Things to Try: The iCorps Program (V6)

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# Overview

First launched in 2011 by the National Science Foundation (NSF), I-Corps provides experiential and evidence-based entrepreneurship education for teams of scientists and engineers. The program pairs participants with business mentors and uses an intensive curriculum to help them discover a “demand-driven path” from their lab research to a marketable product. It’s a direct response to the realization that promising solutions discovered in the lab often fail to reach full impact unless they are successfully transferred to the marketplace as commercial products and services. [[Source](https://www.whitehouse.gov/blog/2014/10/29/empowering-entrepreneurial-labs-new-lab-corps-program-accelerates-energy-technologie)] The rigorous “boot camp” emphasizes the necessity of understanding customer or stakeholder needs in order to implement or scale their idea, technology, project, or program. “Overall, the experience relies on evidence-based decision-making. And it’s evidence that you can’t gather in a lab; you have to go to the people that are the important stakeholders in the ecosystem,” explains Lydia McClure, Program Director for I-Corps at NSF.

As its track record for effective impact grows, the I-Corps program has been adopted and adapted in partnerships with a [growing number of Federal agencies](https://www.whitehouse.gov/the-press-office/2015/08/04/fact-sheet-president-obama-announces-new-commitments-investors-companies), including the [National Institutes of Health (NIH)](https://sbir.cancer.gov/programseducation/icorps), [Department of Energy (DOE)](http://energy.gov/eere/technology-to-market/lab-corps), [Department of Defense (DOD](http://www.defense.gov/)), [National Security Agency (NSA)](https://www.nsa.gov/), [United States Department of Agriculture (USDA)](http://www.usda.gov/wps/portal/usda/usdahome), [Department of Homeland Security (DHS),](https://www.dhs.gov/) and the [Small Business Administration (SBA).](https://www.sba.gov/)  Agency program variations may address extramural university researchers (i.e., researchers receiving Federal funding), intramural researchers (e.g., research scientists at agency labs), or Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funded companies.

## Why iCorps?

The Federal government invests over $130 billion on research and development each year, conducted at universities, Federal laboratories, and companies; this work has yielded extraordinary long-term economic impact through the creation of new knowledge and ultimately new industries. Federally-funded R&D has historically led to dramatic economic growth, and there is significant potential to increase the public’s return on this investment in terms of innovation, job creation, societal impact, competitiveness, and economic prosperity. [[Source](https://www.performance.gov/content/lab-market?view=public)]

In alignment with the [Lab-to-Market Cross-Agency Priority Goal](https://www.performance.gov/content/lab-market?view=public), the chief purpose of the I-Corps program is to reduce the risk of entry for nascent companies and commercialization efforts. This is essential for increasing the economic impact of Federally-funded research and development by accelerating and improving the transfer of new technologies from the laboratory to the commercial marketplace.

# Benefits of iCorps

## Overview

The reality underlying the I-Corps approach is that once an idea is exposed to and tested in the real world, the understanding about what is viable often changes. One common expression: “No plan survives first contact with a customer or stakeholder.” When researchers go into the field through their I-Corps training, they aren’t promoting their technology – they are listening to and learning what customers’ needs and problems actually are. Then, participants evaluate whether their technology will address those needs or whether their plan requires a course alteration to align their ideas to their stakeholders or customers.

“A lot of people think entrepreneurialism is an execution process, but it’s not. It’s a search process – a search for a business model. No one understands this stuff going in. Why would they? But we’ve cracked the code on how to teach entrepreneurialism to scientists and engineers without wasting their time.” Steve Blank (quoted in “To Market, To Market”, 2014 ASEE Prism)

I-Corps provides a systematic and proven methodology for customer discovery, for testing hypotheses around commercializing research and implementing ideas, and it provides a path for scaling and sustaining programs. In an accelerated, rigorous environment, [teams](http://www.nsf.gov/news/special_reports/i-corps/teams.jsp) are pushed to learn quickly whether their ideas have viability. Instruction is provided via online platforms and through on-site activities at one of several regional [I-Corps Nodes](http://www.nsf.gov/news/special_reports/i-corps/nodes.jsp), including:

* [Bay Area I-Corps](http://bayicorps.com/)
* [Georgia Tech I-Corps](http://innovate.gatech.edu/programs/innovation-corps-icorps/)
* [Michigan I-Corps](http://www.michiganicorps.com/)
* [New York City Regional Innovation Node](http://www.nycrin.org/nycrin/i-corps.html)
* [Washington DC I-Corps](http://www.dcicorps.org/) [[Also embed pop-up spotlight content – see below]]

Separately, [I-Corps Sites](http://www.nsf.gov/news/special_reports/i-corps/sites.jsp) catalyze additional groups to explore potential I-Corps team projects and other entrepreneurial opportunities that build on academic research. [[VentureWell](https://venturewell.org/i-corps/)] By the end of the ten-week course, teams have received personal coaching from trainers and mentors and have performed 100 interviews with stakeholders or potential customers in their ecosystem, permitting each participant to confidently decide if their project is a “Go or No-Go” for future investment of time and money. [Lydia McClure/STPI interview]

## Benefits of the Program

The I-Corps curriculum is based on the “Lean Launchpad” framework developed by serial entrepreneur Steve Blank, and I-Corps has provided a key bridging functionality for fully leveraging Federal investment in research. Researchers who have participated in the I-Corps program have a much higher success rate of attracting early-stage technology funding, and report that the experience has materially shaped how they choose future research topics with greater economic and societal relevance. As of August 2016, over 800 teams had completed the NSF’s I-Corps boot camp, leading to the creation of more than 320 companies that collectively have raised more than $83 million in funding from outside sources. Additionally, 4 of the founded companies have already been acquired. [[Marc](https://www.whitehouse.gov/the-press-office/2015/08/04/fact-sheet-president-obama-announces-new-commitments-investors-companies) Wynne]

Results from the initial NSF I-Corps cohort in 2011 indicated early on that the program was effective. The survey results assessing the before-and-after knowledge levels of the participating scientists and engineers were “dramatic,” notes Steve Blank, leading NSF to continue to invest in scaling the program.

The long-term benefits of R&D commercialization (also known as “technology transfer)” are ubiquitous; Federal laboratories developed much of the battery technology that makes electric vehicles possible, university researchers helped bring to market a breakthrough drug that effectively cures certain forms of leukemia, and Google was born as a Federally funded university spin-off company. [[Source](https://www.whitehouse.gov/blog/2014/03/14/lab-market-accelerating-research-breakthroughs-and-economic-growth)] Yet even with exciting breakthroughs and truly impactful research, the jump from the lab to commercialization can be a difficult challenge, explained Dr. Dean Chang, Lead PI for DC I-Corps Regional Node, Associate Vice President for Innovation and Entrepreneurship at University of Maryland, but “I-Corps is by far the best thing I’ve come across for improving the odds of making that transition.” Many people have deep expertise in either the startup world or in academia – and they know well what works in their own field, “but it doesn’t translate over to the other world,” Chang notes. “I-Corps is one of the only things I’ve seen that makes an impact in and translates across both worlds.”

According to Ralph Muehleisen, a researcher from Argonne National Lab and a recent graduate of [Lab-Corps](http://energy.gov/eere/technology-to-market/lab-corps), DOE’s I-Corps program, the experience was deeply valuable:

“I strongly recommend Lab-Corps to any researchers trying to develop technologies that need to be adopted by industry or consumers. The program taught me so much about the needs of industry and how those needs can be met by researchers. Sometimes, it’s easy for us to get caught up in the research and not think about how the commercial impact of our science and technology can actually impact lives. Lab-Corps showed me how I can maximize the benefit of my basic research at Argonne to create technology that has real-world commercial impacts for Americans.” [[Source](https://www.whitehouse.gov/blog/2016/07/12/progress-president-obamas-lab-market-initiative)]

Watch: Why does the I-Corps model work so well? Student insights from Lean Launchpad / NSF I-Corps:

* [Getting to the “Better Idea” faster](https://vimeo.com/groups/213077/videos/81146693)  [4:00 min]
* [Why Researchers Need to Get Out of the Building](https://vimeo.com/groups/213077/videos/79755368) [1:40 min]
* [“You Stop Telling Yourself What You Want to Believe”](https://vimeo.com/groups/213077/videos/79544174) [2:15 min]

# When to Deploy and How to Use

I-Corps has been an avenue for foster researching commercialization or lab-to-market initiatives. The program facilitates evidence gathering and provides a framework for quickly responding to that evidence. The I-Corps model emphasizes experiential learning; rather than learn by lecture, participants propose and test their hypotheses by getting out of the classroom and talking directly to potential customers or stakeholders. Business or mission models are developed and iteratively refined from this discovery process. While the program is highly structured, it has also been adapted to fit the specific needs at each of the agencies who have deployed I-Corps cohorts.

In its original conception at the National Science Foundation (NSF), I-Corps was developed from a recognition that in the world of technology transfer, Federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) awardees were having difficulty fully leveraging their federal funding opportunity and getting to market. I-Corps was brought in as a framework to help enable that to happen -- and to help the NSF extract ‘”considerable further value” from the government’s investment. [[“From Market to Market](http://www.asee-prism.org/to-market-to-market-dec/)”]

While I-Corps presents an effective methodology, it has to be adapted to agency specific contexts, notes Dean Chang. The expansion of I-Corps has to practice what it preaches, in essence, with the realization that there are different customer segments within government. The program structure is not for everyone; other programmatic applications of Lean may be more appropriate. Other adaptations include the Defense Department and Department of State’s pilots of “[Hacking 4 Defense](https://steveblank.com/category/hacking-for-defense/)” and “[Hacking 4 Diplomacy](https://steveblank.com/2016/08/04/hacking-for-diplomacy-solving-foreign-policy-challenges-with-the-lean-launchpad/)” programs with Steve Blank and Lean Launchpad.

Agencies most interested in incorporating Lean but not finding a programmatic fit with I-Corps should also consider experimenting with accelerator programs. Accelerator models can provide a more flexible operational framework for accelerating solution-finding for an agency’s biggest problem areas or highest priority topics. (This helps to create more effective, targeted plans of action by minimizing the problem of “everything looking like a nail” when using only one “methodological hammer”.) “The accelerator models provide the space to test out and explore solutions,” notes OSTP’s Read Holman, while empowering employees “to address the topics they're most interested in.” From their work with I-Corps and their own program, [HHSIgnite,](http://www.hhs.gov/idealab/what-we-do/hhs-ignite/) the Department of Health and Human Services has found that the flexibility of the accelerator model allows them to emphasize their toughest challenges and bring in elements of Lean and other innovative approaches, like design thinking, to provide the most effective solutions. Even though the structure of I-Corps wasn’t the best fit for addressing their challenges, notes Dean Chang, key elements of Lean remained – like the idea of needing to “get out of the building” to clarify out who is being served and what value is being added. [Phase II: LINK TO HCD / HHS case studies]

As part of the I-Corps program, researchers learn key Lean principles, such as:

* Commercializing a new invention requires the identification of a viable business model, not just an increase in the technological maturity of an invention
* Discovering the elements of a successful business model (e.g. value proposition, customer segments, sources of revenue) requires gathering evidence to test and refine their initial hypotheses by talking to many different potential customers and partners—leaving the lab and “getting out of the building”
* Developing prototypes and getting early feedback on these prototypes from customers can reduce the time and cost associated with the commercialization process
* Gathering strong evidence that validates their business model can increase the likelihood that an investor will back their startup

[[Source –WH blog](https://www.whitehouse.gov/blog/2016/01/05/call-to-action-consumer-electronics-show) post]

# Success Stories

## iCorps Programs

### [National Science Foundation - I-Corps](http://www.nsf.gov/news/special_reports/i-corps/teams.jsp)

Summary

The canonical NSF I-Corps program provides immersive education to academic engineers and scientists to help them understand the commercial market viability of their research transitioning into a small company. By preparing researchers to look beyond the laboratory, it broadens the impact of NSF-funded, basic-research projects and helps to create a stronger national ecosystem for innovation.

#### Key Accomplishments and Impact

The NSF I-Corps program was started in 2011 as a way to understand how basic research funding was impacting society through startup formation, according to program director Lydia McClure. Since then, with a $30 million annual program budget, NSF has worked with 800 teams through the national I-Corps program and also created a network of 70 universities that has taught a similar version of the curriculum to tens of thousands. Encompassing the other program variants (NIH and DOE are the largest, with each training two cohorts annually), at present, 14 cohorts of 20 teams a year go through the I-Corps program.

#### How They Did It

With guidance from established entrepreneurs and through a targeted curriculum, I-Corps participants learn to identify valuable product opportunities that can emerge from NSF-supported academic research. Over a period of six months, each Team learns what it will take to achieve an economic impact with their particular innovation.

Read more:

* [From Science Lab to Startup](https://www.whitehouse.gov/blog/2012/08/10/nsf-innovation-corps-science-lab-startup)
* [FY17 NSF budget (provides recent program scope)](https://www.nsf.gov/about/budget/fy2017/pdf/38_fy2017.pdf)

### [National Institutes of Health – I-Corps](http://sbir.cancer.gov/resource/icorps/)

#### Summary

I-Corps at NIH is a pilot of NSF’s I-Corps program specially tailored to biomedical research. NIH-funded researchers receive real-world, hands-on entrepreneurship training from domain experts. They evaluate their potential of their scientific discoveries for commercial application; one program tagline is, “Is your invention enough to turn IP (Intellectual Property) into an IPO (Initial Public Offering)? “ The goal is to accelerate the translation of biomedical innovations into applied health technologies. The program is open to academic researchers and entrepreneurs with [Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR)](http://www.sbir.gov/) "phase one" awards (which establish feasibility of proof of concept for commercializable technology) from participating NIH institutes.

The NIH is also applying the I-Corps teaching methodology to the Clinical and Translational Science Awards (CTSA) program funded by the National Center for Advancing Translational Sciences (NCATS). By training new I-Corps educators and researchers at 10 CTSA institutions, who in turn can provide entrepreneurship training for other translational scientists, the I-Corps at the CTSA program will prepare participants to identify and develop valuable commercial opportunities that emerge from the research setting, with the intent of moving discoveries more quickly into treatments and cures. [[Source](https://www.whitehouse.gov/the-press-office/2015/08/04/fact-sheet-president-obama-announces-new-commitments-investors-companies)]

#### Key Accomplishments and Impact

The NIH awards more than $700 million in [SBIR/STTR research and development awards](http://grants.nih.gov/grants/funding/sbir.htm) each year; the I-Corps program helps to “ leverage NIH's robust SBIR/STTR program and further NIH's mission to advance our understanding of human illness and treatment of disease and disability," said NIH SBIR/STTR program coordinator Matthew Portnoy. In 2017, the program expands to offer two cohorts to SBIR/STTR grantees, including life-sciences entrepreneur project teams, across 16 Institutes and Centers at the NIH and the Centers for Disease Control. [[Source](https://www.nih.gov/news-events/news-releases/nih-nsf-collaborate-accelerate-biomedical-research-innovations-into-marketplace)]

Read more: [I-Corps at NIH](https://sbir.cancer.gov/programseducation/icorps)

### Department of Energy’s Lab-Corps

#### Summary

The Lab-Corps program is a specialized training curriculum aimed at accelerating the transfer of cLean energy technologies from national laboratories into the commercial marketplace. As part of the Lab-Corps program, national laboratories assemble, train, and support entrepreneurial [Lab-Corps teams](http://energy.gov/eere/technology-to-market/lab-corps-teams) to identify private sector opportunities for commercializing promising cLean energy laboratory technologies. Lab-Corps also functions as an innovative program space for the national laboratories test innovative models and gather metrics to identify best practices that support potential full-scale implementation of the Lab-Corps program across the entire DOE national laboratory space. [[Source](http://energy.gov/eere/technology-to-market/lab-corps)]

#### Key Accomplishments and Impact

The Energy Department’s $2.3 million [Lab-Corps Initiative](http://energy.gov/sites/prod/files/2015/08/f25/64779.pdf) officially commenced in October 2015, following a successful [pilot](http://energy.gov/sites/prod/files/2015/03/f20/DOE%2520Lab-Corps%2520Pilot%2520Summary_EERE%2520Comms_3-6-15.pptx) kick-off in 2014. Eight DOE laboratories were selected to participate in the program, which assembles entrepreneurial teams to identify private sector opportunities for commercializing promising sustainable transportation, renewable power, and energy efficiency technologies. Lab-Corps has already provided training to 36 teams in three cohorts. "What gets me incredibly excited about Lab-Corps is that we're taking this tremendous asset -- world-class set of national labs that we have in this country -- and we're taking their commercial engagement and commercial impact to a completely different level," said David Danielson, Assistant Secretary for DOE. [[Source]](https://www.youtube.com/watch?v=w4O8O-pgu5s)

#### How they did it

Lab-Corps teams participate in a seven-week entrepreneurial boot camp, or “cohort”, facilitated by the U.S. Department of Energy's (DOE's) [National Renewable Energy Laboratory](http://www.nrel.gov/). Each cohort includes in-person sessions and weekly webinars to help each team learn how to evaluate the market potential of their technologies and bring a new level of entrepreneurial education back to their research and colleagues. This includes access to a suite of commercialization resources and tools, including direct market feedback on technologies as well as advice for pursuing the development of startup companies, industry partnerships, licensing agreements, and other business opportunities.

Watch: [Lab-Corps program trains scientists in commercialization](https://www.youtube.com/watch?v=w4O8O-pgu5s) [3 min]

Read more:

* [Lab-Corps fact sheet](http://energy.gov/sites/prod/files/2015/09/f26/64779.pdf)
* [A DOE Lab-Corps participant explains his journey from invention to market](https://www.whitehouse.gov/blog/2014/10/29/empowering-entrepreneurial-labs-new-lab-corps-program-accelerates-energy-technologie)

For more information: Contact [lab-corps@nrel.gov](mailto:lab-corps@nrel.gov)

# Challenges and How to Overcome

Key ingredients for deploying an I-Corps cohort for your agency include:

* [Adequate funding, whether new agency model or to support further expansion](#_loskr9inxss3)
* [Balance thoughtful pilot planning with early execution](#_w1ihtvasely1)
* [Agency commitment to following the program structure](#_ae93r89wmttk)
* [Participants’ significant time investment](#_s6t9kb4vchy4)
* [Participants’ openness and adaptiveness to new ways of thinking](#_l2iz7axhb98o)

## Adequate funding for new programs or to support further expansion

I-Corps produces results, but requires adequate investment of agency resources to develop program models. At the same time, agencies may wish to invest in further customizing the program to better fit their particular subject area and operating environment. Even as successful I-Corps programs consider strategic expansion, programs should evaluate whether their models offer grant funding that is adequate to actually spur market commercialization and catalyze systems-level results. “Simply dangling $50,000 as a grant is not enough to have the majority of academic researchers [engage] -- or even if the goal or 10% of all university research -- $50,000 is not a lot of money,” notes Dean Chang.

## Balance thoughtful pilot planning with early execution

The power of a well-planned and -executed pilot deserves extended consideration. “We talk about the importance of starting small and having a touching ground,” says Andrea Kates; “The ability to get a narrative is powerful.” Lydia McClure notes that once a pilot is actually launched, “Everything seems to work very well; the results come back quickly, and the results are typically very good, so then [investing in I-Corps] is pretty easy.” At the same time, she reflects, “But there’s a lot of planning that happens -- and the planning can take a year or years. There’s a lot of thinking about how to make it the best pilot possible; in some ways, that hinders the progress of the program because you can start getting results immediately, and that would probably help gather the support needed to get further financial support within each agency.”

## Agency commitment to following the program structure

NSF is open to working with interested agencies to develop I-Corps variants through an MOU process. However, “The I-Corps program is a discipline and cannot be implemented in an informal manner,” notes program director Lydia McClure. I-Corps maintains quality by ensuring appropriate resources are allocated and support is provided by the National Innovation Network. In some cases -- demonstrated with [HHS’ IdeaLab](http://www.hhs.gov/idealab/) -- agencies may find that less formal frameworks are more appropriate for bringing in Lean methodologies into their day-to-day work. As HHS’s mission involves tackling social problems, not building technology, “There was some confusion for HHS over who the “customer” was,” explains Dean Chang. “What HHS found more helpful was design thinking, since they are trying to redesign a process. But there was still this [Lean] idea of needing to get out of the building, figuring out who you’re serving. and what value you are adding.”

## Participants should have the support and will to devote substantial time

I-Corps is highly effective, but it also requires participants to commit a significant amount of time to the instruction. The curriculum requires full participation from the entire [I-Corps Team](https://www.nsf.gov/news/special_reports/i-corps/teams.jsp), and each team member must commit to in-depth preparation, attendance at webinars and workshops, as well as at least 15 additional hours per week for customer discovery. “There’s no sitting and listening to a lecture,” explains Lydia McClure. “It’s a very self-taught, experiential program, which is very hands-on. There’s a lot of getting out of the building, doing legwork yourself, coming back and talking to people that higher recognition -- the instructors -- to digest what you’re learning.”

## Participants’ openness and adaptiveness to new ways of thinking

“This methodology has friction because inventors are forced to confront some realities about the commercial viability of this genius idea that they have,” notes Andrea Kates, CEO of Lean Launchpad. Acknowledging feedback “is not a natural act” for some subject experts, who may bring technical expertise and are asked to listen with objective ears to the customer discovery feedback process. Sometimes, Kates observes, “there is a lack of sensitivity to what the market need is -- frequently by the very people that could adopt their technology to fit that need.” The I-Corps curriculum recognizes this, in part through its emphasis on a large number of customer interviews; through repeat exposure to customers in the field, participants learn to embrace uncomfortable truths and are given the tools to pivot, or alter course. And for some, the mindset comes more easily: The "Lean" method of hypothesis testing shares a kinship with the scientific method used in R&D, notes [Ralph Muehleisen](https://www.whitehouse.gov/blog/2016/07/12/progress-president-obamas-lab-market-initiative), a researcher from Argonne National Lab and a recent graduate of Lab-Corps. Once researchers make the connection, they can see a natural fit.

# How To Implement iCorps at Your Agency

The NSF has helped facilitate the launch of new I-Corps programs by other groups and agencies using a technique called Train-the-Trainer (TTT), where individuals work with the [National Innovation Network (NIN)](https://venturewell.org/i-corps/nin/) to adopt the I-Corps program for their constituents and to ensure the scale-up and maintenance of quality programming.

Dr. Dean Chang, Lead Principal Investigator for DC I-Corps Regional Node, offered the following guidance as five key elements in your launch of an I-Corps program:

1. Consensus agreement on desired outcomes: Identify your group’s and agency’s long-term goals and preferred outcomes (e.g. Go/No-Go on commercial viability of federally funded research, scale/sustainability of promising new programs or processes, entrepreneurial mindset of constituents, culture change, etc.)
2. Curriculum Development: Work with similarly deployed I-Corps programs to design the optimal program in terms of time duration, expectations for teams, content delivery, and next steps. The NSF I-Corps team has helped facilitated many new variants of the I-Corps program across disciplines and programs.
3. Instructors and Tools: Programs need to identify individuals in with the ability and will to be trained in the I-Corps methodology and to lead the program after the pilot. Additionally, invest in online software for data collection and analysis and curriculum webinars.
4. Team Composition and Resources: Determine which key stakeholders are critical for participation, including individuals with complementary perspectives and core strengths. At NSF, there are three team members: the Entrepreneurial Lead (EL) is typically a graduate or postdoctoral student, the Principal Investigator (PI) is a technical academic lead, and the Industry Mentor (IM) is a volunteer from the industry in which the project may be applied. Obtain resources for teams to explore their project and test their idea. Funding is needed for team salary (typically for the Entrepreneurial Lead and discouraged for the Principal Investigator and Industry Mentor), plus travel for customer discovery and event logistics.
5. Funding structure for pilot/growth programs: Obtain funding for certified instructors during the pilot. With the program infrastructure and teams in place, the creation of a sustainability plan for the evaluation and growth of the program is essential to testing the validity of their proposed plans using customer discovery.

What to look for in an effective instructor: [Dean Chang]

Sourcing the right instructors is perhaps the most critical element for a successful I-Corps program, and finding them can be difficult, says Dr. Dean Chang. What characteristics are most important?

1. Brutal honesty. Instructors must be able to be “brutally honest” with their teams and challenge their work without provoking conflict or resentment.
2. Teach the process, don’t tell. Great instructors don’t tell teams what to do, but encourage adherence to the process, even when they personally have relevant background experience: “What are you hearing from your interviews? Diagram that. Don’t tell me how you think it works; tell me who you talked to, and what you learned from them.”
3. Credibility. Instructors must have credibility. It’s not enough to enforce adherence to the process; participants have to believe that instructors have relevant experience and insight – otherwise, teams may wonder, “Why should I listen to this person?”
4. Charisma and personality. The program is multi-week, multi-hour webinars, and it’s difficult to sustain teams’ engagement through that platform. Being able to read a room and make the curriculum interactive requires skill in the art of pedagogy.

# Future States

I-Corps has had tremendous success in its first five years. One challenge now is to move beyond the supportive early adopters in academia and scale it to the majority of faculty, notes Dean Chang. Because those working so closely with I-Corps see its firsthand success (as well as the high-level administration support it has received), there may be a disconnect in expectations about the challenges facing wider-scale expansion. [[LINK to 8/9 V on Innovation Curve]]

Moreover, as successful as the I-Corps model has been at disseminating and teaching Lean methods, it’s important that the approach maintain its own innovative energy and evolve while it continues its strategic expansion. Opportunities exist for programmatic expansion both before and after participation in the I-Corps curriculum. One challenge many agencies have encountered in running I-Corps cohorts is that Phase I applications can be of variable quality. Introducing a “Phase 0” – a slimmed down version of I-Corps that introduces the business model canvas and customer discovery principles – could be a standalone resource for participants before they formally engage with the canonical I-Corps program. (Currently, another potential model, [I-Corps Lite](http://www.huffingtonpost.com/steve-blank/doubling-down-on-a-good-t_b_7265300.html), is also experimenting with ways to convey value while lessening the time burden of the program.)

A future I-Corps “2.0” could specifically address “what comes next” for the scientists who do successfully commercialize. Follow-on training would be particularly useful for the researchers and scientists who face a new set of entrepreneurial challenges (when to sell a company, valuation, etc.) For particular subject areas – like the life sciences – tailored follow-on training could educate researchers on how to navigate particular regulatory landscapes on the path to market.

# Related Policies

* The Stevenson-Wydler Technology Innovation Act of 1980 (Pub.L. 96–480), as amended (codified at Title 15 of the United States Code (U.S.C.), Section 3701 et seq.) ([94 Stat. 2311](https://www.gpo.gov/fdsys/pkg/STATUTE-94/pdf/STATUTE-94-Pg2311.pdf))
  + This legislation, as the first major U.S. technology transfer law, sets forth a national policy to promote cooperation among academia, Federal laboratories, labor and industry in order to facilitate the transfer of innovative federal technologies to United States and world markets.
* In furtherance of that policy, the Obama Administration’s Lab to Market initiative seeks to “significantly accelerate and improve technology transfer by streamlining administrative processes, facilitating partnerships with industry, evaluating impact, and opening federal research and development (R&D) assets as a platform for innovation and economic growth.” (Lab to Market: Cross Agency Priority Goal Quarterly Progress Update, Fiscal Year 2015 Quarter 4).
* The Bayh-Dole Act of 1980 (Patent Rights in Inventions Made with Federal Assistance) [35 U.S.C. § 200-212](http://www.law.cornell.edu/uscode/text/35/part-II/chapter-18); [37 C.F.R. Part 401](http://www.ecfr.gov/cgi-bin/text-idx?SID=801fba8be97a933ffcbd0b4064552ca0&mc=true&node=pt37.1.401&rgn=div5)
  + This legislation addresses intellectual property arising from federal government-funded research, and was intended to spur academic institutions to fully capitalize on transferring technology to the marketplace. [[Placeholder for not yet public rulemaking – Marc Wynne follow-up]]

# Resources

## Contact

Agencies interested in learning more about the I-Corps model can contact Lydia McClure, I-Corps Program Director for the National Science Foundation at lmcclure@nsf.gov or 703-292-8798.

## Engage

The [National Innovation Network (NIN)](https://venturewell.org/i-corps/nin/) is an active community of practice for I-Corps. NIN offers nation-wide resource in best-practices for curriculum modification/delivery, mentor matching, certified I-Corps instructors, and more.

General information on I-Corps:

* [Video Montage](http://www.nsf.gov/news/special_reports/i-corps/video_montage.jsp): Introducing several I-Corps Teams and their projects.
* [I-Corps Impacts](http://www.nsf.gov/news/special_reports/i-corps/video_impacts.jsp): Team members briefly describe the I-Corps experience.
* [I-Corps Alumni Perspectives](http://www.nsf.gov/news/special_reports/i-corps/video_alumni.jsp): Team members describe their I-Corps experiences, including their interactions with fellow team members and with their I-Corps peers, what mistakes they made, and what they will do next.
* [I-Corps in Their Own Words](http://www.nsf.gov/news/special_reports/i-corps/video_ownwords.jsp): Team members describe the surprising things they learned from participating in I-Corps.

Wondering more about the specifics of the I-Corps methodology? [The curriculum is freely available](https://venturewell.org/i-corps/newfaculty/); you can peruse sample syllabi, class lectures, business canvas development tools, textbooks and supplemental readings, and additional resources. Additionally, I-Corps offers a wealth of open-source, public training resources worth watching:

Before Leaving the Building

1. [Pre-Planning Contacts](https://vimeo.com/groups/204136/videos/87303446) (4:34)
2. [Customer Interview Dry Runs](https://vimeo.com/groups/204136/videos/87302981) (0:49)
3. [Discovery is for Founders](https://vimeo.com/groups/204136/videos/87302891) (1:30)
4. [Pass/Fail Experiments](https://vimeo.com/groups/204136/videos/87302754) (1:32)

Outside the Building: Rules of Customer Interviews

1. [Being Aggressive](https://vimeo.com/groups/204136/videos/87302631) (1:29)
2. [Conducting a Customer Interview](https://vimeo.com/groups/204136/videos/87302479) (1:30)
3. [Letting the Customer Interview Flow](https://vimeo.com/groups/204136/videos/87302329) (1:37)
4. [Sizing the Opportunity](https://vimeo.com/groups/204136/videos/87302172) (2:50)
5. [Finding Patterns](https://vimeo.com/groups/204136/videos/87301903) (1:50)
6. [Looking for Insights](https://vimeo.com/groups/204136/videos/87301695) (0:58)

Early Mistakes to Avoid

1. [Death by Demo 1](https://vimeo.com/groups/204136/videos/76390080) (2:18)
2. [Death by Demo 2](https://vimeo.com/groups/204136/videos/76172223) (1:45)
3. Understanding the Customer Problem (the wrong way) or [Death by PowerPoint](https://vimeo.com/groups/204136/videos/76171146) (1:42)
4. [Understanding the Problem](https://vimeo.com/groups/204136/videos/76173388) the right way(3:22)
5. [Multi-Person Interview](https://vimeo.com/groups/204136/videos/76175265) (2:03)
6. [Assuming You Know](https://vimeo.com/groups/204136/videos/76175907) (1:56)
7. [B-to-B to C](https://vimeo.com/groups/204136/videos/73674284) (2:15)
8. [Existing vs. New Markets](https://vimeo.com/groups/204136/videos/73674022) (5:29)
9. [Asking the Right Question](https://vimeo.com/groups/204136/videos/74338298) (2:37)
10. [Public Interviews](https://vimeo.com/groups/204136/videos/73711818) (2:11)

Understanding What the Customer Is Telling You

1. [Engaging the Customer](https://vimeo.com/groups/204136/videos/76174533) (3:37)
2. [Customer Empathy](https://vimeo.com/groups/204136/videos/73714461) (2:25)
3. [The Distracted Customer](https://vimeo.com/groups/204136/videos/73715398) (3:12)
4. [Customers Lie](https://vimeo.com/groups/204136/videos/76176674) (2:37)
5. [The User, the Buyer & the Saboteur](https://vimeo.com/groups/204136/videos/73673203) (2:24)

Back in the Building

1. [Extracting Insight from Data](https://vimeo.com/groups/204136/videos/76177502) (2:59)
2. [Pay Attention to Outliers](https://vimeo.com/groups/204136/videos/76177672) (2:16)
3. [Getting the MVP Right](https://vimeo.com/groups/204136/videos/73713162) (3:34)
4. [The “Other 85%”](https://vimeo.com/groups/204136/videos/73716009) (2:32)
5. [Finding Early Evangelists](https://vimeo.com/groups/204136/videos/87301612) (1:17)
6. [Communicating Your Discoveries](https://vimeo.com/groups/204136/videos/87313618) (2:26)

Press coverage on I-Corps:

1. [Nature](http://www.nature.com/news/2011/110907/full/477133a.html), September 2011
2. [Scientific American](http://www.scientificamerican.com/article.cfm?id=the-nsf-i-corps-is-turning-scientis-2011-10), October 2011
3. [The Wall Street Journal](http://online.wsj.com/news/articles/SB10001424052702303807404577434273446504172?mg=reno64-wsj&url=http%253A%252F%252Fonline.wsj.com%252Farticle%252FSB10001424052702303807404577434273446504172.html), May 2012
4. [The Economist](http://www.economist.com/node/21559734), July 2012

Other Lean Resources, recommended by NSF I-Corps:

[Blank, Steven](http://www.nsf.gov/cgi-bin/good-bye?http://steveblank.com/). The Four Steps to the Epiphany. 2005.

Steve Blank's book provides step-by-step strategy for any new company or product, including organizing sales, marketing, and product development.

[Blank, Steven and Bob Dorf](http://www.nsf.gov/cgi-bin/good-bye?http://steveblank.com). The Startup Owner's Manual. 2012.

This books takes companies through each stage of the customer development process.

[Constable, Giff](http://www.nsf.gov/cgi-bin/good-bye?http://giffconstable.com/2011/07/12-tips-for-customer-development-interviews-revised/). 12 Tips for Customer Development Interviews (revised). 2011.

Learn how to conduct meaningful interviews and interpret what you hear.

[Kim, W. Chan and Renee Mauborgne](http://www.nsf.gov/cgi-bin/good-bye?http://www.blueoceanstrategy.com/). The Blue Ocean Strategy. 2005.

The Blue Ocean Strategy and book teach companies how to create and capture untapped markets.

[Livingston, Jessica](http://www.nsf.gov/cgi-bin/good-bye?http://www.foundersatwork.com/). Founders at Work: Stories of Startups' Early Days. 2007.

Through interviews with founders of famous technology companies, this book demonstrates what makes a startup successful.

[National Research Council](http://www.nsf.gov/cgi-bin/good-bye?http://www.nap.edu/catalog.php?record_id=12174). Assessing the Impacts of Changes in the Information Technology R&D Ecosystem: Retaining Leadership in an Increasingly Global Environment. 2009.

Chapter 1 offers a useful description of the innovation ecosystem for the information technology sector.

[Osterwalder, Alex, and Yves Pigneur](http://www.nsf.gov/cgi-bin/good-bye?http://www.businessmodelgeneration.com/). Business Model Generation. 2010.

This handbook teaches businesses how to create, examine, refine, and implement successful business models.

[Pincus, Mark](http://www.nsf.gov/cgi-bin/good-bye?http://ecorner.stanford.edu/authorMaterialInfo.html?mid=2313). Quick and Frequent Product Testing and Assessment. 2009.

Mark Pincus discusses the rapid product testing and assessment his company uses to gauge consumer interest and to test and improve multiple products simultaneously.