

Closing the Cognitive Gap to Accelerate Academic Growth for Students in a Neuroscience-Focused Urban Charter School

Background

Research has shown that cognitive skills account for about half of the variance in academic performance. Research has also shown that students from low socio-economic status (low SES) on average have less well developed cognitive skills than their more advantaged peers. Based on this understanding, The Genius School, implemented a comprehensive integrated cognitive training (CICT™) program to support cognitive development and academic growth in students across grades 3 through 6, during the 2023-24 school year. The program was implemented with all 3rd, 4th and 5th grade students. By implementing cognitive training across grade levels, The Genius School aimed to build a shared foundation of cognitive readiness, particularly in executive functions and memory, which are critical for academic success.

Sixty students took the Mindprint Cognitive Assessment in the fall of 2023, and 68 students participated in BrainWare SAFARI cognitive training (this included students who joined the school after the initial assessment had been taken). Forty students completed both the pre- and post-assessments.

Cognitive Assessment

The MindPrint Cognitive Assessment measures ten cognitive skills across four domains:

- **Executive Functions:** Attention, Working Memory, Flexible Thinking
- **Memory:** Visual Memory, Verbal Memory
- **Complex Reasoning:** Verbal Reasoning, Spatial Perception, Abstract Reasoning
- **Speed:** Visual Motor Speed, Processing Speed

Results from their initial Mindprint test (Figure 1) showed that students were performing below the expected range¹ for Attention, Working Memory, Verbal Memory and Visual Memory. The students' nonverbal reasoning skills and overall processing speed scores fell in the middle of the expected range, indicating average capacity for reasoning with spatial and abstract information and average speed of overall processing. Scores below the middle of the expected range indicate that the student will need support in that area beyond the support typically available in a general education classroom setting. For these students, on average 4.4 skills out of the 10 skills assessed fell in that range.

¹ The expected range encompasses scores within 1 standard deviation of the mean. Mindprint reporting further breaks the expected range into the high end of the range (17th-31st percentile), the middle of the range (32nd to 69th percentile) and the high end of the range (70th to 85th percentile).

Average Percentile Rankings – All Students Initial Cognitive Assessment

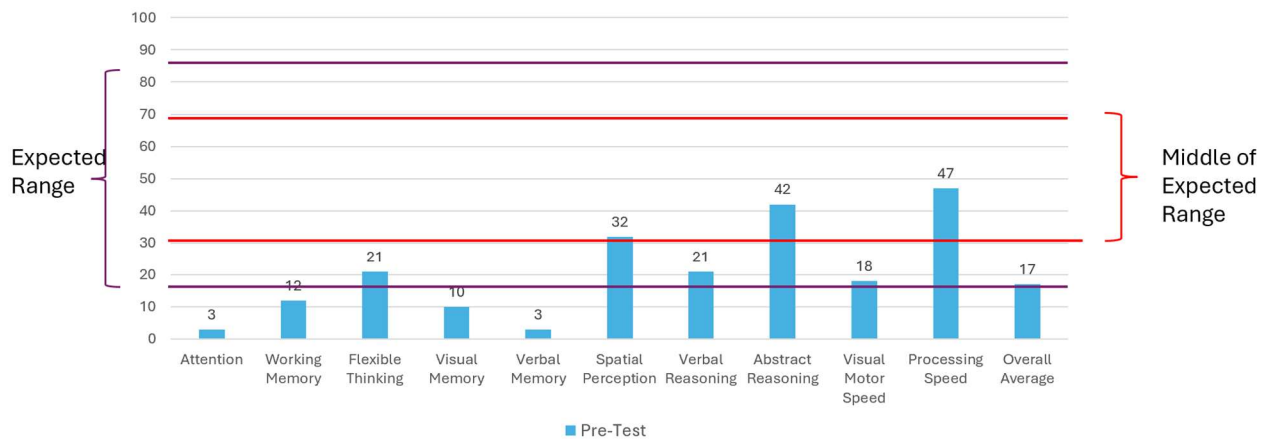


Figure 1. Initial Cognitive Assessment Scores

Cognitive Training

Students engaged in BrainWare SAFARI, a comprehensive integrated cognitive training software that develops 43 cognitive skills through an engaging video-game format. The recommended protocol is 3–5 sessions per week for at least 12–14 weeks.

At The Genius School:

	3 rd Grade	4 th Grade	5 th Grade	6 th Grade
Average Sessions Completed	39	38	31	42
Average Levels Completed	24	27	35	57

Cognitive Gains

Following training, students demonstrated significant cognitive growth, as shown in Figure 2, with average improvement of 11 percentile points (equal to .36 Standard Deviation) across all ten cognitive skills. Significant growth occurred on all three executive functions tests and on both memory tests.

The number of skills in the “Support” range decreased, while those in the “Strength” range increased. On average:

- Skills in the “Weakness” range dropped from 4.4 to 3.3
- Skills in the “Strength” range increased from 0.7 to 0.9

Average Percentile Rankings – All Students Before and After Using BrainWare SAFARI

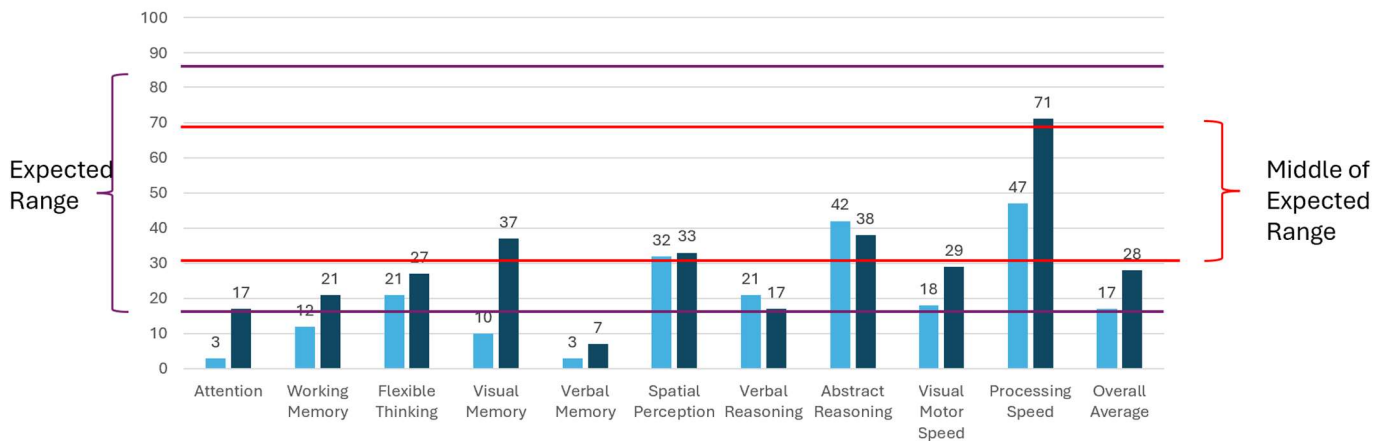


Figure 2. Pre- and Post-Assessment Cognitive Scores

Academic Impact

The Genius School used NWEA as their academic benchmark testing. The students in this study took their Spring academic assessments soon after they had completed their cognitive training leaving a limited amount of time for them to have applied their stronger cognitive skills to academic activities. Academic gains, including those that would exceed expected growth, were observed. It is particularly important to help students who are significantly behind, as these students were, to make more than expected growth in order for them to make meaningful progress toward grade-level performance.

Academic data from NWEA assessments showed encouraging results:

- **75% of students exceeded projected growth** in Math and/or ELA
- **25% exceeded growth targets in both subjects**
- Highest gains were observed in 3rd and 5th grade, as shown in Figure 3

Students Exceeding Projected Growth in Math and ELA (NWEA)

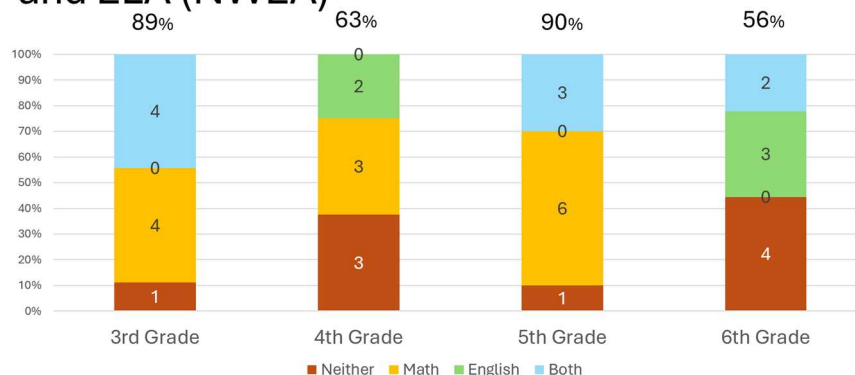


Figure 3. NWEA Academic Growth Results

These gains suggest that students were beginning to apply their strengthened cognitive skills to academic tasks, even within a limited time frame following training.

Conclusions

The Genius School implemented BrainWare SAFARI with strong fidelity to the recommended protocol. Students demonstrated significant cognitive growth, particularly in executive functions and memory, and showed academic improvements that indicate progress toward grade-level proficiency. These results support continued integration of neuroscience-informed cognitive training to help students strengthen their learning potential and accelerate progress toward academic proficiency.