the skills, tools, and qualifications sought by employers can vary significantly by market (such as city or target sector). Providers that fail to engage local employers may be less relevant to employers in their own backyard.

#### Key Practice/

Training providers should engage local companies that hire for the occupations they're targeting as early in the program development process as possible, and re-engage partners regularly to update their offerings.

#### Specifically, providers should solicit and use industry insight to:

- > **Define demand,** including what jobs employers need to fill and how many open positions they anticipate having open in the near- and medium-term. This should include defining the level of experience required for roles that are most in demand.
- > **Specify requirements and produce job descriptions** for positions, in order to define the ultimate end goal of training and ensure employers are providing insight regarding the same type of role or roles within their workplaces. Descriptions should include common titles, required skills, responsibilities, types of interaction with internal teams, salary ranges, and opportunities to advance.
- > **Define common industry tools, approaches, concepts, terminology, and resources** that are typically utilized in

a workplace setting and build exposure to these during the course. This should include insight into specific technologies (e.g. languages, frameworks, etc.) employers require, and how proficient entry-level candidates need to be (e.g. "It is essential that an entry level candidate do X with Y tool or language, but they won't be expect to know Z"). This should always include clarifying with employers the degree to which candidates need to apply more theoretical underpinnings of computer science (e.g. data structures, systems architecture, etc.).

- > **Define what employers look for in projects completed by candidates** including any particular topics, groupwork experience, specific tools or methods, etc., and use this feedback to craft parameters for student projects.

#### This might be effectively accomplished by leveraging all available engagement channels:

- > **Follow up with employers – especially employers who interview training graduates** – to get feedback about gaps in candidates' preparation.
- > **Use the feedback from employers to improve curriculum** and other components of training. This is a significant opportunity that is often underutilized by training providers.

- > **Leverage volunteers** at local companies to review talent and provide feedback on their skills. These volunteer opportunities can provide a first step in building a relationship with employers that ultimately results in hiring.



## What To Look For/

- > **Industry engagement:** The provider shares information about how they engage industry professionals to develop their curriculum, including how often they re-engage industry professionals to revisit and refresh materials.
- > **Candidate feedback:** The provider shares information about how they use employer feedback on their candidates to continually improve programs.
- > **Project work:** The provider shares information about how industry insight was used to inform the parameters for the course's project-based work.

### Spotlight / Using Feedback To Improve Curriculum

In January 2016, TTP launched the first cohort of its Mobile Dev Corps (MDC) program, a full-time, intensive program developed in direct response to industry feedback. MDC was designed to train New Yorkers with no prior coding experience to become production-ready iOS mobile developers.

At the time of curriculum development, Swift had just been introduced as a new programming language, but employer feedback emphasized that most NYC tech companies still needed candidates with knowledge of Objective-C. As a result, the 16-week curriculum focused primarily on Objective-C, with a brief introduction to Swift at the end of the program. During the first cohort's job-hunt, however, the MDC team learned from employers that, increasingly, they needed candidates who were comfortable working in Swift. At the same time, MDC graduates began encountering technical interviews and coding challenges that required them to use Swift and felt that they needed more formal instruction in this language.

As a result of this feedback, the MDC team worked quickly to update its curriculum, increasing Swift to 50% of the content covered and beginning this material earlier in the course. Moving rapidly, the team made these changes in time for the second MDC cohort, which began in March 2016 – just two weeks after the first cohort's completion. These rapid changes helped the second cohort of MDC students to feel more confident and prepared going into the job hunt and contributed to an overall increase in average salary of the second cohort's graduates.

## PRACTICE 2

### Use Industry-Informed Screening That Includes Non-Technical Skills

Work with local companies to identify technical and non-technical skills candidates need to succeed in the target career, and screen for them before admission.

### The Challenge/

While some training providers admit trainees based on a highly selective and competitive process, others are not rigorous. Foregoing screening can lead to poorer job outcomes by admitting those who may not be ready to secure and succeed on-the-job. This ultimately can be a disservice to individuals, including those who make a major financial investment in this education pathway to secure a job.

### Key Practice/

Work with industry professionals to identify the key technical and non-technical knowledge and skills participants must have to succeed in the targeted career and screen for these elements in the application process.

#### Specifically, providers should:

- > **Work with industry professionals to identify knowledge and skills participants must have to secure a first job and succeed in the targeted career.** Determine the “teachability” of each skill: identify which skills the provider can teach in the time available for training, and which (if any) participants must have upon admission. While this usually includes broad critical thinking skills like problem solving, collaboration, and communicating complex concepts, this may also include specific math and/or other foundational concepts. For example, it is generally important for incoming trainees to understand functions and variables, and to apply these concepts in coding. Training providers should decide whether to screen for this knowledge or make additional training available as part of pre-training.
- > **Uses this insight to develop screening tools** that identify whether candidates (1) have the skills needed to enter training and (2) are likely to succeed in securing a job.
- > **Develop rubrics** to score applicants' performance in a consistent, replicable way.
- > **Collect and assess data** at the end of the cohort to determine how well the screening tools identified potential gaps in student aptitude and surfaced high-potential candidates, and **use this information** to update those tools.
- > **Avoid introducing bias;** ensure that screening tools do not screen out people who would otherwise be qualified.
- > **Encourage a growth mindset:** Provide applicants who do not qualify for training with insight into gaps between required and current skill levels, and refer these applicants to resources they can use to improve.



## What To Look For/

- > **Clear criteria:** The provider shares clear information up front about their selection criteria – it is clear what potential students need to demonstrate in order to enter and succeed in the program.

## Spotlight/ Screening for Skills That Successful Candidates Need

In 2015, in direct response to industry need, the Tech Talent Pipeline convened NYC tech employers to help develop the curriculum and screening tools for Series A: Data, a program provided in partnership with General Assembly with the goal of delivering New Yorkers into jobs in data analysis. As part of this work, industry partners pinpointed the skills that all qualified candidates for data analyst positions need. Industry partners then further drilled down to identify the skills that competitive entry-level candidates needed, but were not teachable within the constraints of an accelerated training timeline, such as critical thinking and a strong desire to learn. General Assembly then adjusted their application process to prioritize individuals who did have these essential skills and would be well-positioned as successful candidates for data analyst jobs following technical training.



## PRACTICE 3

### Invest in a Team To Proactively Connect Students to Jobs

Develop targeted job opportunities, work closely with graduates through candidate process, and use employer feedback to help students improve.

### The Challenge/

Many students who go through accelerated training do not have personal or professional networks with inroads to tech companies. This can be especially true for those who are new to the tech world or aren't affiliated with a university that has strong connections to tech companies. While many training providers have embraced the responsibility to help students land great jobs, some organizations place the onus primarily on students' shoulders.

### Key Practice/

Training providers should embrace the responsibility – and intensify career services – to help all training graduates land well-paid, relevant jobs within a reasonable timeframe.

#### Specifically, providers should:

- > **Prioritize career services for students** – and dedicate resources to this work
- > **Develop targeted employment opportunities** for students, whether as part of a formal business development team or otherwise;
- > **Communicate to participants** how staff will continue to support them throughout their job search process, and ensure students have a designated staff person for regular check-in;
- > **Work with students to understand their strengths and interests**, and refer them to opportunities accordingly;
- > **Ensure participants have the tools needed** to support job-search (laptop, transportation, etc.);
- > **Support students' efforts** to develop their own opportunities;
- > **Follow up with employers** to get feedback about students, including interview performance, strengths, and areas for improvement; and
- > **Feed information gleaned** from employers back to students, instructors, curriculum developers, and other relevant staff.

#### In addition, bootcamps should:

- > **Provide training graduates with continued access to their space** during the job-hunt period;
- > **Continue to organize and rally graduates** for attendance at NYC tech events, such as meetups and hackathons; and
- > **Ensure students have access** to continued instructional support and personal coaching, as needed.

### **i** What To Look For/

- > **Dedicated business development:** Provider has staff designated to developing employment opportunities for students.
- > **Clear commitments:** Provider is clear about what their commitments are to students. Potential trainees should be aware of and satisfied with the level of support that the bootcamp will provide.

# Attract and Support an Expanded Pool of Students

## PRACTICE 4

### Expand Student Pool Through Community-Based Recruitment Partners

Engage community-based organizations as recruitment partners, and provide information on what students need to enter and succeed in training.

#### The Challenge/

Training providers seeking to broaden their applicant pool may find that their traditional marketing channels only reach a portion of potential students. Furthermore, among many potential applicants, finding strong candidates who can successfully complete training and move into jobs can require significant time and resources. Community-based organizations can be effective recruiting partners when armed with the right information.

#### Key Practice/

Engage community-based organizations with connections to potential candidates as recruitment partners, and provide them with detailed information needed to successfully pursue training.

#### Specifically, providers should:

- > **Identify organizations that serve a diversity of** potential candidates (for example, community-based organizations that collectively serve a diversity of clients) as recruitment partners
- > **Provide recruitment partners with key information needed to identify** strong candidates for training, including:
  - > An overview of the application process
  - > Plain-language information about key topics that a non-technical professional can use to guide their clients, including:
    - 1 Target jobs and career tracks available following training
    - 2 What it is like to work in these jobs
    - 3 What skills, knowledge, and competencies might be added to CBOs' existing curricula to help students gain entry to and succeed in training
- > **Provide profiles of people with similar backgrounds to the recruitment partners' clientele** who have previously succeeded in training
- > **Solicit feedback** from partner organizations about their clients' experience of applying to training program; consider this feedback and, as needed, implement changes to application process to ensure it is broadly accessible
- > **Give feedback** to recruitment partners about their candidates' strengths and areas for improvement, so that these partners can continually improve their offerings

## Spotlight / Partner Referrals

An organization that helps work-authorized, skilled immigrants rebuild their professional careers in the U.S., Upwardly Global has mobilized strong applicants who might not have otherwise pursued accelerated training. In addition to identifying high-potential candidates from amongst its clientele, Upwardly Global attends information sessions about upcoming training programs to gather detailed information about training application requirements and uses this information to help applicants put their best foot forward. The organization also follows up with their applicants to ensure they pursue the opportunity.

This practice has paid off for both their clients and the bootcamps they collaborate with. For instance, Upwardly Global helped to connect and support Ahmet, originally from Turkey, as he pursued admission to the NYC Web Development Fellowship program. Not only did Ahmet successfully enroll, he graduated with distinction and is today a software engineer at a local tech company. Ahmet “has all it takes: qualifications, spirit and sort of freshness many developers lose along the way.” Says Marek Banczyk, the CEO of Cityglobe. “We want this guy with us for good. This was definitely one of the best decisions I made.”

By engaging such community partners, training providers can increase the number of highly motivated, qualified applicants to their programs.

## PRACTICE 5

### Offer Student-Friendly Financing Options and Guidance

Provide financing options that expand access without unreasonable debt – and staff to help students assess options.

### The Challenge /

The average cost of tech bootcamp training in the U.S. was \$11,498 in 2017.<sup>vii</sup> This tuition – and the living expenses students must cover during training – can be cost prohibitive for individuals with limited income who are otherwise qualified for, and passionate about, pursuing tech careers. While some bootcamps offer financing options through third party lenders, students may need assistance in fully understanding interest rates, repayment timelines, and obligations regardless of job outcomes.

Many NYC-based training providers have taken steps to address this funding barrier. While these options can unlock opportunity for students, they can also come with significant risks. Furthermore, tuition is not the only barrier to access for many students. Other key resources, such as living expenses, laptops and MetroCards, are also critical to success. Securing these resources may be a barrier for students who may have to forgo income to pursue full-time training.

### Key Practice /

Offer student-friendly financing options – and someone who can help students assess these options.

Specifically, providers should:

- > **Offer financing options** that help individuals afford the cost of training, including living expenses for the entire length of the program (including the job hunt period) without incurring burdensome debt. Options include:
  - > **Deferred tuition:** Deferred tuition models allow students to pay the cost of their tuition once they’ve landed a job in their target field. This is a great option for students and one that some providers are starting to implement, but at great risk to themselves; without any guarantee, training providers take on the full risk of losing payment, and as a result, not all providers can afford to offer this option when they are just getting started.
  - > **Scholarships (supported via philanthropy or other sources):** Some training providers have launched successful scholarship funds supported by philanthropy or other sources. Though these can be an option for students, they are limited in scale and sustainability. In addition, not all scholarships cover the entire cost of tuition (or living expenses).
  - > **Partnership with third-party lender:** These can be good options for some students, but (as noted) they can also carry significant risks. These options also may exclude individuals who do not have a strong credit history, or who have low credit scores or insufficient cash flow to secure a loan. Providers should work closely with any third-party lenders to ensure that options offered to students align with and support the timeline that students need to complete all training successfully, including finding a job, before payment becomes due.
  - > **Payment plans:** Many training providers allow participants to pay their tuition over time, rather than as a fixed amount up front. This may help some students who are able to make payments over time more easily than in one up-front amount, but may not ease the burden if payments are due before students begin to work again.
- > **Provide clear information up front** about the obligations associated with each option, and **offer candidates guidance from a knowledgeable professional** who is not incentivized to sell financial products so that potential students understand and assess their options.

> **Help students navigate access to other needed key resources (especially equipment and MetroCards) while they're in training and searching for jobs.**

> **Equipment loan:** While some students have their own laptops, mobile devices, and other equipment needed for a specific training, others do not and are not able to purchase them. Some students wouldn't be able to participate in training without borrowing laptops. Bootcamps should, ideally, have some high-quality, up-to-date laptops (or other equipment needed for training) available to loan students as needed while they're in training and searching for jobs. This should be a 24-7 loan that enables participants to take equipment home and use them to complete work outside of course hours.

> **MetroCards:** Providing monthly MetroCards can be critical to students' success in training and job-hunting. Without a steady income stream, many students can't afford the cost of a monthly MetroCard while in training and instead buy single-ride or other limited cards. However, in order to be successful in training and securing a job, students generally need to get around the city to attend various meetups, participate in site visits, network with current professionals, and so on. To remove the barrier of limited travel budgets, bootcamps are encouraged to provide MetroCards to students as needed and whenever possible.

## **i** What To Look For/

> **Reasonable financing terms:** As noted above, some lenders that partner with training bootcamps offer loans to help cover the costs of training, but can contain repayment terms that require graduates to begin repaying their loans very soon after completing training – at which point many students do not yet have jobs. Potential students should carefully review the terms of any offer they are considering to ensure that lenders' repayment timeline and terms align with

a conservative estimate of how long it may take to land a job after completing training, and reasonable salary expectations.

> **Ability to borrow equipment:** It is not currently standard practice to have laptops available to lend students, but students who do not have needed equipment should ask bootcamps whether these resources are available.

Outside of New York, providers have experimented with income-based repayment of tuition. Currently, under New York Bureau of Proprietary School Supervision (BPSS) regulations, providers are unable to pursue this practice due to prohibitions on differential tuition, though lenders may have more flexibility to support this option.

## **Spotlight/ Deferred Tuition**

A number of bootcamps offer deferred tuition, which generally enables students to only pay tuition after securing related employment with payments starting alongside their employment. For instance, the NYC-based Grace Hopper Program at Fullstack Academy enables students to pay \$3,000 up front and the remaining tuition (\$16,610 as of fall 2017) over nine months once they start working in the field. Recognizing a need to help remove barriers for women entering tech careers, the team at Fullstack Academy adopted this approach in order to alleviate initial financial obstacles to potential candidates and connect the students' incentives with their own. In doing so, they expanded the pool of potential students that could launch careers in the field.



## PRACTICE 6

# Provide Clear Up-Front Information on All Requirements

Provide accessible data on time commitment (and cost) of training and job search, pre-requisites, outcomes, and bootcamp role in connecting to jobs.

## Key Practice/

Provide clear, easily accessible information about total time commitment and costs, provider's (and students') role in job search, previous outcomes, and course pre-requisites.

Specific challenges and promising practices include:

### TOTAL TIME COMMITMENT (AND ASSOCIATED COSTS)

#### Challenge:

Many bootcamps advertise their programs as time-limited experiences, often in the range of 12 to 16 weeks (for full-time programs), but obtaining a job can take much longer – 3 months or more. In fact, some students enter bootcamps unprepared to support themselves during the job-hunt phase and end up going back to non-technical roles to make ends meet – which can ultimately undermine their ability to find a full-time job in their targeted tech career.

#### Recommended Practice:

**Provide clear information upfront to help students understand the total amount of time** they may need to spend engaged in training-related activities. This should include information about not only the total length of the program itself, but also the **total amount of time students may need to commit to:**

- > Any pre-training (approx. # of hours required, and approximate length of time they have available to complete it
- > The training program itself and number of hours required during training, including time in class and time out of class
- > Actively job-hunting after training ends, and approximately how many hours per week and number of weeks they should expect to dedicate to that hunt
- > Any “post training” work the student may be required to complete after formal training if s/he hasn’t sufficiently mastered the course content, and how that could impact their job-hunt timeline

### PROVIDE CLEAR INFORMATION ABOUT STUDENT OUTCOMES

#### Challenge:

While more providers are beginning to share information about graduate outcomes, many still do not provide detailed information about the jobs their graduates secure and in what time period, making it difficult for potential students to accurately assess the potential value of the program.

## The Challenge/

Deciding to attend a full-time training bootcamp can be a major life decision. Not only do candidates spend months working intensely to launch a new career, they often forgo income during the time period, and may even quit a job to attend training. It is extremely important that bootcamps provide easy-to-understand information on the full costs of training to students considering whether to attend training.

## Recommended Practice:

**Share clear information on previous outcomes for program graduates – and the standards used to define these outcomes.** This should include, but is not limited to:

### > **OUTCOMES: Actual outcomes for previous training graduates.**

- 1 Overall outcomes: The percentage of graduates who obtained full-time jobs related to their training, at or above a market-average salary..
- 2 Types of jobs: The types of jobs program graduates hold.
- 3 Average salaries for program graduates as compared to the market average for those jobs.
- 4 Range of salaries earned by program graduates.
- 5 How long it took for previous graduates to land jobs.
- 6 Audited outcomes: Ideally, outcomes should be audited by a third party to confirm results.

### > **STANDARDS: Methods used for calculating placement rate.**

- 1 The numerator: What is counted as a job, including:
  - Permanent vs. short-term: Whether jobs of all durations are counted (namely, whether short-term contracts and internships are counted along with permanent hires).
  - Full-time vs. part-time: Whether all jobs are counted,

including part-time positions, or only full-time jobs – and how “full-time” is defined (generally at least 35 hours per week).

- How closely related to training a job needs to be to count as a placement (for example, whether web development training graduates working in product management are counted).
  - What timeframe the provider uses to count job placements. Different providers use different timeframes as the acceptable cutoff for counting job placements, ranging anywhere from three to 12 months after training ends.
  - Wage standards used to count jobs as successful outcomes, including whether there is a minimum salary a graduate must earn to be counted as a successful placement.
- 2 The denominator: How a bootcamp defines the total population of people who are included in job placement calculations. This can be limited to people who:
    - Completed training
    - Are pursuing employment relevant to training
    - Have fulfilled the bootcamp’s job-search requirements

## CLARITY ABOUT ROLES IN JOB SEARCH: Provide clear information up front about what provider will do for students, as well as what students will be expected to do as part of their job search

#### Challenge:

Unclear marketing can lead students to believe that providers will play a strong role in connecting students to employment, but this may not be the case. Potential students should easily understand what the provider will do to help them secure a job – whether it is proactively developing job leads for students, or simply providing general support – and their own responsibilities in the process. Even in instances where providers proactively develop job opportunities, students often need to put in a significant amount of work to secure the right job.

#### Recommended Practice:

**Provide clear information up front about what provider will do for students, as well as what students will be expected to do as part of their job search.** This should include information about:

### > **Specific services the training provider will offer to students,** including:

- 1 Types of services students can expect (for example, direct connections to interview opportunities)
- 2 The number of people dedicated to doing business development and/or professional development
- 3 Amount of time/personal attention students can expect

### > **What the student will be expected to do** as part of their job search, including:

- 1 Number of jobs to which student must apply per week, where specified
- 2 Expectations around how students will receive and use feedback from employers, training provider
- 3 Level of responsiveness required from student (for example, how quickly graduates are expected to respond to outreach from training provider)

**CLEAR PRE-REQUISITES: Define clear pre-requisites and ideal candidate profile for entry; provide resources to develop any skills needed to apply**

**Challenge:**

While most providers in this space aim to serve individuals who have little or no prior experience in tech, or at least in a specific training program's target occupation, what they do require from applicants is not always clear. Moreover, while most training providers do not explicitly state required pre-requisites for their program, many do in fact expect for candidates to have done some exploration and initial work on their own.

**Recommended Practice:**

Publish clear, specific information about what applicants need to know when they apply for a program, as well as what the training provider looks for in a good candidate.

**If pre-work is required, ensure it is easily accessible, and provide access to knowledgeable staff members** who can answer questions and offer help during this period. Students should not need to purchase any specific software or hardware to complete the work.



### What To Look For/

- > **Time requirements:** Provider's website includes clear information about the total amount of time they may need to spend engaged in training-related activities, including pre-work, training, any post-work, and the job hunt, as well as approximate hours per week students should plan to spend on this work during each phase.
- > **Outcomes data:** Provider's website shares clear information about:
  - 1 Overall outcomes (the percentage of graduates who obtained full-time jobs related to their training, at or above a market-average salary),
  - 2 What the bootcamp counts as a job (see above for important details),
  - 3 How a bootcamp defines the total population of people they consider to be job-seeking, and whether that excludes anyone (see above for important details),
  - 4 What timeframe the provider uses to count job placements, and
  - 5 Average salaries for program graduates as compared to the market average for those jobs.
- > **Job search services and responsibilities:** Provider's website provides clear, specific information about the services they offer to students as part of their job search, as well as clear, specific information about what the student will be expected to do as part of their job search.
- > **Pre-requisites and candidate profile:** Provider's website includes clear, specific information about what applicants need to know when they apply for a program, as well as what the training provider looks for in a good candidate.

## PRACTICE 7

# Deploy Trained Staff To Help Students Manage Non-Technical Challenges

Hire staff or partner with organizations that can coach students through non-technical challenges, and coordinate support through case conferencing.

## The Challenge/

For some students, beginning a full-time, intensive professional training program and launching a new career can be a rewarding, but sometimes overwhelming, experience. Training participants may encounter challenges with time management, financial considerations, mental health and well-being, and other challenges. While instructional staff may be able to address some of these issues, they generally are not qualified to resolve all of them. In addition, students can be reluctant to approach instructional staff with these concerns; students often want to impress their instructors and keep the focus on their technical abilities.

## Key Practice/

Hire support staff or partner with organizations that can help students manage personal challenges, and coordinate holistic delivery of student support through case conferencing.

### Specifically, providers should:

- > **Hire at least one experienced social service or other qualified professional, or partner with a qualified organization,** to support students through training and help them to succeed. This person should identify and address any social, emotional, financial, or other barriers that may affect participants' performance or their ability to complete training and secure a job. They should provide coaching throughout to help students navigate these challenges. Specific promising practices include:
  - > Help incoming students with planning and budgeting for expenses over the entire length of the program commitment, including not only training but also pre-work, job-search time, etc.
  - > Hold an initial meeting with students at beginning of training to understand students' priorities, educational style, family life and any other relevant information
  - > Provide a safe space for participants to ask questions, provide information and give feedback
  - > Ensure there are opportunities for students to check in with supportive services professional that do not conflict with instructional time
  - > As needed, help students navigate and access public benefits
- > **Institute regular "case conferencing" in which staff meet to holistically review participants' progress, identify any challenges, and craft and implement well-coordinated plans of support,** as needed. This can be especially helpful in cases where an individual is struggling with personal issues that may affect his/her performance in class; by providing context to each other, staff members can work together to help address participants' challenges.
- > **Assign responsibility to coordinate amongst all key staff to one person.** It is important to have one central point of contact who is aware of what is happening across the student experience. This can be a program manager, case management professional, or other staff as long as that person has convening and follow-up authority.



## What To Look For/

- > **Coaching and support beyond the classroom:** Clear information about whether there's someone on staff to help students navigate any life challenges they may face while going through training.

### Spotlight/ Targeted Personal Coaching

As part of the third and fourth cohorts of its Web Development Fellowship, which targeted young adults, the NYC Tech Talent Pipeline engaged the Youth Development Institute (YDI) to provide supportive services to its students. With a background in youth-specific coaching needs and on-site immersion in the course, the YDI Youth Coach was able to help students address and manage a wide range of personal issues, including mental health and well-being, family considerations, and struggles with confidence, performance anxiety, and imposter syndrome. These targeted interventions helped students to manage these stressors, and clear the way for increased success in completing the course and securing employment.

## PRACTICE 8

# Cultivate a Supportive Community Through Cohorts

Implement cohort-based training and supportive programming to build a community, support system, and a future network amongst students.

## The Challenge/

Accelerated training is an intense, fast-paced experience that students who are new to the tech space or the nature of tech learning may have difficulty adjusting to in such a short and intense period of time.

## Key Practice/

Cultivate a supportive community for students through cohort-based training, in which a group of students all go through training together, and programming to encourage student cohesion.

Cohort-based training has many benefits, especially for students who are new to the tech space. Even if learning is self-paced, cohort-based training enables students to help each other through material and prepare for a workplace in which they'll need to collaborate with peers to work through hard problems. This approach can also help students realize that if something feels hard, it doesn't mean that they do not have what it takes to succeed. Finally, cohort-based training enables students to develop a group of peers who not only provide social and emotional support, but also provide a built-in network they can tap for networking events, hackathons, and study groups.

### Specifically, providers should:

- > **Launch cohorts** on a set schedule
- > **Encourage students to see each other as resources** and to help each other through classes.
- > **Facilitate opportunities for students to spend time together** and get to know each other both in and outside of class, through structured events.
- > **Create opportunities for students to share their struggles and successes**, creating an environment where openly addressing challenges and accomplishments is the norm.



## What To Look For/

- > **Cohort-based training:** Not all providers offer cohort-based training, and many providers are beginning to offer more individualized training experiences. While these can be good choices for some students, cohort-based training can be helpful for students who are new to the tech world, making a dramatic career change, or in general are looking for a more supportive experience.
- > **Supportive environment:** Some providers offer potential students the opportunity to visit campus before signing up for training. If available, this is a good opportunity to ask current students about their experience, including what their experience has been like and what steps the provider takes to help create a team environment.



### Spotlight / Creating a Supporting Community

In the fifth cohort of TTP’s Web Development Fellowship (WDF), which served foreign-born New Yorkers, WDF’s training provider shifted from a traditional instructional format – lecture followed by a lab – to a more self-paced coursework approach, which enabled students to work ahead when possible and spend more time with a concept when needed. Despite this self-paced learning, students were still considered part of a cohesive group.

The cohort model – including a dedicated physical space for students to work together and creating a clear “team” identity for students – was a key element of students’ success, especially in this self-paced model. The cohort experience created a sense of collective support among students, including a general sense of belonging, availability of informal peer social and academic support, and a shared safe space for taking technical and professional risks to effectively learn through trial-and-error. This helped students to persist and succeed in training and job searches despite challenges along the way.

## PRACTICE 9

### Conduct Assessments Frequently and Provide Targeted Support

Assess students’ progress regularly and provide targeted support where they fall short.

#### The Challenge /

Even with a standardized screening process, students may enter training with different levels of knowledge and ability; over the course of the training program, students encounter different challenges, and without targeted intervention and support, students can fall behind – leading some to drop out of the class, or fail to ultimately get a job.

#### Key Practice /

Assess students’ progress regularly and provide targeted support in areas where students need help.

Specifically, providers should:

#### ASSESSMENT

- > **Conduct initial assessment** to help instructors and students understand student’s level of skill coming into the training, including mastery of or gaps in understanding of any pre-work
- > **Include informal one-on-one check-ins** to gauge students’ level of understanding before any major formal assessments
- > **If assessments are automated/standardized, incorporate an in-person component** in order to test students’ level of

working knowledge and ensure that they are able not just to complete the basics of a task, but also understand and articulate why they solved a problem in a particular way and how else it might be approached

- > **Conduct regular tests of student knowledge** to determine how well they understand the material and provide additional instruction if/as needed

#### TARGETED SUPPORT

- > **Proactively provide targeted support** in areas where students are struggling. This can include mini-review sessions for groups of students who are struggling in common areas as well and one-on-one support.



#### What To Look For /

- > **Information about targeted assessment and support** to ensure that the bootcamp will help to surface areas where students may need additional support and have a plan to provide it, as needed.



### Spotlight / Regular Assessments

For the fifth cohort of the Web Development Fellowship, in which students worked at a more self-guided pace than in past cohorts, the Flatiron School developed and incorporated rigorous, regular assessments into its curriculum to ensure that all students mastered one unit's material before moving onto the next. This included having instructors conduct in-person, one-on-one technical assessment interviews with each student after they completed a module. Implementing these regular assessments enabled instructors to help students identify and correct areas needing improvement. This also enabled instructors to identify common problem areas across students and build targeted workshops to address them.



## PRACTICE 10

# Provide Early, Frequent Tech-Specific Professional Development

Begin preparing students for the job hunt early. Build areas of common professional knowledge and provide opportunities to practice tech-specific interview techniques.

## The Challenge/

Even the best emerging technologists need to develop tech-specific professional skills in order to compete for jobs. In addition, students without significant experience in a professional working environment – including younger students – sometimes lack familiarity with basic professional norms that are critical to securing employment.

## Key Practice/

Introduce both basic and tech-specific professional development early in the course, and integrate opportunities to practice throughout the program. **Depending on participants' prior level of exposure to and comfort with a professional environment, providers should:**

- > **Practice conducting mock technical interviews**, including whiteboarding, pair programming, and other common tech interview techniques.
- > **Provide frequent opportunities for students to practice speaking about their work**; this can be through daily standups, presentations, and/or other venues.
- > **Help students to develop tech-specific job application and interview-related skills and resources**, including:
  - > An understanding of basic job-hunt skills, including guidelines for networking, informational interviews, and thank-you notes
  - > A clear résumé and strong online presence that clearly communicate candidates' qualifications, skills, projects, and experiences specific to the job they're applying for
  - > An online portfolio that gives employers an opportunity to review a candidate's applied work
  - > An effective, easily adaptable elevator pitch that clearly communicates who the candidate is, their specific career goals, and why they're qualified for a specific opportunity
  - > A clear understanding of the company where they're interviewing and where they picture themselves in the company – e.g. in a particular role or on a specific team



## What To Look For/

- > **Technical interview practice:** Potential students should make sure that the training provider's curriculum includes ample technical interviewing practice.
- > **General interview practice:** Similarly, potential students should make sure that the bootcamp they choose includes time to practice general interviewing in a tech-specific setting, including communicating with a non-technical professional about the work they have done.

## Spotlight/ Starting With the Basics

Training provider Per Scholas has developed a well-rounded, comprehensive professional development curriculum. Per Scholas starts from scratch, from breaking down what to wear on an interview to highlighting how applicants should incorporate their knowledge of a specific company into conversations with that employer. Per Scholas also integrates frequent practice with these skills from the very beginning of training. This includes hands on learning and mock interview opportunities with employer partner volunteers who provide constructive feedback in real job and interview scenarios. Through this comprehensive approach, this training provider helps its participants to become comfortable with interviewing and other key skills they need to secure a job.



## PRACTICE 11

# Require Industry-Informed Projects That Involve Real-World Applications And Public Demonstrations

Incorporate project-based work informed by industry that requires students to apply their knowledge and present their work publicly.

## Key Practice/

Incorporate project-based work (informed by industry) into training in order to build and demonstrate candidate experience applying technical concepts in professional settings.

Specifically, providers should:

- > **Embrace a project-based approach to student learning.** Project-based work is important not only because it builds a portfolio that students can show employers, but also because it gives students a chance to apply and deepen their understanding of the course material. It also gives instructors the opportunity to assess how well students truly understand the material and intervene to bolster learning as needed.
- > Within industry-informed parameters, **provide clear guidelines to ensure that students know what deliverables are expected,** including examples of what “good,” “better,” and “best” final projects look like.
- > Within industry-informed parameters, **help students to select project topics that are of personal interest and will help them to build skills that tech employers value.** Enabling students to choose their own projects has many benefits. Working on a project students care about can increase their engagement and success, and can also indicate to employers the passion a student has for tech. It also gives students an opportunity to think more deeply about their projects from a business perspective – through, for example, identifying a business case and defining who their users would be.
- > **Build check-in points into project plans** to ensure that students have the opportunity to surface questions and get feedback from peers, instructors, and (where applicable) employers.
- > **Coach students** about how to best elicit feedback on their projects, assess the feedback to decide what’s helpful, use the feedback to improve features, and **explain their approach** to this process during a demo night or other type of final presentation.
- > **Help students to clearly define and articulate their role in a group project.** Employers have reported that it is not only important to know that a student is able to work in a group setting, but also what that individual’s contributions have been to group work.
- > **Ideally, engage industry professionals as clients** for these projects. If employers are engaged as clients, however, providers should ensure any concerns related to sharing or accessing propriety information (e.g. data, internal tools) are addressed before students begin work on the project so that their work is not delayed while waiting for employer approvals.
- > **Provide a (mandatory) opportunity for students to present their work in an in-person setting,** and provide students with guidance about how to structure their presentations. This could be as simple as a group presentation in class or something more formal (e.g. a “demo night” or a science fair-style event). In addition to giving students an opportunity to practice presenting and communicating tech concepts clearly – two critical skills for the job interview process – they also they provide a clear project goal and can foster a sense of pride and accomplishment.

## The Challenge/

Prospective employers often look to a candidate’s past work to understand their level of skill, passion, and ability to work well with others. However, aspiring technologists generally enter training with little or no professional experience in the tech sector. Projects they may have done before training (for example, in a different kind of tech role) may not be helpful in demonstrating skills relevant to their new desired occupation.

- > **Ensure that students share their work publicly (online)** via GitHub and/or another publicly accessible channel.
- > **Ensure that students incorporate information about their projects into all business-facing documents,** including their

résumés, LinkedIn profiles, and any provider-created student profiles. Students do not always see classroom projects as relevant to their job search, and it is important for project information to be visible and easily accessible to an employer, whether they see a student’s résumé or GitHub first.



## What To Look For/

- > **Publicly-accessible, functional products:** Potential students should look for evidence that they will have to create a publicly-accessible, functional product while in training. Many providers share past students’ work on their websites. Potential students can also search for specific bootcamp graduates’ personal websites, blogs, and other public sources to see work they did during training.
- > **Projects with real-world clients or audiences:** Potential students should take a look at past students’ work to get a sense for what types of projects students typically work on and whether they seem to have been informed by – or produced for – industry professionals.
- > **Presentation days:** Some bootcamps host public presentation opportunities for their students to present their work. In some cases potential students can attend these presentations; this is a good opportunity to get more insight into the types of projects students work on, how well students are able to explain their work to a non-technical audience, and how they approached the work.

## Spotlight/ “Real World” Project Work

Startup Institute knows that it is important for its students to gain hands-on experience during their accelerated training. Co-founder Shaun Johnson explains that, in order to provide this opportunity for their students, Startup Institute works with tech employers to identify “one of the 17 things a business would do if they had enough time – that way it can actually be useful to the business, but it is not a disaster if trainees do not get it done, or do not do it right.” Drawing on students from their programs in web design, web development, digital marketing, and sales & account management, Startup Institute assembles cross-functional teams that enable students to come away with a realistic sense of what it is like to deliver a product in a working environment.

## PRACTICE 12

# Help Students Gain Experience, Including Through Paid Internships

Simulate the experience of working in tech through training and include on-the-job learning for those that need relevant experience regardless of skill.

## Key Practice/

Providers should include “real world” experience and exposure as part of training – and, when appropriate, help trainees to secure paid internships to gain experience in a professional team setting. Providers should also take all opportunities to simulate the experience of working in the tech industry through training.

### EXPERIENCE AND EXPOSURE

One of the most valuable ways for bootcamp grads to gain experience is through a paid internship. **Training providers should help participants secure paid internships** in cases where graduates need on-the-job experience in order to be competitive candidates.

In addition, training providers can help their participants gain experience by connecting these trainees to:

- > **“Shadowing” experiences** for trainees to observe professionals at work
- > **Hackathons** and similar events
- > Making **contributions to open-source repositories**
- > **Participation in the NYC tech community**, including attendance at meetups, blogging, and following industry blogs
- > **Site visits** at NYC tech companies
- > A diverse range of **guest speakers** from industry who enable students to see themselves in the tech field
- > **Mentoring opportunities** with current industry professionals

### “REAL WORLD” ENVIRONMENT SIMULATION

In addition, providers **should simulate the experience of working in the tech industry** by including standard tech sector practices into their day-to-day approach to training. This can include regular stand-ups to help students practice talking about their code, pair programming, and the use of agile development methodology.

## The Challenge/

Employers cite experience as one of the most important requirements for landing a job. While industry-informed project-based work is a crucial part of training and an important stepping stone, this is not always enough experience to help students land a job.



## What To Look For/

- > **Real-world experience:** Opportunities to gain real-world experience, including through internships, on-the-job training, and “shadowing” experiences. This can also include participation in hackathons.
- > **Real-world exposure:** Opportunities to gain a first-hand understanding of the NYC tech ecosystem, including what it is like to work at various companies
- > **Simulation of working environment:** Evidence that a training provider incorporates standard industry practices, such as standups and pair programming, into its regular practices.

and what it takes to land a job there. This can happen through site visits to companies, guest speakers, and other opportunities.

## Spotlight/ The Importance of Internships

Sebastian, a Brooklyn native, always knew that he wanted to be a developer. He held on to this dream even when finances forced him to leave college and take an unrelated job. Ultimately, he enrolled in a bootcamp and thrived, but lacked the professional experience to attest to his skill on the job. Working with local companies, the bootcamp connected Sebastian to an internship at a leading NYC tech firm as part of its web development program. By the end of his internship, Sebastian not only had gained experience in a tech workplace working on a professional codebase, he also demonstrated his ability so effectively that his employer offered him a full-time role as a software engineer.

# Conclusion

**Ensuring the successful delivery of more New Yorkers into jobs that employers are looking to fill is not the responsibility of training providers alone. Beyond bootcamps, there are many entities that play a role in ensuring that companies can find qualified talent and that New Yorkers have an opportunity to access tech jobs.**

Funders of all shapes and sizes can help to improve job outcomes. Some providers are mission-driven and depend on philanthropy to fuel operations. Others, as we have noted, are revenue-generating and look to VCs or larger owners for financial sustainability. In either case, funders can promote the adoption of promising practices that can help more people to successfully connect to tech jobs.

Public-private partnerships that enable bootcamps to join forces with non-profits that excel in supporting students can also play a role in improving outcomes.

And employers must be engaged in defining needs, reviewing candidates, providing feedback, and expanding opportunities for qualified talent that meets their needs. As their demand for tech workers

continues to grow, educators that can effectively evolve to reliably and directly meet this need with a diversity of candidates will prosper.

In the months ahead, TTP will continue to create opportunities to recognize those accelerated programs that adopt these key practices and deliver qualified New Yorkers for jobs in the tech ecosystem. Bootcamps, join the movement – share with us the work you are already doing and the new practices you plan on adopting. Partners, let us know how you plan on supporting and hiring qualified NYC tech talent.

Together, we can ensure that the NYC tech ecosystem is well-positioned to be a global hub of innovation and inclusion for years to come.



# Appendix

## About This Publication >

### Specific Perspective; Broad Applicability

In New York City, there are at least 22 tech bootcamps<sup>iii</sup> working to prepare students for careers in a wide range of jobs, from web development to product management to data science. These providers offer many different types of training with various desired student outcomes. Some providers provide full-time, job-focused training; others provide short-term workshops aimed at discrete skills improvement. This report focuses on providers that are:

- > **Employment focus:** Recommendations here are geared to providers that run tech training programs with the explicit goal of preparing individuals without significant relevant work experience in tech to gain full-time employment in an in-demand tech role in NYC.
- > **Full-time:** The promising practices here are primarily written from the perspective of full-time courses, but they largely apply to part-time courses as well.
- > **In-person focus:** The focus of this document is training that is provided in-person, though many of the practices presented here may apply to online programs as well.

The key practices included in this document were not written for traditional degree-bearing academic programs (e.g., a four-year degree in Computer Science) or “pre-training” programs that prepare individuals for further training or study in a technical field, though some of them may be applicable in those settings as well.

Furthermore, while this document is geared towards for-profit, proprietary bootcamps, there are many types of organizations that offer accelerated technical training in New York City. This includes tech training-focused non-profit organizations whose structures are fundamentally different from, but have the same goals as, for-profit bootcamps: to rapidly prepare individuals for, and deliver them into, tech jobs in New York City. The key practices included here largely apply to these training providers as well.

### What To Look For

The purpose of this document is to offer support primarily to training providers as they strive to improve job outcomes for a broader market of participants. Also included are “indicators” that are meant to help potential students uncover information that will be helpful when making a decision about which program to attend. When choosing between schools, students should be sure to consider how, or if, the organization addresses the key indicators presented here.

### Spotlights

Featured in this report are providers and programs that have exemplified particular practices contained in this briefing. Inclusion in this report does not imply endorsement of a particular program or verification that the program overall is a model for high job outcomes. One practice alone is not sufficient to guarantee positive job outcomes. Potential students should be sure to learn more about each provider before selecting a school using some of the “indicator” questions described below.

## Acknowledgements >

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- iv Ibid.
- v Ibid.
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## About the NYC Tech Talent Pipeline

Launched by Mayor Bill de Blasio in 2014, the NYC Tech Talent Pipeline is the City's tech Industry Partnership, designed to support the inclusive growth of the NYC tech sector and prepare New Yorkers for 21st century jobs. Incubated and supported by the NYC Department of Small Business Services, the NYC Tech Talent Pipeline works with 175 companies, 16 local colleges, and additional public and private partners to define employer needs, develop training and education models to meet these needs, and scale solutions throughout the City, delivering quality talent for the City's businesses and quality jobs for New Yorkers.

The NYC Tech Talent Pipeline is a public-private partnership between the NYC Department of Small Business Services, the Workforce Funders, and JPMorgan Chase Foundation.

[techtalentpipeline.nyc](https://techtalentpipeline.nyc)

 [@NYCTechTalent](https://twitter.com/NYCTechTalent)

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