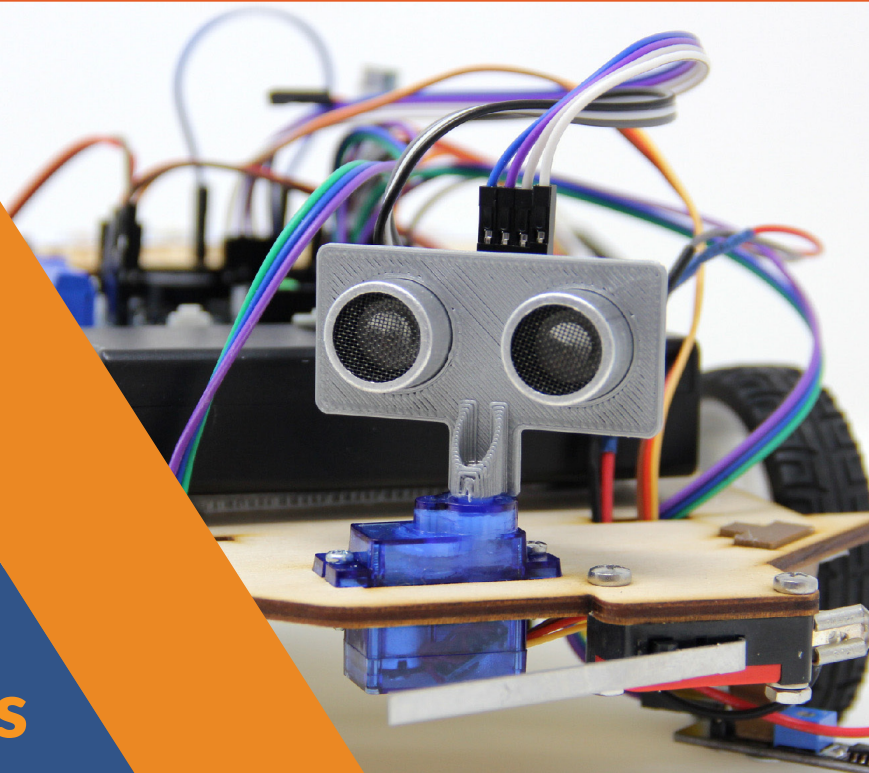




# TinkRworks Program Outcomes



## ATTITUDE AND PREFERENCE IMPACT STUDIES

February, 2021



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## Study Overview & Methodology

TinkRworks STEAM curriculum & projects (collectively known as TinkRworks STEAM programming) provide a transformative learning experience for students K-12 and teachers. TinkRworks has worked with a variety of organizations to measure the behavioral impact of our programming on students, with the synthesis of three such studies presented here. These studies were designed to measure mindset shifts pertaining to attitudes and preferences of students who had participated in TinkRworks STEAM programming through their school, their municipality, or their social-service organization. Students in these studies participated in pre- and post-study surveys where they were asked a variety of questions around subject-interest levels, comfort levels with technology, levels of desire to explore creative processes, and far more. The results were then synthesized with the results summarized below. In total, several hundreds of students served as the population for these studies.

The three studies presented here are:

1. In-class TinkRworks STEAM programming in Chicagoland public school
2. Pilot implementation for at-risk minority-student population in a major municipality
3. Summer-camp programming in diverse urban & suburban geographies



## TinkRworks Impact, Study #1: In-class TinkRworks STEAM programming in Chicagoland public school

During the Fall 2019 TinkRworks STEAM programming was formally utilized for a public middle school (grade 6-8) in the Chicagoland area. Facilitators from the school received professional development from TinkRworks after which they were certified to deliver two projects to 100 students, namely TinkRbot and Art Electric. These facilitators delivered pre- and post-surveys to their students with the results summarized below.

Pre- and Post-surveys were administered to all students enrolled in STEAM class during Fall, 2019; surveys were given to only those students who were in attendance (absent students were not provided surveys at a later date).

Factors analyzed included:

- STEAM appetite / savviness
- Comfort with technology
- Desire for creating/building
- Level of enjoyment related to both learning & the overall experience
- Desire to take additional projects

Based on pre-survey responses, students were segmented into two different categories to better understand granular impact of experiences across these two segments:



**STEAM enthusiasts:**

Students who self-assessed that they embrace and enjoy math & science, art, and building/creating things.



**STEAM agnostics:**

Students who self-assessed their levels of enjoyment as moderate or low when asked the same pre-survey questions above.

### Outcomes:

Across both the full population of students as well as each of the individual segments mentioned above (STEAM Enthusiasts & STEAM Agnostics) the overall desire to create as well as interest levels to further pursue creative processes increased dramatically.



Across the entire population, a **12.3% increase** was observed in their desire to build & create



Comfort level with technology across the full population **increased by 18.3%**



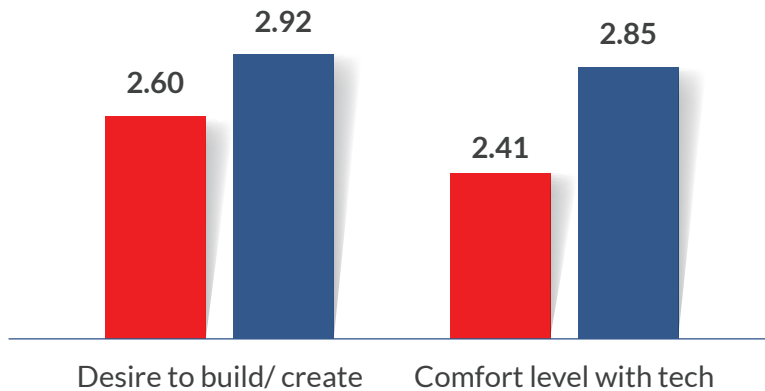
Students showcased strong desire (83%) to pursue additional TinkRworks programming opportunities and expressed heightened enjoyment with the hands-on experiential TinkRworks style of learning (92%).

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## Attitude & Behavior Shifts: Chicagoland Public School, Fall 2019

Full population of students taking programming:  
6<sup>th</sup> - 8<sup>th</sup> graders (N= 86)  
Min level= 1    Max level= 3

■ Pre-survey mean    ■ Post-survey mean



### Other key post-survey metrics

Desire to take another STEAM program: 2.63/ 3.00

Level of enjoyment with STEAM- style of introducing new concepts: 2.77/3.00

Measured impact

+12.3%

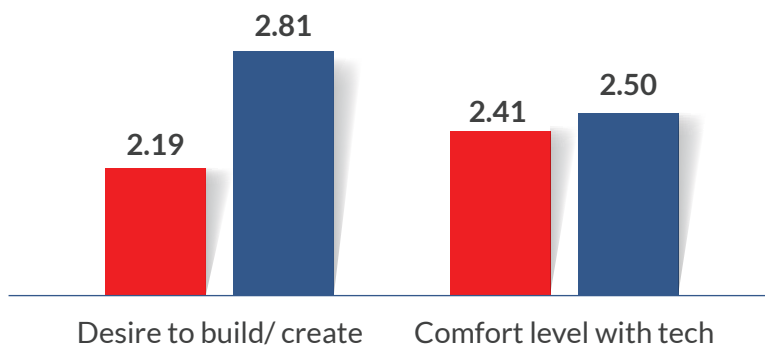
+18.3%

02

## Attitude & Behavior Shifts: STEAM Agnostics (19% of population)

STEAM Agnostics (N=16):  
Chicagoland Public School 6<sup>th</sup>- 8<sup>th</sup> graders  
Min level= 1    Max level= 3

■ Pre-survey mean    ■ Post-survey mean



### Other key post-survey metrics

Desire to take another STEAM program: 2.44/ 3.00

Level of enjoyment with STEAM style of introducing new concepts: 2.69/3.00

Measured impact

+28.3%

+3.7%

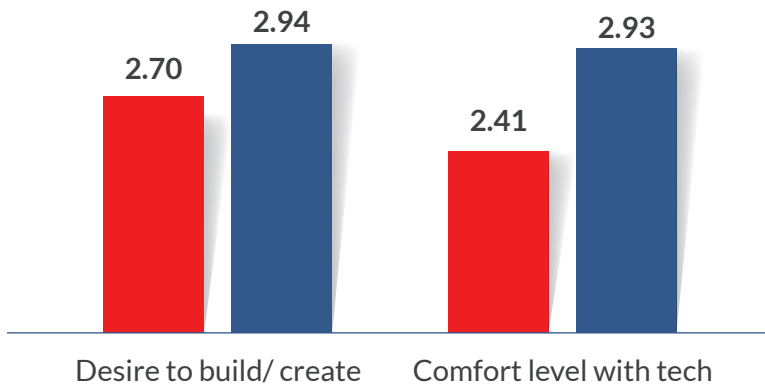


03

## Attitude & Behavior Shifts: STEAM Enthusiasts (81% of population)

STEAM Enthusiasts (N=70):  
Chicagoland Public School 6<sup>th</sup>- 8<sup>th</sup> graders  
Min level= 1    Max level= 3

■ Pre-survey mean    ■ Post-survey mean



**Other key post-survey metrics**

Desire to take another TinkRworks program: 2.67/ 3.00

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Level of enjoyment with TinkRworks style of introducing new concepts: 2.79/3.00

Measured impact

+8.9%

+21.6%



## TinkRworks Impact, Study #2: Pilot implementation for at-risk minority-student population in a major municipality

TinkRworks formally commenced a partnership with a large municipality (>200,000 residents) in the summer of 2020. The partnership involved launching hands-on STEM programming for at-risk and under-served children in 1st-6th grades within the municipality. The overall goal of the effort was to spark an interest in these children to explore STEM opportunities in the future; the eventual goal would be to seed a robust pipeline of candidates for upcoming jobs within the municipality.

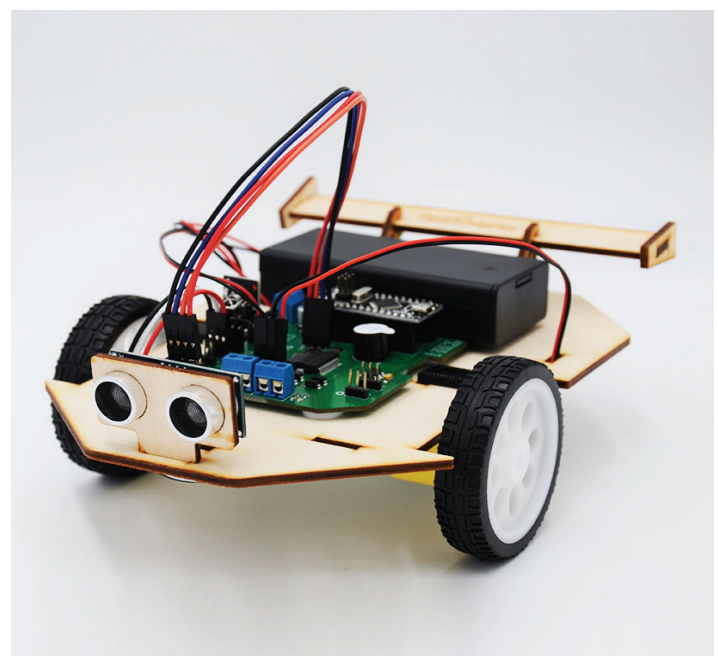
Two different TinkRworks projects were chosen for delivery to children, both of which immersed children in project-based learning (PBL) environments and provided them a holistic STEM experience, weaving together elements of design, building, electronics integration, and computer programming; at the end of their projects, the children kept everything that they created. These projects were Art Electric and TinkRbot.

### Art Electric:

1<sup>st</sup> – 3<sup>rd</sup> graders participated in this project which focused on bringing artwork to life. Participants were asked to create artwork that came to life—with lights, sounds, and motion—as people observed the artwork.

### TinkRbot:

3<sup>rd</sup> – 6<sup>th</sup> graders worked to create their very own robots which they could program and control to perform a variety of different functions the children desired, such as moving, sensing, and reacting to the robot’s environment.



## Outcomes:

All stated objectives were successfully met, and as a direct result of the program outcomes, the pilot effort led to a broader roll-out across the municipality to provide the same type of STEAM programming to >600 at-risk students in Year 1, with strong prospects and interest in growing it further.



### **Diverse population targets achieved:**

In total, 53% of participants self-identified as either Black/African American or Hispanic/Latinx.



### **Significant interest in science & technology sparked through participation:**

Large positive shifts in enjoyment of science and technology subject matters were clearly exhibited as a direct result of participating in the summer-camp experiences.



### **Children have strong desires around creating/building items and computer programming:**

Going into the program, children overwhelmingly indicated they have a very strong desire to create/build “something” and use computer programming to “bring their creation to life”.



### **Enjoyment matched expectations around creation & programming:**

Post-survey results objectively—and empirically—showcased that enjoyment of children in the specific areas of creating/building matched EXACTLY their ingoing expectations & desires—put another way, the program met expectations of participations.



### **Children seek more TinkRworks opportunities:**

Participants overwhelmingly expressed an interest in taking additional TinkRworks programming opportunities; 82% of respondents indicated the highest- level of desire to take another project.

## TinkRworks impact: Let's do it again!

### Post-survey question

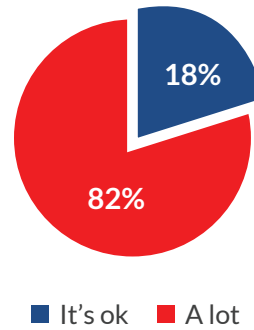
I would enjoy taking another TinkRworks program:

- Not much (1)
- It's ok (2)
- A lot (3)

Maximum level= 3.00



Individual responses



### Key takeaways

Participants have strong desire for more TinkRworks programming

Participants don't just like it- they REALLY like it

## TinkRworks impact: Significant shift in subject enjoyment for Tech & Science

### Question asked

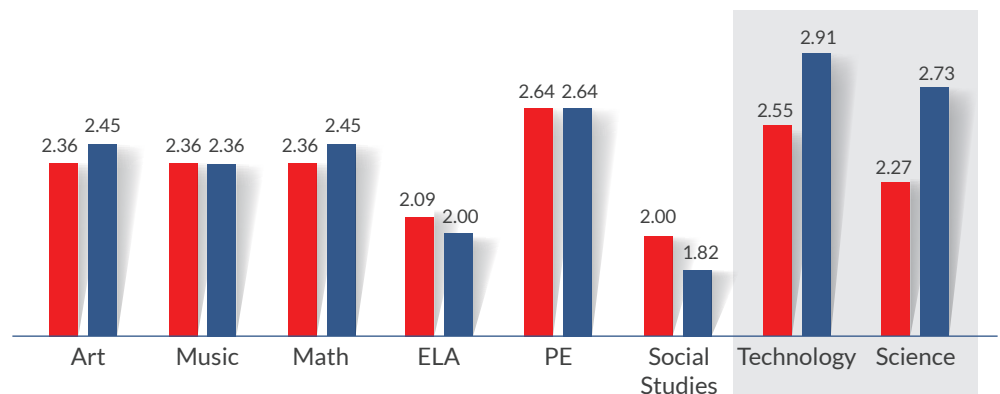
How do you feel about the following subjects?

Select the answer that best represents your enjoyment for each subject:

- Not much (1)
- It's ok (2)
- A lot (3)

3<sup>rd</sup> 8<sup>th</sup> graders

Pre-survey Post-survey





## TinkRworks Impact, Study Study #3: Summer-camp programming in diverse urban & suburban geographies

The summarized results below represent the outcomes from TinkRworks programming run during summer-camp environments (population size of 304). These camps were run both sequentially and simultaneously in demographically diverse urban and suburban settings. As part of this study, pre-survey results were used to objectively segment students into two groups, namely:



**STEAM  
enthusiasts:**

Students who self-assessed that they embrace and enjoy math & science, art, and building/creating things.



**STEAM  
agnostics:**

Students who self-assessed their levels of enjoyment as moderate or low when asked the same pre-survey questions above.

Outcomes were measured across the full population of students as well as within each specific segment above. Focal areas of the study centered around affinity to explore creative processes, comfort level with technology, preference levels related to taking further TinkRworks programming opportunities, and enjoyment levels of hands-on experiential learning methodologies used within the STEAM programming received by students.

### Outcomes:

Across both the full population of students as well as each of the individual segments mentioned above (STEAM Enthusiast & STEAM Agnostics) interest levels to further pursue creative processes increased dramatically.



Across the entire population, a **13.4% increase** was observed while within the STEAM Agnostic segment, a **50.3% increase** was observed showcasing dramatic impact of TinkRworks programming.



Similarly, across the full population as well as within each individual segment, the overall comfort level with technology also increased significantly.



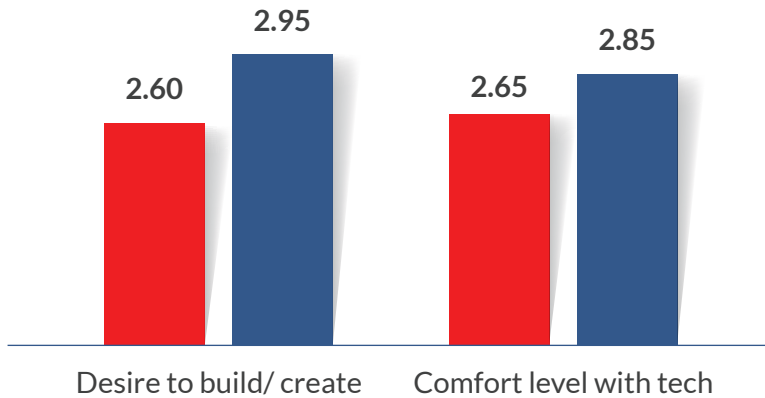
Students showcased strong desire to pursue additional TinkRworks programming opportunities and expressed heightened enjoyment with the hands-on experiential TinkRworks style of learning.

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## TinkRworks Outcomes: Full population, all grades

Full population:  
1<sup>st</sup> - 8<sup>th</sup> graders (N= 304)  
Min level= 1    Max level= 3

■ Pre-survey mean    ■ Post-survey mean



**Other key post-survey metrics**

Desire to take another TinkRworks program: 2.70/ 3.00

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Level of enjoyment with TinkRworks style of introducing new concepts: 2.81/3.00

Measured impact: +13.4%

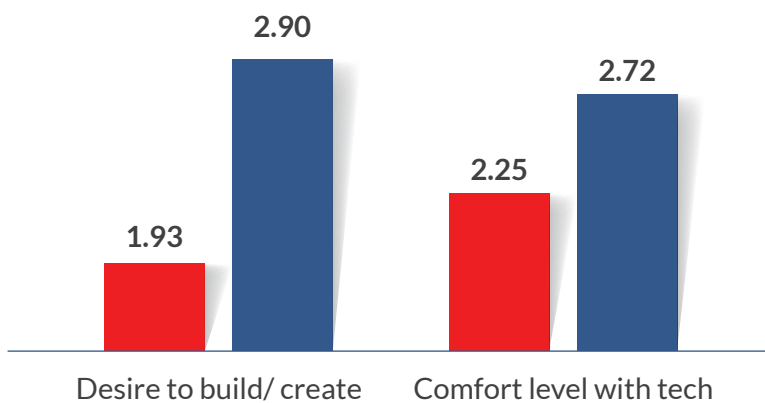
Measured impact: +7.7%

02

## TinkRworks Outcomes: STEAM Agnostics

STEAM Agnostics:  
1<sup>st</sup> - 8<sup>th</sup> graders (N= 44)  
Min level= 1    Max level= 3

■ Pre-survey mean    ■ Post-survey mean



**Other key post-survey metrics**

Desire to take another TinkRworks program: 2.48/ 3.00

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Level of enjoyment with TinkRworks style of introducing new concepts: 2.56/3.00

Measured impact: +50.3%

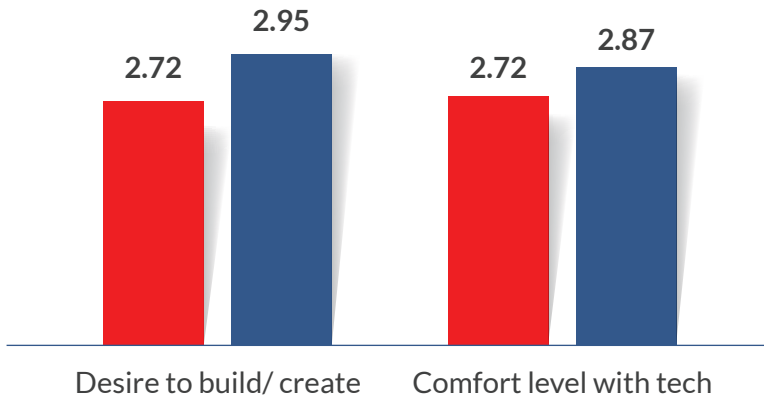
Measured impact: +20.8%

03

## TinkRworks Outcomes: STEAM Enthusiasts

STEAM Enthusiasts:  
1<sup>st</sup> - 8<sup>th</sup> graders (N= 260)  
Min level= 1    Max level= 3

■ Pre-survey mean    ■ Post-survey mean



**Other key post-survey metrics**

Desire to take another TinkRworks program: 2.72/ 3.00

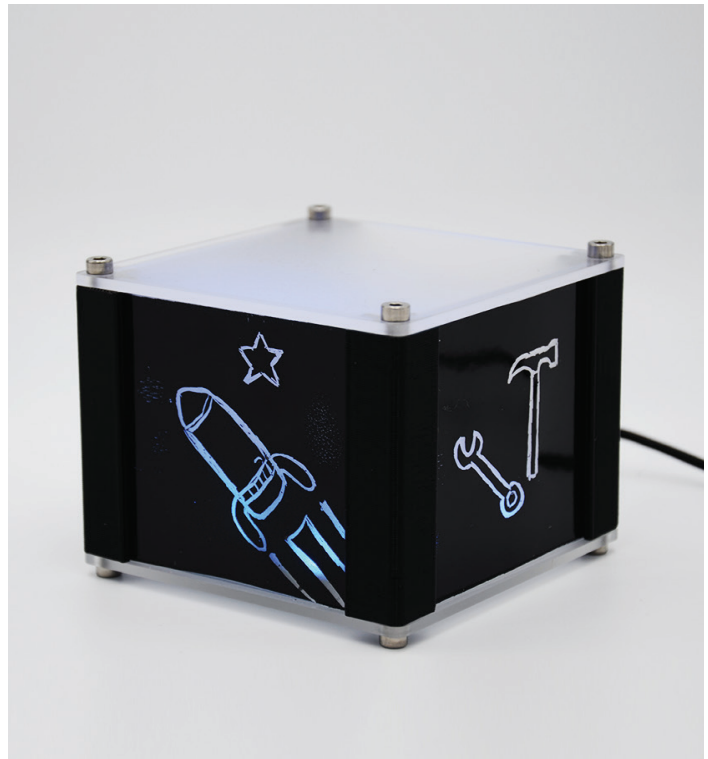
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Level of enjoyment with TinkRworks style of introducing new concepts: 2.84/3.00

Measured impact

+8.6%

+5.7%





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