



Strategies for Transformative Change

OFFICE OF COMMUNITY COLLEGE RESEARCH AND LEADERSHIP

Transformative Change Initiative Overview

The Transformative Change Initiative (TCI) is dedicated to assisting community colleges to scale-up innovations that improve student outcomes and program, organization, and system performance.

Transformative Change Definition

TCI defines transformative change as follows: Raising the individual, organizational, and system performance of community colleges to unprecedented levels without sacrificing their historic commitment to access and equity.

BUILDING BRIDGES FOR STUDENT SUCCESS

The STEM Bridge Program and the National STEM Consortium

The National STEM Consortium (NSC) is a collaborative of ten community colleges in nine states developing five nationally portable, one-year (30-credit) certificate programs: Cyber Technology, Mechatronics, Environmental Technology, Composite Technology, and Electric Vehicle Technology. The NSC is implementing two strategies to increase student success rates and accelerate time to completion: (1) design new curricula that integrate cohort enrollment, block scheduling, and compressed classroom time with hybrid delivery, along with embedding student support and providing employer linkages; and (2) create an accelerated STEM Bridge designed to bypass traditional developmental education by contextualizing remediation within the programs. This brief describes the STEM Bridge program designed to facilitate student transition into the programs of study. Information in this brief was provided by the leadership of National STEM Consortium.

STEM Bridge Program Definition

Each of the five programs of study includes a STEM Bridge that is designed to be consistent across all fields and transferable to other colleges. The STEM Bridge includes two interactive, online courses: **STEM Readiness and STEM Foundations**.

STEM Readiness: This course embeds competency development into the technical curriculum instead of using a traditional pre-program approach to developmental education. The STEM Readiness course has three units – Math, Critical Thinking and Workplace Communication, and Professional Skills to assist students to quickly refresh or build the necessary skills to succeed in the technical courses in the program. Students can enroll in the STEM Readiness course prior to the technical courses or concurrently.

STEM Foundations: This course contains 22 modules designed to help students with greater needs to develop foundational skills prior to entering a technical certificate program, which includes the STEM Readiness course. The units focus on development of key skills including reading strategies, writing skills, time management skills, use of fractions, and order of operations in math. The modules can be adapted and inserted by colleges wherever needed for learners to build foundational skills before entering the credit certificate programs.

Major Themes

- **Industry Relevance:** The curricula were developed with local and national industry support including final review by a subject matter expert. Nationally recognized industry certifications are embedded in each pathway. For the STEM Bridge, core skills were added to the curriculum in four key areas identified by five technical teams: Math, Critical Thinking, Workplace Communication, and Professionalism.
- **Multi-College Collaboration:** All colleges in the consortium worked together to address the common need for new curricula that encompassed broad learning outcomes applicable across regions as well as address regional differences through multiple tracks or “selective” courses to meet local employer needs.
- **Embedded Student Supports:** The NSC pathways feature a range of educational strategies that combine to support acceleration and increase student success. Cohort enrollment, where 15-20 students in a certificate program take all courses together in the same sequence, offers a community atmosphere and an opportunity for students to build relationships with other students, faculty, and staff. The sequencing

of courses in a condensed time frame enables students to complete all required courses in one year, and the consistent schedule leaves students with time for job or family responsibilities. A dedicated program navigator provides one-on-one assistance to students throughout their educational experiences from admissions to job search.



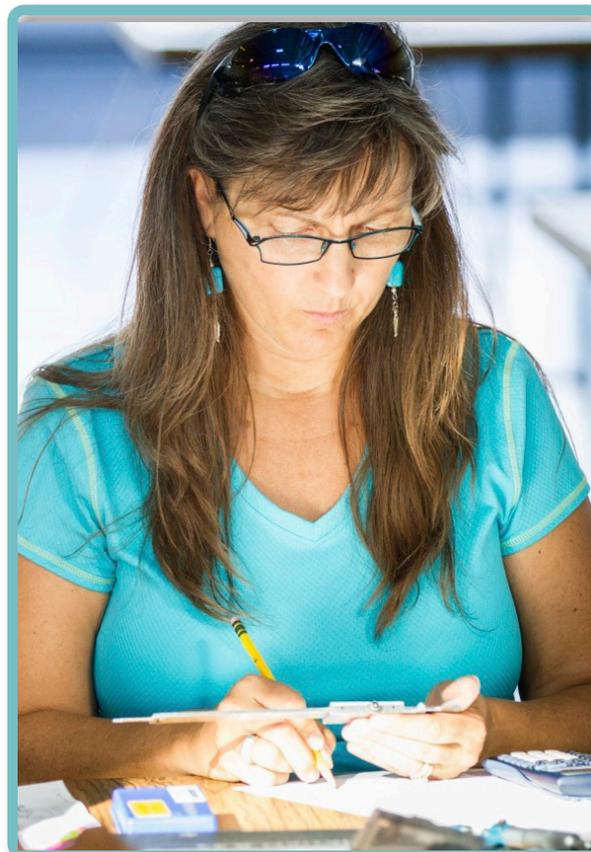
NSC is available online at <http://www.nationalstem.org/>

OER: The STEM Bridge courses are available as OER through Carnegie Mellon's Open Learning Initiative (<http://oli.cmu.edu>). Learner analytics built into the courses allow instructors to determine how well students are mastering the course content. The NSC's technical course materials also will be available in zip files in OLI's repository. Key concepts that pose particular challenges for students in each of the technical courses are being developed in interactive, online modules.

Contextualization: The STEM Readiness course and the technical courses include lessons that are built around real workplace situations. The Communications lesson scenario takes place in an air transportation emergency call center. The Math lesson on charts and graphs focuses on a chemical spill in a paper mill. The Triangles lesson uses the wingspan of a commercial plane. Students can apply classroom and lab lessons to identify solutions to real workplace problems.

"As our students complete the academic program and move into the workplace, we continue to receive feedback from employers that NSC students stand out because they come equipped with the professional and essential skills that are so frequently lacking in today's candidates."

Kimberly P. Law, NSC STEM
Bridge Coordinator



Student working on precision measurement lesson in Composite Technology class at South Seattle College.

Built-in Flexibility: The STEM Bridge courses were designed with maximum flexibility. The STEM Readiness course can be offered for credit or non-credit, taken in advance or concurrently with technical courses. The course is modularized so each unit can be embedded in a technical course to align subject matter with the technical course topic, or omitted if the content is not needed. The math portion includes a pre-test that can enable students to test out of modules.

Transferability: The learning outcomes have been found to be relevant for students in programs outside STEM, with some NSC member colleges adopting the STEM Bridge courses as "Employment Readiness" or "College and Career Readiness" courses. In addition to schools in the NSC, current users include other colleges, high schools, a middle school, alternative educational programs, and a union. One of the employer contributors intends to use the course for employee professional development.

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