STEM REGIONAL COLLABORATIVES

THE OPPORTUNITY

By Lara K. Couturier | OCTOBER 2014

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Jobs for the Future's **Postsecondary State Policy** initiatives help states and their community colleges to dramatically increase the number of students who earn high-value credentials. We lead a multistate collaboration committed to advancing state policy agendas that accelerate community college student success and completion. Our network includes states that are continuing their work with support from Achieving the Dream, Completion by Design, and Student Success Center initiatives.

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Achieving the Dream
Community Colleges Count

Achieving the Dream, Inc. is a national nonprofit that is dedicated to helping more community college students, particularly low-income students and students of color, stay in school and earn a college certificate or degree. Evidence-based, student-centered, and built on the values of equity and excellence, Achieving the Dream is closing achievement gaps and accelerating student success nationwide by: 1) guiding evidence-based institutional change; 2) influencing public policy; 3) generating knowledge; and 4) engaging the public. Conceived as an initiative in 2004 by Lumina Foundation and seven founding partner organizations, today Achieving the Dream leads the nation's most comprehensive non-governmental reform network for student success in higher education history. With nearly 200 colleges, 100 coaches and advisors, and 15 state policy teams—working throughout 34 states and the District of Columbia—Achieving the Dream helps 3.75 million community college students have a better chance of realizing greater economic opportunity and achieving their dreams.

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ABOUT THE AUTHOR

Lara K. Couturier leads research and publications for JFF's Postsecondary State Policy work. She also supports the state policy teams in these initiatives. Before JFF, Dr. Couturier conducted research and evaluations for Achieving the Dream and other higher education initiatives. She also served as the interim principal investigator and director of research for the Futures Project: Policy for Higher Education in a Changing World, a higher education think tank based at Brown University. She has a Ph.D. in history from Brown University.

TABLE OF CONTENTS

INTRODUCTION

Recent research has helped shift the national understanding of the opportunities presented by Science, Technology, Engineering and Math (STEM) fields, drawing attention to the large number of STEM jobs that require less than a Bachelor's degree.[1] The data have also highlighted the critical importance of community colleges as a primary provider of college access for large numbers of low-income students, first generation students, and students of color. The result is a growing national recognition that, with new approaches and support for reform, community colleges can be a launching pad for many more individuals to high-paying, quality careers in STEM fields, and an effective avenue for improving equity.

To address this opportunity, Achieving the Dream, Inc. (ATD) and Jobs for the Future (JFF) launched the STEM Regional Collaboratives initiative in Fall 2013 with support from The Leona M. and Harry B. Helmsley Charitable Trust. Through a competitive request for proposal process, ATD and JFF selected three applicants: Cuyahoga Community College (Tri-C) in partnership with the Ohio Association of Community Colleges; Miami Dade College in partnership with the Florida College System; and Norwalk Community College in partnership with the Connecticut Board of Regents for Higher Education.

Each college is building STEM Regional Collaboratives, bringing together college leadership, faculty and staff, state partners, local employers, P-12 school partners, and community organizations to create stronger, more efficient middle-skill STEM pathways to

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[1] Jonathan Rothwell. *The Hidden STEM Economy*. Washington, DC: Brookings Institution, 2013.

meet high demand in local labor markets. ATD and JFF are providing technical assistance to the three Collaboratives designed to support the community colleges as they identify and build highly structured middle-skill STEM pathways; improve regional coordination among the colleges and their workforce and community partners; and foster cross-college and cross-state learning and collaboration. In addition, ATD and JFF have worked with state leaders in all three states to identify state policies supportive of middle-skill STEM pathways.

The three selected STEM Regional Collaboratives are well-positioned for success. They are located in states in which governors have articulated strong STEM priorities. Their proposals and workplans adhere closely to the redesign principles of structured pathways, identifying interventions that will help their students stay on course to completion. The colleges' leaders are committed, actively engaged, and eager to use real-time labor market information to inform the pathways they are strengthening. Community and employer partners expressed their interest early on in this work and their belief that it will create exciting opportunities for both students and the local workforce. State partners are active participants, willing to provide state policy support and to elevate the importance of middle-skill STEM across the state.

The STEM Regional Collaboratives were officially announced in January 2014 and have since quickly embraced this opportunity, attending in-person and virtual cross-state meetings, identifying their regional workforce and community partners, hosting in-state kickoff meetings, selecting the middle-skill STEM pathways on which they will focus, and submitting and revising workplans outlining how they will engage their Collaboratives and which interventions they will put in place to ensure their students' success.

Principles of the STEM Regional Collaboratives

There are **well-paying, middle-skill STEM jobs** into which community colleges can create effective pathways.

> 20 percent of all jobs require significant STEM knowledge

> Half of these are available to workers without a four-year degree

> These jobs pay $53,000 on average—10% higher than other jobs with comparable educational requirements[2]

Student success can be boosted through **highly structured pathways** with clear academic requirements and comprehensive student supports.

Improving opportunities for underrepresented students requires **regional collaboration** that draws on the expertise and resources of colleges, employers, workforce experts, K12 and other community partners.

Broad adoption of structured pathways to middle-skill STEM careers requires **collaboration and alignment of institutional and state practices and policies**.

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[2] Jonathan Rothwell. *The Hidden STEM Economy*. Washington, DC: Brookings Institution, 2013.

THE ROLE OF STATE PARTNERSHIP

The state partners (Ohio Association of Community Colleges, Florida College System and Connecticut Board of Regents) have been active and engaged participants at every step of the process. The goals for the states are multi-pronged:

> Identify needed state-level actions to facilitate the colleges' work (e.g., program approval, linkages to other STEM and workforce initiatives, alignment with gubernatorial priorities);

> Align the STEM Regional Collaboratives with other relevant work in the state (e.g., federal grants such as Trade Adjustment Assistance Community College and Career Training Grants (TAACCCT), STEM-focused high schools, etc.);

> Design means of spreading lessons learned to other colleges in their states; and

> Team as a cross-state workgroup to identify a Middle-skill STEM State Policy Framework to help other states learn from the work of the STEM Regional Collaboratives and modify their policy environments to support building structured middle-skill STEM pathways.

State leaders have participated in multiple STEM Regional Collaborative meetings, site visits, and kickoffs, as well as meetings with Jobs for the Future and Achieving the Dream. That work, supplemented by research, led the initiative to produce a Middle-Skill STEM State Policy Framework that advances five core policy recommendations for states to accelerate this vital agenda:

> **Create pathways to careers:** Ensure that STEM programs meet employer needs;

> **Open doors to STEM:** Improve math preparation and developmental education to boost student success;

> **Focus on student completion:** Create new pathway models that lead to degree attainment;

> **Make informed decisions:** Improve data collection and data use to enhance transparency, accountability, effectiveness and equity; and

> **Provide incentives for success:** Encourage innovation and reward better outcomes for STEM students and the STEM workforce.[3]

Spotlight | Launching the STEM Regional Collaboratives

Each of the STEM Regional Collaboratives held a kickoff meeting in Spring 2014 to introduce the work and build stakeholder engagement. Though each kickoff was different, they were all successful meetings characterized by high levels of participation and enthusiasm for moving forward. To replicate their work, other colleges might consider some of the Collaboratives' design principles:

> Participant lists were carefully constructed, designed to ensure a diverse mix of employers, trade associations, state partners, community partners, and college roles and departments;

> Agendas were tightly structured to ensure that external participants felt their time was used wisely. At each meeting, college business and workplanning was conducted after external partners departed;

> State partners were deeply involved in meeting planning and spoke at the Kickoffs about the importance and alignment of the STEM Collaboratives to state goals;

> A combination of local and external speakers were used to describe the college's and state's commitment to this work, situate the Collaborative's work in the context of national college completion efforts, and make the case for the strong opportunities that structured middle-skill STEM pathways offer to community college students;

> The meetings were designed to minimize presentations and maximize opportunities for participants to talk, share and plan;

> Discussion guides were used to structure break-out conversations to ensure that goals were clear and achieved;

> Communications were sent after the Kickoff meetings to thank participants and advise on next steps; and

> The Collaboratives specified in their workplans when and how often they will continue to communicate with and convene their Collaborative participants.

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[3] Ian Rosenblum and Richard Kazis. *Middle-Skill STEM State Policy Framework*. Jobs for the Future and Achieving the Dream, October 2014.

STEM REGIONAL COLLABORATIVE PROGRESS

Each Collaborative has made significant progress in the first months of this initiative. At all three colleges, conscientious efforts to build highly structured middle-skill STEM pathways are underway, as evidenced by newly stacked and latticed credentials, recently launched first year seminars and boot camps, and serious conversations about how to tackle math preparation. The pages that follow describe the work of each Collaborative, the lessons learned thus far and next steps.

CUYAHOGA COMMUNITY COLLEGE (TRI-C) AND THE OHIO ASSOCIATION OF COMMUNITY COLLEGES

TARGETED MIDDLE-SKILL STEM PATHWAYS

National Institute for Metalworking Skills (NIMS) Computer Numerical Control (CNC) Operations Certificate, CNC Machining Centers Manufacturing (MCM) 1 year Certificate, and CNC MCM 1 year Certificate into an Apprenticeship

EMPLOYER AND COMMUNITY PARTNERS

A large and engaged group of employers, trade association representatives and other community partners joined Tri-C for its June 4, 2014 Kickoff. Participants included representatives from: GrafTech International, Goodrich Landing Gear, Rockwell Automation,

North East Ohio Regional Sewer District, Precision Machined Products Association, Ohio Board of Regents, Ohio Association of Community Colleges, Maxine Goodman Levin College of Urban Affairs (labor market researchers), Armature Coil Equipment, Imaginit Technologies, RSB Spine, E.C. Kitzel & Sons, Inc., Cleveland Die Manufacturing, ALCOA and Hickok, Inc.

WORKPLAN INTERVENTIONS

Tri-C's workplan covers the student life experience, from student connection/recruiting, through to interventions designed to improve student progress, and finally to linking students to robust career opportunities.

> Redesign intake processes that emphasize STEM pathways and middle STEM labor market opportunities highlighting "One Door and Many Options for Success";

> Infuse Mandatory New Student Orientation and First Year Experience course content with STEM Pathways information;

> Utilize new Degree Works technology and other tools to map and track the student journey through defined STEM pathways;

> Develop joint marketing materials that align Tri-C's Workforce and Access, Learning & Success STEM offerings;

> Develop a Career Advisory Council for STEM Career Pathways; and

> Engage Industry Partners in mentoring and STEM pathway information sessions for students organized in relevant workforce and academic clusters.

Spotlight | A STEM-Infused Mandatory Orientation and First Year Experience

Tri-C plans to infuse STEM content into its new mandatory orientation and First Year Experience. Orientation will now include individual counseling sessions that integrate career and academic planning, in keeping with the latest research. The STEM content will guide students when making program choices, and encourage them to choose STEM programs early in their post-secondary education experience, getting them on track in focused plans of study that lead to desired credentials and employment in timely fashion. Activities will include speakers from industry, team projects, and shadowing experiences. This type of early academic planning—combined with student support and engagement—is a feature of structured pathways reform principles.

MIAMI DADE COLLEGE AND FLORIDA COLLEGE SYSTEM

TARGETED MIDDLE-SKILL STEM PATHWAYS

Psychiatric Technician, Medical Coder/Billing Specialist and Health Informatics Specialists

EMPLOYER AND COMMUNITY PARTNERS

Miami Dade College's May 29-30, 2014 STEM Regional Collaborative Kickoff featured strong employer and community engagement, including representatives from Citrus Health Network, Health Council of South Florida, Mount Sinai Medical Center, Baptist Health South Florida, the Florida Hospital Association, Miami Lakes Educational Center, Miami Dade County Public Schools, the Florida College System, and the Behavioral Science Research Institute.
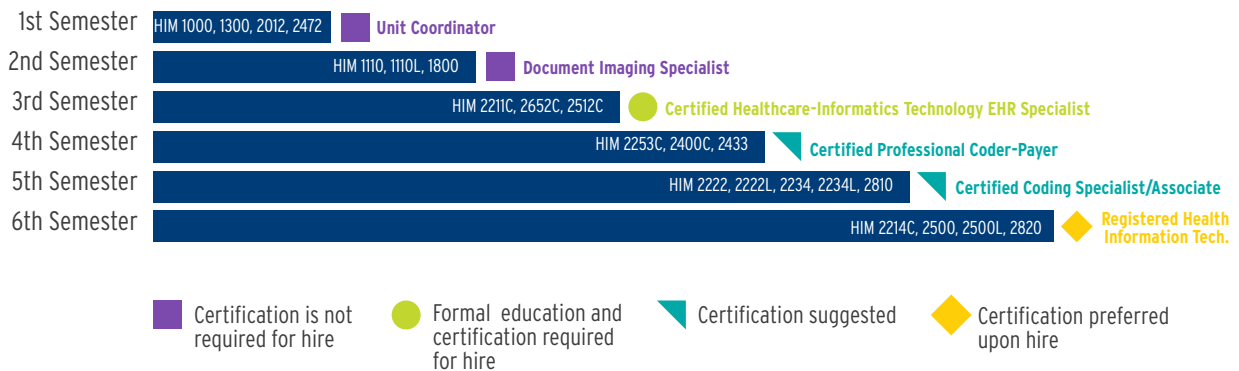
WORKPLAN INTERVENTIONS

Miami Dade College's interventions align tightly with structured pathways reform principles. Their workplan features strategies to:

> Develop a new Psychiatric Technician program, in alignment with structured pathways reforms, and in collaboration with industry partners and the behavioral health services provider Citrus Health Network;

> Create a structured intake process that includes mandatory orientation, assigned advisors, and diagnostic and holistic student assessments;

> Develop and utilize structured curriculum plans with sequential coursework and focused course choices at all levels of instruction to ensure that students know the requirements to enter and succeed in programs of study early in their college careers;

> Increase transition assistance from developmental education and English for Academic Purposes into college-level programs of study and from there into transfer and/or career outcomes;

> Integrate academic and student support programs aligned with learning outcomes; and

> Increase student engagement through participation in communities of interest.

Spotlight | Stacked and Latticed Credentials

In consultation with its Health Information Management Advisory Board of employers, Miami Dade College has stacked and latticed the health informatics pathways, creating a Health Information Career Certificate Ladder. The Ladder makes clear to students how they can progress through their coursework in a manner that leads them to valuable credentials along the way. MDC also mapped out highly structured curricular guides that clearly identify course choices and a recommended sequence for course-taking. These guides provide advisors with a protocol for advising students, and students with a focused guide for choosing courses and staying on track to completion.

Figure 1. Health Information Career Certificate Ladder

Semester	Courses	Credential
1st Semester	HIM 1000, 1300, 2012, 2472	Unit Coordinator
2nd Semester	HIM 1110, 1110L, 1800	Document Imaging Specialist
3rd Semester	HIM 2211C, 2652C, 2512C	Certified Healthcare-Informatics Technology EHR Specialist
4th Semester	HIM 2253C, 2400C, 2433	Certified Professional Coder-Payer
5th Semester	HIM 2222, 2222L, 2234, 2234L, 2810	Certified Coding Specialist/Associate
6th Semester	HIM 2214C, 2500, 2500L, 2820	Registered Health Information Tech.

Legend:
- Certification is not required for hire
- Formal education and certification required for hire
- Certification suggested
- Certification preferred upon hire

NORWALK COMMUNITY COLLEGE AND THE CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION

TARGETED MIDDLE-SKILL STEM PATHWAYS

Community Health concentration (AS degree in Allied Health), Liberal Arts STEM concentration (AS degree in Liberal Arts Transfer), Bioinformatics concentration (AS degree in Computer Science), Software Engineer AAS, Mobile Programming AAS, and Wastewater Management (new non-credit program)

EMPLOYER AND COMMUNITY PARTNERS

On May 2, 2014, Norwalk Community College convened the first meeting of its STEM Regional Collaborative, with broad representation from many engaged and committed partners, including representatives from the Fairfield County Community Foundation, Norwalk Public Schools, the Norwalk Early College Academy (a new P-Tech high school), the Workplace, Inc. (WIB), Norwalk Community College Foundation, Connecticut Board of Regents for Higher Education, HL-SCI (statewide TAACCCT grant), and the Norwalk Chamber of Commerce.

WORKPLAN INTERVENTIONS

Norwalk Community College's interventions focus heavily on increasing the pipeline of students aspiring to, and prepared for, STEM pathways, with the intention of helping Fairfield County to address its dramatic income disparities. Norwalk's workplan focuses on:

> Build the pipeline of STEM-prepared students coming to NCC from K12, through work with three area high schools: the Norwalk Early College Academy, J.M Wright Technical High School and the Academy of Information Technology and Engineering;

> Build intentional on-ramps for incoming students into the identified pathways with embedded developmental math supports through a summer bridge program;

> Create a focused effort to develop NCC's external partnerships and presence in the community and state; and

> Leverage NCC's new Enhanced Freshman Seminar, orientation and early alert programs to create a STEM-focused meta-major or program stream.

Spotlight | Launching the Norwalk Early College Academy

In partnership with IBM and Norwalk Public Schools, Norwalk Community College launched a new P-TECH high school focused on STEM degrees in September 2014. The Norwalk Early College Academy (NECA) will serve grades 9 to 14 and enable students to graduate with both a high school diploma and a no-cost Associate in Applied Science degree that will put graduates on the path to a good job. The first cohort of 100 students attended a summer preparatory program at NCC in summer 2014. NECA students will identify as, and receive the benefits of, being full NCC students. Governor Malloy is a strong supporter; NECA is Connecticut's first P-TECH initiative.

What is Norwalk Early College Academy?

NECA is a new program for Norwalk students based on the Pathways in Early Technology (P-TECH) model. NECA will provides the skills and experience needed for well-paying Information Technology (IT) jobs.

How Does It Work?

NECA is a 9-14 model where students will complete high school, earn a college degree, and be ready to begin a career by the time they graduate. The length of enrollment is tailored to the learning needs and educational goals of each student.

NECA enables students to begin their college and professional lives more quickly, with more support than the traditional school-to-work pathway. NECA graduates will earn an associate degree and graduate with the skills and knowledge needed to continue their studies, or to step seamlessly into competitive jobs in information technology (IT).

Decision Today for ...ccess in the Future.

A brings together the best elements of ...school, college and the professional

...h School

...ents take regular high school courses ...red to earn a high school diploma. They ...ve individual support and guidance as ...plan their high school years and begin ...g college classes. Students also receiv... ...oring and internship opportunities to pre... ...them for college and competitive care... ...ormation technology.

...lege

...A students have the opportunity to earn ...sociate degree from Norwalk Commun... ...ge at no cost. They will take college ...ses with college faculty during normal ...ol hours. Students may continue their ...es at NCC or apply to other four-year ...ges upon graduation.

Career

Students participate ...
where they will learn ...
the skills they'll need ...
personal success. St...
careers through inter...
mentoring opportuni...
Corporation – a foun...
school – as well as c...

What Care...
NECA Stud...

Students will be prep...
a range of exciting, ...
Information Technol...

IT professionals perf...
tasks, work within a ...
lems. Whether desig...
products or analyzing defects in software and driving quality improvements for global customers, NECA graduates will be helping our world work better.

"At schools like P-TECH . . . Students will graduate with a high school diploma and an associate degree . . . We need to give every American student opportunities like this."

- President Barack Obama

Who are our students?

NECA students will reflect the dynamic and diverse Norwalk community.

NECA Students Will Be:

- interested in computers, science and math
- eager to learn the skills needed to succeed in tomorrow's highly competitive technology industries
- curious, dedicated, hands-on learners ready to embrace the challenges of school, college, work and life
- able to attend a school orientation program during the summer before 9th grade
- excited to participate in extended day and summer programs
- willing to intern at IBM and other major companies.

NECA is open at no cost to all Norwalk students. Admission is by lottery and students of all abilities are welcome. There are no tests or screening required for admission.

For More Information

Talk to your middle school guidance counselor, or contact Norwalk High School Principal Reginald Roberts, robertsr@norwalkps.org, 203-838-4481.

www.nowalkps.org

NORWALK EARLY COLLEGE ACADEMY

Preparing students to succeed in college and career

MEASURES OF SUCCESS

The STEM Regional Collaboratives have agreed to a robust set of outcome measures including:

> Number of employers and other community partners actively engaged in the STEM Regional Collaborative;

> Number of middle-skill STEM pathways the college is improving/restructuring/building in each academic year;

> Within each pathway:

  » Students recruited;

  » Students enrolled; and

  » Credentials received.

The initiative will also capture indicators of institutions' increasing capacity to create and maintain highly structured middle-skill STEM pathways, by analyzing measures such as how institutions are building: data capacity to track and report on student outcomes; capacity of faculty and staff to utilize outcomes data and labor market information; faculty expertise on improving teaching and learning in middle-skill STEM courses; and, capacity of colleges to effectively implement and execute student success interventions.

LESSONS LEARNED

Though it is still too early in the work for a thorough analysis of successes and challenges, each STEM Regional Collaborative has made notable progress, and we have learned some useful lessons thus far. Important lessons for the field include:

> Employers and community partners are often eager participants, and engaging them at the beginning of the pathway creation or redesign builds trust and creates opportunities for partnership beyond the Collaboratives. As just one good example, inspired by the work of the STEM Regional Collaborative, Dr. Mark Everett, Dean of Health Sciences at Miami Dade College Medical Campus, made new connections with the Miami Dade County Public Schools (MDCPS). Through their interactions, Dr. Everett has been nominated to begin serving on the MDCPS STEM Advisory Council.

> Though external partners are eager to come to the table and partner with colleges, their participation must be carefully managed so that they remain enthusiastic and committed. Thus, outcome goals should be clear, the roles of each stakeholder should be well-defined, and regular communications between partners should be established to maintain momentum and build relationships. Stemming from the work of the Collaboratives, Norwalk Community College has recently appointed a Special Assistant to the President for Career Development and Community Outreach to ensure the health of external relationships.

> The original request for proposal process asked the colleges to focus on specific STEM pathways, but the potential for this work is much greater. As we move into the next phase of the work, ATD and JFF are seeking to help the colleges scale their work horizontally to impact more STEM pathways, and potentially the

whole college. Tri-C's plans to leverage their new mandatory orientation and First Year Experience programming to create a STEM-infused program stream—also commonly referred to as a meta-major or career cluster—will help them to impact far more STEM pathways than those originally identified, and potentially other program streams as well.

> Structured pathways is an ambitious and holistic reform agenda. Colleges benefit from technical assistance designed to help them in areas such as: implementing interventions that look holistically at student connection, entry, progress and completion; engaging employers to maximum impact; identifying concrete means of leveraging other innovations for maximum impact in this initiative; and structuring ambitious, actionable outcome goals.

> In all three Collaboratives, the state partner has been welcomed to the table and actively engaged in conversations about how to both facilitate the work and spread lessons to other colleges. The proposal process required an active partnership between the colleges and their state partners; in hindsight, that requirement was quite fruitful.

> Though local politics and economies are important determinants of each Collaborative's work, the challenges faced across the colleges and states are remarkably similar. Thus far, some common themes across the Collaboratives include:

  » Math preparation for students in STEM is a serious challenge;

  » Colleges face a tension between calls for workforce skills and simultaneous requests to decrease time to degree and excess credits. Colleges are seeking solutions that will embed workforce skills into the existing curriculum; and

  » There are many disconnected STEM initiatives in each state.

> Each STEM Regional Collaborative is creating materials and models that can be codified to help others replicate their work, for example stacked and latticed credentials and STEM introductory curricula. For the next phase of work, ATD and JFF will work to document any replicable learnings.

> Initiative participants benefit a great deal from sharing ideas and discussing solutions to common problems. It is important to be deliberate about building a robust, amiable learning community among initiative participants.

> As is always true in any initiative, staff transitions are common and need to be actively managed. Two of the three participating colleges have experienced staff turnover among initiative leadership in the past year. By working quickly to bring new staff into the initative, colleges were able to move forward on their pathways work without delay.

NEXT STEPS

The Leona M. and Harry B. Helmsley Charitable Trust investment in the STEM Regional Collaboratives has focused attention on the importance of the middle-skill STEM agenda. The hard work and progress of the Collaborative participants have inspired a deepening commitment to strengthen the pipline into middle-skill STEM careers. Over the next three years, ATD and JFF's work through the Helmsley investment will include:

> The existing STEM Regional Collaboratives will expand their work to include other STEM pathways at their colleges. In particular, we will be working with the Collaboratives to:

>> Identify interventions that will improve student progress and completion of the pathways. In the first year of the work, interventions have been heavily focused on entry into the pathways;

>> Carefully monitor outcome metrics to gauge their reasonableness and fit for measuring student outcomes; and

>> Monitor employer and community engagement and assess the most effective ways to partner with stakeholders to build, prime, and execute the pathways.

> The states in the STEM Regional Collaborative initiative, along with partner states in JFF's Postsecondary State Policy Network, will make concrete commitments to the Middle-Skill STEM State Policy Framework and start prioritizing and implementing policy changes. Their work will be guided by the initiative's creation of a Middle-Skill STEM State Policy Framework Self-Assessment Tool;

> ATD and JFF will document and codify the work of the Collaboratives thus far to ensure that other colleges and states can learn from and adopt their work; and

> State partners will create Learning Communities in their states designed to encourage other colleges to create highly structured middle-skill STEM pathways.

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