



STARTUP Central



July 17, 2023

Lisa Friis, PI, STARTUP Central

Adam Courtney, Co-PI, STARTUP Central

Tricia Bergman, Assistant Director, STARTUP Central

Introduction



Lisa Friis

- University of Kansas, C.E. and M.J. Spahr Professor and Chair, Mechanical Engineering, 2020 – present
- University of Kansas, Assistant/Associate/Full Professor, Mechanical Engineering, 2001-2020
- Private orthopedic research lab in med center, Wichita, KS, 1987 – 2001
- Education
 - BS, Biomedical Engineering, 1985, University of Iowa
 - MS, Mechanical Engineering, 1987, University of Iowa
 - PhD, Mechanical Engineering, 1994. Wichita State University

My Background - Motivations



- Helping patients has been my career goal
- Worked in private research institute in a medical center for 14 years to have a more direct connection with clinical needs
- KU faculty position in 2001
 - goal to bring what I learned about working with MDs and device design/development to engineering students
- Medical innovation and entrepreneurship has always been my focus

My Background – Entrepreneurship



- 1987-1998: Learned the hard way why understanding FDA regulations and commercialization strategies for medical products is so important...
- 1998–2000: Attended workshops and training sessions on quality systems, led implementation in my workplace
- 2001-present: Ad hoc reviewer for NIH NIAMS SBIR/STTR Orthopaedics study sections
- 2004-2005: Kauffman Entrepreneurial Faculty Scholar
- 2007-2008: KTEC PIPELINE (Kansas Technology Enterprise Corporation Promotes Innovation, Provides Education and Leadership and Invests in New Entrepreneurs) award, one of nine charter class members
- 2007 – 2020: Co-Director, Biomedical Product Design and Development Track, Bioengineering Program, KU
- 2009 – 2011: Director, Institute for Advancing Medical Innovation (IAMI) Fellowship program, KU
- 2012 – PI in NSF I-Corps team
- 2008 – present: Part of teams awarded six NIH SBIR/STTR grants (three Phase I, two Phase II, one FastTrack)
- 2005+: Co-Founder of four companies
- 2008-2012: Two technologies licensed (developed at KU) that are now commercial products at small companies
- 2016+: Other technology platform licensed (now in stages of commercialization)
- 2016+: Current CTO/partner in medical device startup currently seeking Phase III funding (venture capital)
- 2022- present: Principal Investigator of STARTUP Central I-RED for entrepreneurial education in biomedical space

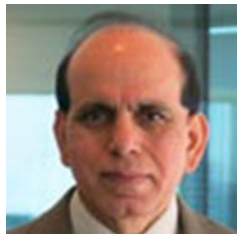
Major Lessons Learned



- Failure is compost for success
- Translation of research...
 - is about listening to customers
 - requires pivoting when needed
 - requires working both hard and smart to overcome barriers
 - in a university setting requires balance (“Papers are products too!”)
- Translational research is not for everyone
 - Do what makes you happy and fulfilled
 - Don’t listen to naysayers who oppose your work just because it is translational
- Translation requires a diverse team and diverse thinking

STARTUP Central - Introductions

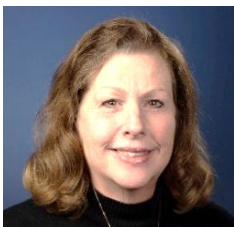
Dr. Krishan Arora, Program Director, Chief, Networks and Development Programs Branch, NIGMS



Dr. Olga Kovbasnjuk, Program Coordinator, Division for Research Capacity Building, NIGMS



Lisa Friis, Co-PI STARTUP Central
Professor and Chair, KU Mechanical Engineering



Adam Courtney, Co-PI STARTUP Central
President, Continuum Educational Technologies, PBC
Executive Vice President – Finance, KU Innovation Park



Tricia Bergman,
Assistant Director, STARTUP Central,
Associate Vice Chancellor for Economic Development, KU



KU Innovation Park
Phases 1-3

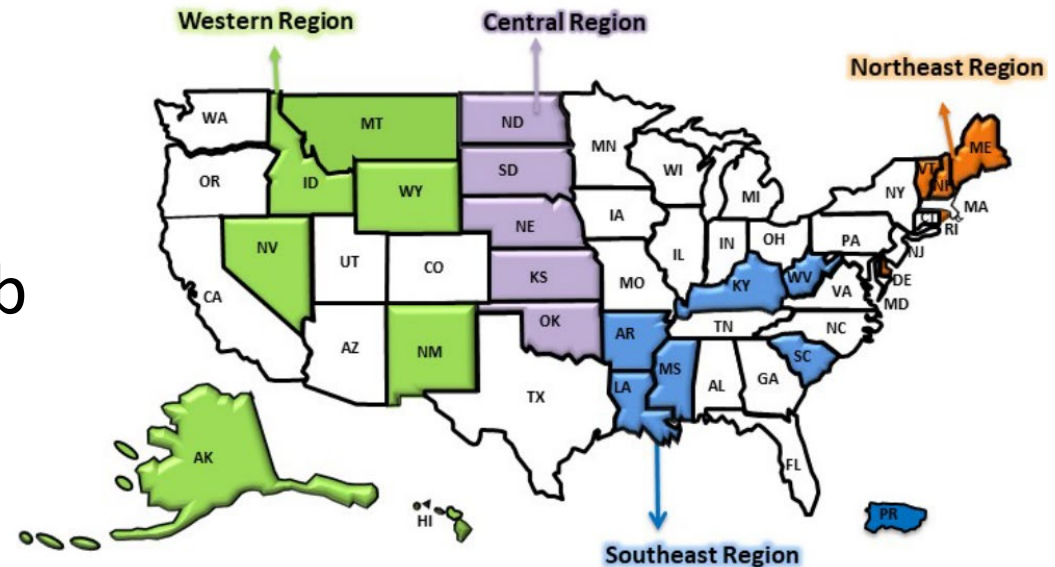


Previous NIGMS Accelerator Hubs Program

Previous Four Regional Technology Transfer Accelerator HUBs Funded in 2018

- Conducted gap analyses at academic partner institutions in each of the IDeA regions
- Developed and delivered entrepreneurship training and education materials based on the gap analyses for faculty, postdoctoral fellows, graduate and undergraduate students
- Supported the establishment of technology transfer offices in some academic institutions and developed Technology Transfer Networks
- Supported Pilot Projects

Previous Central IDeA Regional Accelerator Hub
→ SHARPhub



I-RED Program - RFA-GM-22-001

- **I-RED = IDeA Regional Entrepreneurship Development**
- **I-RED program purposes (not the same as Accelerator Hubs)**
 - Support eligible SBCs to develop educational products to promote biomedical entrepreneurship
 - Enhance entrepreneurial knowledge and skills of investigators
 - Develop and strengthen Technology Transfer Programs
 - Stimulate technological innovation and translate technologies, materials, and/or services from academic research into commercial products

STARTUP Central ≠ SHARPhub

Different company Different team Different approach

STARTUP Central Premise & Goals

- **Smart Tools to Accelerate Research Translation by Uplifting Participants for the Central IDeA State Region (STARTUP Central)**

Long-term goals – same as SHARPhub

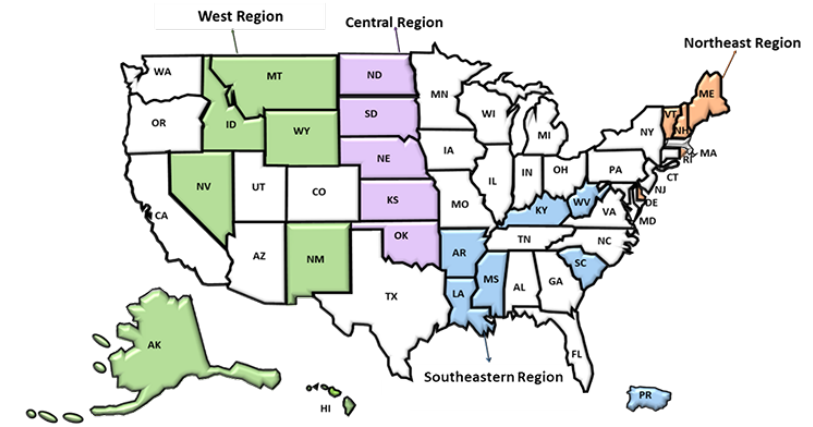
- stimulate commercialization of innovation in the Central IDeA region and beyond
- better address the entrepreneurial educational needs of academic investigators
- help academic investigators to more efficiently translate scientific discoveries and technologies from research laboratories into commercial products that improve human health
- promote economic growth in our region

- **Short-term goal → Iteratively design, evaluate, and validate an online Learning Management System product for entrepreneurial education**

STARTUP Central Premise & Goals

- **What problems are we addressing?**

Perceived barriers for faculty innovators identified in the Central IDeA states by the previous SHARPhub



Major Barriers to Faculty Entrepreneurship

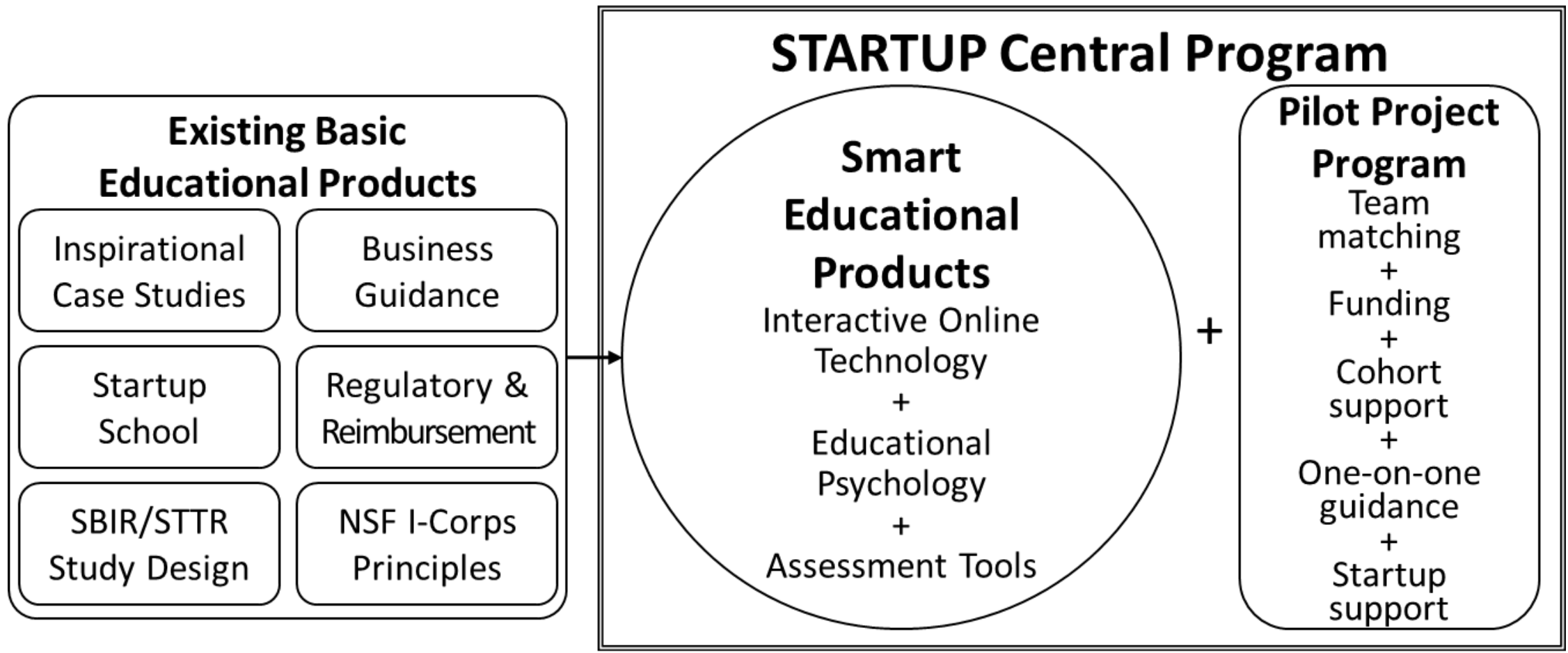
- low numbers of faculty entrepreneur role models
- limited faculty education on why translation is needed
- high potential risk for faculty entrepreneurs
- limited resources for faculty education on innovation
- promotion/education of available resources needed
- limited financial support at all stages
- limited resources inside and outside of the universities
- university support is perceived to be low
- mentors and management teams needed

Inspire

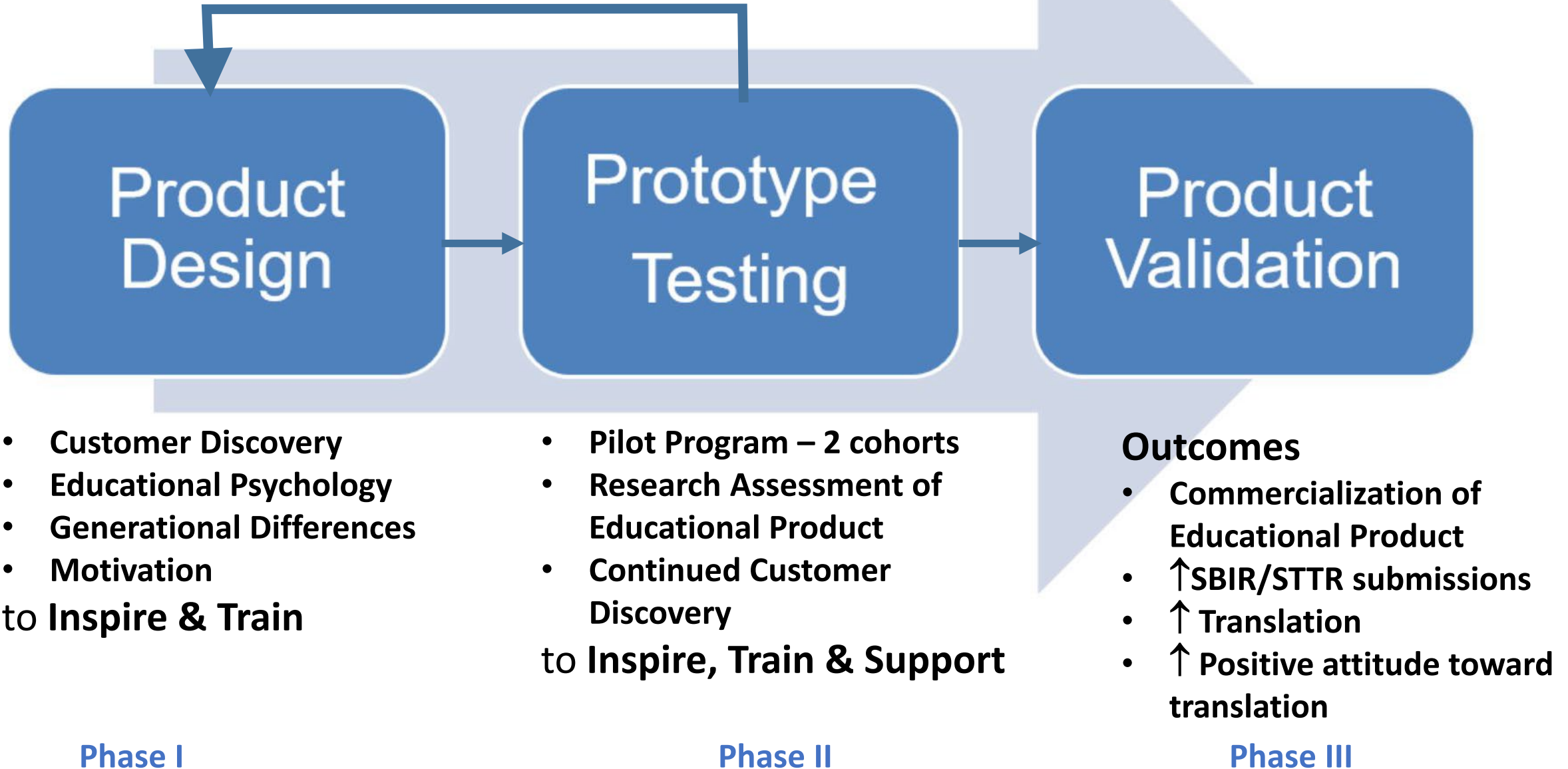
Train

Support

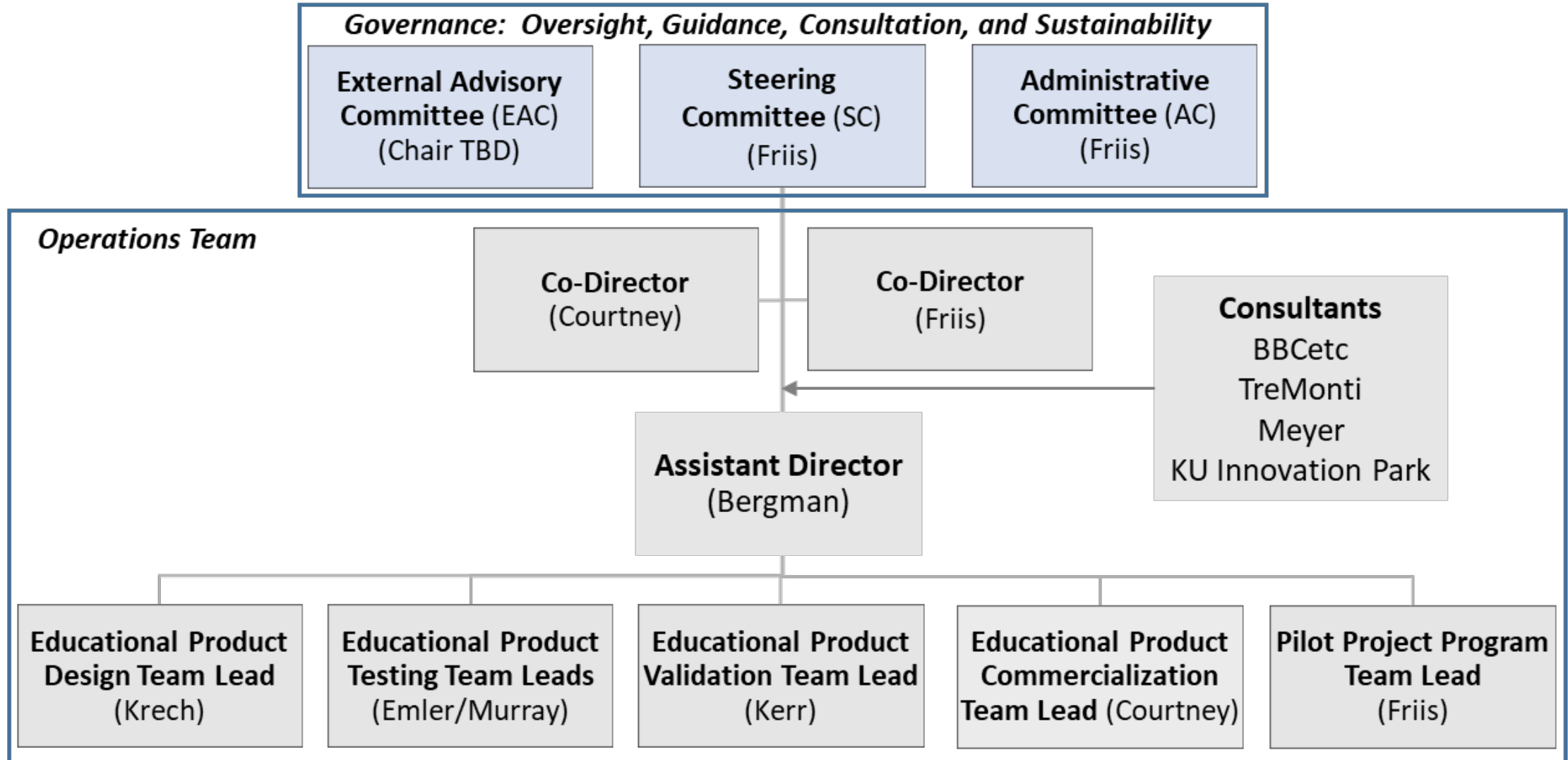
Smart Tools to Accelerate Research Translation by Uplifting Participants for the Central IDeA State Region (STARTUP Central)

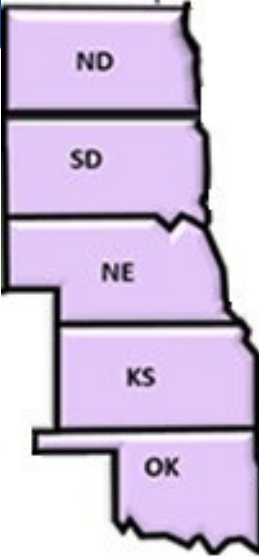


Iterative Product Design, Prototype Testing, and Product Validation Process



STARTUP Central Organization





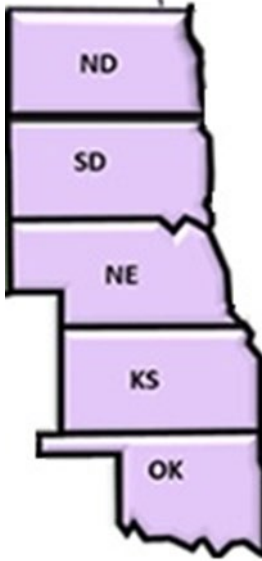
STARTUP Central Steering Committee Members

- **STARTUP Central Co-Principal Investigators and Assistant Director**
 - Lisa Friis, Professor and Chair, Mechanical Engineering, KU, Chair of SC
 - Adam Courtney, Acting President and CEO, Continuum Educational Technologies, PBC
 - Tricia Bergman, Associate Vice Chancellor for Economic Development, KU
- **NIH Project Coordinator**
 - Olga Kovbasnjuk, Program Coordinator, Division for Research Capacity Building, NIGMS
- **Representative from each IDeA state:**
 - **North Dakota:** Amy Whitney, Director, Center for Innovation, UND
 - **South Dakota:** Daniel Engebretson, VP Research & Spon Programs, USD
 - **Nebraska:** Michael Dixon, President and CEO, UNeMed Corporation
 - **Kansas:**
 - Simon Atkinson, Vice Chancellor for Research, KU-Lawrence
 - Doug Wright, KU Med Center, PI K-INBRE Program, former President, National Association of IDeA PIs
 - **Oklahoma:** Andrew Pollack, Managing Director, Office of Technology Comm, OU

STARTUP Central External Advisory Comm Membership

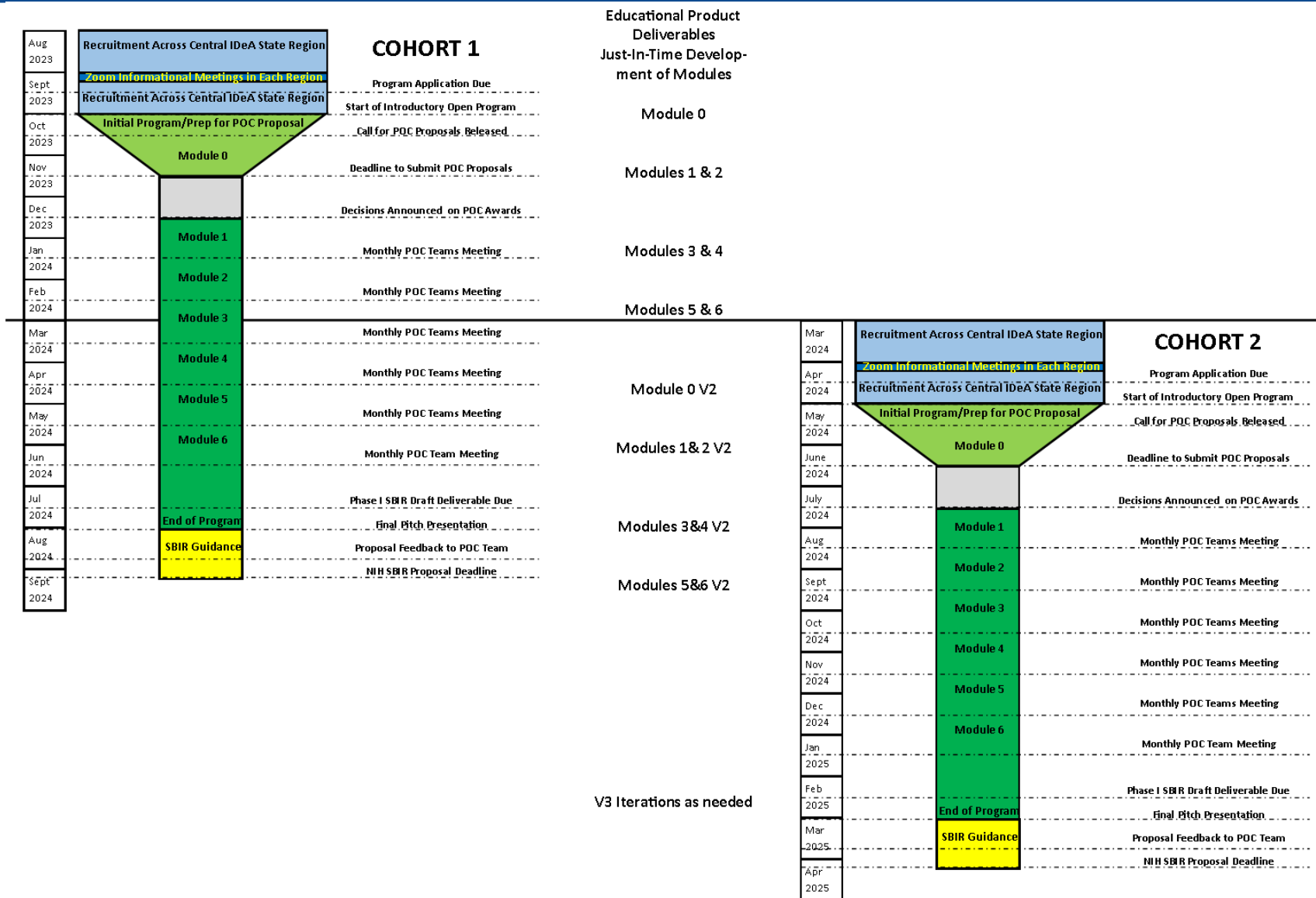
- **Joni Cobb, JD**
 - Founding president and CEO of PIPELINE for 13 years, Chair, Board Of Directors, Center for American Entrepreneurship, Experience in program evaluation
- **Nick Love, MD, MBA**
 - Co-Founder and CEO, Love LifeSciences, regional med tech entrepreneur, younger generation perspective
- **Jaya Ghosh, PhD**
 - Program Director, Univ. of MO Coulter Biomedical Accelerator, Lead Program Manager, MBarC-NIH Research Evaluation & Commercialization Hub
- **Dennis Deppenbusch, MBA**
 - New Ventures Initiative - Corporate Venture Capital, BlueCross and BlueShield of KS, Corporate venture capital experience, Experienced entrepreneur
- **Tammy Ham, RN**
 - President, BioNOVUS Innovations, President & CEO, CicloMed LLC, Experienced in entrepreneurship and venture capital
- **Maggie Kenefake, MBA**
 - General Partner, Iron Prairie Ventures, Experience in business development, venture capital, strategic planning and operations management

Central Region



Team Report: Pilot Study Program with POC Fund

Pilot Study design coordinated with assessment feedback and product design iterations



COHORT 1

| | | |
|-----------|--|---|
| Aug 2023 | Recruitment Across Central IDEa State Region | Program Application Due |
| Sept 2023 | Zoom Informational Meetings in Each Region Recruitment Across Central IDEa State Region | Start of Introductory Open Program |
| Oct 2023 | Initial Program/Prep for POC Proposal | Call for POC Proposals Released |
| Nov 2023 | Module 0 | Deadline to Submit POC Proposals |
| Dec 2023 | | Decisions Announced on POC Awards |
| Jan 2024 | Module 1 | Monthly POC Teams Meeting |
| Feb 2024 | Module 2 | Monthly POC Teams Meeting |
| Mar 2024 | Module 3 | Monthly POC Teams Meeting |
| Apr 2024 | Module 4 | Monthly POC Teams Meeting |
| May 2024 | Module 5 | Monthly POC Teams Meeting |
| Jun 2024 | Module 6 | Monthly POC Team Meeting |
| Jul 2024 | End of Program | Phase I SBIR Draft Deliverable Due |
| Aug 2024 | SBIR Guidance | Final Pitch Presentation Proposal Feedback to POC Team |
| Sept 2024 | | NIH SBIR Proposal Deadline |

Proof of Concept awards will be made by December 15, 2023 for the 1st Cohort

POC Fund Pilot Study - Application Phase

- Apply to join the “top of the funnel” program by Sept. 15
 - All applicants accepted
- Complete Module 0 and participate in the Zoom meeting after Oct. 1
- Submit a three-page proposal
 - ✓ Page 1: Describe the problem, solution, rationale, and research proposed; describe the team, give the current status of development, and include a statement of agreement to participate in the educational program
 - ✓ Page 2: Budget and Justification -- up to \$40k (average award will be \$25K)
 - ✓ Page 3: Initial Business Model Canvas
- 5-minute presentation of their product concept to the External Advisory Committee – get immediate feedback and provide clarification

After application submission, we will help connect applicants with a potential CEO for a future company (if needed)

POC Fund Pilot Study – Program Phase

- POC Fund proposal awards made no later than Dec. 15, 2023
 - Important to be in line with academic schedule
- Deliverables for POC Fund awardees
 1. Completion of monthly educational product modules (~1.5 hours each)
 2. Participation of the team in monthly program Zoom meeting with their cohort
 3. At the end of the cohort pilot study period
 - Submission of a draft NIH SBIR/STTR Phase I proposal that will be reviewed by BBCetc
 - Pitch to External Advisory Committee for project report

Example: InspireU2 iTi Course Landing Page



HOME

MODULES

TEAM

NETWORK CHAT

RESOURCES

EVENTS

HELP & FAQ

CONTACT US

Welcome, [Name]

Progress Overview

Show progression in various modules and major benchmarks completed/for completion

Modules:
2 completed
2 started
8 not started

Milestones:
Milestone 1 Submitted (awaiting feedback)
Milestone 2 Not Yet Submitted

My Modules & Courses

- Pre-Course Questionnaire
- Module 0, Lesson 1: What is Translation in Academic Research Laboratories?
- Module 0, Lesson 2: Building a Culture of Innovation

Featured Resource

Tip of the Day

FEEDBACK

Example: Modules Landing Page Storyboard

For comments, feedback, or requested revisions, copy this block, add your notes and initials, and move to the relevant area for iteration needs.

Modules Landing Page:

InspireU2
innovation Translation impact

Modules

- Experimental Design of Product and Business
- Pivoting: Avoiding the Product Concept Death Grip
- Business & Team Formation
- Barriers to Entry
- Intellectual Property
- SBIR Grant Writing 101
- Taking your Startup to the Next Level

Important Dates:
Module 0: Available for 15 more days
Deadline to submit Proof of Concept for Program Continuation: 15 November 2023
Notification of Awards for Proof of Concept: 15 December 2023
Upcoming Modules:
Module 1: 15 December 2023
Module 2: 15 January 2023

FEEDBACK

Feedback button is associated with user's current page to be able to report bug issues, reactions, or other notes as desired for iterative development. Stays on all pages.


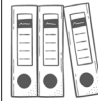





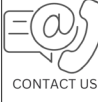
Example: Module 0 Landing Page Storyboard

For comments, feedback, or requested revisions, copy this block, add your notes and initials, and move to the relevant area for iteration needs.

Icons within Navigation Menu appear on all pages. Ability to hide the navigation pane on user's click.

to be developed for final product

Landing Page:

-  HOME
-  MODULES
-  TEAM
-  NETWORK CHAT
-  RESOURCES
-  EVENTS
-  HELP & FAQ
-  CONTACT US

InspireU2

innovation Translation impact

Module 0: Experimental Design of Product and Business

Overview
Through this foundational module, participants will build a comprehensive understanding of the translation process, from initial ideation to successful product realization. It is specifically designed to present the importance of nurturing a culture of innovation within academic research laboratories and provides an exploration of the iterative process of translating research into viable, marketable products or services.

Lessons

- **Lesson 1** introduces the concept of translation and provides a roadmap for the innovation process.
- **Lesson 2** focuses on building a culture of innovation that values bringing solutions to patients beyond just patents and publications.
- **Lesson 3** reframes failure as a steppingstone to success, emphasizing the importance of psychological safety within a team.
- **Lesson 4** facilitates team-building strategies for product success, including embracing diversity and leveraging individual strengths.
- [Read more](#)



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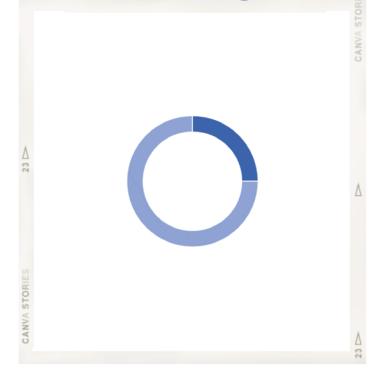
All Text Content should have audio option available

Resume Lesson 1





Begin Lesson 2

Begin Lesson 3

Module Progress



Module Learning Requirements

| | |
|--|---|
| Lesson 1: What is Translation in Academic Research Laboratories? Discussion Post |  In Progress |
| Lesson 2: Building a Culture of Innovation Discussion Post Strengths Assessment Upload |  Not Started |
| Lesson 3: Using Failure as Compost for Success Quick Check |  Not Started |
| End of Module Survey |  Not Started |
| See more | |

Page rating available for each section page to troubleshoot areas that may be unclear, unattractive, or "broken."

Current Page Rating
★★★★★



Contact us opens form submitting feedback.

OUTLINE DRAFT ONLY – SUBJECT TO FURTHER REVISIONS

| | Module 0 | Module 1 | Module 2 | Module 3 | Module 4 | Module 5 | Module 6 |
|----------|--|---|--|-------------------------------------|--|--------------------------------------|--|
| | Experimental Design of Product and Business | Pivoting – Avoiding the Product Concept Death Grip | Business and Team Formation | Barriers to Entry | Intellectual Property & Licensing | SBIR Grant Writing 101 | Taking Your Startup to the Next Level |
| Lesson 1 | Roadmap for Translation | Looking at Research & Product Through New Lens | Does Your Product Concept Require a Startup? | What are Barriers to Entry? | What is IP and Why Do You Care? | How to Get Non-Dilutive Funding | Why to Raise Money Beyond SBIR |
| Lesson 2 | Building a Culture of Innovation | Using CD to Pivot Your Product Concept | How to Start Your Startup | Overview of FDA | Working with Your Tech Transfer Office | Federal Granting Agencies 101 | Communicating Unique Value of Your Startup |
| Lesson 3 | Using Failure as Compost for Success | Effective Customer Discovery | Preparing Your Startup to Submit Federal Proposals | Medical Device Regulation | IP Basics | Writing for Success | The Right People at the Right Time |
| Lesson 4 | Building a Team for Product Success | Utilizing Customer Discovery Data | Logistics of Your Business | Pharmaceutical Regulation | Value of Your IP Portfolio | So You Got the Grant, Now What? | Fundraising Introduction |
| Lesson 5 | How Conflict of Interest Supports You | Looking at Big Picture of Product in the Market | Putting Together Your Startup Team | Combination Product Regulation | Navigating Publish or Perish of Product IP Dilemma | Gaps Between Grants, What Do You Do? | Planning Your Exit from the Company |
| Lesson 6 | Using the Business Model Canvas to Test Hypotheses | Pivoting Your Idea to Meet Customer Needs | Building Your Startup Company Culture | Combination Product Regulation | Licensing IP to Your Startup | | |
| Lesson 7 | Customer Discovery Basics | Pivoting Your Research to Address Product Idea | | Software Regulation | | | |
| Lesson 8 | Using BMC to Define Initial Product Concept | Working with Your Team Throughout Pivots | | Overview of Reimbursement | | | |
| Lesson 9 | Designing a Go/No-Go Experiment | Navigating Tug of War Between Risk and Value | | Regulatory & Reimbursement Strategy | | | |

- Each lesson will take between 5-20 minutes to complete
- Lessons include written and interactive visual content, short inspirational videos
- Each lesson will list supplemental resources for further exploration

Storyboard Examples:

Module 0, Lesson 5 Screen Layout

Landing Page:

HOME

MODULES

TEAM

NETWORK CHAT

RESOURCES

EVENTS

HELP

CONTACT US

InspireU2

innovation Translation impact

Experimental Design of Product and Business: How Conflict of Interest Supports You

Lesson 5
covers conflict of interest, positioning it as a supportive tool rather than a hurdle.

A

Multimedia for one section rotates within media space; other content remains fixed with updates as appropriate - e.g., module progression updates, paired text updates.

Previous button does not show if first resource in section.

PREVIOUS

NEXT

Paired text for multimedia above appears here. May be as simple as summary caption if video or extended explanation if graphic of some sort.

All Text Content should have audio option available.

NEXT LESSON

Interview with University Counterparts

Module Progress

Module Progress

Lesson Learning Requirements

Lesson Learning Requirements

D

Page rating available for each section page to troubleshoot areas that may be unclear, unattractive, or "broken".

Current Page Rating

★★★★☆

FEEDBACK

Storyboard Examples:

Module 0, Lesson 5 Details for Coders

**Experimental
Design of
Product and
Business**

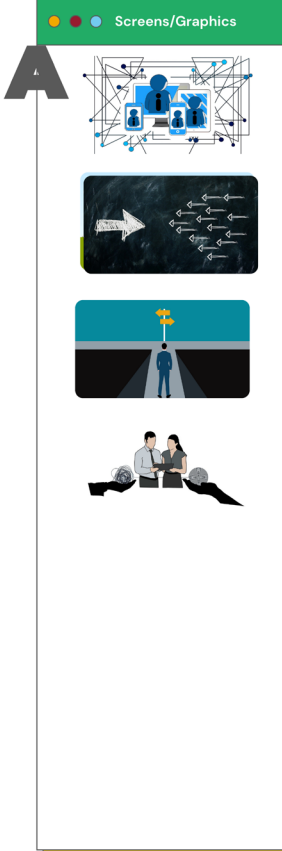
#.5

**How Conflict of
Interest Supports
You**

Planned Duration:

A

Screens/Graphics



BC

Narration, Script, Experiential Content, and Instructions to Developers

- 0.5.1 - Base Picture
- 0.5.2-3: paired with text as noted
- Flip cards on four points for managing COI (to be created)
- 0.5.4: paired with text

Section C:
University official interview on COI and researcher/university partnerships

D

Data Points Collected or Other Assessment Tools, Protocols, or Questions

Page Rating Option (not required) to highlight issues (added proxy variable)
Proxy variable collection (time in section)

Quick Check: Match examples with four COI management strategies (4 MC)

Experimental Design of Product and Business:
 Lesson 5 - Looking at the Big Picture of your Product in the Market



Defining your industry ecosystem mapping for translational product concepts emerging from academic research laboratories involves applying the insights gained from validating the Business Model Canvas (BMC) through customer discovery interviews. This process helps create a comprehensive understanding of the market landscape and the product's position within it.

For many academic innovators, it can be difficult to address the market aspects of the BMC and your product idea. We are excited about our idea and how it can help solve a problem! Yes, we can solve a problem, but if it is ever going to make a difference for people, there have to be enough people who are willing and able to pay for the solution so that your idea can eventually be commercialized. It is quite possible to spend all your time generating a solution that will never be used. Exploring the market size alongside product-market fit will help ensure that your product solution has a chance of making it out of your laboratory into the hands of people it can help.

Explore the steps below for defining the market and market size for your product idea. Having data to back up these areas will help convince potential business partners and investors (as well as funding agencies) to invest in taking your product concept forward.

Your Idea in the Market

Begin

By thoroughly examining each of these aspects, you can create a robust industry ecosystem map that will guide your product development and commercialization strategy. This map will serve as a foundation for decision-making, resource allocation, and business planning, ultimately increasing the likelihood of your translational product's success in the market.

[Module 0 Home](#)

[Next Lesson](#)

Define your customer archetype

Flip

Define your customer archetype

Based on the customer discovery interviews, identify the primary customer segments and their needs, preferences, and pain points. Develop a detailed customer archetype, or persona, representing the ideal target customer, incorporating their demographic, psychographic, and behavioral characteristics.

Flip

Build your market

Flip

Build your market

Evaluate the competitive landscape, identifying the key players, their products, and their market positioning. Analyze the gaps, opportunities, and threats present in the market, and determine how your product concept can differentiate itself and address the unmet needs of your target customers.

Flip

Build out your market size

Flip

Build out your market size

Estimate the total addressable market (TAM), serviceable available market (SAM), and serviceable obtainable market (SOM) for your product concept. This will help you understand the potential revenue opportunities and the market share you can realistically capture.

Flip

Determine who is going to pay for the product

Flip

Determine who is going to pay for the product

Based on your customer archetype and BMC validation, identify the primary decision-makers and influencers who will be responsible for purchasing or recommending your product. This may include end-users, intermediaries, or organizations, depending on the nature of the product and its intended market.

Flip

Determine how the product will make money for the company

Flip

Determine how the product will make money for the company

Develop a comprehensive revenue model that outlines the various revenue streams your product will generate. This may include sales, subscriptions, licensing, or partnerships. Additionally, consider the pricing strategy, taking into account customer willingness to pay, perceived value, and competitive pricing in the market.

Flip

Storyboard Examples:

Module 0, Lesson 5
 Section A Content

Interactive drop-down clicks

Storyboard Examples:

Module 0, Lesson 1 Section A Content

Interactive drop-down clicks

Experimental Design of Product and Business: Lesson 1 - What is Translation in Academic Research Laboratories?



In biomedical academic research laboratories, **translation refers to the process of converting fundamental scientific discoveries into practical applications**, such as diagnostics, therapeutics, and medical devices, to improve human health and well-being. This interdisciplinary endeavor bridges the gap between basic research and clinical practice, necessitating the collaboration of researchers, clinicians, engineers, and industry partners. The translational process typically involves multiple stages, from understanding the underlying mechanisms of diseases and identifying potential therapeutic targets, to preclinical testing, clinical trials, and ultimately, the development and commercialization of new healthcare solutions. Note that not all of these stages are required for every product. It is important to understand the pathway needed for your product development efforts so that patients can benefit from innovation in a timely and safe fashion. *By fostering a culture of innovation and promoting translation in biomedical research laboratories, scientists can expedite the advancement of cutting-edge medical technologies and therapies, ultimately benefiting patients and society as a whole.*



The Roadmap for Innovation and Translation in Academic Research Laboratories

Successfully translating scientific discoveries into practical applications in an academic research laboratory requires a well-defined roadmap that fosters innovation and streamlines the translational process. This overview outlines the key steps in creating a comprehensive strategy for driving innovation and accelerating the translation of research findings into tangible healthcare solutions.

1. Set clear goals and objectives. ✓
2. Foster Interdisciplinary Collaboration. ✓
3. Develop Translation Research Infrastructure. ✓
4. Prioritize Education and Training. ✓
5. Establish Industry Partnerships. ✓
6. Secure Funding and Resources. ✓
7. Evaluate and Monitor Progress. ✓

By following this roadmap, academic research laboratories can foster a culture of innovation and effectively navigate the complex process of translating scientific discoveries into real-world healthcare solutions. This strategy will not only benefit your laboratory team members, but also have a lasting impact on the broader scientific community, patients, and society as a whole.

Module 0 Lesson 1 before interactive dropdown clicks

Experimental Design of Product and Business: Lesson 1 - What is Translation in Academic Research Laboratories?



In biomedical academic research laboratories, **translation refers to the process of converting fundamental scientific discoveries into practical applications**, such as diagnostics, therapeutics, and medical devices, to improve human health and well-being. This interdisciplinary endeavor bridges the gap between basic research and clinical practice, necessitating the collaboration of researchers, clinicians, engineers, and industry partners. The translational process typically involves multiple stages, from understanding the underlying mechanisms of diseases and identifying potential therapeutic targets, to preclinical testing, clinical trials, and ultimately, the development and commercialization of new healthcare solutions. Note that not all of these stages are required for every product. It is important to understand the pathway needed for your product development efforts so that patients can benefit from innovation in a timely and safe fashion. *By fostering a culture of innovation and promoting translation in biomedical research laboratories, scientists can expedite the advancement of cutting-edge medical technologies and therapies, ultimately benefiting patients and society as a whole.*



The Roadmap for Innovation and Translation in Academic Research Laboratories

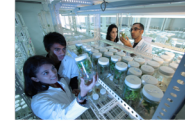
Successfully translating scientific discoveries into practical applications in an academic research laboratory requires a well-defined roadmap that fosters innovation and streamlines the translational process. This overview outlines the key steps in creating a comprehensive strategy for driving innovation and accelerating the translation of research findings into tangible healthcare solutions.

1. Set clear goals and objectives. Define your laboratory's mission and long-term objectives, focusing on translational research and impactful outcomes. Make sure that the team understands and is onboard with the goals. Establish measurable goals that align with the mission and prioritize projects with high potential for translation and societal impact. Later in this module, you will learn about Customer Discovery and how to use these techniques for early evaluation of the clinical need and potential acceptance of your translational ideas.
2. Foster Interdisciplinary Collaboration. Promote collaborations among researchers, clinicians, engineers, and industry partners to facilitate knowledge exchange and accelerate the translation process. Encourage interdisciplinary research initiatives and the integration of complementary expertise to drive innovation.
3. Develop Translation Research Infrastructure. Develop a supportive infrastructure tailored to the needs of your translational research. This may include working with core facilities, specialized equipment, and access to clinical resources, as well as streamlined processes for regulatory compliance, intellectual property protection, and technology transfer. Working with your Technology Transfer Office early in the process of translational research can be critical.
4. Prioritize Education and Training. Invest in education and training programs that equip your team with the skills and knowledge necessary for successful translation. Participate in workshops, seminars, and mentorship opportunities focused on translational research, regulatory requirements, and entrepreneurship. The time invested in these activities will be worthwhile.
5. Establish Industry Partnerships. Cultivate relationships with industry partners, including biotech and pharmaceutical companies, to facilitate the commercialization of research findings. Seek out meeting industry employees at conferences and learn their perspectives. Engage in collaborative research projects, licensing agreements, and other partnerships that promote the translation of academic discoveries into marketable products.
6. Secure Funding and Resources. Identify and secure funding opportunities that support translational research, including grants, industry collaborations, and philanthropic support. Allocate resources strategically to ensure the efficient progression of projects through the translational pipeline. Check to see if your Research Office has special programs to allow nontraditional research activities with industry.
7. Evaluate and Monitor Progress. Regularly evaluate the progress of translational projects and adjust strategies as needed. Implement metrics to assess the impact of translational research efforts and use this data to inform future decision-making and resource allocation.

By following this roadmap, academic research laboratories can foster a culture of innovation and effectively navigate the complex process of translating scientific discoveries into real-world healthcare solutions. This strategy will not only benefit your laboratory team members, but also have a lasting impact on the broader scientific community, patients, and society as a whole.

Module 0 Lesson 1 after interactive dropdown clicks

Experimental Design of Product and Business: Lesson 2 - Using Customer Discovery to Pivot your Product Concept



In an academic translational research laboratory, using customer discovery and the Business Model Canvas (BMC) to pivot on your product idea is crucial for ensuring that the product aligns with market needs and has a strong value proposition. **Through customer discovery, you gather invaluable feedback and insights from potential customers**, uncovering pain points and preferences that can help refine the product concept and help ensure that your product will eventually be accepted by those customers.

The BMC provides a structured framework for organizing these insights and evaluating the impact of potential changes on various aspects of the product concept and business model. By iterating on your product idea based on the scientific-method-inspired customer discovery findings and BMC analysis, you can make informed decisions about pivoting and ultimately develop a more robust, market-ready product that addresses real-world needs and has a higher potential for successful commercialization.

The video below shows how using the BMC changed the way one academic researcher viewed their product development work:





To help you get started on the first draft of your BMC, the Kauffman Foundation in partnership with Strategizer Academy has developed an overview, "Visualizing your Business Model." While not all analogies may directly apply to translation of your research work, you may want to navigate through the various video resources to expand your perspectives of and drafts on your own BMC.



In the context of an academic translational research laboratory, **customer discovery is an indispensable aspect of the product development process**. Best practices for customer discovery involve engaging with potential users, clinicians, and other stakeholders through interviews, focus groups, and surveys to gain insights into their needs, preferences, and expectations. Future Founders identifies four essential steps for customer discovery. These are highlighted below and a link for more information is included in the supplemental resources.



 **1: Define a Hypothesis**

 **2: Define your Assumptions**

 **3: Ask Good Questions**

 **4: Evaluate and Refine**

By fostering a deep understanding of the target audience and the problems they face, researchers can effectively tailor their product concept to address the unmet needs and requirements of the market. This iterative process enables the identification and validation of assumptions, facilitating the fine-tuning of the product's value proposition for specific customer segments. Ultimately, **customer discovery fosters innovation, reduces the risk of product failure, and accelerates the translation of cutting-edge research findings into practical, market-driven solutions that have a real-world impact on healthcare and patient outcomes.**

Storyboard Examples:

Module 0, Lesson 2 Section A Content

Embedded video, visuals to increase engagement

Experimental Design of Product and Business: Lesson 3 - Effective Customer Discovery



Customer discovery is an essential part of understanding how your product concept will be accepted by customers. As academic researchers, we focus on answering scientific questions and making discoveries. How our discoveries are best used in products is a question answered by asking potential customers.

While customer discovery was introduced in the previous lesson, "Customer Discovery Basics" by the Harvard Business School (2021) provides an excellent summary.



"Customer discovery is invaluable because it forces you to challenge your assumptions and to refine your ideas before investing too much time and money. I now find myself evaluating all sorts of products in this light."
—NSF I-CORPS PARTICIPANT

Active listening is a crucial skill in customer discovery, as it enables you to truly understand the perspectives and needs of target audiences without imposing your own biases. By attentively engaging with the interviewee, maintaining eye contact, and providing verbal and non-verbal cues, researchers can create an environment that encourages open and honest communication. To avoid biasing the conversation, it is essential to ask open-ended questions, refrain from leading the person, and suspend any preconceived notions or judgments. Demonstrating empathy is equally important, as it allows researchers to connect with the interviewee on a deeper level and appreciate the emotions and experiences that drive their responses. By genuinely empathizing with the customer, you can better identify pain points and unmet needs, which ultimately contributes to the development of a more impactful and user-centered product. The article below explains more about techniques to increase your active listening during customer discovery to maximize your learning.

"Active Listening Results in Successful Customer Interviews" by Kristy Sullivan (2022)



There is no power analysis for statistical significance for customer discovery! This can be unsettling when you approach the Business Model Canvas (BMC) from a scientific hypothesis-testing perspective. Deciding on the number of customer discovery interviews needed for validation requires an assessment of various factors, including the following:



- Size and diversity of your target market: the larger and more diverse the market, the more interviews may be required to ensure a representative sample.

- Complexity of your product: the complexity of your product or service may necessitate a higher number of interviews to gather sufficient insights.

- Balance: you need to balance the need for quality data with the constraints of time and resources available for conducting interviews. Generally, aim to reach a point of saturation, where conducting additional interviews no longer yields meaningful new insights. As a rule of thumb, conducting 20-50 interviews is often sufficient for preliminary validation, but the number may vary depending on your specific context and the factors mentioned above. When you have revised your BMC and hear feedback that is repeated consistently, you may be on track to have validation of your hypotheses. Continually assess your progress and consider seeking expert advice to determine the optimal number of interviews for your unique situation.

As an academic researcher looking to integrate customer discovery interviews into your translational product concept, you should systematically map your findings to each component of the BMC. As you conduct interviews and gather data, you should identify patterns, trends, and insights relevant to each area, ultimately refining the initial assumptions and hypotheses that underpin their product concept.

Utilizing the customer discovery findings, you can pivot your product concept to better address the needs and desires of your target market. If you compare the initial BMC with the updated versions, you can identify areas where the product concept needs to evolve or be modified. By continuously iterating and updating your BMC based on customer discovery findings, you can successfully refine your translational product concept, ensuring it aligns with market needs and maximizes the potential for success.

Storyboard Examples:

Module 0, Lesson 3 Section A Content

Short articles, cartoons to increase engagement

Storyboard Examples:

Module 0, Assessment Questionnaire

Assessment will also include:

- pre- and post- surveys to determine influence on entrepreneurial intent
- Comments on lessons
- Page ratings

Landing Page:

The storyboard illustrates the layout of the landing page, which is titled "InspireU2 innovation Translation impact" and "Experimental Design of Product and Business".

Navigation Menu (Left Side):

- HOME (House icon)
- MODULES (Three binders icon)
- TEAM (Three people icon)
- NETWORK CHAT (Three people with speech bubbles icon)
- RESOURCES (Folder icon)
- EVENTS (Calendar icon)
- HELP & FAQ (Question mark icon)
- CONTACT US (Envelope icon)

Main Content Area:

- Overview:** Through this foundational module, participants will build a comprehensive understanding of the translation process, from initial ideation to successful product realization. It is specifically designed to present the importance of nurturing a culture of innovation within academic research laboratories and provides an exploration of the iterative process of translating research into viable, marketable products or services.
- Module Questionnaire:** A section for user input.
- Survey Questions:**
 - Please rate this module for its effectiveness in achieving the listed objectives (noted above). (5 stars)
 - Please rate this module for its overall engagement. (5 stars)
 - Please rate this module for its usefulness to you. (5 stars)
 - What did you like about this module?
 - What would you change about this module?
- Submit Button:** A yellow button labeled "SUBMIT".
- Option 1:** Upon pressing submit, return to module # landing page for fulfilling any other requirements of the module.
- Option 2:** Hover Screen over questions (not available to complete) stating there are still module requirements that must be completed prior to completing end-of-module survey. "Click here" to take to the Module # landing page to review module requirements.

Module Progress (Top Right): A circular progress indicator showing 0% completion.

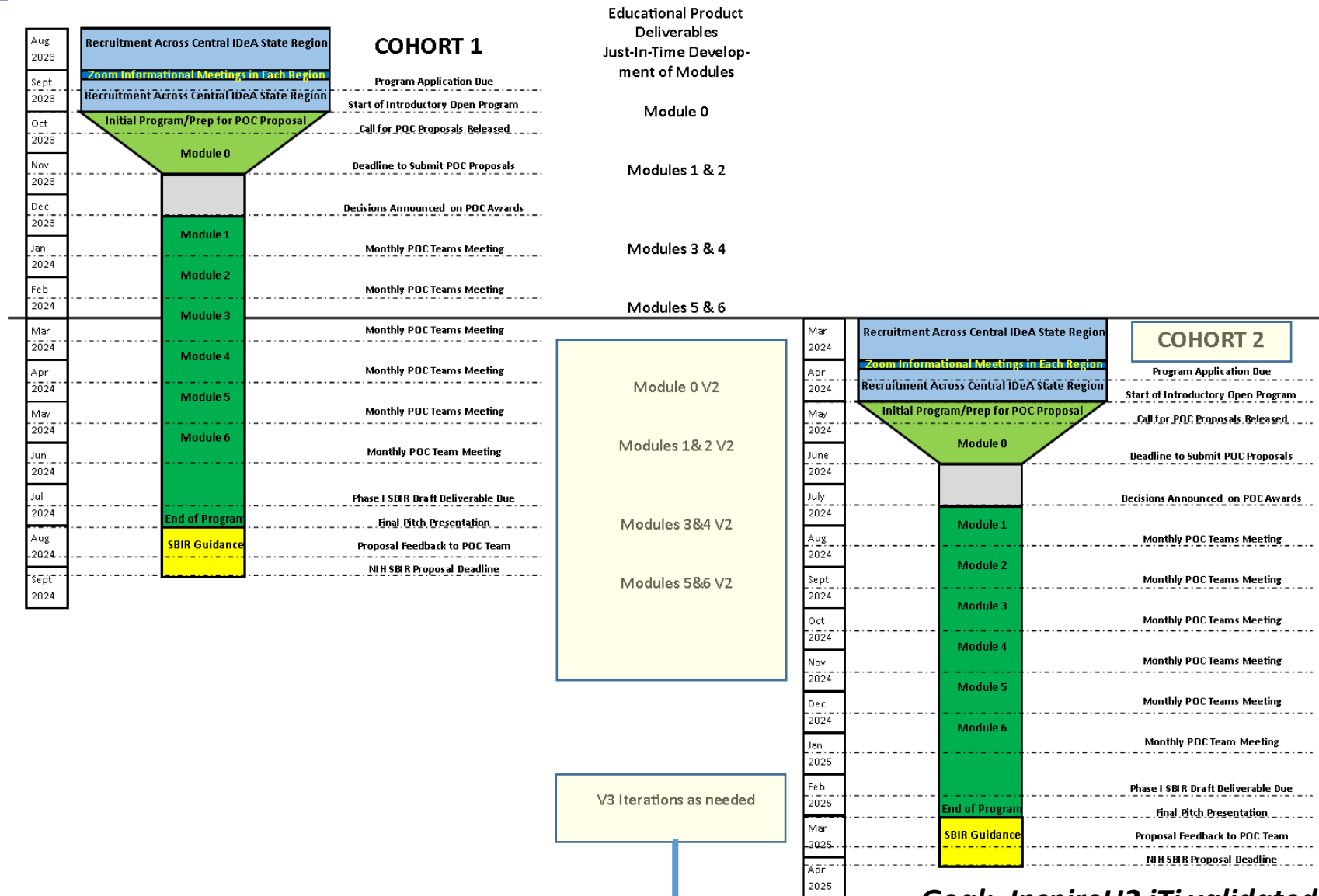
Paired (external) Resources (Bottom Right): A landscape image with a blue sky, white clouds, and green hills.

Current Page Rating (Bottom Right): A star rating system showing 5 stars.

Feedback (Bottom Right): A circular button with a speech bubble icon and the word "FEEDBACK".

Team Report: Pilot Study Program with POC Fund

Pilot Study design coordinated with assessment feedback and product design iterations



Module 0 V2
 Modules 1&2 V2
 Modules 3&4 V2
 Modules 5&6 V2

V3 Iterations as needed

Goal: InspireU2 iTi validated by peer-reviewed publications and ready for commercialization

POC Fund Pilot Study – What do participants get?

- Support to help them get preliminary data for an SBIR/STTR grant
- Online education on their timeframe on the fundamentals of innovation, translation, and entrepreneurship in an academic culture
- Pre-review of their draft SBIR Phase I proposal by professionals
- To be part of an ongoing community of innovators across the Central IDeA region who can help support and inspire each other
- Connection with a potential CEO for their future business





STARTUP Central

Thank you for your time!

Questions?



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