National Inventors Hall of Fame

Club Invention Youth View Survey Report 2021-2022

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SUMMIT EDUCATION INITIATIVE

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SYSTEM OVERVIEW

Supporting student success from cradle to career is a complex challenge. No single person, policy, or initiative can drive transformation. Only collective action can lead to system change.

Individuals and organizations across the community have different skills and resources, and each plays a role in supporting student success. Some organizations provide direct services to students but cannot measure the impact of their work. Increasing technical capacity in a small nonprofit can be costly. Other organizations have the technical capability to collect and analyze data, report program impacts, and direct community efforts to areas of need. Still, they do not provide direct services to students. These organizations are known as *backbone organizations*.

Backbone organizations support data collection and program evaluation tasks for nonprofit partners working with students through partnerships and shared funding streams. When backbone organizations provide this support, those working with students can focus attention on the quality of their work with fewer distractions. This collective approach has the benefit of generating shared outcomes and impact measures across various community programs.

ABOUT SUMMIT EDUCATION INITIATIVE

Summit Education Initiative (SEI) is a research-based nonprofit organization that supports personal and regional prosperity through educational attainment in Summit County, Ohio. SEI does not directly operate programs. SEI has established research partnerships with schools to analyze and report on trends in student success across the region. SEI measures cradle to career educational outcomes across the region, identifying inequities and opportunities for improvement.

SEI also works with *Out of School Time Partners* (OSTPs) that support students beyond the school day. While OSTPs work directly with students, SEI coordinates and manages their program evaluations. SEI and many OSPTs are financially supported by the same philanthropic organizations in the region. SEI does not charge partners for small-scale program evaluations, as such costs would change the dispersion of grant funds from one nonprofit to another. Philanthropic organizations view their investments in SEI and these OSTPs as a mutually reinforcing activity to drive system change.

BACKBONE SUPPORT FOR MEASURING IMPACT

SEI supports official 501(c)(3) and other recognized nonprofits, provided the majority of the served youth reside in and attend school in Summit County, Ohio. The intent is to help partners measure the impact of out-of-school programs on students' academic outcomes. OSTPs working with SEI meet general criteria regarding program design and length. Additionally, parents must provide written consent for their student's outcome data in program evaluations. SEI only shares aggregated and de-identified results with OSTPs unless parents explicitly authorize sharing personally-identifiable information.

Results of SEI's program evaluations do not necessarily represent an endorsement of any specific organization, program, or product.

NATIONAL INVENTORS HALL OF FAME (NIHF) AND CLUB INVENTION

ABOUT NIHF

The National Inventors Hall of Fame Reaches Far Beyond their museum. The National Inventors Hall of Fame® (NIHF) mission is to recognize inventors, promote creativity, and advance the spirit of innovation and entrepreneurship. They connect inventors who have built the world around us with the innovators of tomorrow. Their approach includes inducting the world's most creative minds into the National Inventors Hall of Fame, working one-on-one with each new Inductee class to learn about their unique innovation journeys, and infusing their stories, insights, and passion into our STEM education programs. They provide authentic, impactful experiences that help tomorrow's innovators realize their potential.

ABOUT CLUB INVENTION

Club Invention® takes the nationally-recognized Camp Invention summer program and turns it into an innovative afterschool option. Children participate in STEM activities that encourage imagination and build creative problem-solving skills. With NIHF Inductees' insights and feedback integrated directly into curricula, NIHF programs are exceptionally positioned to inspire children through the real perspective of individuals who saw an opportunity and improved the world through innovation and inventiveness. Club Invention is designed to focus on and strengthen creativity, real-world problem solving, open-ended building, exploration of STEAM (science, technology, engineering, art, and math) concepts, and discovery of the invention process.

EVALUATION FOCUS

The targeted goals for the programs were many. We would highlight the purposes related to the socio-emotional outcomes and the YouthView Out Of School Time (OST) Surveys conducted at the target program sites *in 2021-2022 for 5th and 6th graders*. YouthView OST is a social-emotional survey developed by Summit Education Initiative. Our goal was to contribute something other than grades and test scores to conversations about youth development and create a solution for Out School Time Providers that could drive positive action at the student, program, and OST Organization levels.

YOUTHVIEW OUT OF SCHOOL TIME SURVEYS (YV OST SURVEYS)

After several field tests and revisions, SEI validated the YouthView survey instrument in 2014. This survey has been administered to over 14,500 students over the years. The YouthView OST Survey is program-specific. The results are anonymous and aggregated at the program level. The 16 item survey measures student perceptions in four main domains apart from program participation and post-graduation items. The survey domains include a sense of belonging, academic motivation and confidence, college-going identity, and future sense of self.

PROGRAM GOALS

The expected benefits of the Club Invention program include a priority set of results which evidence shows to be essential to student success. The socio-emotional outcomes as demonstrated through YouthView Survey Results and as it pertains to the program targeted socio-emotional and student perceptions outcomes include:

- Improved Sense of Belonging (Relationship skills - adults, peers)
- Increased Motivation and Confidence for Academic Success in school (Perseverance, Curiosity, growth mindset)

- Improved College-Going Identity (Perseverance and Growth Mindset)
- Improved Future Sense of Self (Self-efficacy, Executive Function, Self- Regulation)

YOUTH POPULATION SERVED

The YouthView Surveys were administered to the 5th and 6th graders between the ages of 10 and 14 at five different program sites across the nation. There were more male survey respondents than females in both the pre and post surveys administered. Similarly, more white students took the surveys over minority student respondents (Asians, Black, Hispanics, Multiracial, and others). The surveys were administered twice- once at the program's start and once at the end. More respondents were for pre-surveys (N=336) than post-surveys (N=304). A couple of sites had taken the surveys just once (N=128). A total of 293 5th graders and 454 6th graders had completed the pre, post, and one-time surveys from all sites. About 21 of them did not report their grade levels.

TABLE 1: NUMBER OF SURVEYS COMPLETED DISAGGREGATED BY GENDER

Sites	Gender			
Pre-Surveys	**Female**	**Male**	**Not Reported**	**Site Total**
Akron City Ohio 5th	32	44	8	84
Akron City Ohio 6th	21	51	16	88
Chicago Room 1	13	8	5	26
Chicago Room 2	7	9	4	20
New York City Online	3	2		5
Norwayne Local Schools Ohio	52	56	5	113
Total	**128**	**170**	**38**	**336**

One Time Surveys	**Female**	**Male**	**Not Reported**	**Site Total**
NYC - District 22	52	35	7	94
DallasI SD	18	16		34
Total	**70**	**51**	**7**	**128**

Post-Surveys	**Female**	**Male**	**Not Reported**	**Site Total**
Akron City Ohio 5th	36	39	11	86
Akron City Ohio 6th	18	30	9	57
Chicago Room 1	14	8	4	26
Chicago Room 2	8	8		16
New York City Online	1	6	2	9
Norwayne Local Schools	51	55	4	110
Total	**128**	**146**	**30**	**304**

TABLE 2: NUMBER OF SURVEYS COMPLETED DISAGGREGATED BY ETHNICITY

Sites	Ethnicity					
Pre-Surveys	Asian	Black	Hispanic or Multiracial or Others	Not Reported	White	Grand Total
Akron City Ohio 5th	6	30	13	1	34	84
Akron City Ohio 6th	6	21	28	3	30	88
Chicago Room 1			23	1	2	26
Chicago Room 2	1		17	1	1	20
New York City Online		2	3			5
Norwayne Local Schools		1	7	5	100	113
Total	**13**	**54**	**91**	**11**	**167**	**336**

One Time Surveys	Asian	Black	Hispanic or Multiracial or Others	Not Reported	White	Grand Total
NYC - District 22	14	30	26	1	23	94
DallasI SD			28		6	34
Total	**14**	**30**	**91**	**1**	**29**	**128**

Post-Surveys at	Asian	Black	Hispanic or Multiracial or Others	Not Reported	White	Grand Total
Akron City Ohio 5th	8	29	13	4	32	86
Akron City Ohio 6th	5	21	14		17	57
Chicago Room 1		1	23		2	26
Chicago Room 2	1		15			16
New York City Online		2	1	1	5	9
Norwayne Local Schools	1	1	8	4	96	110
Total	**15**	**54**	**74**	**9**	**152**	**304**

OUTCOME MEASURES AND DATA SOURCES

The outcome measures are the specific domain-centric results of the YV OST surveys administered both in-person and virtually through Survey Monkey across the five sites.

Sense of Belonging: Students on their path to success need to feel valued and respected. Students who feel connected with their environment, including peers, mentors, or other role models, are more likely to persist throughout life.

Academic Motivation & Confidence: Combines student willingness to learn new content with the belief that success is attainable. Students who are motivated and confident in their abilities experience greater success.

College-Going Identity: Attending college or advanced training after high school created more significant opportunities for students. Students who intend to go to college are more likely to invest in themselves and seek new learning opportunities.

Future Sense of Self: When students visualize who and what they want to be in the future, they are more likely to regulate behaviors and make positive decisions in the present.

The domain score ranges from low to average and high scores. The minimum score possible is 10, and the maximum for each domain is 60. The low, middle, or average and high or upper range of scores for each domain and the norms for the YouthView survey domains across age groups can be found here.

RESULTS

The results include Survey Domain levels Distribution for pre and post-surveys.

SENSE OF BELONGING DOMAIN LEVELS

Table 3. **Sense of Belonging Pre-Surveys**

Site	Average	High	Low	Not Calculated
Akron City Ohio 5th	46.43%	30.95%	15.48%	7.14%
Akron City Ohio 6th	44.32%	23.86%	26.14%	5.68%
Chicago Room 1	50.00%	19.23%	23.08%	7.69%
Chicago Room 2	55.00%	25.00%	15.00%	5.00%
New York City Online	40.00%	40.00%		20.00%
Norwayne Local Schools	36.28%	21.24%	37.17%	5.31%
Grand Total	**43.15%**	**24.70%**	**25.89%**	**6.25%**

Table 4. **Sense of Belonging Post-Surveys**

Site	Average	High	Low	Not Calculated
Akron City Ohio 5th	25.58%	60.47%	5.81%	8.14%
Akron City Ohio 6th	40.35%	45.61%	7.02%	7.02%
Chicago Room 1	34.62%	42.31%	23.08%	
Chicago Room 2	31.25%	25.00%	31.25%	12.50%
New York City Online	11.11%	66.67%	22.22%	
Norwayne Local Schools	33.64%	31.82%	30.00%	4.55%
Grand Total	**31.91%**	**44.08%**	**18.09%**	**5.92%**

As evidenced from tables 3 and 4, the percentage of students scoring average plus a high sense of belonging taken together were higher in post surveys (80%) than in pre-surveys (68%). Likewise, the number of students scoring low for the domain was lower in post-surveys (18%) than in pre-surveys (26%). The increase in high scores in the domain levels and reduced low scores accounts for an increase in the Sense of Belonging after the Club Invention program. The sense of belonging levels for one-time surveys are below in table 5.

Table 5. **Sense of Belonging One Time Surveys**

Site	Average	High	Low	Not Calculated
NYC - District 22	44.12%	20.59%	35.29%	
Dallas SD	30.85%	13.83%	51.06%	4.26%
Grand Total	**34.38%**	**15.63%**	**46.88%**	**3.13%**

ACADEMIC MOTIVATION AND CONFIDENCE DOMAIN LEVELS

Table 6. **Academic Motivation And Confidence Pre-Surveys**

Site	Average	High	Low	Not Calculated
Akron City Ohio 5th	48.81%	25.00%	16.67%	9.52%
Akron City Ohio 6th	40.91%	15.91%	34.09%	9.09%
Chicago Room 1	34.62%	42.31%	15.38%	7.69%
Chicago Room 2	65.00%	10.00%	25.00%	
New York City Online	20.00%	40.00%	40.00%	
Norwayne Local Schools	44.25%	22.12%	31.86%	1.77%
Grand Total	**44.64%**	**22.32%**	**27.08%**	**5.95%**

Table 7. **Academic Motivation And Confidence Post-Surveys**

Site	Average	High	Low	Not Calculated
Akron City Ohio 5th	38.37%	39.53%	16.28%	5.81%
Akron City Ohio 6th	31.58%	26.32%	29.82%	12.28%
Chicago Room 1	30.77%	38.46%	26.92%	3.85%
Chicago Room 2	50.00%	25.00%	18.75%	6.25%
New York City Online	44.44%	44.44%	11.11%	
Norwayne Local Schools	34.55%	30.91%	28.18%	6.36%
Grand Total	**35.86%**	**33.22%**	**24.01%**	**6.91%**

As evidenced from tables 6 and 7, the percentage of students scoring average plus a high Academic Motivation and Confidence taken together were higher in post surveys (70%) than in pre-surveys (67%). Likewise, the number of students scoring low or average for the domain was lower in post-surveys (24% and 36%) than in pre-surveys (27% and 45%). The increase in high scores in the domain levels and reduced low scores accounts for increased Academic Motivation and Confidence after the Club Invention program. The sense of belonging levels for one-time surveys are below in table 8. The average and high scores accounted for close to 3/4th of the survey respondents.

Table 8. **Academic Motivation And Confidence One Time Surveys**

Site	Average	High	Low	Not Calculated
NYC - District 22	50.00%	29.41%	17.65%	2.94%
Dallas SD	43.62%	27.66%	21.28%	7.45%
Grand Total	**45.31%**	**28.13%**	**20.31%**	**6.25%**

FUTURE SENSE OF SELF DOMAIN LEVELS

Table 9. **Future Sense of Self Pre-Surveys**

Site	Average	High	Low	Not Calculated
Akron City Ohio 5th	32.14%	28.57%	23.81%	15.48%
Akron City Ohio 6th	30.68%	27.27%	36.36%	5.68%
Chicago Room 1	23.08%	26.92%	30.77%	19.23%
Chicago Room 2	45.00%	25.00%	30.00%	
New York City Online	20.00%	20.00%	40.00%	20.00%
Norwayne Local Schools	33.63%	34.51%	24.78%	7.08%
Grand Total	**32.14%**	**29.76%**	**28.57%**	**9.52%**

Table 10. **Future Sense of Self Post-Surveys**

Site	Average	High	Low	Not Calculated
Akron City Ohio 5th	41.86%	30.23%	20.93%	6.98%
Akron City Ohio 6th	33.33%	33.33%	28.07%	5.26%
Chicago Room 1	30.77%	30.77%	34.62%	3.85%
Chicago Room 2	25.00%	37.50%	12.50%	25.00%
New York City Online	77.78%	11.11%	11.11%	
Norwayne Local Schools	29.09%	43.64%	22.73%	4.55%
Grand Total	**34.87%**	**35.53%**	**23.36%**	**6.25%**

As evidenced from tables 9 and 10, the percentage of students scoring average plus a high Future Sense of Self taken together were higher in post surveys (70%) than in pre-surveys (62%). Likewise, the number of students scoring low for the domain was lower in post-surveys (23%) than in pre-surveys (29%). The increase in high scores post surveys and reduced low scores accounts for an increased Future sense of self after the Club Invention program. The sense of belonging levels for one-time surveys are below in table 11. The average and high scores for the one-timers accounted for 75% of the survey respondents.

Table 11. **Future Sense of Self One Time Surveys**

Site	Average	High	Low	Not Calculated
NYC - District 22	47.06%	41.18%	11.76%	
Dallas SD	34.04%	37.23%	20.21%	8.51%
Grand Total	**37.50%**	**38.28%**	**17.97%**	**6.25%**

COLLEGE GOING IDENTITY DOMAIN LEVELS

Table 11. **College-Going Identity Pre-Surveys**

Site	Average	High	Low	Not Calculated
Akron City Ohio 5th	15.48%	45.24%	30.95%	8.33%
Akron City Ohio 6th	28.41%	25.00%	37.50%	9.09%
Chicago Room 1	30.77%	38.46%	19.23%	11.54%
Chicago Room 2	45.00%	15.00%	35.00%	5.00%
New York City Online	20.00%	40.00%	40.00%	
Norwayne Local Schools	18.58%	30.09%	46.90%	4.42%
Grand Total	**22.92%**	**32.44%**	**37.50%**	**7.14%**

Table 12. **College-Going Identity Post-Surveys**

Site	Average	High	Low	Not Calculated
Akron City Ohio 5th	24.42%	39.53%	27.91%	8.14%
Akron City Ohio 6th	15.79%	38.60%	38.60%	7.02%
Chicago Room 1	34.62%	30.77%	26.92%	7.69%
Chicago Room 2	31.25%	31.25%	25.00%	12.50%
New York City Online	22.22%	66.67%	11.11%	
Norwayne Local Schools	16.36%	37.27%	42.73%	3.64%
Grand Total	**21.05%**	**38.16%**	**34.54%**	**6.25%**

As evidenced from tables 11 and 12, the percentage of students scoring average plus a high College-Going Identity taken together were higher in post surveys (59%) than in pre-surveys (55%). However, the scores in this domain were lesser than in other domains. Likewise, the number of students scoring low for the domain was lower in post-surveys (35%) than in pre-surveys (37%). After the Club Invention program, the increase in high scores post surveys and reduced low scores accounts for an increased College-Going Identity. The sense of belonging levels for one-time surveys are below. The average and high scores for the one-timers accounted for 71% of the survey respondents.

Table 13. **College-Going Identity One Time Surveys**

Site	Average	High	Low	Not Calculated
NYC - District 22	41.18%	38.24%	20.59%	
Dallas SD	23.40%	44.68%	25.53%	6.38%
Grand Total	**28.13%**	**42.97%**	**24.22%**	**4.69%**

PLANS AFTER HIGH SCHOOL

The following table shows the distribution of pre, post, and one-time survey responses when asked for their plans after High School. Most of your students plan to enroll in college; some favor getting employed, and the rest would get enlisted. A minor percentage of students are unsure of their post-high school plans.

Table 14. **College-Going Identity One Time Surveys**

| Surveys	Enroll In College	Enlist in Service	Get Employed	Unsure Of Post HS Plans
Pre-Survey	192	13	38	13
Post- Survey	187	10	30	11
One Timers	98	9	28	7

RECOMMENDING CLUB INVENTION TO OTHERS

Table 15 and Chart 1 shows the distribution of pre, post, and one-time survey responses when asked for their recommendations for Club Invention Program. Most of your students reported their positive views of your program by their willingness to recommend it to others, followed by unsure, not recommend, and no response. A small number of students (3-10%) had responded *No* when asked for a recommendation. As highlighted below, the number of students recommending your program was higher in post-surveys than in pre-surveys.

Table 15. **College-Going Identity One Time Surveys**

Surveys	No	Not Reported	Not Sure	Yes
Pre-Survey	10	10	146	170 (69%)
Post- Survey	15	7	78	204 (52%)
One Timers	10	1	54	63 (50%)

Figure 1. Club Invention Recommendations by Participants

Will You Recommend Club Invention to Others?
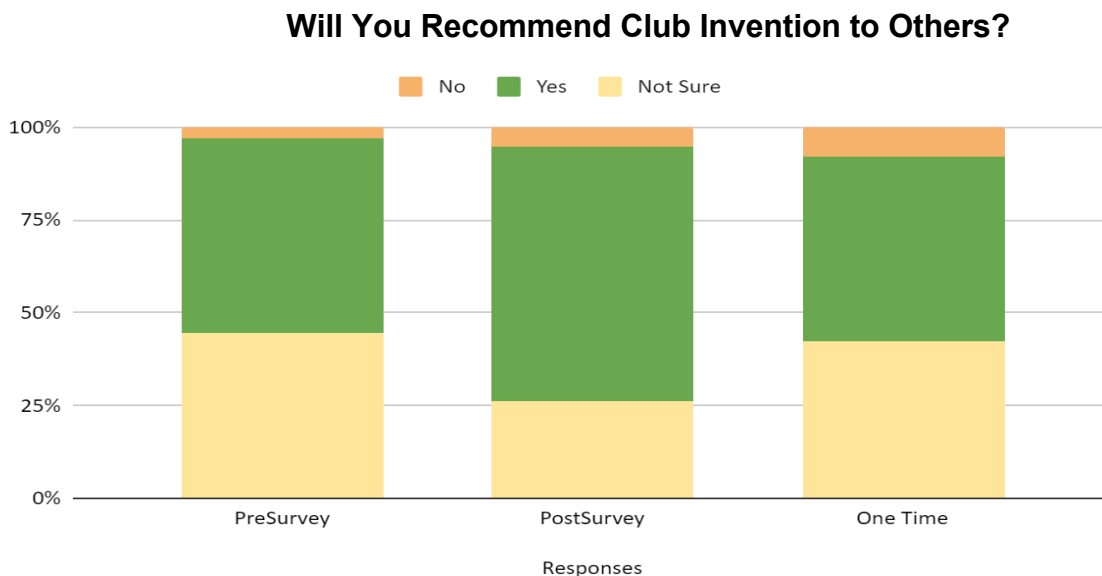
RECOMMENDATIONS

This report section will provide recommendations to consider when continuing or expanding your work. Based on these results, it seems the 2021-22 Club Invention Program was a positive experience for most participants. Results show that the program effectively accomplished its goals – improved sense of belonging, motivation, and confidence for academic success in school, improved college-going Identity, and enhanced future sense of self. Future iterations of the program should continue to work toward this goal. There are some opportunities to consider how to address the diverse needs of the survey administration at various sites—ensuring the fidelity of administration and similar program quality at each of these sites. It could increase the rate of post-survey responses and boost participants' recommendations for the program.

Additionally, it's essential to consider that the post-surveys results do not reflect overall program participants (with fewer post-survey participants). The results of this post-survey can assist in better understanding the needs and plans of participants and assist them in reaching your and their future goals. Strategies to boost participation in a post-survey for all sites would be helpful to further understand experiences in the program.

IMPLICATIONS

The summary of results depicts the potential benefits of expanding program offerings to more students. STEM-based programs such as the Club Invention fosters ingenuity and creativity: ingenuity and creativity can pair with STEM and lead to new ideas and innovations. STEM education in a safe environment such as this stresses the value of failure as a learning exercise, which will enable students to embrace mistakes as part of the learning process. These socio-emotional and perception outcomes, along with other academic indicators, restate the benefits of Club Invention to build resilience, confidence, self-efficacy in team players apart from enhancing their academic behaviors.