ENTREPRENEURSHIP & INNOVATION IN CONNECTICUT'S HIGHER EDUCATION SYSTEM

UCONN INCUBATOR BUILDING IN FARMINGTON

5/1/2017

A Catalytic Roadmap for Higher Education Collaboration

Entrepreneurship & Innovation in Connecticut's Higher Education System

A Catalytic Roadmap for Higher Education Collaboration

Contents

Imagine

Julia grew up in Connecticut. She wants to stay close to her family but still be able to pursue her dreams. She decides to go to community college, then transfer to Trinity. It is 2019 and Julia is double majoring in neuroscience and biology. A professor urges her to take the idea she had in lab and see where it leads.

It is now the fall of 2020, her senior year, and she signs up to attend the Connecticut Catalyst Conference, the annual entrepreneur conference that was recently written up in Entrepreneur Magazine as the "next South by Southwest (SxSW) for entrepreneurs and innovators". She is excited! At the conference, she meets a pharmacy student from St. Josephs and a researcher at UConn who was a semi-finalist at Mass Challenge last year with a new start-up specializing in neuro-technologies and social behavior: her new team. In the spring, Julia graduates and decides to stay in the Hartford area because it has all the business and industry connections she craves, and her new partners agree – they have located laboratory incubator space nearby that is an easy train ride for their potential 4th partner, a bio-polymer researcher at Cornell's Roosevelt Tech Campus in New York City. She's also impressed with the all the investments the state has put into supporting entrepreneurs; she connects to services and mentors through the Hartford Hub and finds a strong social network and information about events at universities and colleges through CT Start-Up Revolution's website.

It is now 2022: With the progress made on her company's research she decides it is time to get her master's degree. The 11-college Hartford Consortium has a unique entrepreneur program that she can tailor to address the challenges of the bio-medical industry and fit into her busy schedule. Even better, its free if she commits to 3 more years in the Hartford area.

It is 2028 and the company has hit it big: They have 300 employees in the Hartford area, a customer base of 500,000 in North America, and an office in Mumbai run by a graduate of University of Bridgeport they met at a CT Revolution event 3 years ago. Catalyst Conference now attracts 10,000 people from around the world and supports a huge summer festival. Grateful for their start, Julia and her partners are now Conference Platinum partners and to celebrate its tenth anniversary they commit $1million to Manchester Community College, Trinity, UConn and the Hartford Consortium. They are happy to support the next generation of Connecticut entrepreneurs.

There are now hundreds of stories like this popping up around the state, due to investments started in 2017.

Executive Summary

<Post April 11 meeting>

A. Assessment –The E&I Landscape

The following section summaries state, global, and industry trends that impact entrepreneurism and innovation and role of Higher Education as a catalyst in the ecosystem.

Connecticut By The Numbers

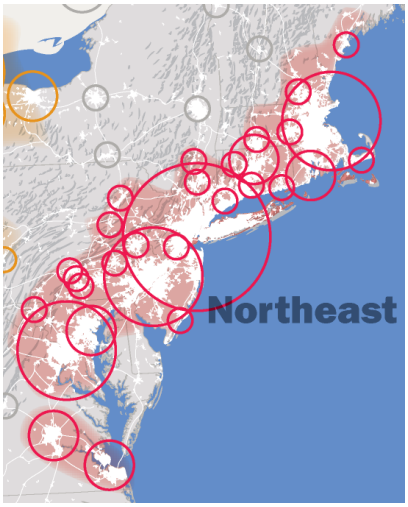


FIGURE 1. AMERICA 2050, REGIONAL PLAN ASSOCIATION

Connecticut's Economy. Connecticut is part of the Northeast megaregion, which ranges from Washington D.C. to Boston and lower Maine. The megaregion supports 20% of the U.S. GDP ($2.6Trillion) with 17% of the population (52.3Million), and 2% of the U.S. land are (60,000 sq miles). (NIH, 2016) By 2050 those numbers are expected to grow to $7 Trillion in GDP and 70 million citizens. Having 7% of the population and 9% of the megaregion's land use, Connecticut's share of its GDP is 9% ($253 Billion).

Connecticut's R&D. In the National Science Foundation's recent Science and Technology review, Connecticut ranked seventh in R&D expenditures, sixth for science and engineering doctorates in the workforce, as well sixth on the State Technology and Science Index (Milken Institute's State Technology and Science Index, 2016). The State also has two top ranked R1 Research Universities: Yale University and UConn.

Characteristic	Connecticut		U. S.
	Value	Rank	
All employed SEH doctorates, 2013	10,800	23	717,600
S&E doctorates awarded, 2014	564	23	40,588
SEH post-doctorates in doctorate-granting institutions, 2014	1,431	13	63,446
SEH graduate students in doctorate-granting institutions, 2014	7,558	23	588,952
Total R&D performance, 2014 ($millions)	10,219	14	451,631
State R&D expenditures, 2015 ($thousands)	55,817	7	2,210,820
Business R&D performance, 2014 ($millions)	9,093	10	331,222
Academic research space, 2015 (thousands sq. ft.)	3,782	19	214,575
Higher education R&D performance, 2014 ($millions)	1,032	20	63,721
SBIR awards, 2015	65	18	4,534

TABLE 1. NATIONAL SCIENCE FOUNDATION, 2016

FIGURE 2. 2017 CONNECTICUT ECONOMIC REVIEW

CT Manufacturing. Connecticut has nearly 4,500 manufacturing firms that directly employ over 161,000 workers, provides the state $14 billion in wages, and wins the "vast majority of the state's nearly $13 billion per year in defense contracts" (2014 *Survey of Connecticut Manufacturing Workforce Needs*, SBIA). Connecticut manufacturers, when surveyed by SBIA in 2014, cited the top six needed skills: critical thinking and problem solving (98%), engineering (94%), robotics and automation (93%), CNC programming, (93%), CAD/CAM (92%), and technical writing/comprehension (91%).

CT Population Migration. The U.S. census shows that the state has seen net negative migration between 2010 and 2016. Fairfield is the only county with net population gains last year, although Hartford population has not gone below 2010 levels. International immigrants into the state reduce population losses, making up for two-thirds of residents moving out of state. Notably, when evaluating migration loss by education attainment, residents with post-secondary education are the largest outmigration segment (86%). The same study also highlighted that in 2014 the greatest out-migration occurred among young adults ages 18–24 —42% of the 18,367 who left the state.

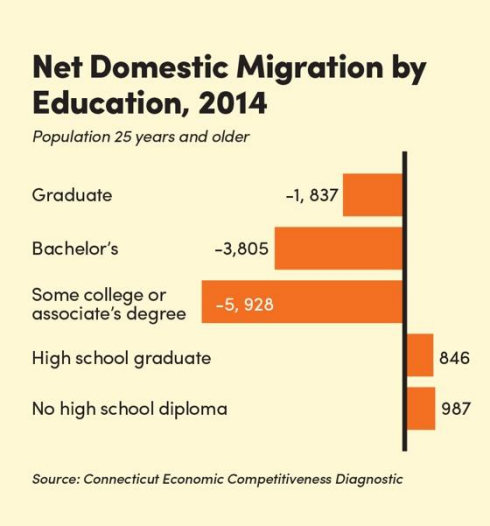


FIGURE 3. CONNECTICUT ECONOMIC COMPETITIVENESS DIAGNOSTIC, 2016

Global/National Trends

The U.S. R&D lead is closing in the face of competition from Asia and Europe. Increases in R&D budgets by competing nations means that the U.S. advantage on technology infrastructure, talent development, and access to funding is narrowing. From 1991 to 2013, Chinese investment increased from $13.5 billion to $316.3 billion (2,242%) while U.S. investment went from $236.8 billion to $432.6 billion (82.7%).[i] Besides the U.S., countries with the highest intensity of R&D (per GDP) are South Korea, Japan, Taiwan, Germany, and France.

Around the globe, government funded R&D is shifting. According to the OECD, part of the decline, or plateau, of publicly funded R&D is a policy shift towards tax incentives, signaling a shift in the policy mix towards the private sector. Other reasons for the reduction in government sponsored R&D include budgetary pressure on rising expenditures in health, pensions and social services. However, the OECD also emphasizes that basic research is needed because it leads to transformative 'frontier technologies' that tackle global challenges.

In the past 10 years, venture capital access has become more globalized and thus more competitive for US firms. Capital markets, especially those in the U.S., are increasingly turning to in Asia due to the strength of the Chinese economy. Meanwhile, U.S. markets are experiencing an increase in crowdfunding and angel investing. Of particular concern for Connecticut are the results of a 2014 survey of U.S. capital markets by The Brookings Institute outlining the deal density of early-stage VC funding by geography that revealed that the Nutmeg State was not among the top twenty metropolitan areas. Other important points about VC funding are:

- The number of angel groups in the US increased by more than 30% from 2009-2013, and individual angel investors increased by 22% over the same period;

- Crowdfunding levels have grown at an annual rate of more than 110% to almost $70Billion in 2015 in six categories: marketplace, equity, donation, reward, real estate, and royalty. Most of the "crowd" in crowdfunding is actually institutional investors;
- Few U.S. entrepreneurs have an international reach; Since 2009, only 11% - 13% of entrepreneurs report 25% or more international customers

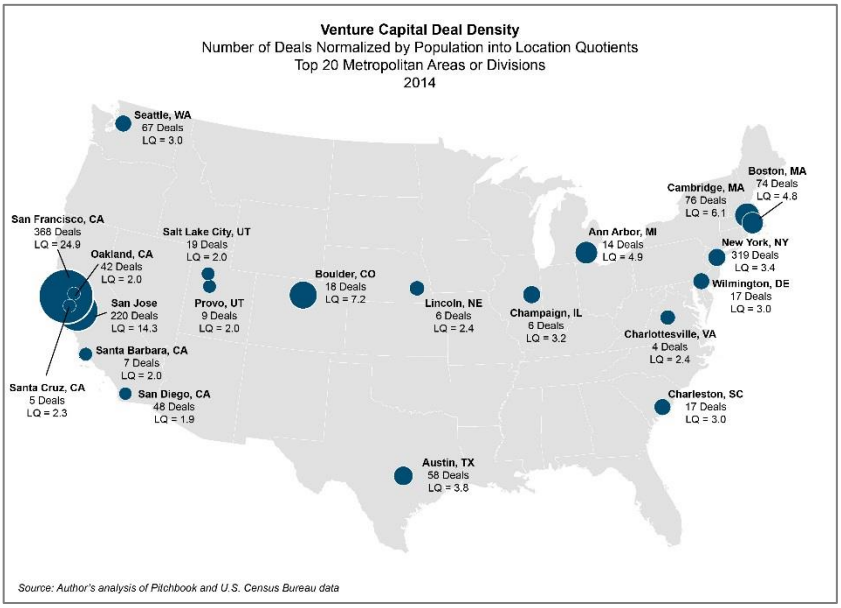


FIGURE 4. EARLY-STAGE VENTURE CAPITAL: MORE REGIONS GET IN ON THE ACTION, BROOKINGS INSTITUTE REPORT, 2015

Knowledge is driving today's markets. In 2016, intangible assets - patents, trademarks, brands, research and software – represented almost 80% of the S&P 500 Index. By contrast, in 1980, tangible assets like buildings, equipment and inventory made up 80% of the index.

Degree Production in S&E. According to the National Science Foundation, the proportion of Science and Engineering (S&E) degrees compared to the general pool of bachelors, graduate and PhD degrees has remained roughly constant over the last twenty years. Despite this general trend, Connecticut has outperformed the national average in the number of S&E graduate students and percentage of S&E occupations per capita.

"Silver Tsunami". According to the Census, more than one in five (twenty per cent) Americans will be over the age of 65 by 2030. This poses unique challenges and opportunities for small business owners ('Main Street'). In Connecticut, small businesses make up 69% of companies (1-50 employees) and 6.5% of the adult population owns their own business. Existing small business owners need to plan for succession as they retire, which means younger people need to know how to run small businesses and address 21st century economic changes. In contrast, 'Encore Entrepreneurs' (a term for people over 50 who want to start new businesses) is a growing demographic with lifelong hobbies or professional skills that can be turned into small businesses.

Industry Trends

Trends in Innovation. In 2015, the U.S. Council on Competitiveness interviewed hundreds of executives to develop a list of most promising global industry trends. 'Predictive Analytics,' 'Internet-of-Things' and 'Advanced Materials' were considered the most promising in the United States. The top 10 are listed in the table to the right. The Organization for Economic Co-operation and Development (OECD) also released their global trends outlook in 2016. Both are included in the table to the right. Healthcare/BioScience, Advanced Manufacturing, Digital Media, and Green Technology clusters in the State of Connecticut are already primed to capitalize on these trends.

U.S. Council of Competitiveness 2015 Trends	OECD Science & Technology Outlook 2016 Trends
Internet of Things	Additive Manufacturing
Energy Efficiency	Advanced Energy Storage Technologies
Materials, Alloys, and Metals	Artificial Intelligence
Ceramics and Composites	Neuro-technologies
Advanced Robotics	Nanomaterials
AI and Machine Learning	Macro and Nano Satellites
3D Printng	Synthetic Biology
Critical Materials (clean energy)	Internet of Things
Bio-Based Polymers	Blockchain (underlies cryptocurrency)
Virtual Design, Prototyping, Augmented Reality	Big Data Analytics

The Future of Job Skills. Labor experts around the globe are debating the socio-economic impacts of technological innovation on the future labor force. They are taking into account automation, skills substitution and job creation. The World Economic Forum emphasized this trend in its annual "2015 Executive Opinion Survey "that found that the changing nature of work was the among the most important trends influencing economic stability worldwide. The next two trends were effects of mobile Internet/cloud (34%) and the use of big data (26%). Respondents noted that these impacts would be felt almost immediately (1-5 years).

Talent Shortage. Innovation is critical for company competitiveness, but companies cannot innovate without a trained workforce, especially STEM professionals. **In 2014, the** President's Council of Advisors on Science and Technology estimated that the U.S. would need approximately a million more STEM professionals than it was scheduled to produce over the next decade to retain competitiveness in science and technology.

U.S. Entrepreneurism Trends

Social mission Entrepreneurism.

Nationally, 8% of Americans are leading a social enterprise, and 7% are trying to start one. The majority are less than three years old. Government funding is the most common funding source. Foundations such as Ashoka and Skoll encourage and support the growth of social entrepreneurism to solve national and global problems.

skoll FOUNDATION

The Skoll World Forum on Social Entrepreneurship seeks to accelerate entrepreneurial approaches and solutions to the world's most pressing problems by uniting social entrepreneurs with essential partners. Delegates represent nearly 65 countries.

Skoll Awards for Social Entrepreneurship Awardees receives a $1.25 million, three-year core support investment to scale their work and increase their impact.

The percentage of the adult population that are entrepreneurs peaks among 35 to 44 year olds. At 17% of the U.S. population this group, is likely to have accumulated experience, credentials, relevant networks and other resources they can leverage. (Global Entrepreneurship Monitor Global Report, 2016/17)

Gender disparity. Women make up 52% of economy in US but the rate of men's entrepreneurship trends at one and a half times that of women since 2001. People who believe they have the business skills and competencies to launch a venture are more likely to plan to start a business. Nationally, 62% of men believe they are capable compared to 50% of women. The latest data on business degree attainment shows that of the 10,148 degrees awarded in Connecticut in 2015, only 37% went to women.

Online Resources. The internet has transformed the E&I landscape, reducing barriers by increasing access to market information, financing, education, and other services for potential entrepreneurs.

"Preferred" Start-Up Businesses. Entrepreneurship in the U.S. economy consists of primarily (80%+) consumer-oriented and business-services.

New Company Establishment. The number of jobs created by establishments less than 1 year old in the U.S. has decreased from 4.1 million in 1994 to 3 million in 2015. According to the U.S. Bureau of Labor Statistics (BLS), although new businesses are critical to the U.S. economy, the survival rate has declined. Since 1994, the share of private sector employment has decreased for companies with less than 249 employees and has increased for those with 250 or more employees.

University E&I Ecosystems

The academic ecosystem is becoming more interconnected. Academic R&D is increasingly collaborative. Although most collaboration is not international, a new trend reflects the shift from s*cience diplomacy* to *innovation diplomacy*. Innovation diplomacy includes influence through the attractiveness of national or regional innovation hubs; developing early-stage partnerships between businesses, or between businesses and universities; creating conditions for regional and global innovation partnerships to flourish; and encouraging and enabling collaborations between public, private, and non-governmental actors.

'Open Access' Science. The OECD identifies 'open science' – or open access data and citizen contributions – as a growing trend that will require deep changes in academic culture. The 2013 U.S. federal mandate *'Increasing Access to the Results of Federally Funded Scientific Research'* required increasing public access to scientific publications and digital data resulting from federally-funded research.

Academic Collaboration. Academic R&D is increasingly collaborative, both domestically and internationally. Increased collaboration rates between the United States and Canada and Asia reflect, in part, ties formed through growing numbers of international students.

In the U.S., R&D funds passed through universities to other universities or to non-academic institutions grew more rapidly than total academic R&D funding. (Between FY 2000 and FY 2009, pass-through funds grew by 171% while overall academic R&D expenditures grew by 82%)

2-yr to 4-yr Pathways. Education Attainment trends also reflect the interconnections: One-fifth of all U.S. citizens or permanent residents who received a doctoral degree from 2007 to 2011 earned some college credit from a community or 2-year college.

Growth of Entrepreneurship Education. In 1995, only 400 universities across the U.S. offered spell out (EET) classes. By 2012, 2,000 universities offered EET programs (two-thirds of the total)[x]. Connecticut shared in this surge. New minor and majors are offered across the state of Connecticut every year.

> "The teaching of entrepreneurship has moved from the margins of higher education closer to the mainstream. developing rapidly." Kauffman Foundation, *Entrepreneurship Education Comes of Age on the Campus* (2013)

'Beyond STEM' Workforce. In '*Revisiting the STEM Workforce', the* National Science Foundation emphasized the critical need for a broad STEM pathways approach to education in the U.S. that can adapt to rapidly evolving workforce needs.

> *"Innovation is not the sole province of R&D workers. Although companies engaged in R&D activities report a higher incidence of innovation, most of the innovation in the U.S. occurs in firms that are not significantly engaged in R&D."* National Science Foundation.

Ecosystem Complexity: No two institutions have the exact same ecosystem. Institutions take many approaches to develop and encourage entrepreneurism and innovation on campus, from classes to commercialization support. Like a biological ecosystem, these elements form in an open environment but are adapted to their specific institutional mission and culture and change as the needs of the students and faculty evolve.

Ecosystem Characteristics. Although each institutional ecosystem is unique, a 2014 benchmarking study out of the MIT/Skoltech Program identified two main institutional ecosystems - bottom-up and top-down. The study suggests that the two models can work together despite some disconnects by:

- Expanding metrics to measure culture, capacity and connectivity in addition to university-focused outputs.
- Leveraging the power of strong grassroots and student entrepreneurial movements; they make strong connections with local and international networks.
- Reduce isolation and combine resources; Many universities work in isolation from each other and from the community, each struggling to build capacity and connections on their own.

Bottom-up, community-led. Focused on regional capacity, it is usually led by students, alumni and entrepreneurs in the regional economy with a desire to stimulate regional economic growth and create jobs.

'Top-down', university-led. Focuses on income from university research, driven by a strong technology transfer office. Building on university research strengths, this model focuses on university policies, budgets, incentives, and curriculum.

FIGURE 5. MIT/SKOLTECH ECOSYSTEMS

In a 2015 report, the Kaufman Center suggested that a dense networked bottom-up approach is a stronger ecosystem approach than top-down support of traditional incubators and venture funds and recommended

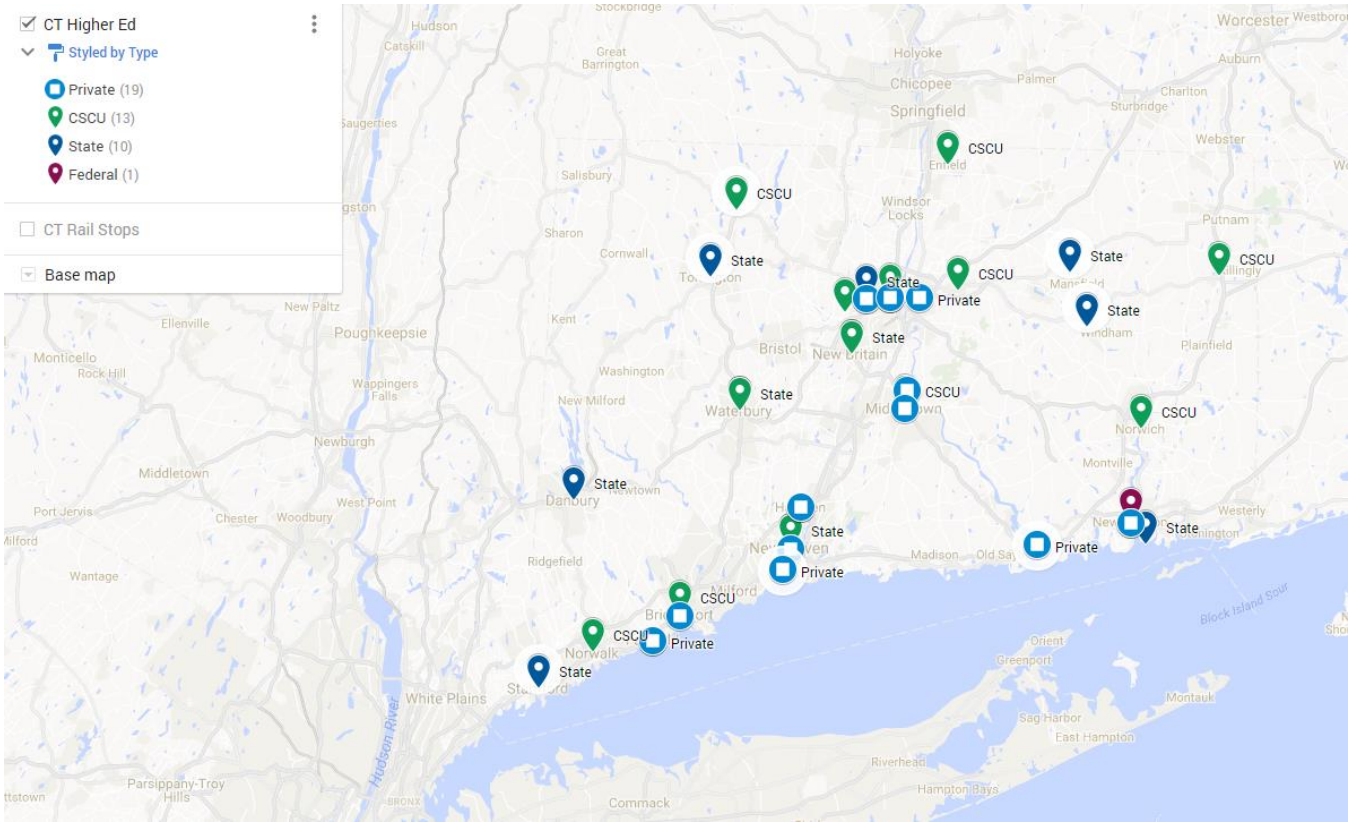
"*catalytic events*" that go beyond informal networking towards creating common objectives, turning incubators into referral service centers, and strengthening local university/college alumni networks.

CT Higher Ed E&I Ecosystem

An analysis of a written survey (80% response rate), interviews, group meetings and extensive site visits across the state reveal that the CT higher Education E&I Ecosystem is extensive, and growing.

The System

- The system includes 43 institutions including 13 in the CSCU, 19 Private Universities, 10 state university campuses and 1 federal academy (Coast Guard);
- There are 168,000 Students in the state (131K Undergraduate, 30,000 graduate)
- Higher Education employs 48,000 residents (36,000 staff, 12,000 faculty)



Entrepreneur Studies

- Eleven out of 21 four-year degree-granting institutions in both the private and public sectors currently offer specific Concentration,/Minors and/or Majors in entrepreneurial studies..
- Quinnipiac University and University of Hartford both offer four-year degrees specifically dedicated to Entrepreneurship. Most institutions offer a minor/concentration for business students in either management or administration. Many institutions have programs are under review or are discussing new programs. Some institutions now offer their Entrepreneurship minors as an option for any major. UCONN

for example, is providing this pathway as a means to expand E&I focused thinking campus wide and not simply in the traditional business school.

- Nine out of the state's 13 Community Colleges have either an Entrepreneur Certificate or Small Business/Entrepreneurship Concentration generally housed within their Business Administration programs.
- Many institutions throughout the state also offer graduate degrees with an Entrepreneurial focus through their schools of business. Examples include Yale, UCONN, University of Hartford and University of Bridgeport.

E&I faculty and staff

- The state has 14 schools of business among all degree granting institutions. In addition, five community colleges offer business training.
    - These schools handle the bulk of Entrepreneurship based support services and related coursework.
- The 19 schools of business throughout the state handle the bulk of Entrepreneurship based support services and related coursework.
- Eight institutions currently have dedicated Entrepreneur in Residence Programs with many others expressing interest in creating similar programing in the next few years.
- Another avenue institutions have explored to expand access to experienced E&I personnel has been to establish networks of local business owners and alumni that serve as advisors and mentors to curious student entrepreneurs.
- Many of the Community Colleges have sought out collaborations and partnerships with local manufactures. These partnerships often involve the Advanced Manufacturing Programs on campus. UCONN's School of Business has the Wolff Family Chair in Strategic Entrepreneurship, and the Connecticut Center for Entrepreneurship and Innovation, as well as many campus wide collaborations that promote entrepreneurship and innovation.
- Many institutions have worked closely with the Connecticut Entrepreneur Foundation. The foundation oversees the New Venture Competition as well as the Consortium of Entrepreneurship Educators. The consortium has been to help add or refine entrepreneurship programing on many campuses across the state.

Institutes, Incubators and Centers

- There are 22 university centers that foster campus-wide entrepreneurial spirit. They include centers focused on community development and social entrepreneurship, traditional incubators, and experimental learning labs.
- There are currently 3 centers that plan to open in 2017 alone (SCSU, WCSU and Northwestern Connecticut Community College all have centers in development)
- The traditional incubator centers are generally open to all enrolled students and, in many cases, to the local community. Services offered to the local community can include marketing and branding advice, tax preparation and workshops.

- A few services offered at the traditional incubator centers for students can include workshops, lectures, startup funding and acquisition, networking events and concept development. While the social entrepreneur centers (Patricelli Center at Wesleyan & Holleran Center at Connecticut College), offer seed grants and fellowships to help get social initiatives off the ground.
- Wesleyan, Yale, Connecticut College, and ESCU are examples of institutions with social entrepreneurial focused centers.
- The Eastern Connecticut Advanced Manufacturing Technology Center at Quinebaug Valley Community College is an example of how Community Colleges are leveraging their local manufacturing assets. The center serves as a central hub for innovation and design within the manufacturing program as well as local producers
- As part of Connecticut State Colleges and Universities' advanced manufacturing programs, the Advanced Manufacturing Technology Centers at 7 of the CSCU community colleges have a long history of engaging with manufacturing companies and the supply chain, representing a variety of sectors in the manufacturing space. Statewide collaboration in the fields of biomedicine, aerospace and defense is currently underway to define pathways for prospective workers needed in those sectors.
- UConn operates the Technology Incubation Program (TIP) which offers labs, office space, startup and R&D services, Entrepreneurship Bootcamp for Veterans with Disabilities (EBV); Innovation Quest; and Accelerate UCONN among other programs.
- The Viscogliosi Center at Manchester Community College, The GREAT Center at Gateway, and the soon to be open (2017) Entrepreneurial Center of Northwest Connecticut are examples of incubator centers at the community college level.
- Sacred Heart's incubator center houses the Welch Experience Program. This university supported initiative hosts 5-6 student run startups per year and provides them with various support services. In this center, student run businesses have access to funding, mentoring, concept development, and marketing services.

Experimental Classrooms

Some experimental classrooms and centers of note include; Trinity's Investment Club, Fairfield's Business Simulator (BEST) Classroom and the Ancell Learning Commons at WCSU. Recently Yale opened the Center for Teaching and Learning, to gather together students from all disciplines to collaborate. Gateway Community College is the only institution that houses the local SCORE center on its campus and is an interesting example of a private and public collaboration of education and business support services.

Mentor Programs

Schools of Business or campus incubator centers offer many formal mentor programs for curious entrepreneurs. Some programs are implemented campus wide as soon as students enter their first semester, other institutions connect students with mentors through their mandatory internship/fellowships aspect of their degree program, or specifically when they seek out advice on business ideas and planning.

- University of Bridgeport and Connecticut College are both examples of institutions with intensive four-year programs designed to link students with mentors at the very start of their college career.
- Nearly every surveyed school described an established system for connecting students with mentors, some formal while others more informal.
- Often Career Services handles the bulk of connecting students with mentors when formal systems are not established
- Over 15 institutions at both the two year and four year level have established mentor networks that often consist of key faculty members, local entrepreneurs, personnel at various organizations as well as students. Institutions with established programs often assess each student on an individual basis and assign mentors based on specific needs.
- An example of a formal program is at Albertus Magnus through their Practica and Internships network. Currently 69 different businesses connect vetted mentors with students.
- Asnuntuck, Quinebaug Valley and Northwestern Community Colleges manage networks of local manufacturers who serve as mentors to Advance Manufacturing students.
- Institutions with Entrepreneur-In-Residence programs will often leverage this relationship to connect students to mentors.
- Many institutions including University of New Haven and CCSU have expressed plans to create new formal networks of mentors over the next few years.
- Tunxis Community College offers a Job Shadowing/Mentoring service through their Business Administration degree program.
- Yale has licensed the MIT mentor network model which UConn and Fairfield University also strive to follow.

University Events

- Thirty-one institutions have described hosting some type of event specifically designed to foster entrepreneurial spirit on campus.
- Examples of events include Start-Up Weekends, lecture series, week long summer intensives, boot camps, networking series and more
- Six institutions host Startup weekends. Participants include a mix of students from all majors and many of these startup weekends are collaborative. These students have the opportunity to attend lectures, speak with local entrepreneurs, participate in competitions and network with like-minded peers both from their multiple schools.
- Ten institutions participate in the New Venture Challenge. This program managed by the Entrepreneurial Foundation and CCEE. The program unites students from a variety of different majors and ten different institutions. Participants work in groups to develop concepts and solve problems.
- Business Plan Competitions are popular events that bring together students from all different backgrounds to pitch ideas and concepts. Half of the survey respondents stated that their institution either participated in the statewide competition run by the Entrepreneur Foundation, national competitions, the Shipman and Goodwin Elevator Pitch Contest, or hosted another internal competition for their students.

- Sacred Heart has a program requiring participation of all students in their Intro to Business course. Students team up and work on a business plans and ultimately have the opportunity to present in front of a panel of faculty judges. The selected top 9-10 groups go on to present their plan to local entrepreneurs and business leaders.
- The Fairfield StartUp program calendar runs from September to April. The fall events are geared toward recruitment, engagement, and active learning experiences in professional networking, business modeling, and pitch making. The spring calendar includes weekly meetings with students to prepare for the StartUp Showcase in early April. The spring curriculum is based on the Lean LaunchPad program. Other events: IACT (Inventors Association of Connecticut);, Crossroads Venture Group - CVG and Angel Investor Forum; networking events for the CT Technology Council, CT Next, IACT, CVG.

Student-run Programs

- Twenty-four Institutions responded that they have a student run organization that focuses on business, entrepreneurship or social justice; thirteen organizations are explicitly dedicated Entrepreneur Clubs
- Tunxis Community College's Business Club manages a significant portion of entrepreneur-focused events on campus using social media and specifically using Facebook as a means to promote organized events
- SCSU hosts the Connecticut branch of Conscious Capitalism, a national organization with state chapters that focuses on developing businesses that are ethical, noble and inspire people to do good Conscious Capitalism frequently hosts public events that bring panelists from all sectors of business together to discuss how to improve the state and local area.
- KAI Wesleyan is the student run non-profit organization that focuses on promoting social entrepreneurship on campus. KAI supports an internal Fellows program offering additional support services to student social initiatives and projects.
- Trinity's Investment Club give students access to a real fund and the responsibility to invest in various stocks, bonds and companies.
- UCONN hosts a variety of different student run organizations such as the UConn Consulting Group (UCG), International Business Society (IBS), Student Entrepreneurial Organization (SEO), and Women in Business (WIB)

E&I Related Partnerships

Examples of partnerships already implemented around the state.

- Multiple Institutions
    - Connecticut Consortium Of Entrepreneur Educators
    - Innovation Destination: Hartford
    - Entrepreneurs' Organization Connecticut
    - The Global Student Entrepreneur Awards
    - Connecticut New Venture Challenge
    - BioPipeline (Yale, UConn, Quinnipiac)
    - Engineering Dean's Council (CCIC)
    - CT Skills Challenge

    - SCORE New Haven – (Gateway)
    - CURE
- Partnerships
    - CT Manufacturing Simulation Center (UCONN)
    - PITCH Program (The Program in Innovative Therapeutics for Connecticut's Health) Yale and UConn
    - The Central European Institute and the Center for Innovation and Entrepreneurship (Quinnipiac)
    - Comradity - Shared Incubator Space in Bridgeport (Sacred Heart, UB)
    - Charlie Yarish – Kelp Harvesting Company – (UCONN and Norwalk Community College)
- Other
    - Entrepreneurial Center of Northwest Connecticut – (Northwestern Connecticut Community College)
    - Conscious Capitalism (SCSU)
    - Kern Entrepreneurial Engineering Network (KEEN) (UNH)
    - ESUMS Engineering Science University Magnet School (UNH)
    - Viscogliosi Entrepreneurship Center, Manchester

Proof of Concept Support, Technology Transfer, Commercialization

Five institutions (UCONN, SCSU, Yale, UB, Fairfield) explicitly offer their faculty services for the licensing of intellectual property while three others have stated that they have systems in place to seek out these services via outside consultants or on a case by case basis.

- UConn Technology Commercialization Services (TCS) is the university's technology transfer enterprise. As part of the Office of the Vice President for Research, TCS works closely with internal and external stakeholders, and maintains a particularly close affiliation with the UConn School of Business, Center for Entrepreneurship and Innovation (CCEI) to operate Accelerate UConn, and the UConn NSF I-Corps Site. TCS and its network collaborate to support technology transfer and venture development based on student and faculty innovations. TCS currently provides services for entrepreneurial training, intellectual property protection, technology licensing, mentorship, business startup, technology incubation, and connections to the investment community. As one of the State's centers of entrepreneurship, TCS provides these resources to external stakeholders as well.
    - UCONN's SPARK Proof of Concept Program (Supporting Innovative Translational Research and Pathways to Commercialization) is a two-phase proposal process with a $400,000 fund.
- UHART has an established network of outside consultants brought in ad hoc to help with the licensing of intellectual property.
- Yale's Office of Cooperative Research is responsible for managing their portfolio of intellectual property. Their mission is to: leverage intellectual property assets and provide incentives for commercial investment; focus on impact opportunities with the highest probable benefit to both Yale and society; and assess and pursue discoveries with high potential to improve the health or prosperity of the global

community irrespective of monetary gain to Yale. OCR also runs the Blavatnik Fund for Innovation, which bridges the gap between early-stage life science research and biomedical product commercialization.

- Fairfield University does not take equity stakes in startups developed on campus but does have explicit guidelines for the commercialization of products developed by faculty using campus resources.
- College of Technology – All twelve Community Colleges and 8 Public and Private Institutions participate in this collaboration.. Collaborations between these students have yielded some exciting products and concepts. Many of these concepts have moved past design into the proof of concept stage of development. Examples of concepts in 2016:
    - Embedded Microcontroller Design Project- (University of Hartford, Quinebaug Valley CC, Tunxis CC, Norwalk CC, Central CT State University, University of Connecticut)
    - Smart Guitar V2 – (Gateway CC, Middlesex CC, Tunxis CC)
    - Traveling Oasis - University of New Haven, Gateway CC, Quinebaug Vallely CC

Examples of products or start-ups

- **Quinnipiac University:** Treatment for MVID, Check Samples system, Diagnosis system for pancreatic cancer, Cervical Incontinent product, a Game to help young women chose birth control method, etc
- **University of Bridgeport:** Patent -Bike Helmut with right and left signal blinkers, My Air Streamer, Cross Cultural Education, Yayci Nail Lacquer, Tuccipolo, Car Wash
- **University of New Haven:** Rapid detection technology for Lyme disease, Tri-sol (three-in-one) solar energy pane, Solar powered traffic lights, Rapid detection of health of HVAC ducts
- **UCONN:** Holds over 500 patents, more than 75 active technology licenses with industry. Selected patented technology and startups can be found at this link. Current UConn startups include Lambdavision, Mobile Sense™ Technologies, ActualMeds Corp and Amastan.
- **Yale:** A venture list is found on the Office of Cooperative Research site lists current and previous ventures. Examples from the current cohort from the student Venture Creation program include HemoState, Shopthisfeed, Practice Portal, and Zerit
- **Charter Oak State College**: Has launched eTutoring.org and ePortfolio, programs designed, produced, and marketed on campus.
- **University of Hartford**: Developed a patented Rehab Walk Assist System currently installed at a Hospital in New York City, is funding three patents from faculty research and has a four year design process in the school of engineering that encourages students to design viable products during their four years of coursework.
- **Fairfield University**: The FUEL Center currently hosts Cometa Works, Crowdflik, and eSolutionsOne and since its inception in 2013 the has supported over a dozen different startups/companies
- **Sacred Heart University**: The Welsh Experience Program currently supports six student run startups. Current companies are The Peak - Ice Cream shop and student lounge; Nantucket Buckets a Clothing and beach apparel; Twin Tides – Clothing; Sonus - Digital Music Remastering Software; Madely Clean - Residential Cleaning Service; and Agora Bookshelf - Textbook Exchange Service

- Asnuntuck Community College: AMTC used its Additive Manufacturing technology to provide Senior Aerospace with prototype parts which ultimately led to the campus purchasing additional equipment to further develop parts.

B. Analysis

Ecosystem Strengths

The greatest strength and weakness of Connecticut's Higher Education E&I ecosystem is structural, and are flip sides of the same coin: Variety. The previous section outlines an amazing variety of programs, educational offerings and partnerships at higher education institutions around the state. During interviews over the last four months, stakeholders revealed that more programs and entrepreneurship center programming are in development, and tours of science and engineering labs revealed exciting research projects and industry partnerships with the potential for break-through products. Students, faculty and administrators expressed enthusiasm and commitment for the value of entrepreneurial mindsets on their campuses and the value of retaining students and faculty to grow new businesses and contribute to the state economy.

The mix of public and private institutions around the state also support a diverse economy, which in turns means increased stability, resiliency, flexibility, and economic development. Degree and certificate programs prepare students for the growth of STEM employment sectors in the state as well supporting students who want to run businesses of their own. Encouraging innovation and entrepreneurship helps create a culture that embraces and seeks out new opportunities in the state.

However, surveys and interviews also revealed an uneven, relatively young ecosystem. Many institutions are building their E&I network in relative isolation, relying on the passion of campus leaders to champion campus initiatives with relatively few resources; many observed that the entrepreneurial spirit reveals itself in the determined efforts with which these champions have doggedly pursued new opportunities for their communities. Networks rely on bottom-up organizations of volunteers with limited statewide infrastructure to draw on.

Top-down support from executive administrators competes with education mission imperatives and competing fiscal priorities. The kick-off meeting for this planning process was the first time in memory that all the university presidents (senior executives) have gotten together to discuss a statewide topic of common interest. This presents a unique opportunity to launch further discussions on how to incorporate innovation and entrepreneurism into the academic mission. With awareness of their strategic value for all institutions comes the opportunity to gain university leadership support to pursue innovative partnerships and commitment for infrastructure investments. Another "top-down" barrier is support from academic departments. Most interviewees highlighted the importance of university wide promotion and acceptance of entrepreneurism and innovation across departments. Successful partnerships need supportive academic and administrative infrastructure to attract students and faculty and grow programs.

With the state trending towards net losses of residents ages 18-24, the real or perceived competition for students, faculty or income was an anticipated challenge that did not materialize. Although some schools do compete for the same pools of local students, and every institution has budget constraints, no one interviewed

thought they were significant barriers to collaboration. They all recognize that certain types of programs or initiatives need a critical mass of students or researchers that their campuses cannot provide. No one disagreed that their institutions could benefit from larger networks and strong collaborative partnerships.

Barriers and Opportunities

In addition to overcoming structural barriers, building a strong ecosystem with institutional partnerships and collaboration must address external barriers emerging from the economic, social, political and geographic forces in the assessment section. While they all have implications for entrepreneurism and innovation at large, certain forces have a particular impact on the ability to create sustainable collaborations and partnerships.

Regionalism. Without significant county-level government structures, Connecticut is a state of parochial municipalities and regional identities. This poses a challenge for any group endeavoring to build a statewide entrepreneurial culture and identity. Partnerships and collaboration must cross "invisible lines" including traditional institutional associations, distance, economic and fiscal barriers, institutional insularity, or a simple lack of awareness of each other. A more strongly focused statewide infrastructure that leverages but does not solely rely on volunteer efforts can help overcome natural inertia and resistance.

Location, Location, Location. Connecticut lies in between two metropolitan powerhouses: Boston and New York City. The result is often negative contrasts - real or perceived – that the state must overcome to retain start-ups and attract the creative workforce and funders an entrepreneurial economy demands. The main drivers relate to value, not costs. Despite cheaper real estate and services, post-graduate start-up employees want to live in dynamic urban centers like Boston or Brooklyn with public transit and a strong network of like-minded new companies. However, the fastest growing age group of entrepreneurs is over 30, which is also the demographic that finds the strong schools and housing markets of Connecticut appealing. Partnerships and institutional collaborations would benefit from tighter coordination with place-based initiatives like CTNext's Innovation Places program to address these barriers and opportunities.

The Wider State Ecosystem. Higher Educations Institutions are embedded in a wider state ecosystem mentioned infrequently or not at all by many interviewees. Although some organizations in the system are well established, many are still relatively new. Some, like makerspaces and co-working spaces, are new infrastructure elements seeing rapid growth across the country. Connecticut has also seen a renewed investment in Small Business Development Centers. As a result, the overall state ecosystem is also relatively young, diverse, growing, and struggling with the same limited resources and barriers. Higher Education Partnerships and collaboration that leverage these resources and create new linkages would help institutions and their communities support each other.

State Demographics. Throughout the interview process, the planning team heard about the "silver tsunami" – the wave of baby boomer retirees. Educating an entrepreneurial workforce who can take over and adapt companies to address 21st century economic changes was a chief concern of many institutions, particularly community colleges and state universities whose students come from and stay in local communities. This growing gap, however, creates new opportunities for institutions. Alumni can become a great source of mentors and a

professional resource for training and certificate programs. Retirees are also a growing segment of entrepreneurs, with time to turn hobbies or professional expertise into new businesses.

Funding Resources. New companies need investors and business partners. Whether a company needs $10,000 for software development or $10 Million for advanced laboratory equipment, the pitch for funding is increasingly competitive. While the largest nodes such as Palo Alto or Boston are not the only game anymore, they are still the largest. Retaining students and researchers in Connecticut requires more funding opportunities. Institutions that use their E&I networks to help retain students, and attract faculty and researchers need to consider the impact of funding opportunities in the state and how they could use their alumni and industry networks to create new funding avenues.

Global Competition. The growth of entrepreneurism and innovation is a global trend. Every major city is looking at ways to build innovation places, attract creatives and STEM workforces, as well as support new businesses. Partnerships and collaboration with international partner universities could attract new business opportunities and industry connections. Connecticut universities also have a significant international student population and the state's population stability is largely due to international migration. Tapping into the potential of those connections can build bridges to growing economies.

How CT Stacks Up Against National Practices

Entrepreneurship and innovation can be unleashed anywhere. When asked, most people identify Palo Alto (Silicon Valley), Boston (MIT) and New York City as hot spots for entrepreneurship and innovation– but they are not the only answers anymore. The trend to harness the potential from technological disruption has spread around the globe, a race to capture growth and job creation at local and national levels. The White House hosted the first Global Entrepreneurship Summit in 2010 and this year the Summit was by India. In 2009, The Kauffman Foundation hosted the first Global Entrepreneurship Congress in Kansas; this year representatives from 173 countries were at the ninth Congress, hosted by South Africa. Nationally, every state is trying to tap into entrepreneurship and innovation as the new lodestone for economic development. In Connecticut, CT Innovations runs seven funds for start-up capitalization and CTNext provides guidance, resources, and networks to accelerate their growth.

Underlying this transformation is a workforce that needs to tap into post-secondary education to take advantage of these opportunities. By 2020, 70% of new jobs will require education beyond high school. As a result, higher education has a large role in the growth and success of entrepreneurs and an innovative economy.

Resources and networks for promoting student entrepreneurism and innovation as well as research commercialization has grown exponentially over the last 15 years. Over 2,200 universities offer E&I programs and. The Kaufmann Foundation's Campus Initiative, (from 2003 – 2013) leveraged a $100million to develop interdisciplinary entrepreneurship education at schools ranging from small liberal arts colleges to large research universities. Reflecting on the impact of the initiative, the foundation observed that it shifts in campus-wide mindset and culture changes encouraged educators to think of themselves as "change-agents", catalyzing economic "value" beyond the bottom line to include social and intellectual value.

With so many technology transfer programs and educational offerings across the United States, how does the Higher Education ecosystem in Connecticut stack up? The short answer is – good, but it could be better. There are many examples of best practices in the state ripe for more peer-to-per knowledge exchange. Some institutions like Yale or UConn have extensive ecosystems of their own, with extensive resources for both students and scientists tied into national networks like iCorps. Most institutions in the state have some research activity, but not on a scale that warrants extensive commercialization support services. Other institutions are starting new programs or expanding their offerings on shoestring budgets. Most institutions are in the middle, with small but active campus programs for students. Entrepreneurial centers and makerspaces are expanding campus outreach beyond business schools and tapping into the creative ideas of chefs, engineers, artists and students who might not otherwise think of themselves as entrepreneurial. Institutions are tapping into national resources like the Kaufmann Foundation or MIT's Venture Mentoring Service, going to national conferences, investigating new pedagogical ideas, and adopting and modifying best practices to meet the needs of their students and faculty. There are over twenty-five examples of existing partnerships that all point to a growing higher education network in the State. A couple are statewide, many are collaborations of more than two institutions, and a few reach out to their local communities. But a network with strong nodes and limited connections is more accurately a collection, not a true system. Broadening and deepening the statewide network is critical to address economic development needs.

A flourishing Higher Education E&I system needs the same resources as a start-up company with an idea and a business plan: Access to larger communities of like-minded individuals; a strong network of mentors; and a structured 'accelerator program' to help it tap into resources and funding to grow, test, and broaden its market reach.

Promoting State Ecosystems

The American Jobs Project, a national research project from the Berkeley Energy and Climate Institute, developed a database of best practice policies that help strengthen state innovation ecosystems. Higher education collaboration and partnerships could be leveraged to expand these best practices in Connecticut:

Innovation Voucher Programs: State governments provide funding for competitive application process that connects businesses with in-state research scientists. The New Mexico Small Business Assistance Program helped 2,341 businesses gain access to technology at the Sandia or Los Alamos National Labs. In Tennessee, the state's $2.5-million innovation voucher program connected businesses to Oak Ridge scientists.

Equity Crowdfunding Portals. An alternative to state-financed venture funds or a work-around to address reduced levels of federal research dollars. Examples include Wisconsin's CraftFund, and crowdfunding portals at Penn State and UC Santa Cruz. Sites that researchers can raise funds directly on include Experiment.com and scifundchallenge.org. These resources do not always have the checks and balances of federal research funds but can fill gaps for young scientists who find it hard to compete for federal funding.

State-matching grants for Federal Funding. These grants match funding by the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Kentucky, Virginia and North Carolina are examples of states with these programs. Connecticut Innovations/CTNext from 2012 thru 2016 provided

matching funds to SBIR/STTR Federal awardees to help fill the gap and further advance the commercialization of technologies. While the matching program has been paused due to the transition of CTNext as a wholly-owned subsidiary of CT Innovations, CTNext continues to provide comprehensive technical assistance to companies cultivating a strong pipeline of SBIR/STTR companies winning Federal R&D grants. In addition, the state of CT has been awarded the Federal And State Technology Partnership program (FAST) grant consecutively for the last 7 years ensuring access to underserved and under-represented communities within the SBIR/STTR program.

Foundation Liaisons. Foundations award billions of dollars that could be tapped to support strategic E&I ecosystem initiatives. In Michigan, the state legislature created a cabinet-level, non-partisan position to work with elected officials, the business community and foundations to build partnerships and strategic collaborations. The program could be extended to coordinate with higher education institutions to leverage their foundation and corporate relationships and community investment strategies.

Innovation Districts. Encouraging sustainable town-gown relationships and strategic collaborate on innovation district initiatives. CTNext Innovation Places Grant program is currently in the competitive implementation application phase.

Promoting Student and Faculty Entrepreneurship and Education

Connecticut has an extensive list of education options including entrepreneurism majors, minors, and certificate programs. Beyond these, schools offer a wide array of programs that promote E&I to students and faculty. Universities use best practice like Lean Launchpad (VentureWell), and multiple schools and the Connecticut Consortium of Entrepreneurial Educators (CCEE) partner with local companies and foundations like Kaufmann Foundation to sponsor non-credit events like Start-Up Weekends, Business Plan Competitions and Hackathons modeled after national programs. Over ten schools support Entrepreneurial Centers and more centers are on the drawing board. Start-up Incubators range in size and resources, tapping into local entrepreneurs in addition to university students and researchers. Many institutions have formal mentor programs. Yale's Entrepreneurial Institute has informally advised universities on their mentor network experience and lessons learned.

Other great examples of creating an innovative mindset and encouraging entrepreneurship in CT include:

- Norwalk Community College's Entrepreneurship & Workforce Development Initiative
- University of New Haven E-learning Modules Supporting Entrepreneurially Minded Learning
- Southern Connecticut State University BioPath
- WCOB Innovation Center's Problem-Based Learning Lab
- UConn Entrepreneurship Bootcamp for Veterans with Disabilities (EBV)
- UConn Minor in Creativity Innovation and Entrepreneurship
- UNH Kern Entrepreneurial Engineering Network
- Sacred Heart's Lisa Powell Memorial Endowed Scholarship Fund(female entrepreneurs)S
- Yale Entrepreneurial Institute (Licensed MIT Venture Mentoring Service)
- UConn IQ Competition.
- CCEI Mentor Program

- Accelerate UConn (NSF I-Corps Site)
- Consortium of Entrepreneurship Educators
- Patricelli Center for Social Entrepreneurship

Promoting Research, Technology Transfer and Commercialization

The state has two R1 Research Universities, Yale University and the University of Connecticut. Five institutions (UCONN, SCSU, Yale, UB, Fairfield) explicitly offer their faculty services for the licensing of intellectual property while three others have stated that they have systems in place to seek out these services via outside consultants or on a case- by-case basis. The largest are UConn and Yale. At UConn Technology Commercialization Services (TCS) has successfully launched over 50 companies. As part of the Office of the Vice President for Research, TCS works closely with internal and external stakeholders, and maintains a particularly close affiliation with the UConn School of Business, Center for Entrepreneurship and Innovation (CCEI) to operate Accelerate UConn, the UConn NSF I-Corps Site. TCS currently provides services for entrepreneurial training, intellectual property protection, technology licensing, mentorship, business startup, technology incubation, and connections to the investment community. UCONN's SPARK Proof of Concept Program (Supporting Innovative Translational Research and Pathways to Commercialization) is a two-phase proposal process with $400,000 of available funding.

At Yale, the Office of Cooperative Research is responsible for managing their portfolio of intellectual property covering over twelve areas including biotechnology, medical devices, medial diagnostics, photonics and microsystems, energy and the environment, information technology, nanotechnology, therapeutics and biological tools like mice models and cell lines. There are currently fifty new bioscience related ventures and 41 products in the pharmaceutical pipeline including six that have gone to market for HIV/AIDS, Hepatitis B, Cancer, Lyme Disease and ADHD. They offer consulting and support for scientific discoveries and inventions, and connects researchers with industry partners such as Johnson & Johnson and GSK. The OCR also manages the Yale Entrepreneurial Center (YEI) and the Blavatnik Fund for Innovation at Yale, which bridges the gap between "innovative, early-stage life science research and successful development of high-impact biomedical products."

The smaller scale of research at other institutions makes it more difficult to support commercialization infrastructure elsewhere in the state. Five other universities have IP Policies, and support discoveries with ad hoc services using outside consultants.

Examples of Multi-University Consortia:

Georgia Research Alliance GRA is a nonprofit organization that works with the Georgia's Department of Economic Development and universities to seed and shape startup companies that come out of university research. Partners include The University of Georgia, Augusta University, Emory University, Clark Atlanta University, Georgia Institute of Technology, Georgia State University, Mercer University, and Morehouse School of Medicine.

Ohio Research Network. The Ohio Federal Research Network leverages the strength of ten world-class public and private research universities, industry, and four federal labs to help revitalize the state's economy for the 21st century.

ICorps Nodes. Unlike ICorps Sites, Nodes are multi-university consortia that support regional needs for innovation education, infrastructure, and research. Both sites and nodes are part of the NSF National innovation Network, created in partnership with VentureWell. Regional Nodes are found in Massachusetts (MIT, National Collegiate Inventors and Innovators Alliance), and New York (CUNY, Cornell)

Southern Tier Startup Alliance. The Southern Tier Startup Alliance is a consortium of university, state and business incubators in southern New York with the purpose to support growing companies in the region. The incubators partners include Cornell University and Binghampton University, Rev in Ithaca, Corning Ceramics Corridor Innovation Centers, Ithaca Start-up Works, and The Center.

Virginia Innovation Partnership. Funded as part of the U.S. Department of Commerce's i6 Challenge in 2012, the Virginia Innovation Partnership brings together 17 universities and community colleges with corporations, investment capital and other resources. The partnership has a yearly goal of funding 20 projects at the $40,000–$80,000 level, or about $800,000 a year.

Ben Franklin Technology Partners. Ben Franklin Technology Partners seeds innovation and economic growth in the Greater Philadelphia region. They have invested $170M and have launched over 1,750 companies and created 3,900 jobs since 2001. Partners include 29 regional university partners.

C. GOALS

1. Establish Collaboration & Partnerships

Building a robust ecosystem for entrepreneurship and innovation in Connecticut requires cooperation and collaboration among the State's institutions of higher education. Partnerships provide a powerful mechanism for tapping into existing assets and scaling up limited resources. They also empower a shared sense of purpose, and create a stronger community of students, faculty, researchers, and administration.

Criteria

- A minimum of two higher education applicants per proposal, preferably one public and one private;
- Partnering with non-higher education organizations involved in local, regional, or state-wide entrepreneurship and innovation;
- Creating regional or state-wide programs or initiatives that support all institutions of higher education or a significant subset with aligned interests; or
- Expanding leadership and peer networks to promote state-wide cooperation and collaboration

2. Engage in the 21st Century Economy

Higher Education institutions are a major economic force in Connecticut, providing jobs and services as well as serving as the wellspring of the state's workforce. Today, like every economic sector, Higher Education faces disruptions and challenge due to global economic trends, national policies, and technological innovation. By 2020, 70% of jobs in the state will require post-secondary degrees, and those jobs need new skills to compete in the 21st century economy. The states' fastest growing industries such as healthcare/bioscience and digital media, as

well as crucial "Main Street" businesses - our local, established businesses typically with 50 employers or less - need entrepreneurial skills, and the state's economic success depends on their continued growth.

Criteria

- Encourage student and faculty innovation in growth-oriented industry clusters (identified in the 2016 Connecticut Economic Development Strategic Plan): health/bioscience, insurance and financial services, advanced manufacturing; digital media; and green technology;
- Support the vitality of Connecticut's "Main Street" businesses by catalyzing entrepreneurship skills and mindsets at the 'academy' for the benefit of local and regional communities.

3. Educate an Innovative Workforce

Achieving the dream of opportunity and social mobility in 21st century America means adapting to trends like the growth of STEM jobs (6.2% of all U.S. employment in 2015), and the impact of technological innovation on traditional business models. Preparing students to navigate these challenges requires a culture that fosters entrepreneurial and innovative thinking. The 2015 Strategic Master Plan for Higher Education in Connecticut laid out the essential skills ('educational outcomes') of an innovative workforce: Inquiry and analysis; critical and creative thinking; written and oral communication; quantitative literacy; information literacy; and teamwork and problem solving.

Criteria

- Expand E&I Community of Practice to strengthen knowledge sharing, collective learning, and resources for staff and faculty;
- Increase E&I educational pathways and integrate E&I more broadly across institutions;
- Enhance non-credit learning environments and programs that support budding entrepreneurs;
- Expand local mentor programs that inspire and support the entrepreneurial spirit.

4. Expand 'Development' Infrastructure

Historically, U.S. research universities played a major role in stimulating innovation through basic research while private industry dominated R&D. Applied research development at universities has grown steadily since 1980 (Bayh-Dole Act) and tech transfer is now a major pathway for connecting universities with industry partners. New companies and partnerships that result from university R&D support the local economy and entice students and researchers to live locally. Connecticut, with two R1 universities, 18 of the Fortune 500 companies and a top-five ranked educated workforce in the country, takes advantage of these opportunities. However, capitalizing on the statewide economic potential of research requires additional infrastructure and resources to identify products and promote faculty entrepreneurialism.

Criteria

- Create state-wide faculty/staff resources to encourage knowledge sharing;
- Promote academic cultures of entrepreneurship;
- Expand access to commercialization infrastructure for all academic researchers, including proof of concept support and technology transfer services.

D. Roadmap – Recommended Initiatives

The Working Group prioritized initiatives for funding that build relationships and increase statewide capacity.

Priority 1: Communication & Building Relationships

Working Group members acknowledged that linkages between higher education institutions are uneven and often missing. Inter-institutional relationships must overcome institutions' natural focus on their mission and, despite the small size of the state, entrenched regional cultures and limited public transportation networks. Building stronger peer relationships creates the necessary conditions to encourage new collaborations for capacity building, the second priority of the group.

Face-to-Face Convenings

Members suggested regular, more structured networking and learning platforms for face-to-face peer interactions. These events should capture as many participating institutions as possible to broaden relationships and help build a statewide culture of entrepreneurship. A broader network, in turn, will lead to new ideas for partnerships and opportunities for students and researchers to meet and explore collaborations beyond their respective institutions. Preferred Initiatives include: Formal State Conferences (multi-track); Regional Symposia; and, Thematic Workshops. Examples of best practices include the Ashoka Foundation Exchange, the Global Entrepreneurial Summit, and SXSW.

State-wide 'Portal' for Higher Ed Resources

Although many institutions have created their own institutional portal, there is currently no statewide portal for all higher education E&I assets and programs in the state of Connecticut. The working group agreed that a statewide platform would help foster awareness and collaboration as well as communicate to prospective students, researchers, and companies the breadth of Connecticut's E&I ecosystem. Examples of best practices include the Yale Entrepreneurial Institute, The Connecticut Center for Entrepreneurship and Innovation at UConn, Harvard's iLab, and NYU Entrepreneurship.

Priority 2: Building Capacity through Collaboration

The E&I ecosystem in Connecticut is a network of networks, with extensive institutional programs found around the state. Building capacity through collaboration allows institutions to take advantage of economies of scale and invest in programs or assets that would otherwise be difficult to support or expand separately. Underserved populations gain access to services and resources and new pathways open up to support new business ventures and innovative ideas across the state.

Shared Commercialization Infrastructure

The ability to promote technological innovation at higher institutions is highly dependent on the capacity to demonstrate the commercial potential and market value of a discovery. Successful business plans and commercialization strategies require timely identification of IP, an ability to determine patentability and market opportunity, and access to early funding. Preferred initiatives include:

- Proof of Concept funding that fill gaps between demonstrated research potential and commercialization feasibility;
- Expanded state-wide commercialization infrastructure, including technology transfer services: IP policy training; technology transfer services; state-wide business mentoring opportunities for scientists; partnering events to support formation of commercialization teams and training; and incubator support that promotes access to R&D infrastructure (Core research facilities) statewide

Mentor Programs

Recruiting and maintaining strong mentor networks is invaluable for supporting entrepreneurs and innovators. Higher Education Institutions have the unique capability of tapping into deep alumni networks and industry experts locally, nationally, and internationally. The benefits extend from students and scientists to the university at large, which can benefit from drawing their alumni networks back to campus to work with students or new ventures. Programs range from monthly "coffee with an entrepreneur" events, periodic legal, tax and leadership advice, commitments to incubators/accelerator programs, or one-on-one mentoring. Critical to any mentor program is a carefully crafted system to vet, match and manage mentors to ensure alignment of skills and expectations with startup needs. Preferred Initiatives: Licensing and training for Faculty and Staff; Expanding industry mentor programs to more institutions. Best Practice: MIT Venture Mentor Service, Blackstone Launchpad at NYU, and GRA Ventures.

Regional Hubs

Regional hubs can serve as "one-stop" centers and support a regional "feeder" system. One-stop entrepreneurial centers are physical hubs dedicated to building the E&I community through shared equipment, services and programming and the happenstance of opportunity that occurs when you have a dense hub of like-minded people. In additional to leveraging limited funding at separate institutions, shared facilities can help students and researchers engage with the community beyond campus, encouraging them to explore and stay after graduation. Regional Hubs can function as part of a statewide "feeder system". After students and researchers with business plans grow beyond the services offered at their respective institutions, regional and state hubs offer advanced venture support services and can connect them to other state and national networks.

One-stop center ideas include: Regional or joint makerspaces; joint hubs with non-academic organization partners, Programs that connect the local community to students and services (e.g. high school students); programs that encourage interaction through experiential learning and problem solving. "Feeder" hubs include venture support services such as: fellowship programs, incubators, and accelerators.

Innovation Education to Attract/Retain Students

By being more entrepreneurial in their academic and administrative practices, universities can help students become independent and innovative risk-takers. The more comprehensively students encounter entrepreneurial concepts and behaviors in their college experience, the more likely they are to assimilate them. A more explicit educational focus on innovation and its implementation—in ways that respect the integrity of the varied academic disciplines—would help encourage university faculty and academic departments to adopt, apply, and assess methods of teaching and learning that foster creativity and originality. Best practices include:

- Baldwin Wallace Center for Innovation and Growth (KCI)
- Purdue University Burton D. Morgan Entrepreneurship Center
- Oberlin College Creativity and Leadership (KCI)
- Lean Launchpad (VentureWell)

Peer Knowledge Sharing

A key driver of capacity development is knowledge sharing. There is incredible diversity and knowledge embedded at institutions across the state, but limited means for sharing best practices or resources to help educators learn how to integrate E&I into their curriculum, their departments, or across their campuses. Opportunities to attend educate-the-educator conferences and training, as well increasing peer-to-peer interactions will help sustain and build upon the new collaborations or partnerships. Educate-the-Educator best practices include: Babson College Hub for Entrepreneurship

E. Measuring Impact

Metrics –How Can we measure impact?

RFP recommended evaluation criteria

Post-April 11 Meeting

F. Unexpected Outcomes

Sustaining Leadership Momentum

The first meeting of the Working Group was, rather inadvertently, an historic moment: the first remembered meeting of Connecticut's Higher Education Presidents all in one room. Immediately remarked upon with a note of surprise, by the end of the meeting the surprise had been replaced with conviction; the value of sustaining regular leadership convenings was clear. Together, Higher Education Institutions are educators, employers, and community partners and have a large impact on the continued vitality of the state's economy and communities – and vice versa. Although Ad hoc face-to-face meetings are valuable and should continue, the attendees agreed that some type of annual 'Presidents Council' should be created to discuss strategic issues impacting higher education across the state.

Administrative E&I Leadership Infrastructure

Another outcome of the planning process was a general recognition by stakeholders that a 3-tier leadership coalition is required: students, faculty, *and* university leaderships/administrators. An administrative network can champion E&I with campus and community leadership, support faculty and staff efforts to integrate E&I across campuses, and sustain the momentum of new partnerships and collaborations. It was further agreed that key administrators engaged in I&E should directly participate in occasional statewide meetings to track progress and discuss new opportunities in regard to E&I.

Developing a Culture of Entrepreneurism

Throughout the planning process the value of an "entrepreneurial culture" was raised repeatedly. The consensus was that despite an ecosystem with extensive resources and services, Connecticut is a state of regions, and lacks an "culture of entrepreneurism" – innovation as a core element of the Connecticut 'identity' is missing. This roadmap is one of many ways that state leadership can demonstrate that entrepreneurism is a core value of Connecticut's citizens. However, partnerships and collaboration are a necessary but not sufficient requirement to develop a stronger culture of entrepreneurism. Stakeholders identified a couple of next steps beyond the grants-in-aid initiatives that would contribute to a stronger state-wide culture of entrepreneurism and innovation.

- CT Innovations/CTNext: Expanding collaboration with, and support for, higher education institutions; to increase their actual and perceived integration in the broader state E&I ecosystem. This could take the form of dedicated staff and/or support for a higher education-led coalition;
- Storytelling and promotion: Creation of a broad communications strategy that raises Connecticut's profile as an entrepreneurial and innovative state with its citizens, as well as nationally and globally. Great storytelling creates a shared sense of purpose and identity.

F. Conclusion

Post-April 11 meeting

Appendix

State Inventory by Institution

Albertus Magnus College
New Haven

Interested students at Albertus Magnus College can find support services at the Center for Teaching and Learning Excellence as well as a variety of mentor and internship opportunities through their Career Services Department. Wayne Gineo currently serves as their Entrepreneur in residence. Recent campus events included an Experimental Learning Day where students were able to network with alumni and faculty as well show off their different projects. Albertus Magnus College offers a BS in Management with an Entrepreneurship Concentration. They have various course offerings that focus on the management and the development of small business. Students also have the opportunity to join the student run Business Club.

Asnuntuck Community College
Enfield

ACC's Business Administration department has established a partnership with the CT Small Business Association to offer no cost seminars and a few credit free classes for local small business owners. ACC also works with local manufacturers to pair students up with these businesses for on the job training. ACC hosts an event series called Career Chats with Cat where students can network and hear about ways to improve their business skills. In the past, the Advanced Manufacturing department has worked with local businesses to create aerospace parts which eventually led to the department purchasing additional equipment to generate revenue for product creation. Students are given access to use this equipment during their coursework. Internships can be obtained through the Career Services Center. ACC offers an Entrepreneur Certificate and a Business Administration A.S. Degree.

Capital Community College
Hartford

Students at CCC have the opportunity to get involved with the Hartford Heritage Project which partners with local businesses and projects in the surrounding area. CCC has a partnership with Guardian Insurance and has the FIRST Center (Financial Independence to Reach Success and Transformation) that provides financial education, coaching, information and referral services, as well internships to low and moderate income individuals. Students get hands on experience and can seek mentors through this project as well as at the Advising Center or Career Services. Students at CCC can obtain an Associate's Degree in Management with an option to complete an Entrepreneurship Concentration.

Central Connecticut State University
New Britain

CCSU's Institute for Technology and Business Development, located in downtown New Britain, serves as the campus incubator center and provides support services to the community and students. Faculty in the Entrepreneur-in-Residence program, specifically Mike Nicastro (EIR), can also provide guidance and connections to resources, both internally and externally for all curious students. Students at CCSU have the opportunity to participate in the annual Shipman & Goodwin Elevator Pitch Contest. This event challenges students to come up with a pitch for a business and deliver it in a short period of time with no visual aids to a panel of judges. CCSU recently offered an intensive for-credit Entrepreneurship Program course during the summer of 2016. CCSU provides cash prizes and in-kind services to students starting businesses through an internal business plan competition but students also have the opportunity to participate in the statewide Connecticut Collegiate Business Plan Competition, offered in partnership with the Connecticut Consortium of Entrepreneurial Educators. Students also have the option to join the Entrepreneur Club.

CCSU offers a Management – Entrepreneurship Concentration Bachelor's Degree through the School of Business. Students complete specific Entrepreneurship courses that focus on the management of small business. Resources to develop business plans are available through the School of Business Service Center and all students can seek internships as well as mentors through the institution's Leadership Development Program.

Charter Oak State College
New Britain

Charter Oak State College offers an online Bachelor's Degree in Business Administration with a Small Business Concentration. Being an online college, students have the opportunity to be instructed by a variety of professors with real world business experience. Charter Oak has launched products such as eTutoring.org and ePortfolio that were designed, produced, and marketed by the school. They have also created and sold both versions of the eTutoring software and versions of a Learning Management system for an online K-12 high school. Career advancement services are managed through the College Unbound Program as well the Career Services. Students can network at the various fundraising events hosted throughout the year or join the Student Association.

Connecticut College
New London

Connecticut College offers extensive opportunities and resources for students interested in starting their own businesses. At the institution's Holleran Center for Community Action and Public Policy students can find a variety of resources to develop their social entrepreneurship ideas as well as attend hosted events. The campus also has LaunchPad, a daylong event about entrepreneurship, innovation, and socially impactful design. Students can join the Launch Club Organization if they are interested in meeting with likeminded entrepreneurs. Conn. College has a fully funded summer internship program where students can get hands on job experience with a variety of different organizations and businesses. Conn. College manages an extensive network of Alumni Entrepreneurs and provides opportunities for students to interact with these former students. Obtaining an Economics Degree will give students the skill set to analyze how markets function.

Eastern Connecticut State University
Willimantic

ESCU partners with various state entrepreneurial organizations and has a campus Entrepreneur Club. ECSU has the Center for Community Engagement where students can connect with their local community through volunteer services as well as meet local business owners. The institution also provides key faculty in various disciplines to serve as mentors both inside and outside of the business school to help develop entrepreneurial concepts. The Business department and Career Services Department has a program that connects students and business mentors together on and off campus as well as hosts various lectures and events throughout the year.

ECSU has an active collaboration with the Northeast CT Economic Alliance and houses their offices on campus. The institution collaborates with the Alliance in many different ways and with the local chamber of commerce and business as well. The Northeast CT Economic Alliance, Inc. is a regional non-profit 501(c)3 economic development corporation that uniquely serves small businesses in northeast Connecticut by providing loans to new and existing businesses primarily unable to obtain funding from traditional lending sources. ECSU also provides loans and business development resources to both start-up and exiting businesses in the 21-town region of Northeast Connecticut. Eastern hosts a campus work hub of a major insurance company that provides their students with paid jobs and valuable business experience. The Business department hosts various lectures and events throughout the year that students can also attend. These lectures can help students develop their skills and the opportunity to learn from the local business community.

ECSU is grounded in a liberal arts experience and seeks to offer students a variety of learning experiences in the hopes that they think independently. They believe their approach to education fosters entrepreneurial spirit. They created the Liberal Arts Work program which further provides students with work experiences. ECSU's Center for Internships and Career Development also offers students the opportunity to complete internships as well as a chance to work with the established Co-ops and campus partners. ECSU offers a Bachelor's Degree in Business Administration and students in their third and fourth years can take advanced courses such as Business Concepts and Entrepreneurial Applications.

Fairfield University
Fairfield

Fairfield University's annual Startup Program is a year long program of events and lectures designed to foster young entrepreneurial talent at the University through engagement with mentors and investors drawn from alumni and local business communities. Fairfield's Startup Program offers support services for up to 5-6 student run ventures per year. The program culminates each year with the StartUp Showcase where students negotiate live with investors for seed money to start their businesses. Various events include a pitch contest, a business plan competition and the opportunity for students to meet and network. Fairfield also has a Business Education Simulation and Trading Classroom that gives students the opportunity to interact with the business world through a variety of software programs.

Fairfield University Entrepreneurship Laboratories (FUEL), housed on campus, is a co-working and accelerator program serving Fairfield University and Town of Fairfield communities. Since its founding in 2013, FUEL has been home to over a dozen small companies. Current companies in residence are Cometa Works, Crowdflik, and eSolutionsOne. FUEL also offers office space and mentoring to Fairfield StartUp companies in the FUEL Summer Fellows program. FUEL has generated 10 full-time jobs, $500K in investment, 14 partnerships, and over 20 student internships to date. Fairfield has heavily developed Technology Transfer systems that has helped faculty to further patent and develop their concepts. Fairfield has deeply engrained themselves into their local community by working with the local police department, bookstore and local chamber of commerce creating a symbiotic relationship with their host town. FUEL's openness to serve both the local community and the campus community has been critical to its success.

Students can obtain internships through the Professional Development Program as well as seek out mentors at the School of Business. Students can interact with their like-minded peers in the Entrepreneurship Club. The Dolan School also helps provide internships for students and encourages each student to complete at least one during their undergraduate studies. Curious future entrepreneurs can pursue a Management Bachelor's Degree with a Minor/Concentration in Entrepreneurship at the Charles F. Dolan School of Business. A variety of management courses are offered including Managing a Family Business and Technology Ventures.

Gateway Community College
New Haven

Gateway Community College works in collaboration with the New Haven SCORE network. SCORE provides a variety of resources to get individual concepts off the ground. Through this collaboration students can be assigned mentors in the local business community as well attend a variety of different events. The GREAT Center, Gateway Community College's Resource, Education and Training Center, offers fast-paced training in high-growth occupations and builds customized programs to suit the scheduling, budget and

professional development needs of local business. This center streamlines certain training services that are essential to running a business and Gateway's Small Business Center Workshops are offered all year long through New Haven SCORE. Examples of workshops include Business Planning, CT Tax Regulations, Insurance, Legal Considerations, Financing, Marketing, Bookkeeping and Websites. Both the SCORE program and Gateway's Leadership Development Program offer students opportunities to develop their concepts. Students can also attend SCORE Pre-Business Workshops as well as leverage their many existing partnerships including Veteran Association Vet Biz, SBA, Women Entrepreneurs, the City of New Haven and Yale University Computer Science Department.

Both the SCORE program and Gateway's Leadership Development Program offer students opportunities to develop their concepts. Students can also attend SCORE Pre-Business Workshops as well as join the Students in Free Enterprise organization on campus. They can also utilize the Small Business Center where they can network and find resources for developing their various concepts. Gateway offers an Associate's Degree in Entrepreneurial Studies. Students can expect to take a variety of business and management courses intended to provide the skills needed to run a small business.

Goodwin College
East Hartford

Goodwin College offers an Entrepreneurship Program through their Business Administration Bachelor's degree. They offer specific entrepreneurship courses that will help students gain the skills needed to manage a small business. Recently they hosted the CT Invention Convention as well as a Startup Weekend: Education. An example of the collaboration that occurred during the startup weekend was when a group of students developed an online tool to help with studying in the digital age. Goodwin is also involved with the CT Manufacturing Advisory Council. Students can find a variety of resources as well as seek out an internships and mentors at the Career Services Office. Goodwin also has a WAVE Club (Women Achieving Voices of Empowerment) that can help female students with finding mentors and networking opportunities.

Housatonic Community College
Bridgeport

Housatonic offers two programs which include a Business Administration - Small Business Management/Entrepreneurship Option (Certificate also available) and an Accounting - Small Business Option Associates Degree. Students can join the student run Business Club as well as participate in the annual Elevator Pitch Contest. Students looking to develop their skills can access internship opportunities at Career Services or participate in the Experimental Learning Program.

Manchester Community College
Manchester

Students can access a variety of networking events and workshops managed by the Viscogliosi Entrepreneurship Center. The Viscogliosi Entrepreneurship Center provides entrepreneurs and small business owners with opportunities to explore and develop their passion and vision, and hopes to create responsible leadership and viable businesses through innovative and informative educational and networking programs. Students can also participate in the Voluntary Action Program where they can connect with the local community as well as community organizers and businesses. Students at MCC have access a variety of networking events and workshops at available at the Academic Support Center. MCC also participates in the CONNTAC program which can offer students additional career planning and mentorship opportunities. MCC offers a Business Administration Entrepreneurship Option A.S. as well as an Entrepreneurship/Small Business Certificate. Internships are managed by Career Services.

Middlesex Community College
Middletown

Students at Middlesex can pursue an Entrepreneurship Certificate Program or a Business Administration A.S. Degree at Middlesex Community College. Their certificate program has been sanctioned by the United States Small Business Association and offers a combination of liberal arts skills and practical business management skills. MXCC lead marketing professor engages her classes in several marketing/fundraising events each semester, giving them the opportunity to learn about acquiring startup funding and resource gathering. MXCC is also currently involved with the Innovation Places program and has representation on both the Middlesex and MidState Chambers of Commerce Resources are available for career development through the Self-Paced Career and Education Planning Tool program. Students also have the opportunity to get hands on experience at the Center for Civic Engagement. The center will provide the opportunity to work closely with the local community. MXCC also participates in the CT Make a Difference Week which offers students further chances to connect with their community. Internships can be obtained through the Career Development and Counseling Center.

Mitchell College
New London

Mitchell offers a Business Administration Entrepreneurship Concentration Bachelor's degree. Student will take a variety of business specific courses geared towards managing and operating a small business. Mitchell offers students various resources through the Integrative Career Development Office which partners with leading Southeastern Connecticut organizations to enhance its academic programs and increase pathways to professional employment for students. Students can become members of The National Society of Leadership and Success where further networking can occur.

Naugatuck Valley Community College
Waterbury

NVCC has recently outlined a new strategic plan for the next 10 years that aims to further develop innovation focused programing on campus. NVCC plans to expand seed funding for staff/faculty initiatives as well as other programing that supports innovation on campus.

NVCC is also working closely with area partners on a variety of initiatives. President De Filippis is currently serving as an advisor to the city of Waterbury on their "Waterbury Innovates Now" Innovation Places Grant from CT Next. President De Filippis is also a member of the Connecticut Technical High School System Board and works closely with Superintendent Nivea Torres and the technical high schools in the region to share space and ideas about partnerships. As is the case with many other Community Colleges in the state NVCC has a robust manufacturing program that is deeply connected to the local business community. Many students have received the opportunity to get involved with their local business community through these partnerships. The school is also helping to create a pipeline of workers to support these local ventures.

NVCC currently hosts a lecture series called Campus Conversations where students can connect with a variety of people. Students can join the Accounting, Legal, and Finance Club where they can meet likeminded peers. Job placement and internship services are handled by The Center for Job Placement and College Opportunities. NVCC offers an Associate's Degree and a Certificate in Business Management. Students can join the Alpha Beta Gamma Business Honors Association where networking and additional services can be accessed. Additional support services can be found at the Center for Academic Planning & Student Success. Job placement and internship services are handled by The Center for Job Placement and College Opportunities.

Northwestern Connecticut Community College
Winsted

In the fall of 2017 NCCC intends to start a new Entrepreneurial Studies program. Students will be able seek out resources at their new Entrepreneurial Center of Northwest Connecticut and at the NCCC Center for Workforce Development which is slated to open in Spring 2017. Programing at the center will include a summer boot camp as well as support services for students who choose to participate in various state competitions such as the New Venture Challenge. The NCCC advisory board for the Entrepreneurial Center of Northwest Connecticut has been meeting since the summer of 2016 to develop vibrant and connected network of entrepreneurs throughout Northwest CT. The strategic goal is to connect established and new entrepreneurs to the NCCC Center for Workforce Development and provide business development support, education and training to students and the community. Advisers include entrepreneurs, municipal governments, financial institutions, SCORE and the NWCT Chamber of Commerce. NCCC supports the ongoing efforts of the Northwest Connecticut Manufacturers' Coalition as well as other organizations and individuals that are considered to be key stakeholders in the area. Northwestern offers a Business & Management Associate's Degree and the courses are taught by professors with real world small business experience. Students can seek out resources at The Center for Student Development. Career Services handles the bulk of internship placement as well as any additional services a student may need to help get their concept moving forward.

Norwalk Community College
Norwalk

Norwalk has a Business Administration Degree that is geared towards a student who intends to transfer to a four year institution as well as an Entrepreneurial Studies Certificate. Norwalk hosts a variety of alumni-student networking events which give students opportunities to make connections with business owners and the local community. They offer every student the Start2Finish program which can set up students with mentors as well as focuses on the skills needed to pursue their future career plans. Interested students can join the Accounting Club and find internship opportunities through the Department of Counseling.

Quinebaug Valley Community College
Danielson

Many QVCC faculty members participate in a "Makers' Space" event at Woodstock Academy each year. As is the case with many other Connecticut Community Colleges, QVCC has stated that they believe the Advanced Manufacturing Technology Program will be the most logical way for their students to hatch entrepreneurial ideas. They have established The Eastern Connecticut Advanced Manufacturing Technology Center as a central hub for innovation and design. The Center includes a machine lab, mechatronics and metrology lab, classroom, conference space and offices and offers training to both the students and local manufactures. Students at QVCC can pursue an Associate of Science in Business Administration: Management. They will take a variety of business courses such as BUS 218 Entrepreneurship which is intended to help teach the skills needed to open a small business. All internships and mentor services are managed by Career Services.

Quinnipiac University
Hamden

Quinnipiac University offers students an on campus incubator, Quinnipiac Center for Innovation and Entrepreneurship. Through several resources and programs for students, faculty, and alumni, the center aims to help turn ideas into viable business solutions. Quinnipiac offers curious future entrepreneurs multiple opportunities to compete both on campus and in national entrepreneurial competitions. QU's entrepreneurial culture embraces multiple disciplines as the university has supported ventures outside the business school including viable products created in both the Engineering and Medical schools. Examples of concepts and products supported include a diagnosis system for pancreatic cancer, cervical incontinent product, a Cryogenic cell prep device and a Game to help young women chose birth control methods. An undergrad at QU even recently won the EO: Connecticut Business Competition and will represent the state at the nationals in Kansas City later this year.

Students at Quinnipiac University can pursue a Bachelor's Degree in Entrepreneurship and Small Business Management at the Lender School of Business. QU offers specific Entrepreneurship courses such as Business Plan Competition and Business Plan Creation. The university employs a number of staff who either currently or formally ran their own businesses. Quinnipiac also has a variety of student run clubs and organizations and a dedicated Career Services Department in the School Of Business.

Sacred Heart University
Fairfield

SHU's Jack Welch Business School offers a variety of hands-on learning opportunities for students including the WCOB Innovation Center's Problem-Based Learning Lab. The Innovation Center was created to help establish connections between the local business community and give students an opportunity to network within these collaborations. SHU also offers students the opportunity to help manage the on-campus SHU Creamery, an ice cream bar and dairy. Recently SHU acquired the former headquarters of GE and has plans to create an innovation campus that will focus on developing new technology, expanding STEM field studies, and partnering with local health care providers.

The bulk of entrepreneurial focused activity and events are managed at the Jack Welsh Business School. SHU also funds student-run businesses through the Welch Experience Program, where support is offered to students through the business creation process. Currently they have six businesses under their umbrella, with applications in review for two more. The Peak - Ice Cream shop and student lounge, Nantucket Buckets - Clothing and beach apparel Twin Tides, Clothing Sonus, Digital Music Remastering Software, Madely Clean - Residential Cleaning Service, and Agora Bookshelf are examples of ventures supported by the institution.

An example of programing that introduces students to entrepreneurship early is the BU 121 Intro to Business course offered each semester. During the semester 9 -10 sections of the course that run at once and each section has five teams that must compete with each other to be chosen as the finalist for that section. The 9 - 10 finalists compete in a business plan presentation where they get to present their concepts to local investors/entrepreneurs. The remaining 36-40 teams all create posters and compete in a poster session competition, where winners are chosen. SHU has multiple outlets that serve as incubator centers that offer students the opportunity to develop ideas. Along with the Welsh Experience they even recently got involved the Chrome Cherry an international business incubator with a local office where students can intern and work with real world business owners. SHU even recently became involved in a media promotion collaborative with the town of Fairfield to help attract businesses to the Fairfield area.

Students also have the option to join the Entrepreneurship Club and must complete an internship as a core requirement for graduating from this program. SHU manages a network of alumni entrepreneurs that students can interact with and network. SHU offers a Small Business Management and Entrepreneurship Minor for declared Business major students.

Southern Connecticut State University
New Haven

The Business Success Center as well as a new center in development through School of Graduate Studies are examples of where students can seek out support services to develop entrepreneurial concepts. SCSU also offers a Professional Development Series specifically designed for business students. The series can help students find mentors and partner with local businesses. Students are also encouraged utilize the Business Advisory Council for additional resources on concept development. SCSU has an established close relationship with Mike Roer of the Entrepreneurship Foundation who has helped consult on the development of some of their entrepreneurship initiatives. The Business School regularly hosts events including networking and lectures. Students at SCSU have the opportunity to also participate in the Connecticut Venture Capital Investment Competition and there are a variety of student run organizations including the Accounting Society, American Marketing Association, Business School Student Ambassadors, Delta Mu Delta, and Finance Trading Team to join. Students can seek out internships with local businesses at the Internship Job Board located at Career Services in the School of Business. SCSU offers a B.S. in Business Administration at the School of Business. Students can choose from a variety of concentrations including courses specifically geared towards the management of small business.

St. Vincent's College
Bridgeport

SVC is a nursing school and offers programing for those students who may want to pursue the business end of the medical profession with its Healthcare Management (online) Certificate. Course work focuses on the management of various health care services and offices. Students also have access to a skills laboratory as well as a Career Service Department that can help students obtain internships in this field. SVC offers a variety of Career Development Workshops as well as an extensive network of internship sites for undergraduates.

Three Rivers Community College
Norwich

Three Rivers offers a Certificate and an Associate's Degree in Business Administration with a Small Business and Entrepreneurial Studies concentration. Students can access various resources at the school's Advising and Counseling Services Center. The school's Service Learning Center gives students the opportunity to interact with the community through a variety non-traditional academic assignments and independent studies. Students also can

join the student run Business Club where they can participate in campus events. Internships and mentors can be sought out at the school's dedicated Career Services Center.

Trinity College
Hartford

Trinity has many resources to connect students with the Hartford community including a new downtown space in Hartford that will accommodate entrepreneurship programing. The space will be co-located within Trinity's planned new Liberal Arts Action Lab. The Community Learning Initiative and the Center for Global and Urban Studies are further examples of how students have the opportunity to work both inside and outside the classroom with active projects in the surrounding area Hartford area. The Investment Club at Trinity College offers students the opportunity to work with a real investment fund and experience the impact of investing in various real world companies. Trinity has also hosted a campus wide Entrepreneurship Contest (2014) facilitated by the Career Services Department. Students had the opportunity to submit their ideas and compete for a cash prize during this competition. Recently Trinity got involved with Hartford's Innovation Places, a program that seeks to create hubs where people can seek out the resources and space to open their own businesses. Trinity hasan established minor in Formal Organizations with a track in Entrepreneurship. Trinity's Career Services department can help students obtain internships as well as help connect with mentors.

Tunxis Community College
Farmington

Tunxis Community College

Education That Works For a Lifetime

Students at Tunxis have access to a variety of resources through the Business Administration Department Advisory Committee, a group of professors assigned to provide resources for student growth. TXCC also has a mandatory Eportfolio Program and a Center where students can create the online portfolio. The portfolio program can also be used to pitch ideas to potential employers and investors. The student run Business Club serves as an incubator center for students to interact with the local business community. The Club manages a variety of events throughout the year both on and off campus. TXCC also offers a Job Shadowing/Mentorship Program so students can get real world experience before graduating. Internships are available through the Business Administration Office. TXCC offers a Business Associates Degree for students looking for the skills to manage a small business.

University of Bridgeport
Bridgeport

The University of Bridgeport's Student Entrepreneur Center (SEC) at The Ernest C. Trefz School of Business is open to all matriculated University of Bridgeport students and aims to accelerate the successful development of start-ups. The same center also houses the CTech IncUBator which functions as one of Fairfield County's only university run high-tech incubator center. The SEC helps students accelerate their vision and connects them with mentors and local business owners. The Mission of the Center is to produce successful businesses by providing student entrepreneurs with an array of targeted resources and services. UB also hosts the Ubusiness Plan event which has a variety of events that help student entrepreneurs develop their ideas. UB has also been actively participating in the New Venture Challenge since its inception. Students can join the Business Club and internships and mentors can be found while completing Bridgeport's 4-Year Career Development Plan. UB offers two different undergraduate degrees; Management & Industrial Relations (B.S.) (Manufacturing Entrepreneur), Business Administration (A.A. & B.S.).

University of Connecticut
Storrs

The University of Connecticut offers students a wide array of Entrepreneurial Programs and Innovation Services. For example:

- Technology Commercialization Services is the University of Connecticut's technology transfer enterprise and has successfully launched over 50 companies. As part of the Office of the Vice President for Research, TCS works closely with internal and external stakeholders, and maintains a particularly close affiliation with the UConn School of Business, Center for Entrepreneurship and Innovation (CCEI) to jointly operate Accelerate UConn, the UConn NSF I-Corps Site. TCS and its network collaborate to support technology transfer and venture development based on student and faculty innovations. TCS currently provides services for entrepreneurial training, intellectual property protection, technology licensing, mentorship, business startup, technology incubation, and connections to the investment community. As one of the State's centers of entrepreneurship, TCS provides these resources to external stakeholders as well.
- Technology Incubation Program (TIP) is a part of TCS, and offers incubator facilities at three locations across the State: Storrs, Farmington, and Avery Point. TIP offers technically-based start-up companies access to a unique range of unparalleled resources, including: Incubator facilities featuring wet labs and access to instrumentation; the opportunity to collaborate with scientific experts; Technically trained student interns, employees, and graduates; the University of Connecticut's world-class library resources; Customized business education events, planning assistance, and mentoring.

- Connecticut Center for Entrepreneurship and Innovation (CCEI) helps students and faculty become successful entrepreneurs. CCEI has a number of programs aimed at achieving this purpose:
    - Accelerate UCONN is UConn's National Science Foundation Innovation Corps (I-Corps) Site, with a $300,000, 3-year grant awarded in February 2015 to help catalyze entrepreneurial teams whose technology concepts are likely candidates for commercialization. Educational programs share the principles of the I-Corps Curriculum on Lean Launchpad methodology. With the support of Accelerate UConn, teams will learn first-hand about entrepreneurship and explore the transition of their ideas, devices, processes, or other intellectual activities to the marketplace. This is a partnership between Technology Commercialization Services within the Office of the Vice President for Research and the Connecticut Center for Entrepreneurship and Innovation.
    - Biomedical Entrepreneurship Initiative allows for graduate students from medicine, engineering, bioscience, nursing, pharmacy, and management take a class to develop entrepreneurial skills, forming teams to launch biomedical companies. This was founded by CCEI Faculty Director, Professor Tim Folta, who was also Founding Director of BIOMEDSHIP, a partnership with Purdue's Weldon School of Biomedical Engineering and Indiana University's School of Medicine to train graduate students around "BIOMEDical entrepreneurship."
    - Summer Fellowship Program awards $15,000 summer grants for teams to move their businesses forward, along with providing access to professional services and Lean Launchpad training.
    - Innovation Accelerator: Students from different disciplines are placed in teams and assigned a real problem to tackle for a local start-up.
    - VERGE Consulting Program: Graduate students work within CCEI to help UConn related start-ups overcome the hurdles of entrepreneurship. This is a partnership with the Small Business Development Center
- Other UConn programs include:
    - The Entrepreneurship Bootcamp for Veterans with Disabilities
    - Family Business Program
    - Project Mentors
    - SPARK Proof of Concept Program (Supporting Innovative Translational Research and Pathways to Commercialization) A two phase proposal process and $400,000 of available funding
    - University Prototype Fund which it will use to fund the commercially viable technology developed by student and faculty.
- UCONN also hosted events that foster entrepreneurial spirit such as the Connecticut's Conference for Women in Innovation, Technology and Entrepreneurship and the Wolff New Venture Competition. Students have the ability to join various student organizations including International Business Society, Student Entrepreneurial Organization and Women in Business.

UCONN offers a Bachelor's Degree in Management with an Entrepreneurship Concentration at the dedicated School of Business. Students completing the Entrepreneurship Concentration have the opportunity to enroll in specific courses that focus on the unique skills needed to manage a small business. UCONN has a full staff of dedicated professors with a variety of backgrounds in many aspects of business.

University of Hartford
Hartford

Students at the University of Hartford have access to a variety of resources including the Entrepreneurial Center that has been in operation for over 30 years. The Student Resource Center and The Women's Business Center are two more locations where students can seek out support services. UHART has hosted the Successful Creative Entrepreneur Program and InnovateHER Business Challenge. Both events offer students opportunities to compete for various prizes and interact with nationally recognized entrepreneurs. UHART's Career Ready Program hosts various networking and campus events dedicated towards developing small businesses as well. Recently UHART committed to serving as an anchor partner in the Innovation Places Program along with Trinity, Goodwin and UCONN showing its commitment to collaboration in the city of Hartford.

UHART has successfully funded startups and products. In the last year they funded three patents in as well as set up a patented Rehab Walk Assist System at the Rehab Department at Montefiore Hospital in Bronx, NY. This system was designed on campus by faculty and students and is considered commercially viable. UHART encourages all disciplines, not just business school students, to think like entrepreneurs. An example of programming outside the traditional business school is the four year design sequence in the engineering college. The program challenges students to develop a concept fit for commercialization during their undergraduate studies.

Internships are managed through a dedicated Career Services at the School of Business and students can join many clubs and organizations including The Young Entrepreneurs Society and The Innovators Group. Students at UHART can complete an Entrepreneurial Studies Bachelor's Degree at the Barney School of Business. UHART staffs a diverse faculty who specialize in Management. Some unique entrepreneurship focused courses include Small Business Finance, Seminar in Entrepreneurship, and their mandatory Internship.

University of New Haven
West Haven

University of New Haven hosts an annual Charger Startup Weekend where students from UNH as well as other institutions compete for prizes as well as attend lectures and workshops dedicated towards small business development. University of New Haven's The Center for Family Business offers students the opportunity to network with local business owners as well as access resources unique to running a small business. Students also have access to an on campus makerspace. The institution blends disciplines with their Entreprenuership and Innovation program that is a co-curricular program offered by the School of Business and Engineering. Interested students may also join the Kern Entrepreneurial Engineering Network (KEEN) which seeks to foster an

entrepreneurial mindset in engineering students. Students can access additional career development services at the Professional Enrichment Program in Career Services. The program offers students the ability to connect with mentors earn internships as well as handle real world problems alongside local business owners

Recently UNH established a new cutting-edge academic building specifically created for the purpose setting up new science classrooms, communications studios, advanced "smart" classrooms, an atrium/café, and space for multidisciplinary student and faculty collaboration. Starting in 2016 UNH has committed to expanding programing and creating a new vision for their Entrepreneurship and Innovation Department. University of New Haven offers a Business Administration Bachelor's Degree – Entrepreneurship Minor at The College of Business but is currently in the process of reworking the entire major under the newly established department vision. Students can expect to take courses such as Sustainable Entrepreneurship and New Venture Management and Growth.

University of Saint Joseph
West Hartford

At USJ students can pursue a Bachelor's Degree in Business Management. Students will take a variety of Management classes along with the core curriculum. All senior management students are required to complete an internship that is facilitated through the Career Services department. USJ also has an Accounting and Business Society student run organization. Every year the school also awards one alumni of the program with The Business and Entrepreneurial Award. The event allows students the opportunity to network with entrepreneurs and business owners.

Wesleyan University
Middletown

Wesleyan's Patricelli Center for Social Entrepreneurship supports Wesleyan student entrepreneurs, intrapreneurs, and changemakers in a variety of ways. Students may participate in the Seed Grant Challenge which awards $5,000 Seed Grants to fund the launch or early-stage growth of a Wesleyan-connected project, program, or venture as well as other various grants. The Patricelli Center also has a competitive Fellowship Program where students will develop a variety of business plans and ventures in teams with other fellows. Students can also find ways to connect with mentors at the Patricelli Center and the Kai Entrepreneurship Club. Students can access various resources through the Kai Wesleyan Entrepreneurship Program. The for-credit program places students together to solve problems and develop plans over the course of four weeks. Wesleyan manages student internships through the office of Career Services. Wesleyan offers an Economics Bachelor's Degree for students seeking employment in the business.

Western Connecticut State University
Danbury

WCSU hosts an annual Startup Weekend where students compete amongst each other and have the opportunity to attend lectures and events geared towards fostering entrepreneurship. Many resources to develop their business ideas are available through the Ancell Learning Commons. WCSU is also in the development phase of a new space on campus that will house the Center for Entrepreneurship, Research, Innovation and Creativity (ERIC). ERIC intends to provide services to support new ventures and help student business get off the ground. Faculty member Dr. Pauline Assenza, Co-Vice Chair of the CT Consortium of Entrepreneurship Educators (CCEE), is involved with integrating the CT Business Plan competition on campus and helped with the creation MGT298 Creating New Ventures course. This programing is a result of the collaboration between the institution and CCEE and shows WCSU's commitment to an expanded focus on E&I programing.

WCSU collaborates with community partners such as Danbury Hackerspace, Danbury SCORE, Danbury region SBDC, Danbury area WBDC and the Danbury Chamber of Commerce. Local businesses periodically ask for assistance with business planning, marketing, or other programmatic help from various faculty members. For instance the Ancell School of Business currently has a Center for Business Research, and the Marketing Club has a group Agency@Ancell which offers branding assistance for local businesses. Students have the opportunity to connect with mentors through the Alumni Mentor Program managed at the Business School. WCSU offers a Bachelor's Degree in Business Management with a Small Business and Entrepreneurial Concentration at the Ancell School of Business. Students can expect to take a variety of courses specifically focused on the unique set of skills required to manage a small business. Internships and career development are available through the office of Career Services. Students can join several of the available student organizations at WCSU.

Yale University
New Haven

Yale University offers students a wide array of Entrepreneurial Programs and Innovation Services. For example:

- The Yale Entrepreneurial Institute (YEI) : YEI is a university department that helps entrepreneurs and innovators at Yale start scalable new ventures. YEI offers three dedicated programs for accelerating ventures at Yale from early-stage conception to investable startup: the Venture Creation Program, the YEI Fellowship and the YEI Innovation Fund, which provides $100,000 in pre-seed funding. YEI is dedicated to fostering

entrepreneurship across all schools at Yale and providing opportunities for students and faculty to test their ideas, develop them with expert guidance and launch companies that can make an impact in their respective industries. YEI resources include a 150+ Mentor Network; resident entrepreneurs; access to in-kind services from corporate partners in legal, accounting, financial, IP, communications and branding; connections to the angel and venture community; and connections to campus and community entrepreneurship partners. YEI serves as one of Yale's incubator centers and hosts numerous events throughout the year that foster entrepreneurial spirit.

- Center for Engineering Innovation and Design: serves as the hub for collaborative design and interdisciplinary activity at Yale University. Its goal is to enable the design, development, and actualization of ideas, from the whiteboard to the real world. Students, staff, and faculty from across Yale have access to CEID resources, participate in courses and events, and collaborate with CEID staff on a wide range of projects. See the one pager for more details about the program.
- Yale Office of Cooperative Research (OCR)'s mission is to facilitate the translation of research from Yale's labs into products and services that benefit society. Since its founding in 1982 it has built a significant portfolio of inventions and patents and has grown into an engine of regional economic development. OCR is recognized as a leading force for catalyzing economic growth by identifying, counseling and nurturing early-stage technologies and guiding the transition into robust companies.
- Yale offers a graduate degree in Entrepreneurship through the School of Management. This program more specifically teaches students skills to work on developing and understanding the complexities of managing small business while also supporting a growing network of student entrepreneurs.
- Internships are accessible in a variety of ways including directly through YEI and also at Career Services.

Additional Collaborations in the State

Innovation Destination: Hartford

ID:H is a coalition of entrepreneurs and service professions dedicated to enhancing the Hartford region's ability to support startups and second-stage entrepreneurs. ID:H has a Partner with a Professor program that connects entrepreneurs with professors for purpose of technology transfer. Currently ID:H lists UCONN, CCSU and University of Hartford as partner schools. ID:H provides support services in accounting, case studies, exiting, funding, growing, human resources, legal, marketing and public relations.

Entrepreneurs' Organization Connecticut

The Entrepreneurs' Organization (EO) is a Global business network of 12,000+ leading entrepreneurs in 160 chapters and 50 countries. The Connecticut Chapter recently hosted The Global Student Entrepreneur Awards (GSEA) where students competed for a cash prize and the opportunity to represent the state at the national competition in Kansas.

Connecticut New Venture Challenge

This accelerated course open to all students offers the opportunity to solve problems and develop business plans with students from various institutions. The challenge allows students the chance to present business plans and

concepts for analysis. Students from different disciplines work together to breakdown complex problems facing the concepts that are presented. Participating schools include CCSU, Fairfield University, Gateway Community College, Housatonic Community College, Quinnipiac University, Sacred Heart University, Southern Connecticut State University, University of Bridgeport, University of Hartford and WCSU.

Connecticut Bioscience Innovation Fund

The Connecticut Bioscience Innovation Fund (CBIF) seeks to drive innovation in the biosciences throughout Connecticut by providing focused financial assistance to startups, early stage businesses, non-profits and accredited colleges and universities.

CT Manufacturing Simulation Center

UCONN recently won federal grant money to help open the Simulation Center. Business owners and students will have the opportunity to interact and collectively solve problems. The center will work closely with tech businesses and the School of Engineering when construction is complete.

Connecticut Technology Council

CTC hosts the Connecticut Skills Challenge with various stages of held throughout the year. It is a coding challenge that connects talented, tech-savvy students to cutting-edge technology companies in Connecticut. The challenge can help connect the institutions and their students with organizations looking to develop new technologies. Last year Central Connecticut State University, Eastern Connecticut State University, Fairfield University, Norwalk Community College, Quinnipiac University, Sacred Heart University, Southern Connecticut State University, University of Bridgeport, University of Connecticut, University of New Haven and Western Connecticut State University were all schools who participated in the event.

Regenerative Medicine Research Fund

Formerly the Connecticut Stem Cell Program, the Regenerative Medicine Research Fund provides millions of dollars in grants each year to scientists and companies who are conducting biomedical, embryonic or human adult stem cell research that shows clinical promise—treatments that will make a real, significant impact on human health.