



Impact Report Memo - Spring 2023
STEM Innovation Challenges in Kigali, Rwanda - The Cornerstone Initiative

The Junior Academy is an international community of young people dedicated to solving the world's most pressing challenges using STEM. Administered by The New York Academy of Sciences (The Academy), each semester, teams of young people opt into online open innovation challenges and work through a 10- week design thinking and research curriculum through our distance learning platform, Launchpad. In regions around the world, including Rwanda, the program is customized and adapted to best serve the students, educators and communities of that region.

[Since 2020, The Academy has been engaged with students, ages 13-17, in Kigali to pilot a hybrid model of the program.](#) Piloting with 15 government schools in the Kicukiro School District, 2,500 students have participated in 10-week open innovation challenges facilitated by their STEM teachers in the after school hours and on weekends. With a 98% completion rate, students “graduate” from their teacher-led program into the Global Junior Academy, where they can partner with students from around the world. Students develop interests in a wide-range of skills in STEM, innovation, ICT, and civics with challenges that connect to the Sustainable Development Goals. The program prepares them for careers in STEM, ICT, civil service and entrepreneurship and the technical and soft skills skills gained are of utmost importance in the knowledge economy.

Overview of the Evaluation and the Importance of SEL

The Academy uses [HelloInsight](#), an external youth development evaluation system that provides a holistic assessment which measures growth in areas that are predictive of success later in life. Growth in these Social Emotional Learning (SEL) areas are predictors not only of social and academic success later in life but also the likelihood of thriving as a young person. Evaluation by HelloInsight student-based surveys provide evidence that throughout the Academy's Innovation Challenge program, young people gain 21st-century skills and develop social and emotional capacities that correlate with long-term gains in high school completion, college/career readiness, and increased life-long thriving.

Social and emotional learning (SEL) is the process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. There is growing evidence that SEL qualities, often referred to as “soft skills,” rival academic or technical skills in their ability to predict employment and earnings, among other outcomes. While the demand for such soft skills has increased over the past twenty years, many employers around the world have reported that

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job candidates lack the soft skills related to SEL qualities which are needed to effectively fill available positions.

In the face of current societal, economic, environmental, and social challenges, the promotion of these non-academic SEL skills is seen as more critical than ever before, with business and political leaders urging schools to pay more attention to equipping students with soft skills such as positive identity, social skills, self-management, social capital, academic self-efficacy, and a sense of contribution – often referred to as SEL or “21st Century Skills” (CASEL, 2021). The report below describes the holistic growth areas in SEL that are measured through Hello Insight and explains how they are applied within the Innovation Challenge program and why they matter for student development overall.

Program Satisfaction: Young people were asked whether they would recommend the Innovation Challenge to a friend. They ranked their responses on a five-point scale from Definitely Not to Definitely Yes. Most young people (94%) answered Definitely Yes or Probably Yes when asked if they would recommend this program to a friend.

Promote Peer Bonds: Many of the young people in the Innovation Challenge experienced authentic engagement with their peers in the program’s community (81%). Authentic engagement is a key best practice shown to promote SEL growth. In our program, young people build peer bonds with a cohort of their peers where they learn to collaborate and communicate in geographically and culturally diverse teams. Students also built a group or team identity (84%) where they felt safe and supported by one another (76%). Young people felt that the program created safe spaces in which to learn with and from one another, exploring similarities and differences and developing deep bonds and relationships.

Manage Goals: Most young people (80%) experienced a program in which they set up and managed goals that are important to them and that build upon their passions and interests, a key best practice shown to promote SEL growth. It has been shown to increase motivation, impact an individual’s perceived control over their future, and promote overall positive youth development (Lerner, R.M., et al., 2011; Houston, E. 2020). Many students have the opportunity with the Innovation Challenge to pursue various strategies to meet their goals, including reflecting on progress along the way and shifting gears when necessary (84%). They also worked to set both individual and group goals while supported by an adult in the program.

Expand Interests: Many (82%) of the young people in the Innovation Challenge reported that this program expanded their interests, a key best practice shown to promote SEL growth. Expanding interests indicate that a young person experienced a program in which they are supported to try new things, broaden their horizons, learn about other people’s cultures and

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perspectives, and explore their own identities. Expanded interests for young people have been shown to have many positive benefits, including: increase in school engagement and high school graduation rates; promotion of healthy behaviors and decrease in risky behaviors; increase in overall satisfaction with life (Search Institute, 2020); increase in a sense of contribution and desire to give back; and promotion of a healthy, positive identity (Benson, P.L. 2006; Scales, P.C., et al., 2011). Students in the Innovation Challenge felt encouraged to try new things and take a risk, even if it felt difficult (83%). These qualities - a willingness to explore the similarities and differences among peers and being comfortable with taking risks - are key factors in innovation in science, so we are proud to see that these elements score so highly on the program's evaluation.

Challenge Growth: The majority of students (90%) reported that they felt positively challenged. They were encouraged to take risks in their work and perform beyond their own expectations, a key best practice shown to promote SEL growth. Increasing a young person's growth through positively-challenging experiences has also been shown to promote resilience (Zhang, Y. et al., 2011), strengthen their ability to stay focused on achieving their long-term goals (Steele, C.M. 2011), enhance their academic performance (Bowen, G., et al., 2012), and increase their civic participation (Mesurado, B., et al., 2014). Growth through positive challenge is, in part, a measurement of how students interacted with adult mentors and staff during the program. The vast majority of students (90%) felt that these adults in the program believed in the students' abilities to solve hard problems. In addition, 92% of students felt the adults in the program often expressed to young people that they expected them to try hard and do their best.

Share Power: It is rare that students get to follow their own interests and passions in a high school research program. Within the Innovation Challenge, the majority of students (87%) worked on a project of their own choice and in groups with shared interests. The division of labor within the teams - a key program element - allowed students to follow their individual interests while deriving the most benefit from the group as a whole. Many (84%) of the young people in this program had an experience with an adult who shared power with them and ensured that their voices and opinions mattered, a key best practice shown to promote SEL growth. Sharing power involves supporting young people to feel connected, engaged, and included as true contributing members of their programs, teams, groups, communities, and societies. It has also been shown to promote diversity, equity, and inclusion both in the classroom and in society (Zeldin, S et al., 2000; Sabo-Flores, 2013; Ginwright, S. & James, T., 2002). It enhances problem-solving skills, builds effective communication skills, increases critical thinking, and ignites a sense of contribution and civic engagement (Sabo Flores, K., 2013; Ginwright, S. & James T., 2002; Zeldin, Z. et al., 2000).