

# Cognitive Skills Development Helps Close the Gap for Students Performing Below Grade Level in Millville PA

Millville School District in Millville PA adopted BrainWare SAFARI in the fall of 2013 to be used in the elementary school with students in grades 3 through 6 during the fall semester. While the district had been performing well overall the administration wanted to see if cognitive development could play a role in sustaining that level of performance, particularly in the midst of many changes in the state standardized testing (PSSA).

## Synopsis of Results

DIBELS results in the 3<sup>rd</sup> grade demonstrate that students that are below core narrowed the gap to expectations and those that are traditionally behind (IEP and F/R) close the gap to expectations. In 4<sup>th</sup> grade the students that are thought of as traditionally behind were not behind but showed greater than expected growth after using BWS while the students that tested below core expectations closed the gap with greater than expected growth. While DIBELS is not the best test for high performing 5<sup>th</sup> graders, the below core students closed the gap to expectations. The GRADE testing in 5<sup>th</sup> grade showed a similar trend with below core and IEP students significantly behind expectations the year prior and increasing more than 6 times expected in 5<sup>th</sup> grade. While the more diagnostic reading tests show great improvement, the PSSA test does not show a clear trend. The 2013 test and the 2014 test model is greatly different as the state toward PA Core Standards. The data shows the state decreasing in grades 3-5. The Millville 3<sup>rd</sup> graders and the 5<sup>th</sup> graders exceeded the state median score.

## BrainWare SARFARI (BWS) Use

The students in grades 3-6 used BWS with fidelity to the recommended protocol, completing an average of 34-38 sessions during the fall semester of 2013. The number of levels completed in the program suggests that the intensity of use was also good with the average levels completed of 104 in 3<sup>rd</sup> grade, 112 in 4<sup>th</sup> grade, 141 in 5<sup>th</sup> grade and 148 in 6<sup>th</sup> grade. With the frequency (number of session within the time period) and intensity (number of levels completed) achieved in this implementation, Millville students would be expected to be demonstrating the academic benefit of their time developing attention, visual processing, auditory processing, memory, sensory integration and reasoning skills.

## Results

The DIBELS® ORF<sup>1</sup> results for the students in grades 3-5 were evaluated by observing the trends for those performing at expectations or better (core ability) and those performing below that ability. In addition, the IEP students and F/R students were evaluated. The students were compared to their performance on the ORF the year prior with respect to expectations to observe if trends changed after the use of BWS.

In 3<sup>rd</sup> grade there were 40 students, 29 performing at core ability and 11 below core. There were 5 students who had IEP's and 11 who qualified F/R. 36% of the below core 3<sup>rd</sup> graders were on IEP's and 36% were F/R. By definition, the core students were performing above expectations. The core students were on average performing above the expectation for 5<sup>th</sup> grade.

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1. Oral Reading Fluency (ORF) is tested by the student reading a grade-level passage out loud for 1 minute. They are scored on the number of words correctly read in one minute. There are deductions for corrections and incorrect words spoken.

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**Figure 1: 3<sup>rd</sup> grade ΔORF EOY-BOY**

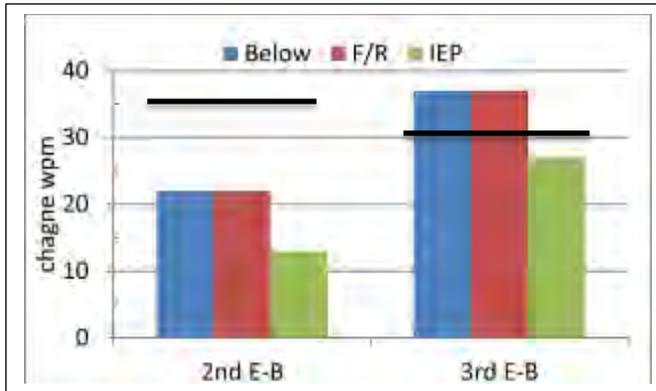
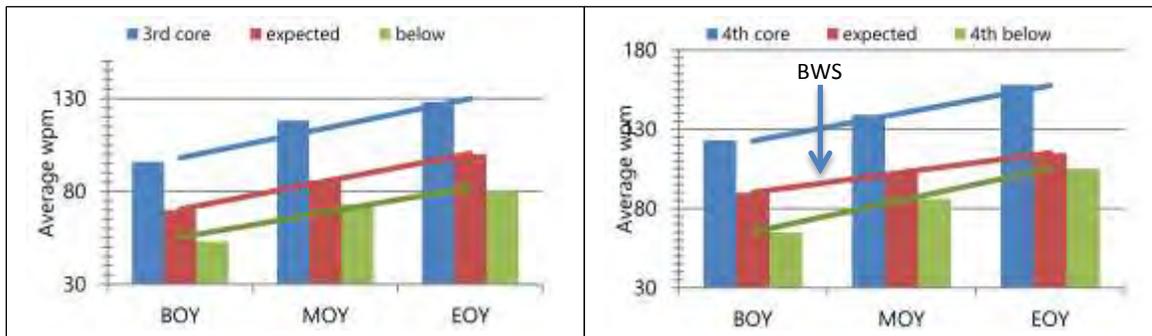


Figure 1 is designed to show the performance of the below core, IEP and F/R lunch student performance and compare 3<sup>rd</sup> grade (BWS) performance to those same students the year prior (2<sup>nd</sup> grade). In this case, we are using the relationship of how much change is expected during the school year (in words per minute, wpm) to how much each of these students actually changed over the whole year in 2<sup>nd</sup> grade compared to 3<sup>rd</sup> grade when they used BWS between beginning (BOY) and middle (MOY).. The black line in Figure 1 is the expected change from BOY to EOY.

Figure 1 show the three underperforming groups were behind expectations in 2<sup>nd</sup> grade but at the end of 3<sup>rd</sup> grade, despite starting the year behind, had either closed the gap or narrowed the gap to expectations.

In 4<sup>th</sup> grade of 2013 SY there were 56 students, 33 at core ability and 23 below core. In addition, there were 3 students with IEP's (2 of which were below core) and 20 who qualified F/R (all 20 were below core). As with 3<sup>rd</sup> grade the students at core ability were high performing in 4<sup>th</sup> grade and the year prior, scoring above 5<sup>th</sup> grade expectations. Figure 2 is a comparison of the average wpm at each test for students that tested core ability & below in 4<sup>th</sup> grade of 2013 SY and their own progress the year prior. The red bars are

**Figure 2: ORF Core vs Below Core 4<sup>th</sup> Grade 2013 vs. Prior Year**



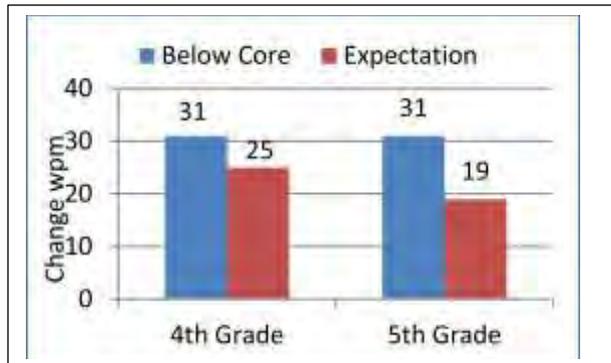
the expected wpm at each test. The trendlines show the rate that the students performed compared to the expectation. Visually the difference in slope tells the result. The core students were performing at a higher rate than expected while the below core is slightly lower rate in 3<sup>rd</sup> grade increasing only 27 wpm over the year compared to the 30 wpm expectation. However, after using BWS in 4<sup>th</sup> grade they increased 40 wpm when the expectation in 4<sup>th</sup> grade is 25 wpm. Of the students performing below core, 88% increased more than the 19 wpm expectation in 4<sup>th</sup> grade.

Unlike the 3<sup>rd</sup> grade the students considered traditionally behind, IEP and F/R, in 4<sup>th</sup> grade 2013 SY were not behind. In 3<sup>rd</sup> grade the IEP students increased the expected amount and in 4<sup>th</sup> grade, after using BWS the increased 46 wpm over the year when the expectation is 25 wpm. In addition, the F/R students were not behind in 3<sup>rd</sup> grade but increased 35 wpm in 4<sup>th</sup> grade.

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The ORF exam begins to be less diagnostic in 5<sup>th</sup> grade because the students are reaching the limit of the test. In 5<sup>th</sup> grade of the 2013 SY there were 63 students, 40 core ability and 24 below core. There were 4 IEP and 23 F/R students. The students that were core ability were significantly ahead of expectations reaching the top level of the test. The IEP students and F/R students in 5<sup>th</sup> grade did not test behind on the ORF. In the year prior to using BWS, the students that were below core were behind expectations and by the end of the year they had started to narrow the gap slightly by increasing 31 wpm in 4<sup>th</sup> grade when the expectation is 25 wpm. However, they ended the year behind. In 5<sup>th</sup> grade, they also increased 31 wpm while the 5<sup>th</sup> grade expectation is 19, as shown in figure 3. This higher with an increase that was 12 wpm more than expected, the students in 5<sup>th</sup> grade closed the gap to expectations.

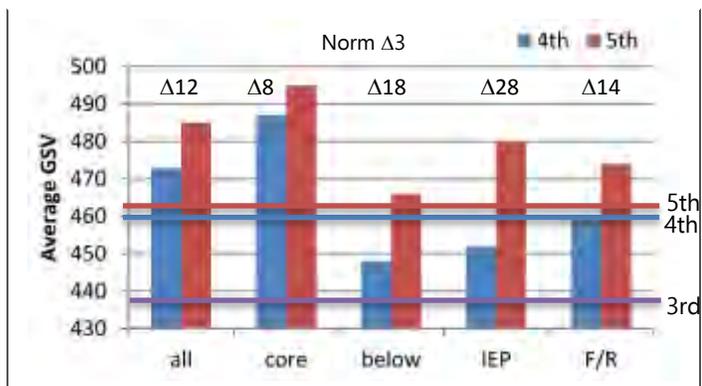
Figure 3: 5<sup>th</sup> grade ΔORF EOY-BOY



In 5<sup>th</sup> grade, a more diagnostic test of reading ability is the GRADE assessment. The GRADE assessment provides a Growth Scale Value (GSV) that is normed for the grade. It is determined from a series of tests that measure word reading, word meaning, vocabulary, sentence comprehension, passage comprehension and listening comprehension. The Millville students take the GRADE assessment in the Spring of each year. Using this diagnostic provides more detail on the improvement of the students in 5<sup>th</sup> grade and 6<sup>th</sup> grade compared to the year prior.

Keeping consistent with the ORF groupings for comparison, figure 4 compares the 5<sup>th</sup> grade GSV scores to the year prior. The blue line is the norm GSV for 4th grade while the red line is the norm GSV for 5th grade. The purple line is the norm GSV for 3rd grade. The deltas (Δ's) in the figure indicate the increase between the two years for each group. The expectation is an increase 3 units between Spring of 4th grade and Spring of 5th grade.

Figure 4: GSV Grade Comparison 5<sup>th</sup> Grade vs year prior



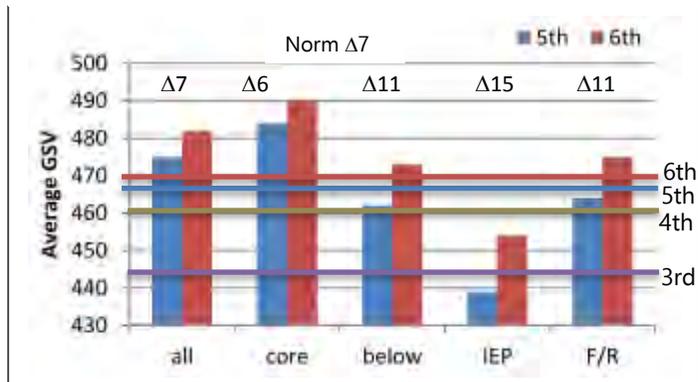
Using this assessment the below core students and the IEP students are the furthest behind and also are the largest increases. With the below core starting significantly below 4<sup>th</sup> grade ability in increasing 18 units ( 6 times expected) to end ahead of the 5<sup>th</sup> grade expectation. The IEP students also were below 4<sup>th</sup> grade ability and increased 28 units (9 times expected) to significantly above 5<sup>th</sup> grade ability.

In 6<sup>th</sup> grade of the 2013 SY there were 55 students. There were 43 students who were core ability on the ORF, 12 below core, 10 with and IEP and 27 F/R qualified. The DIBELS test is not comparable between 6<sup>th</sup> and 5<sup>th</sup> grade as the expectation of the test changes significantly. However, the GRADE

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assessment of these groups is quite revealing on the ability of the students. Figure 5 is the GRADE comparison for the 6<sup>th</sup> grade 2013 SY and the year prior. The norm expectation between 5<sup>th</sup> and 6<sup>th</sup> grade increases 7 units. Only the below core students and the IEP students were below 5<sup>th</sup> grade expectation in the year prior to BWS use. The class increased the norm amount on average while the core students increased 6 units. The below core students were slightly behind in 5<sup>th</sup> grade but increased 11 units to a GSV in 6<sup>th</sup> grade that was above the 6<sup>th</sup> grade norm. The F/R students were at 5<sup>th</sup> grade ability and increased 11 units to above the 6<sup>th</sup> grade norm. The largest change in 6<sup>th</sup> grade was the IEP students with more than double the norm at 15 units. In 5<sup>th</sup> grade they were performing at the 3<sup>rd</sup> grade level and after using BWS increased to below 4<sup>th</sup> grade but narrowed the gap to expectations on this assessment.

**Figure 5: GSV Grade Comparison 6<sup>th</sup> Grade vs year prior**



## Conclusions

DIBELS results in the 3<sup>rd</sup> demonstrate that students that are below core narrowed the gap to expectations and those that are traditionally behind (IEP and F/R) close the gap to expectations. In 4<sup>th</sup> grade the students that are thought of as traditionally behind were not behind but showed greater than expected growth after using BWS while the students that tested below core expectations closed the gap with greater than expected growth. While DIBELS is not the best test for high performing 5<sup>th</sup> graders, the below core students closed the gap to expectations. The GRADE testing in 5<sup>th</sup> grade showed a similar trend with below core and IEP students significantly behind expectations the year prior and increasing more than 6 times expected in 5<sup>th</sup> grade. While the more diagnostic reading tests show great improvement, the PSSA test does not show a clear trend, which is not unexpected. The 2013 test and the 2014 test model is greatly different as the state toward PA Core Standards. The data shows the state decreasing in grades 3-5. The Millville 3<sup>rd</sup> graders and the 5<sup>th</sup> graders exceeded the state median score.