

Higher Education Innovation & Entrepreneurship Working Group Meeting

14 February, 2017 | Middlesex Community College

Working Group Goals

Growing institutional capacity in entrepreneurship and innovation (E&I) to contribute to state economic vitality

From the Senate Bill

- ▶ Address opportunities and risk in such an enterprise
- ▶ Assess existing E&I programs and initiatives at Higher Eds throughout the state
- ▶ Recommend initiatives that facilitate collaboration and cooperation among Higher Eds on E&I projects
- ▶ Identify funding priorities for higher education entrepreneurship grants-in-aid (pursuant to sec. 28)

Progress-to-date

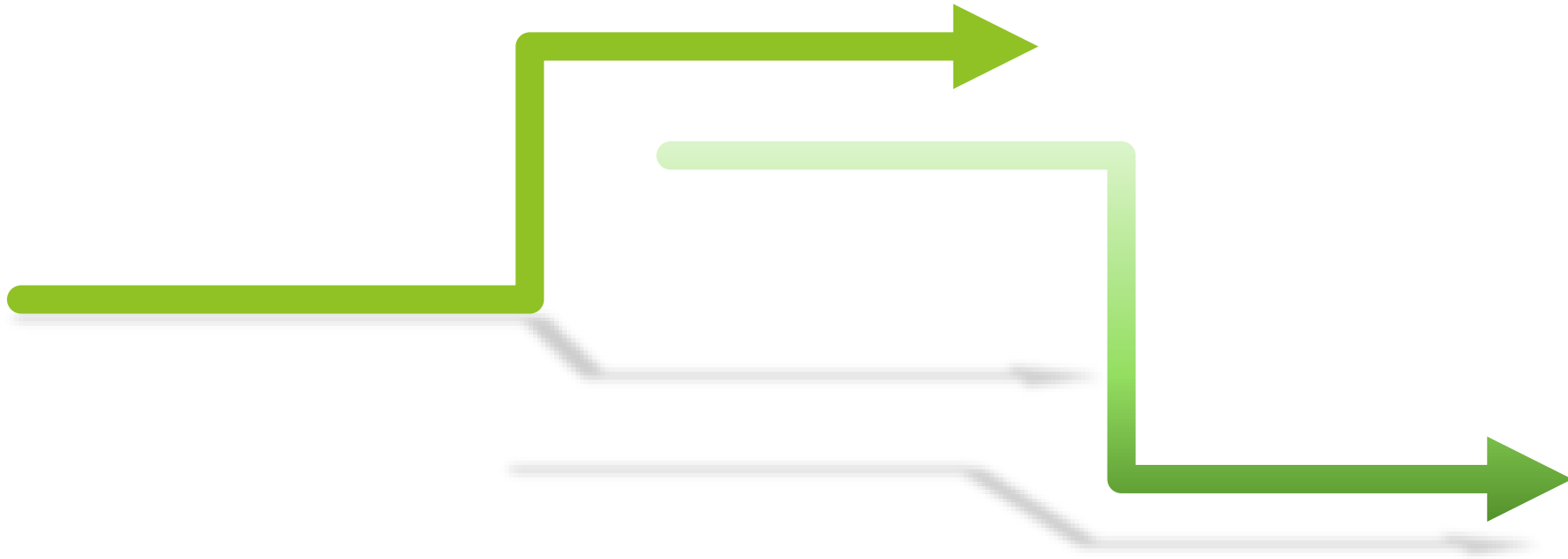


- ✓ December: Kick-Off Working Group Meeting
- ✓ Higher Education E&I Surveys
- ✓ Trends & Best Practices Research
- ✓ In-Person Interviews
 - UConn
 - Yale
 - University of Hartford
 - Wesleyan University
 - Consortium of Entrepreneur Educations
 - Trinity College
 - Quinnipiac University
 - University of New Haven
 - Fairfield University
 - University of Bridgeport
 - Southern Connecticut State University



Agenda

- **Implications of Global, National and Local Trends**
- **Higher Ed Assets: Opportunities, Challenges**
- **Brainstorming: Collaboration Opportunities**



Trends

QUESTIONS:

Which trends are you most concerned about? Why?

How could these trends affect entrepreneurship and innovation in Higher Ed?

Pre-Read Highlights



▶ Global & National Trends

- ▶ The U.S. R&D lead is closing
- ▶ Government funded R&D is shifting
- ▶ Venture capital is globalizing
- ▶ Knowledge is driving today's markets
- ▶ The academic ecosystem is growing more interconnected
- ▶ Entrepreneurial education
- ▶ Degree Production in S&E
- ▶ **“Silver Tsunami”**

▶ Industry Trends

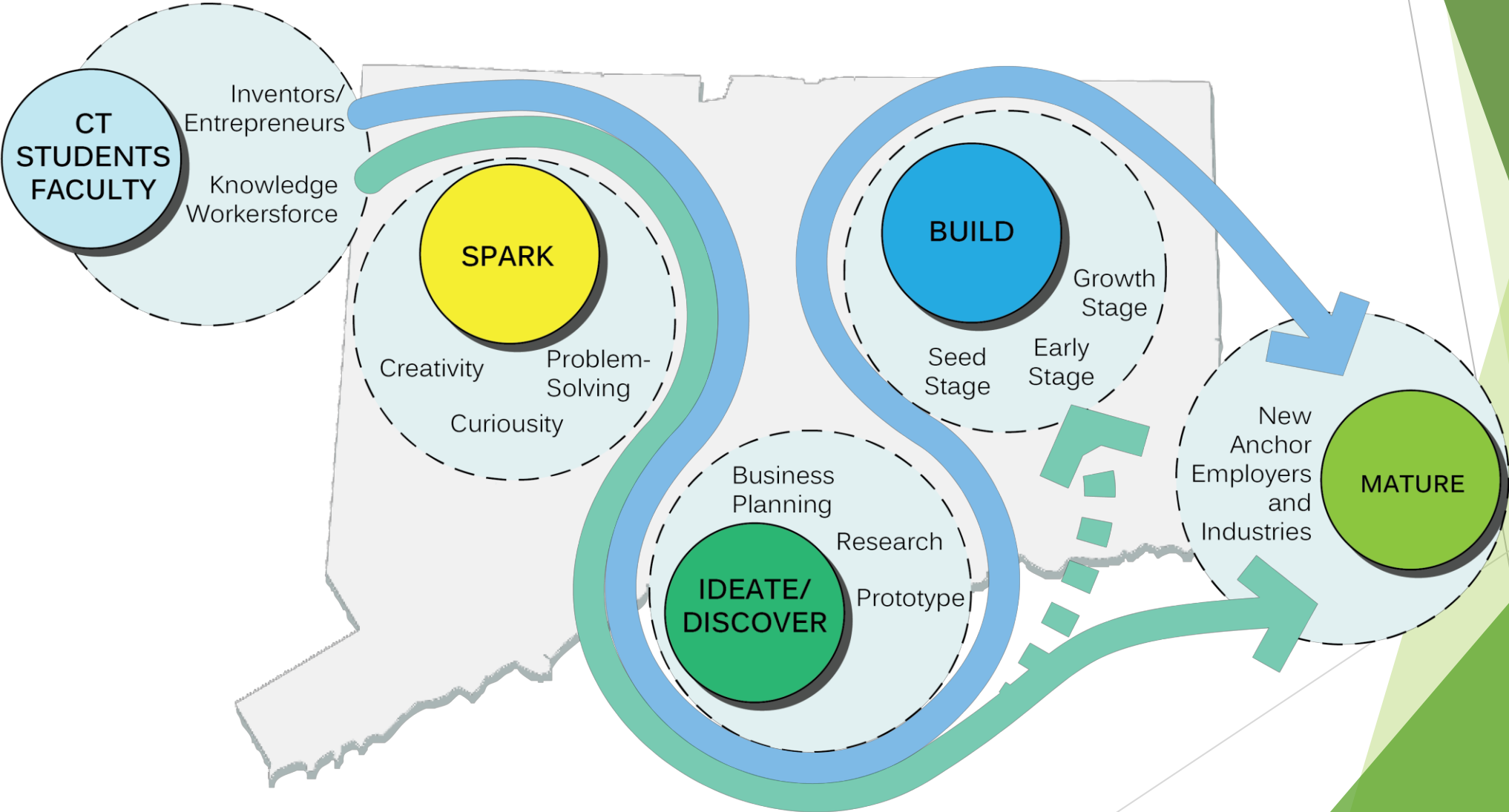
- ▶ Key Industry clusters
- ▶ **STEM educated workforce needs**
- ▶ **Beyond “STEM” Workforce**

▶ Entrepreneurial Trends

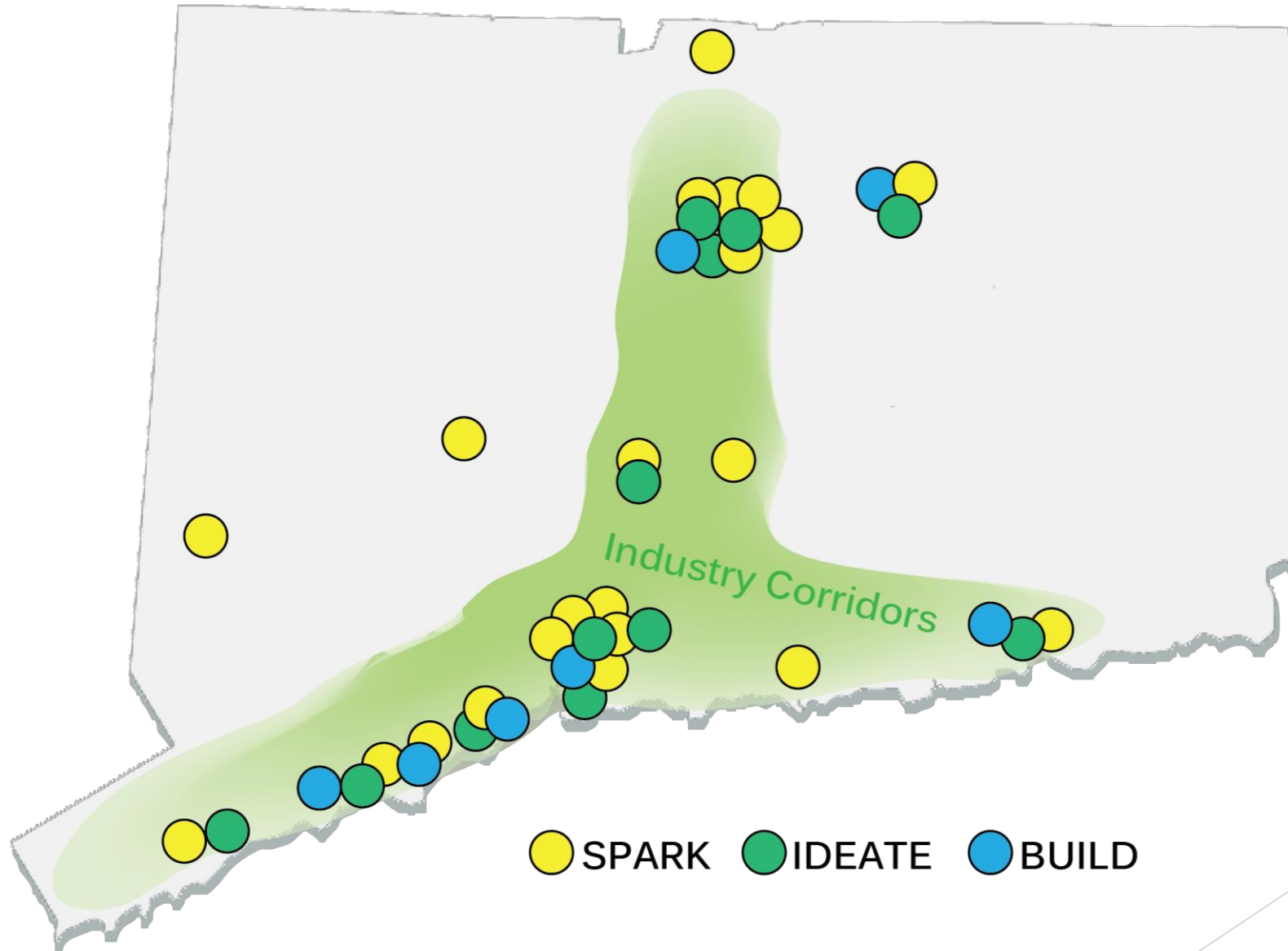
- ▶ Social mission is a growing force in U.S. entrepreneurial activity
- ▶ Entrepreneurship peaks among 35 to 44 year olds at 17%
- ▶ Gender disparity
- ▶ **Business skills training**
- ▶ Online resources
- ▶ “Preferred” start-up businesses

Others to Add, Discuss?

Higher Ed Innovation Ecosystem Pathways



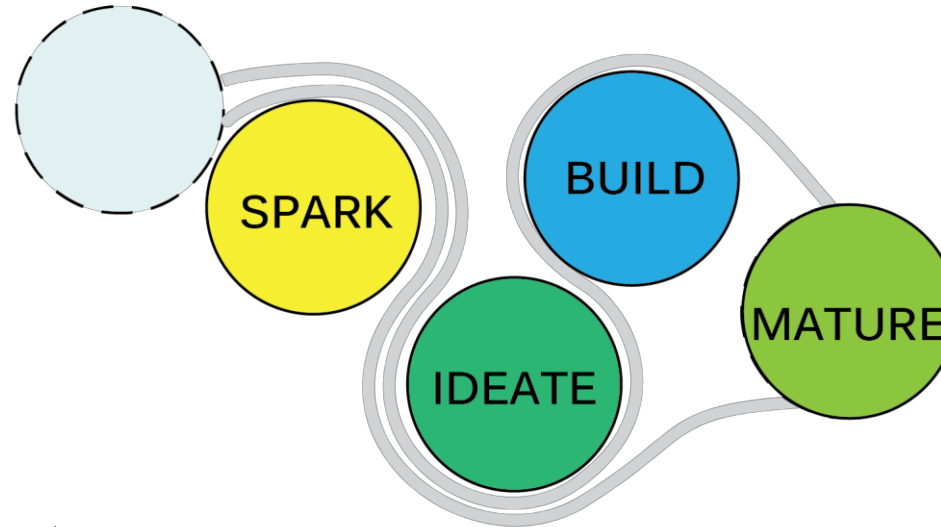
... A Rich Ecosystem(But Not Yet Robust)



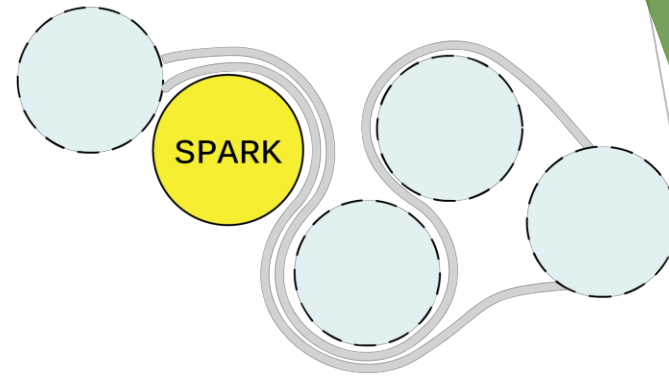
Opportunities & Challenges

What we've heard

- **SPARK:** Innovative Workforce
- **IDEATE:** Entrepreneur Centers
- **IDEATE:** Mentor Networks
- **BUILD:** Commercialization Infrastructure
- **MATURE:** Tech Talent Bridge
- **OTHER:** Innovation Places



Innovative Workforce



Opportunities

- ▶ Growing 'Entrepreneurial Studies'
- ▶ Cross-disciplinary project-based learning
- ▶ Research Days - exposing faculty and students to research and innovation around campus
- ▶ Business idea, pitch competitions open to all students

Constraints

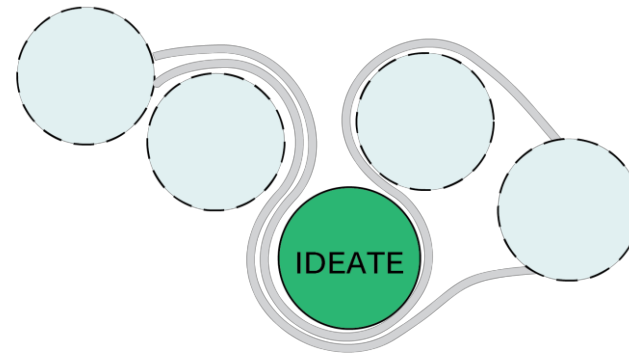
- ▶ Quickly evolving trend; lack of standards, best practices
- ▶ Often business-school based, not university wide
- ▶ Generating student/faculty interest
- ▶ Student debt and risk aversion
- ▶ University resource constraints

Higher Ed Examples

- ▶ *Quinnipiac - Internships with start-ups for college credit*
- ▶ *SCSU - Business certificate programs for scientists*
- ▶ *New Venture Challenge - 10 participating schools*
- ▶ *New Haven U - Business modules integrated in engineering courses*
- ▶ *Wesleyan and Connecticut College - Social entrepreneur initiatives*
- ▶ *UConn, I-Corps Program (faculty-focused)*
- ▶ *Entrepreneur Clubs (multiple)*

Do You Agree?

Entrepreneur Centers



Opportunities

- ▶ Potential to become university-wide resource
- ▶ Open to students, faculty, alumni
- ▶ Dedicated FT Staff
- ▶ Industry Internships
- ▶ Associated or nearby makerspaces
- ▶ Business planning assistance
- ▶ Workshops
- ▶ Internal & External Boards
- ▶ Alumni Networks

Challenges

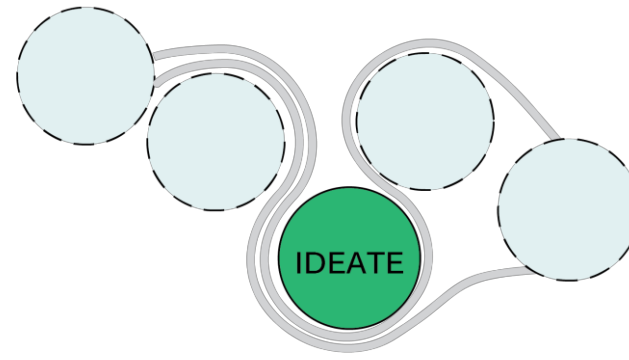
- ▶ Many models, stages of maturity, funding, staffing, across the state
- ▶ Staff trained in best practices
- ▶ Lack of established center network

Higher Ed Examples

- ▶ *UConn, CCEI (School of Business)*
- ▶ *Yale, YEI (University)*
- ▶ *U Fairfield, Entrepreneurship Lab (University)*
- ▶ *U New Haven, Entrepreneurship and Innovation Program, Center for Family Business (University)*
- ▶ *Quinnipiac U, Center for Innovation and Entrepreneurship (University)*
- ▶ *U Bridgeport, Student Entrepreneur Center (School of Business)*
- ▶ *U Hartford (Community-focused)*

Do You Agree?

Mentor Networks



Opportunities

- ▶ Regional alumni engagement
 - ▶ Integrate with Development Office
- ▶ Industry engagement
 - ▶ Internships and job placement
- ▶ Entrepreneur-in-Residences
- ▶ Supports faculty and student Entrepreneurs
- ▶ Enhances incubators, accelerators

Challenges

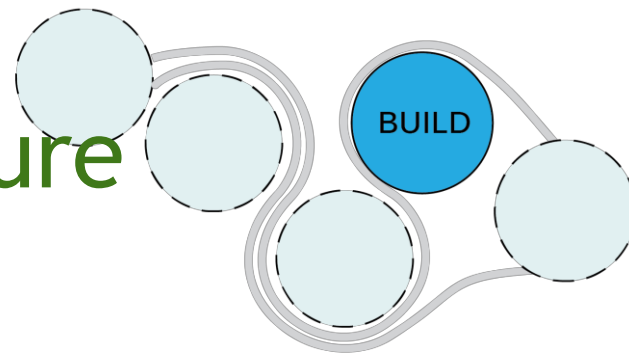
- ▶ Alumni leave the state or not engaged
- ▶ Resources and skills to pursue industry and alumni contacts
- ▶ Need for best practices

Higher Education Examples

- ▶ Yale University, YEI
- ▶ UConn, Undergrad and Graduate programs
- ▶ Fairfield University
- ▶ SCORE/SBA, 25 centers (including Gateway, Housatonic)

Do You Agree?

Commercialization Infrastructure



Opportunities

- ▶ Two major research universities
 - ▶ UConn
 - ▶ Yale
- ▶ Other universities with research faculty & commercialization potential

Challenges

- ▶ Faculty culture & mentality
- ▶ Capacity to identify opportunities
- ▶ Systems for IP/TT services; Ad Hoc v. Permanent
- ▶ University IP policies

Higher Ed Examples

Full-Time IP/TTO Support

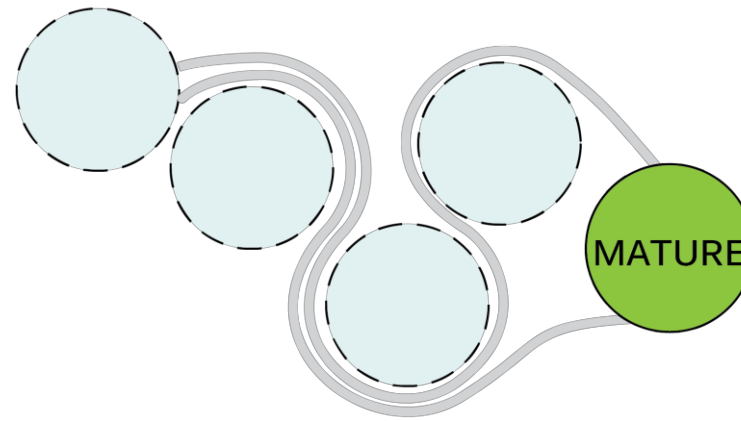
- ▶ UConn, Office of Vice President of Research
- ▶ Yale, Office of Cooperative Research

Engineering Labs and Consortiums

- ▶ University of Hartford
- ▶ Fairfield University
- ▶ Trinity College
- ▶ Southern Connecticut
- ▶ University of Bridgeport

Do You Agree?

STEM Workforce



From Brookings, 2013:

- Workers with at least some college have seen a **net increase** of 2.5 million manufacturing jobs (1980 - 2011)
- **More STEM-oriented metropolitan economies perform strongly** on a wide variety of economic indicators, from innovation to employment.
- The presence of **sub-bachelor's degree STEM workers helps boost innovation** measures one-fourth to one-half as much as bachelor's degree STEM workers.

Do You Agree?

Ranked 38 of the top 100 metro regions, Share of workers in STEM



THE HIDDEN STEM ECONOMY

Hartford-West Hartford-East Hartford, CT metropolitan area profile

STEM JOBS, 2011

Jobs

121,060

RANK: 38 out of 100

Job Share

22.8%

RANK: 11 out of 100

Jobs requiring specialized knowledge in...

SCIENCE

51,940 (9.8%)

COMPUTERS

29,840 (5.6%)

ENGINEERING

62,810 (11.8%)

MATH

42,310 (8.0%)

STEM JOBS by DEGREE REQUIRED

Bachelor's or more

53.5%

RANK: 25 out of 100



Associates' or less

46.5%

RANK: 76 out of 100

STEM WAGES

All jobs

STEM: \$74,286

NON-STEM: \$46,212

Jobs requiring a Bachelor's or more

STEM: \$87,614

NON-STEM: \$72,757

Jobs requiring an Associates' or less

STEM: \$58,970

NON-STEM: \$38,095

TOP TEN STEM OCCUPATIONS

Job title	Number of jobs	Share req. Bachelor's
Health Diagnosing and Treating Practitioners	20,820	36.1%
Computer Occupations	17,400	75.6%
Financial Specialists	9,750	96.9%
Engineers	8,550	100.0%
Operations Specialties Managers	8,250	100.0%
Metal Workers and Plastic Workers	7,440	0.0%
Construction Trades Workers	6,390	0.0%
Other Management Occupations	4,790	85.6%
Health Technologists and Technicians	4,050	9.0%
Business Operations Specialists	3,440	80.0%

ECONOMIC PERFORMANCE INDICATORS

Unemployment rate, 2011

8.8% RANK: 59 out of 100

Median household income, 2011

\$64,508 RANK: 10 out of 100

Patents per thousand workers, 2007-2011

0.95 RANK: 27 out of 100

Ranked 39 of the top 100 metro regions, Share of workers in STEM



THE HIDDEN STEM ECONOMY

Bridgeport-Stamford-Norwalk, CT metropolitan area profile

STEM JOBS, 2011

Jobs

87,550

RANK: 53 out of 100

Job Share

19.5%

RANK: 60 out of 100

Jobs requiring specialized knowledge in...

SCIENCE

34,040 (7.6%)

COMPUTERS

20,470 (4.6%)

ENGINEERING

41,110 (9.1%)

MATH

31,370 (7.0%)

STEM JOBS by DEGREE REQUIRED

Bachelor's or more

57.5%

RANK: 10 out of 100



Associates' or less

42.5%

RANK: 91 out of 100

STEM WAGES

All jobs

STEM: \$82,318

NON-STEM: \$51,291

Jobs requiring a Bachelor's or more

STEM: \$97,247

NON-STEM: \$85,987

Jobs requiring an Associates' or less

STEM: \$62,092

NON-STEM: \$40,926

TOP TEN STEM OCCUPATIONS

Job title	Number of jobs	Share req. Bachelor's
Computer Occupations	12,090	87.0%
Health Diagnosing and Treating Practitioners	11,990	37.0%
Financial Specialists	9,680	98.0%
Operations Specialties Managers	6,960	100.0%
Engineers	4,030	100.0%
Construction Trades Workers	3,570	0.0%
Other Management Occupations	2,690	82.7%
Health Technologists and Technicians	2,670	8.9%
Business Operations Specialists	2,430	82.7%
Metal Workers and Plastic Workers	2,380	0.0%

ECONOMIC PERFORMANCE INDICATORS

Unemployment rate, 2011

8.2% RANK: 39 out of 100

Median household income, 2011

\$77,289 RANK: 3 out of 100

Patents per thousand workers, 2007-2011

1.66 RANK: 15 out of 100

Ranked 69 of the top 100 metro regions, Share of workers in STEM



THE HIDDEN STEM ECONOMY

New Haven-Milford, CT metropolitan area profile

STEM JOBS, 2011

Jobs

59,310

RANK: 69 out of 100

Job Share

19.5%

RANK: 61 out of 100

Jobs requiring specialized knowledge in...

SCIENCE

30,370 (10.0%)

COMPUTERS

8,160 (2.7%)

ENGINEERING

27,350 (9.0%)

MATH

15,810 (5.2%)

STEM JOBS by DEGREE REQUIRED

Bachelor's or more

45.0%

RANK: 66 out of 100



Associates' or less

55.0%

RANK: 35 out of 100

STEM WAGES

All jobs

STEM: \$71,473

NON-STEM: \$43,687

Jobs requiring a Bachelor's or more

STEM: \$86,584

NON-STEM: \$69,645

Jobs requiring an Associates' or less

STEM: \$59,125

NON-STEM: \$36,792

TOP TEN STEM OCCUPATIONS

<i>Job title</i>	<i>Number of jobs</i>	<i>Share req. Bachelor's</i>
Health Diagnosing and Treating Practitioners	11,560	32.1%
Computer Occupations	4,330	82.9%
Construction Trades Workers	3,160	0.0%
Health Technologists and Technicians	2,960	17.1%
Metal Workers and Plastic Workers	2,640	0.0%
Operations Specialties Managers	2,590	100.0%
Financial Specialists	2,430	96.7%
Engineers	2,070	100.0%
Postsecondary Teachers	1,990	87.9%
Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	1,900	0.0%

ECONOMIC PERFORMANCE INDICATORS

Unemployment rate, 2011

9.2% RANK: 64 out of 100

Median household income, 2011

\$59,245 RANK: 18 out of 100

Patents per thousand workers, 2007-2011

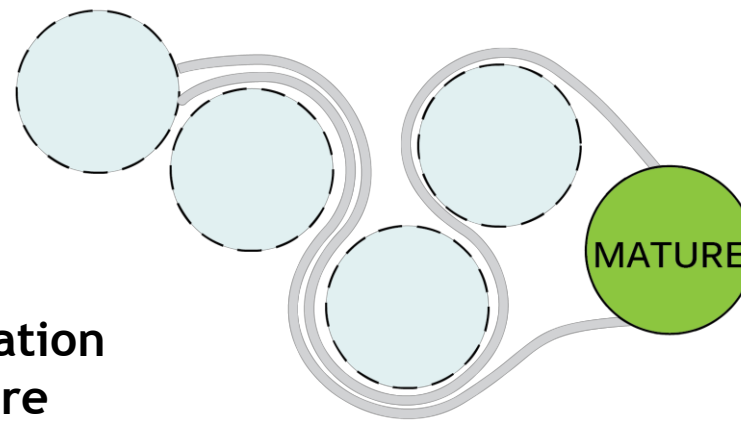
1.37 RANK: 21 out of 100

Anchors

Opportunities to engage with larger CT innovation ecosystem that focuses on Innovation Places, where many Higher Ed institutions are participating as anchors.

Strong places entice residents and workers to remain in the area off hours, extending the opportunities for collaboration. Strong places create a culturally and educationally enriched environment that strengthens human interaction, knowledge, and motivation.

Brookings Institute *One year after: Observations on the rise of innovation districts*



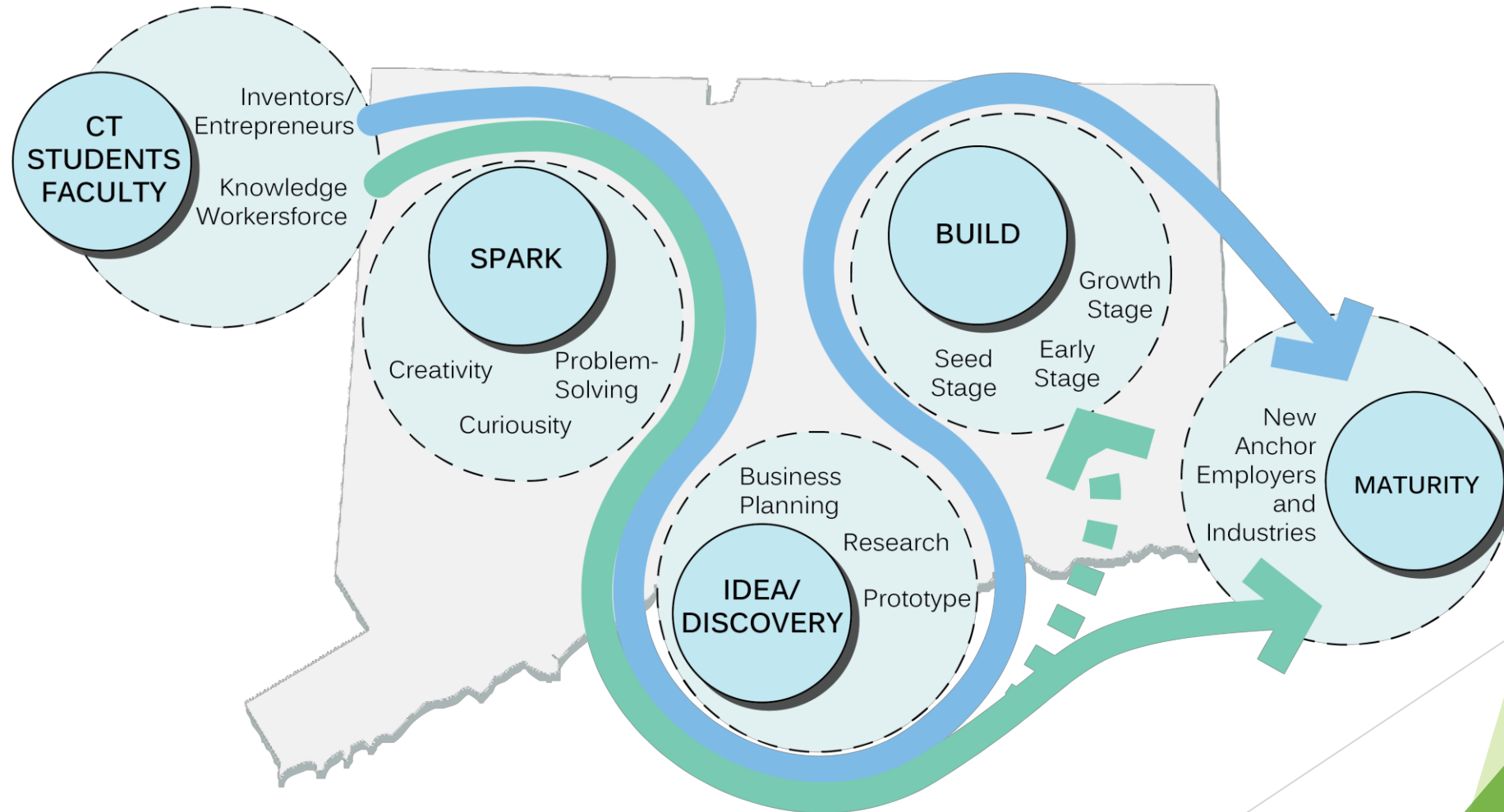
A college involved in cultivating and nurturing an entrepreneurial ecosystem must exhibit its own entrepreneurial spirit while creating an environment where discoveries are made, learning is emphasized, and lives are changed.

Thomas McKeon *Journal of Higher Education Outreach and Engagement, Volume 17, Number 3, p. 85, (2013)*

Do You Agree?

Further Discussion

Do you see other opportunities for collaboration?



Next Steps

March 27: Higher Ed Working Group Meeting (Confirm Goals and Priorities)

April 11: Higher Ed Working Group Meeting (Draft Master Plan)

May 1: Submit Master Plan to CTNext Board