

Science, Technology, Engineering, Math

BRIDGE

Partnership Program



# INSPIRING STUDENTS THROUGH STRUCTURED BUSINESS ENGAGEMENT

## A Talent Pipeline Case Study

### Abstract

The Economic Development Partnership of Greater Oak Brook is helping its members build a talent pipeline. Using innovative, interactive connections that expand area students' perceptions, inspire their imaginations, and challenge their creativity, local STEM professionals are invested in creating home-grown talent with the right skills to land hard-to-fill jobs.

Michael Baker, Gary Eicken, Hannah Temeyer & Tamryn Hennessy  
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Illinois  
Department of Commerce  
& Economic Opportunity  
OFFICE OF EMPLOYMENT & TRAINING  
Bruce Rauner, Governor



# Case Study – Greater Oak Brook Illinois STEM Bridge Partnership Program

## Rationale

Science, technology, engineering, and mathematics (STEM) jobs have outgrown non-STEM jobs over the past decade and employment projections are for STEM jobs to continue to outpace growth in non-STEM jobs over the next decade. The United States Department of Labor Bureau of Labor Statistics occupational projections for 2016-2026, project a growth of 13.5% for Computer and Mathematical occupations, and 7.4% growth in Architecture and Engineering occupations ([www.bls.gov/emp/ep\\_table\\_107.htm](http://www.bls.gov/emp/ep_table_107.htm)). As of May 2016, there were nearly 8.8 million science, technology, engineering, and mathematics (STEM) jobs, representing 6.3 percent of total U.S. Employment (*Occupational Employment and Wages Summary, March 31, 2017*). STEM occupations had an annual mean wage of \$89,400, compared with \$46,950 for non-STEM occupations ([www.bls.gov/news.release/ocwage.t01.htm](http://www.bls.gov/news.release/ocwage.t01.htm)).

Businesses need workers with skills that include: problem solving, analytical thinking and the ability to work independently; all of which are STEM skills. Historically, STEM jobs have been, and are to a large extent today, male dominated. However, today's employers are making special efforts to access talent by looking to employ more minorities and women. To meet these demands for acquiring talent, STEM educational and training initiatives need to address the widespread issue of an under-representation of minority and females in STEM careers. According to the Illinois ACT report: In 2017, 42% of Illinois graduates indicated having an interest in STEM careers, below the national average of 48%.

To address this issue, the Greater Oak Brook Economic Development Partnership (EDP), using its unique position as a community connector, formed a Steering Committee. Susan Lindquist, Chief Talent Officer at BCS Financial and the Chair of Greater Oak Brook Chamber of Commerce (GOCC) led this committee as a private sector champion with the assistance of Dr. Mary Biniewicz, STEM Coordinator for DuPage Regional Office of Education. The objective of the committee was to deliver innovative solutions to fill community needs. One such solution was the STEM Bridge<sup>1</sup> Partnership Program.

## Objectives

The ultimate objective of the STEM Bridge Program is to improve the regional talent pipeline to give businesses greater access to skilled workers and prepare students for access to career pathway occupations.

This ultimate objective of improving the talent pipeline is the key hook to secure business engagement.

The immediate objectives are to enhance career opportunities, inspire underserved students and provide career-ready future leaders for our business community.

To achieve this objective, the following activities were identified for implementation.

- Establish real-world hands-on student work simulations that could be experienced by a larger group of students
- Secure the leadership of young business leaders for demonstrating, in a relatable fashion to students, the wide variety of job types within their organizations that require and use STEM skills

### ULTIMATE OBJECTIVES

- Improve the regional talent pipeline
- Business access to skilled workers
- Jobseeker access to career pathway occupations
- Community prosperity

<sup>1</sup> “Bridge” in this context does not refer to contextualized learning bridge programs for low-skill adults.

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- Share local career data outcomes for STEM careers in salaries, job growth, etc., with students
- Establish a direct relationship between the young business leaders (YBLs) and students and have the YBLs share stories/lessons learned of their successes and failures in how they attained career-readiness competencies
- YBLs repeatedly highlighting the application of specific career-readiness skills during hands-on work activities for greater impact vs. just hearing it from teachers and advisors
- Demonstrating linkages between students' socially conscience perspective and STEM occupations

### **IMMEDIATE GOALS**

#### **1. INCREASED STEM CAREER INTEREST**

#### **2. INCREASED APPRECIATION OF EMPLOYABILITY SKILLS**

Two companion STEM areas of focus were selected for this pilot project, math and engineering. As a pilot it was important to develop a program with measurable and sustainable success. The goal of the program is to see both an increase in STEM career interest, and new appreciation for career-readiness skills to guide their future success.

### **Metrics**

Using the areas of focus described above allowed for the development of comparable standards that could later be scaled to many more programs. For the pilot stage of the initiative, surveys were developed consisting of pre- and post-surveys for Math in Marketing and for Architecture/Engineering. The survey methodology developed was reviewed by the project's higher education partners (ROE) and the high school leadership. The project also received feedback weekly through a standard email form from the mentors and high school champions (teachers). This information was used for real time suggestions and for future process improvement.

The surveys gathered the following information:

- Previous contact with a professional in this STEM field
- Clarity in applying skills from class in industry
- Level of importance of career-readiness skills on future success
- Interest in pursuing STEM-related career

### **Desired Student Take-Away**

With greater acknowledgement and understanding of essential employability skills, it is hoped the students will hone these skills along with technical skills to set themselves apart in obtaining employment and in the workplace.

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## Program Design

Young business leaders from the Greater Oak Brook Chamber of Commerce Young Business Leader group were invited to provide relatable experiences to the programming, including both hands-on, work simulations, and also through their invaluable early career experiences that they could use to inspire at-risk students to explore STEM careers. Willowbrook High School (WHS) was selected as the pilot partner, because it represented a highly diverse economic and ethnic student body, with over 50% of students receiving supplemental funding and with over 40 languages spoken in the student body. Young Business Leaders were matched with a high school champion teacher to develop hands-on work simulation projects. Invaluable bridges were built between relatable YBLs and impressionable, inspired high school students and their teachers. The buy-in and participation of the YBLs was essential to the development and implanting of this initiative.

The initial launch was the spring 2017 semester. Young STEM business leaders from Ace Hardware, GEA Architects, and Terracon Construction worked with 40 students from the culturally and economically diverse Willowbrook High School on real-life, hands-on math and engineering work simulations over an eight-week period. Through weekly meetings in the high school over the eight-week period, the YBLs led a series of fun, hands-on activities applying coursework to the real world of work. An important element for success was the school providing a dedicated time and space for project activities.

## Architecture/Engineering

The Architecture/Engineering project brought career pathways to life by challenging students to CAD design the layout and develop the construction schedule for a new York Restaurant, an actual project on which the two YBL mentors were collaborating.

### Weekly Activities

- Overview of interdependencies within engineering and construction/Yolk restaurant introduction
- Tour of school cafeteria to demonstrate restaurant design needs/review of AutoCAD/overview of structural issues
- Student presentations of designs/project management process
- Student presentations of project management recommendations/team "blueprint wars" locating elements on prints
- Tour of two Yolks restaurants and lunch

## Math in Marketing

The Math in Marketing project brought career pathways from math studies to life by simulating Ace Hardware's category review, a process of mathematically analyzing product's performance and profitability. Students conducted product testing, analyzed marketing data and built out actual plan-o-gram product displays (POG) at Ace's warehouse headquarters.

### Weekly Activities

- Ace Hardware organizational overview and utilization of big data in marketing
- Analytics presentation/student team product testing of broom category
- Student presentations based upon data/promotions marketing overview
- Vendor factory tour/ACE corporate tour/Introduction of POGs and profitability based upon analytics

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- Student team POG building and presentations competitions at warehouse

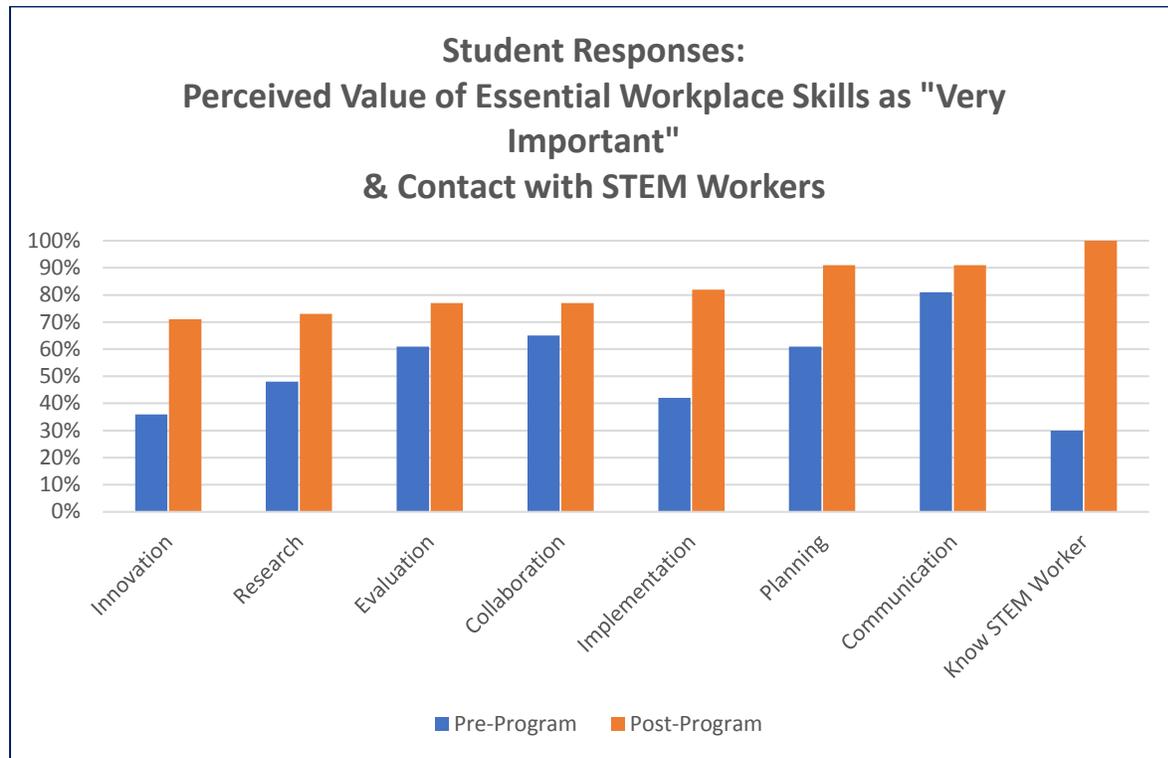
The STEM Bridge Partnership Program worked closely with a strategic alliance of key partners to ensure that a variety of interests were served and success attained.

## Results

Student surveys were conducted at the beginning and end of the project to measure their perception of the importance of several essential workplace skills and their prior awareness of STEM-related occupations and professionals working in those occupations. The survey results indicated:

- There was a significant increase in appreciation for the importance of specific career-readiness skills on their future careers in comparing Pre- and Post-project surveys. Significant improvements in appreciation for career skills were noted in innovation (97% increase), implementation (95% increase), research (52% increase), and planning (49% increase).
- The percent of students that personally knew a STEM professional increased from 30% to 100%

Student Survey Results				
Perceived skill as "Very Important" & Personally know a STEM worker				
Skill	Pre-Program	Post-Program	Change	% Change
Innovation	36%	71%	0.35	97.2%
Research	48%	73%	0.25	52.1%
Evaluation	61%	77%	0.16	26.2%
Collaboration	65%	77%	0.12	18.5%
Implementation	42%	82%	0.40	95.2%
Planning	61%	91%	0.30	49.2%
Communication	81%	91%	0.10	12.3%
Know STEM Worker	30%	100%	0.70	233.3%



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## Partners

- Greater Oak Brook Economic Development Partnership
- STEM Bridge Partnership Steering Committee,
- Steering Committee
  - DuPage Regional Office of Education
  - BCS Financial
  - Willowbrook High School

In the initial launch year, the majority of effort was expended researching the needs of the community, studying successful existing programming, and building out an innovative model that could be expanded and replicated. At the conclusion of the pilot year, the results of the pre- and post-program surveys as well as weekly assessments were presented to all participants to follow a continuous process improvement methodology and adjust the project for 2018's expansion. Through the Greater Oak Brook Economic Development Partnership's website and social media presence, the program has been fully shared through the online community.

## Organizations that shared solutions and best practices

- DuPage Regional Office of Education-Supporting 42 school districts in DuPage County IL
- Greater Oak Brook Chamber of Commerce Talented Workforce Committee-Chief Human Resources Officers and Higher Education Partners from Greater Oak Brook area
- Greater Oak Brook Economic Development Partnership Council-Executive leadership group from Greater Oak Brook area
- IACCE (Illinois Association of Chamber of Commerce Executives) Annual Meeting Conference Presenter-Membership comprised of 100 Illinois Chambers' Executives
- Regional Press Releases
- James R. Jordan Foundation (STEAM program)-Supporting inner-city Chicago grade school awareness of STEAM related careers

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## Program Take-Aways – Promising Practices & Lessons Learned

Desirable project elements that could be replicated statewide and focused on a variety of industries and occupations include:

- Business engagement in directing program activities throughout the program
- Career awareness and exploration
- Awareness and development of essential employability skills
- Mentoring
- Hands-on student projects using real-world examples
- Connecting students with potential future employers

## Keys to success-Bringing excited and motivated stakeholders together with a “can-do” attitude.

- The Willowbrook High School principal enthusiastically sponsored the program and included forward thinking teachers to manage the in-school component. Without the principal, teachers, and advisors ensuring students completed assignments between meetings, the young business leader (YBL) role would have been overwhelmed. Faculty and staff supported classroom management and provided insightful feedback to improve the program.
- The YBLs well represented their generation in finding great meaning in melding their work life and social impact goals. They originated challenge project concepts which would have been impossible for the program sponsor or the school to develop. They also obviously brought immediate credibility in their youthful demeanor in building bridges to the students.
- The Greater Oak Brook Economic Development Partnership was critical in spearheading this initiative. It formed this coalition of informed stakeholders through connections to corporate council partners and credibility within educational leadership. It was enlightening to hear from both sides that they had no pre-existing “bridge” to come together and share their needs and vision for a stronger workforce. Access to enthused young business leaders provided insights into great potential mentors for the projects as well.

## Lessons Learned

- Anytime the content was too heavy in lecture or simply asking for volunteers to present, on-the-whole the level of enthusiasm diminished. Only a very few students feel comfortable in speaking up in the school setting. This led to a less than energetic pace to that week’s activity.

## During-the-project changes

- Began to always incorporate competitions and individual and group presentations that everyone had to participate in. The students would immediately respond well for the most part and were very respectful of each other’s abilities.

## Changes based on final results

- Several enhancements are planned based on student feedback. Students would like a better sense of how the Bridge project fits into their actual school course. With more planning and knowledge of the project in advance, teachers will be able to cross reference in both the class and during the project this relevance.

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- Incorporate expanded career-readiness programming in small groups facilitated by YBLs including interview prep, resume building, and networking.

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# BRIDGE

Partnership Program

*Inspiring students to develop their full career potential and pursue in-demand careers & engaging businesses to directly impact the career readiness of their future workforce*

70% of students had never engaged with a professional in their STEM-chosen field of study

The Greater Oak Brook Economic Development Partnership sponsored a "near peer" group mentoring program for students interested in pursuing in-demand STEM careers by building an informational bridge:

**Matching diverse students with young business professionals**

to provide students experience in:

- Hands-On, Work Simulations patterned after actual workplace projects
- Career-Readiness Skills including communication, collaboration, and planning

**Student Projects**

**Architecture/Engineering**

Students worked with GEA Architects and Terracon Construction to utilize CAD to design the layout of a new York restaurant and develop the construction schedule.

**Math in Marketing**

Students utilized big data analysis and performance testing while working with Ace Hardware to conduct product category reviews.

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