

INVENTION PROJECT® EVALUATION EXECUTIVE SUMMARY

Conducted by **CHANGEmaker Consulting**



ABOUT INVENTION PROJECT

Invention Project is a middle school program where children entering grades 6-8 engage in hands-on activities that promote engagement with STEM and the building of 21st century skills (e.g., creative problem solving) through the lenses of invention, innovation and entrepreneurship. Developed by educators, the curricula align with Common Core State Standards and Next Generation Science Standards, and are carefully piloted before a national roll-out. The program also provides teachers with professional development opportunities to apply new teaching methods and rethink learning environments.

ABOUT THE INVENTION PROJECT EVALUATION

In 2015, the first year of the national roll-out of the Invention Project program, the National Inventors Hall of Fame engaged in an independent program evaluation of the 5-day Invention Project program. Researchers have discovered correlations between a young person's attitude toward STEM and their success in STEM, which may encourage a student to pursue these subjects at the college level and ultimately have careers in these fields.

Scientific literature indicates that STEM, creativity and invention share many critical attitudes and skillsets. As such, this evaluation was designed to better understand and capture the level of impact Invention Project had on participants' creativity as well as changes in attitude or future aspirations for invention, entrepreneurship and STEM learning.

THE QUESTIONS THAT GUIDED THE EVALUATION

- In what ways and to what extent do students express an increased interest

in or communicate an increased intent to pursue education or a career in STEM, invention and entrepreneurship?

- In what ways and to what extent do students demonstrate attitudes and behaviors known to foster creativity, innovation and invention?
- In what ways and to what extent do students demonstrate attitudes and behaviors known to foster STEM learning?
- In what ways and to what extent do instructors' beliefs about curriculum, pedagogy and content change as a result of teaching for Invention Project?

FINDINGS

Impact on Participants' Positivity about STEM, Invention and Entrepreneurship

Overall, student survey results showed a statistically significant increase in participants' positivity toward STEM, invention and entrepreneurship. Students were more positive about the meaningful difference inventors and entrepreneurs make in the world and the belief that the purpose for inventions is to help people live better lives.

Impact on Participants' Attitudes that Foster STEM Learning

Participant surveys noted a statistically significant belief that they could be a successful inventor or entrepreneur after participating in Invention Project. The instructor survey results reveal a statistically significant large positive change in their willingness to persist despite difficulties, ability to function effectively as a team, comfort in making changes when things didn't go as planned and the ability to accept mistakes as part of the learning process.

Impact on Participants' Creative Thinking

Creative thinking and problem solving had two dimensions that were assessed: divergent thinking and convergent thinking. Results showed that Invention Project contributed to a statistically significant change in convergent thinking skills.

Impact on Participants' Future Aspirations for STEM/Invention and Entrepreneurship

Instructors reported that participants were considerably more likely to:

- Envision themselves as an inventor or entrepreneur after participating in the program.
- Believe that what they learned at Invention Project would be important for their future career.
- Recognize the rewarding nature of a career as an inventor.
- Understand the education requirements to prepare for a career as an inventor or entrepreneur.

Impact on Invention Project Instructors

Overall, instructors reported improved attitudes about STEM and STEM teaching, frequent use of techniques that foster creative thinking in their regular classroom and expressed more willingness to incorporate evidence-based strategies into their teaching in the future. The literature on the positive impact these strategies have on student learning is vast.

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