

Richmond School District Enhances RTI Interventions
by Adding BrainWare SAFARI



Study Abstract

Richmond School District applied for and received a BrainWare Brain Awareness Grant for up to 30 BrainWare SAFARI (BWS) licenses to be used in the 2013-2014 school year with students who were receiving reading and/or math interventions in grades 1-6, as part of the schools RTI (Response to Intervention) efforts. The students used BWS between October 2013 and March 2014. The chosen students were recommended by the teachers and used BWS during a specific intervention time or after school. The program effectiveness was determined using the AIMSweb® ROI (Rate of Improvement). The goal of an intervention is to see the students improve more than their expected ROI.

The majority of the students who used BrainWare SAFARI and had reading intervention scored above ROI on AIMSweb reading. The majority of students who used BWS and had a math intervention also had above ROI on their AIMSweb math. In addition, the majority of students who just used BWS without a reading or math intervention scored above ROI. These findings demonstrate that the students benefited from the use of BWS and that adding BWS to the interventions that were already being used delivered even more gains.

Study Details

BWS does not build academic skills directly. Rather, it develops 41 foundational cognitive skills in the areas of attention, memory, visual and auditory processing, sensory motor and thinking skills. These skills include some executive functions, working memory, visual processing, auditory processing, visualization and skills that support pattern recognition, to name a few. These are skills that are necessary in the performance of academic tasks.

When students use BWS with the appropriate engagement and for the recommended time period, the gains they experience in cognitive skills begin to transfer to academic skills and result in improvements in academic performance. For students who are significantly behind in academic performance, using BWS in conjunction with an academic intervention helps students catch up academically, which they often would not do in the absence of training to develop their foundational cognitive skills. This is evidenced in published research¹ with students that were diagnosed SLD and used BWS in addition to the work that they were already doing.

21 students in grades 1-6 at Richmond School used BrainWare SAFARI during their intervention time. In some cases, BWS served as the only intervention; in others, BWS was used in addition to their reading and/or math intervention. The students who used BWS did it at the same time as others in their class who were using other software programs. Some of the older students were assigned afterschool time as their intervention time, which resulted in occasional attendance problems. Table 1 shows the progress with BWS by grade during their 16 weeks² of using BWS. The students had a median of 35 ± 8 sessions with a minimum of 25 and maximum of 50, as expected

	Levels (min/max)	Sessions (min/max)
Grade 1 (n=2)	40 (29 51)	31 (26 35)
Grade 2 (n=4)	95 (83 116)	48 (46 50)
Grade 3 (n=4)	79 (68 86)	44 (40 48)
Grade 4 (n=4)	90 (79 100)	34 (34 36)
Grade 5 (n=2)	91 (82 100)	37 (33 40)
Grade 6 (n=5)	118 (96 125)	28 (25 32)

1. "Effect of Neuroscience-Based Cognitive Skill Training on Growth of Cognitive Deficits Associated with Learning Disabilities in Children Grade 2-4." Sarah Abitbol Avtzon. Learning Disabilities: A Multidisciplinary Journal. Vol 18 (3), 2012: pp. 111-122.
2. The 16 weeks excludes time when school was not in session.

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for a 2 session / week schedule.³ Overall, they completed a median of 94 ± 23 levels.

The number of sessions and levels completed usually indicates the engagement of the students. However, it can also be an indicator of how difficult the program was for the students. Overall, the 2nd graders and 4th graders had a range of levels completed consistent with other studies. The 1st, 3rd, 5th and 6th graders were lower in levels completed than would be expected for 16 weeks of BWS usage. This could be due to the difficulty of the program for the students, but may be a sign that the coaches were not able to provide the purposeful coaching which helps keep the students motivated and engaged despite the challenges they encounter at more difficult levels of BWS.

For this study, AIMSweb was the reading and math assessment chosen to determine the benefit of using BWS. AIMSweb is a common assessment that is completely web-based for universal screening, progress monitoring and data management for Grades K-12. AIMSweb is a Curriculum-Based Measure (CBM) for reading and math performance including early literacy, reading, early numeracy, mathematics, spelling and writing. The students in this study used Nonsense Word Fluency (1st grade) or MAZE and Math computation. The data collected from the assessments, include the rate of improvement (ROI) to assess whether the students are making academic progress. ROI is a numerical index that reflects how rapidly raw scores on a measure increase during a given school year. For this study, it was administered in October and March with BWS use occurring between administrations.

The most useful measure to indicate progress for the students in this study is ROI, rather than looking at the scores on the various tests for a couple of reasons. First, there is a small number of students at each grade, with different expectations at each grade. Second, the expectation of a resource intervention is to see that the student is progressing above their expected ROI. The goal is for student gains to be greater than the expected ROI value if they are receiving intervention, but that is not always the case. This is the first year that AIMSweb ROI was used at Richmond SD so a comparison to past experience is not possible. In addition, some students received multiple interventions, so a comparison to a group of matched students who are just doing interventions would be difficult since each one is specialized to help the individual.

Study Results

Reading Progress: All 21 students have BWS and a reading score – either Nonsense Word Fluency or MAZE. 12 of the 21 have a reading intervention and used BWS while 9 just used BWS without a reading intervention. Table 2 shows the ROI progress for the Reading scores.

Overall 20 students were at typical or above performance on their reading score, with 16 above their expected ROI performance. Of those 16, 6 were using only BWS and 10 were using BWS and had a reading intervention.

Table 2: Reading ROI Progress Compared to Expected

	Above	Typical	Below
BWS & Read Int. (n=12)	10	2	0
BWS (n=9)	6	2	1
All Reading Scores (n=21)	16	4	1

The data in Table 2 indicates that the use of BWS to develop the foundational skills of the students had an impact on their ability to perform on their reading assessment. An even larger number of students that

3. The typical protocol for use of BWS with students is 3 to 5 sessions a week for 10-14 weeks. Sometimes when being used with interventions, the schedule permits only 2 sessions a week with BWS.

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were using BWS and a reading intervention performed above their expected ROI. Only one student's performance did not exceed their expected ROI; this student was using only BWS. It is reasonable to speculate that this student would have performed better had he/she also received a reading intervention.

Math Progress: 19 of the students used BWS and had a math computation score. 3 students were using BWS and received a math intervention⁴, while the remaining 16 were just using BWS. Table 3 shows the ROI progress for the math computation scores of the 19 students with Math scores⁵.

Overall 13 students were at typical or above performance on the math ROI performance, with 10 above the expected ROI performance. There were 3 students using BWS and receiving math interventions, 2 of whom were above their expected ROI.

Table 3: Math ROI Progress Compared to Expected

	Above	Typical	Below
BWS & Math Int. (n=3)	2	0	1
BWs (n=16)	8	3	5
All Math Scores (19)	10	3	6

This data in Table 3 indicate that the use of BWS to develop foundational cognitive skills helped improved students' ROI in math, as it did in reading. The students whose gains were less than the expected ROI likely also need a math intervention focused on computation concepts. Additional intervention is likely to be more effective now that these students have further developed their foundational cognitive skills.

Conclusions

Most of the students who used BrainWare SAFARI completed a sufficient number of sessions and levels to indicate that they improved their foundational cognitive skills. The implementation was complicated by having students using a variety of different programs at the same time in the computer lab (limited ability for them to support and encourage each other), and the fact that some students used the program after school (attendance issues). It is likely that more purposeful coaching would have resulted in even greater growth. Suggestions to address these situations include (1) grouping the students who are on the same program near each other in the computer lab so that they can also support each other in addition to being supported by the teacher, (2) provide an area where the BWS students in different classes can support each other with a "grade level BWS team" so that they can see how everyone else is doing and help each other even if they are not in the same class., and (3) afterschool programs work best with complete parent buy-in. The more the parents are aware of BWS and how it works, the more appropriate their expectations will be regarding the level of challenge their students will encounter and the more they can support and motivate students at home.

Even with evidence of somewhat less than optimal engagement, the majority of the students who used BrainWare SAFARI and had a reading intervention scored above their expected ROI on AIMSweb reading. Similarly, while there were a smaller number of students using BWS in addition to math intervention, the majority of those that did also had above expected ROI on their AIMSweb math. In addition, the majority of students who just used BWS without a reading or math intervention also scored above ROI. These findings further demonstrate that the students benefited from the use of BWS in achieving higher than expected ROI, and support the benefit of adding BWS to intervention programs that are already in place.

4. Two were also doing a reading intervention.

5. The majority of the students (16) tested in math were not receiving a math intervention.