STEM playbook

prepare, progress, persist

Program Efficacy Report

March 2025

www.stemplaybook.org

Executive Summary

This report analyzes data collected from 45 youth participants across four locations (Broadway, St. Luke's, LeBron James, and Helen Arnold; 60+ participants in total) to evaluate the efficacy of the STEM Playbook program. The program aims to integrate STEM education with sports activities to engage students in learning science, technology, engineering, and mathematics concepts through physical activities they enjoy.

The findings indicate the program has been highly successful in fostering positive attitudes toward both STEM and sports while building student confidence. Participants showed strong engagement with technological aspects of the program, particularly with smart sports equipment and wearable technology. Notable achievements include increased problem-solving confidence, enhanced awareness of STEM applications in sports, and growing interest in future STEM learning opportunities.

Key Findings

*Data taken from 45 participants completing the survey

Participant Demographics

- Total participants: 60+
- Location distribution:
  - Broadway: 13 participants (28.9%)
  - St. Lukes: 14 participants (31.1%)
  - LeBron James: 20 participants (22.2%)
  - Helen Arnold: 15 participants (17.8%)

STEM Interest & Engagement

- 55.6% of participants reported enjoying STEM subjects "A lot"
- 35.6% reported enjoying STEM "A little"
- Only 8.9% reported "Not at all" enjoying STEM
- These figures suggest strong program efficacy in developing STEM interest

Sports Interest & Engagement

- 66.7% of participants reported enjoying sports "A lot"
- 24.4% reported enjoying sports "A little"
- Only 8.9% reported "Not at all" enjoying sports
- These results confirm the program reaches youth with strong sports preferences

Key Findings

STEM-Sports Connection

- 24.4% of participants reported knowing "A lot" about how STEM is used in sports
- 62.2% reported knowing "A little" about the connection
- 13.3% reported knowing "Not at all" about the connection
- This distribution demonstrates the program's effectiveness in fostering STEM awareness in sports contexts, laying a strong foundation for continued expansion and deeper engagement.

Confidence in Problem-Solving

- 66.7% of participants reported feeling "Very confident" in solving problems, building things, or doing experiments
- 26.7% reported feeling "A little confident"
- Only 6.7% reported feeling "Not confident"
- These results indicate the program effectively builds self-efficacy in STEM-related activities.

Future Interest in STEM/Sports Learning

- 64.4% of participants indicated they would "Definitely" want to learn more about STEM or sports
- 28.9% responded "Maybe" to future learning
- Only 6.7% expressed no interest

This strong interest in continued learning suggests the program creates sustainable engagement.

*Data taken from 45 participants completing the survey

Qualitative Insights

Popular Program Elements

Analysis of participant feedback revealed several program elements that resonated strongly with participants:

Smart Basketball Technology

Multiple participants mentioned the smart basketball tracking system as a highlight

Wearable Technology

Watches that connect to WiFi/tracking devices were frequently mentioned

Heart Rate & Pulse Monitoring

Activities tracking physical metrics were popular

Football Activities

Integration of STEM with football was highlighted by several participants

Hands-on Projects

Designing and building equipment prototypes was a favorite activity

Qualitative Insights

Proud Moments

When asked about moments of pride during the program, participants shared experiences that demonstrate the program's impact:

Skill Development

"When I dribbled the highest" and "when I got 5 reps on smart basketballs"

Measurement Activities

"When we tested our heartbeats"

Technology Mastery

"I was proud when I was wearing the watch last time that connected to wifi"

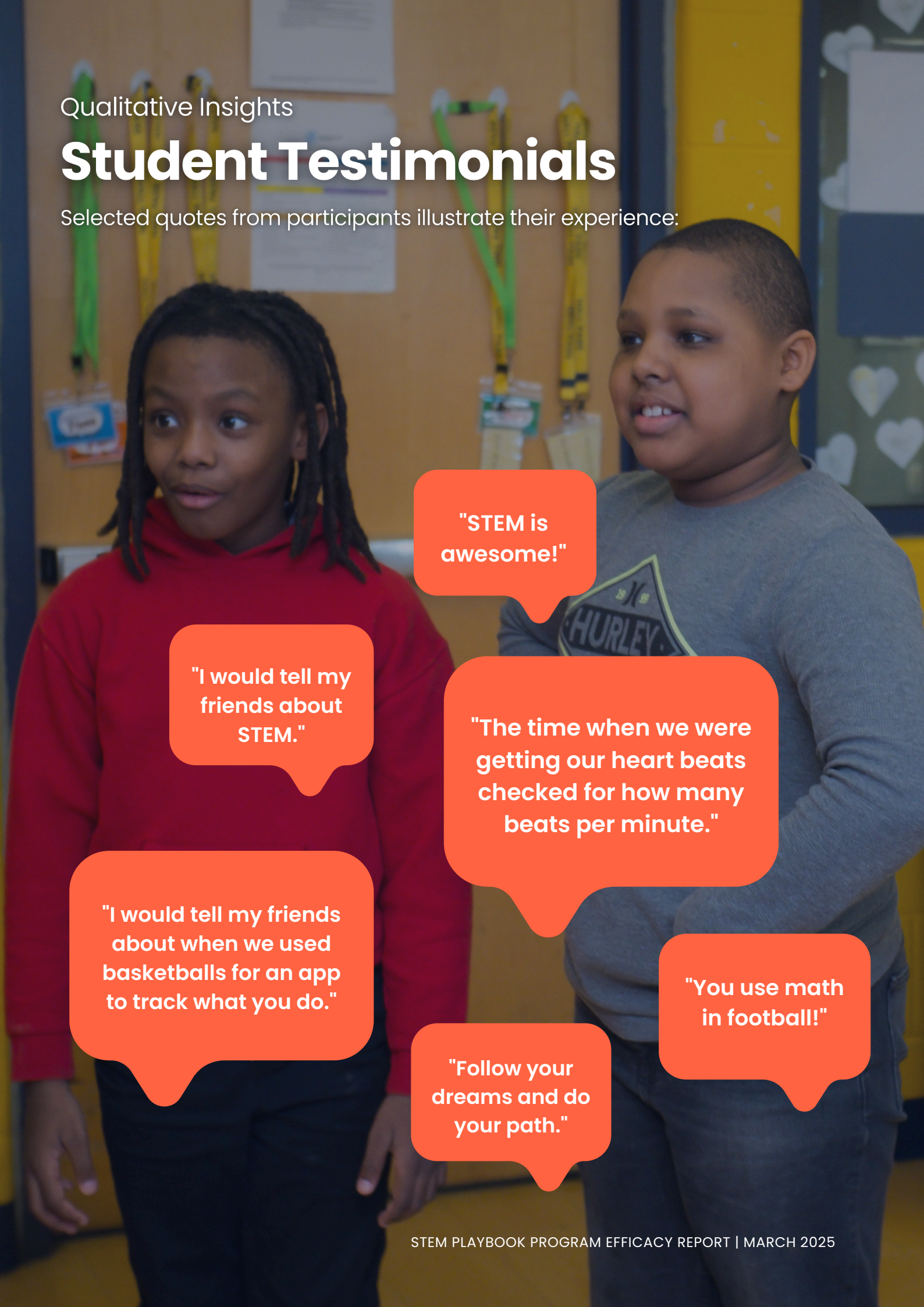
Social Connections

"I was proud because I like meeting new people"

Qualitative Insights

Student Testimonials

Selected quotes from participants illustrate their experience:



Program Strengths

Successful Integration of STEM and Sports

The program effectively bridges academic concepts with physical activities students enjoy.

Technology-Enhanced Learning

Smart equipment and wearable tech create engaging, modern learning experiences.

Inclusive Environment

The program appeals to students with varying levels of initial interest in STEM.

Confidence Building

Students develop self-efficacy through hands-on problem-solving.

Future Orientation

Participants express strong interest in continued learning after the program.

Areas for Growth

Deepening STEM-Sports Connections

While awareness is growing, many students still report only "a little" knowledge of how STEM connects to sports.

Reaching Disengaged Students

A small percentage of students reported no interest in STEM or future learning.

Facility Considerations

One participant mentioned wanting "a bigger room" for activities.

Comprehensive Documentation

Some survey responses were incomplete (missing comments or identification) Because some students struggled with reading and writing, we also captured some responses via video that are not included in this tabulation.

Recommendations

Expand Technology Integration: The smart sports equipment and wearable tech were highly popular and could be expanded.

Increase Explicit STEM Connections: Help students more clearly recognize the STEM principles underlying sports activities.

Develop Advanced Modules: Create additional activities for students who show high aptitude and interest.

Consider Spatial Needs: Ensure adequate space for activities, particularly those involving physical movement.

Document Success Stories: Collect more detailed narratives of student experiences for program development and outreach.

Conclusion

The STEM Playbook program demonstrates strong efficacy in engaging youth with STEM concepts through sports activities. The high levels of enjoyment, confidence, and future interest reported by participants indicate the program is achieving its core objectives. Students particularly value the technological aspects of the program and the hands-on learning experiences it provides.

The integration of STEM and sports creates an accessible entry point for students to engage with scientific and mathematical concepts in practical, enjoyable ways. By continuing to refine this approach and addressing the identified areas for growth, the program has significant potential for expanded impact.

This report was compiled based on survey responses collected from 45 participants across four program locations in February-March 2025.

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