



Summary

The School City of Hammond Bilingual Program piloted BrainWare Safari in the spring of 2010. The Limited English Proficient (LEP) students in the All-day Program who used BrainWare Safari showed significant improvement in their cognitive functioning, especially in behaviors reflective of attention, working memory and visualization skills. Improvement in academic performance was also seen for these students, with early indications of improvement on the Scholastic Reading Inventory (SRI) exam. While academic progress typically lags cognitive growth, ELL students rely more heavily than native English-speaking students on working memory (translation) and visualization. The improvements experienced by these students in these key areas of cognitive function may have translated more quickly into performance on reading tests.

Pilot BrainWare Safari Usage

The School City of Hammond (SCH) Bilingual Program began the pilot on April 11, 2010 with 39 school days remaining in year. They committed to using BrainWare Safari every day with the LEP students¹ in the All-Day Program so the students would receive as much time in BrainWare Safari as possible. Table 1 shows the grade levels of the 39 LEP students in the All-Day Program, as well as the average levels and sessions completed over the 8 weeks of the pilot.

Grade	# Students in BWS	Avg Levels	Avg Sessions	Weeks	Avg Sess/Wk
6	12	130 ± 16	38 ± 2	8	5
7	13	151 ± 19	37 ± 2	8	5
8 & 9	14	139 ± 17	36 ± 3	8	5
Overall	39	140 ± 19	37 ± 3	8	5

Recommended usage of BrainWare Safari is 3 to 5 sessions a week for 10 to 12 weeks, which corresponds to 30 to 60 sessions in a 12 week period. Since the pilot was initiated so close to the end of the school year, the All-Day Program committed to daily usage to ensure that the students would be able to complete the same number of sessions as they would have over the usual 10 to 12-week time frame. The Hammond LEP students completed an average of 37 sessions in 8 weeks. This is an appropriate amount of time and intensity, to notice cognitive changes in the students that are using BrainWare Safari.

Cognitive Growth

The impact of BrainWare Safari on cognitive functioning was assessed by surveys completed by the four teachers in the All-Day Program. The survey asks for ratings on 14 specific behaviors related to cognitive functioning. The classes in general and individual students were rated as either “Improved a Lot,” “Improved,” or “No Change” on each behavior.

As indicated in Table 2, all of the teachers noted improvement for their classes on all of the 14 behaviors. The strongest area of improvement noted was “Attention Span and Focus”, with three of the four teachers (75%) rating their classes as “Improved a Lot.”

1. Non-native English-speaking students in Indiana are classified into five levels: Beginning, Early Intermediate, Intermediate, Advanced and Proficient. The students in the Hammond All-Day program fall into the lowest two levels.



Table 2: Observed Behavioral changes				
Behavior	# Classes Improved A lot		# Classes Improved	
Attention span and focus	3	75%	1	25%
Ability to visualize	2	50%	2	50%
Desire to perform or put in effort	2	50%	2	50%
Following directions	2	50%	2	50%
Ability to complete work	1	25%	3	75%
Attention to details	1	25%	3	75%
Distractibility	1	25%	3	75%
Memory	1	25%	3	75%
Parent, peer and teacher communication	1	25%	3	75%
Ability to grasp new concepts	0	0%	4	100%
Careless errors	0	0%	4	100%
Effective thinking	0	0%	4	100%
Recall information for tests	0	0%	4	100%
Self-confidence	0	0%	4	100%

In addition to the general class ratings, the teachers were given the opportunity to rate individual students. Ten individual students were rated, with five of the ten (50%) rated as "Improved a Lot" on all 14 behaviors. The individual student ratings were similar to the overall classroom ratings in terms of the areas of strongest growth, those being: Attention Span and Focus, Ability to Visualize, Desire to Perform and Put in Effort, and Following Directions. These areas are highly indicative of improvement in attention skills, working memory, and visual processing (especially visualization).

Academic Growth

At the time of the pilot, the LEP students in the All-Day Program had already taken their annual language proficiency assessment (LAS Links). Since this test will not be given again until the 2010-2011 school year, no progress data on English Language Proficiency is available at this time.

Students in the LEP program, like all students in the district take the SRI (Scholastic Reading Inventory) trimester exams. Thus, student performance changes between the first and second trimesters (before using BrainWare) and the second and third trimesters (while using BrainWare) can be compared. Only those students who had scores for all three benchmark tests were used in this analysis (31 of the 39 students who used BrainWare Safari).

Scores on the SRI exams nationally normed for students of all types and are used for instructional placement and benchmark assessments. The exams are considered to be challenging and the district has set high standards for performance. According to the administrators in the All-Day Program, the SRI exams do not have any visual cues and require inference on the part of the students to successfully answer the questions. ELL students typically find this exam even harder than other students.



Performance on the SRI, expressed as a lexile score, is used to place students into one of four categories: At Risk, Basic, Proficient, and Advanced. SCH's definition of Proficient on the SRI exam sets the expected annual increase in lexile score at 250 points, or approximately 83 points per trimester. Most of the LEP students in the All-Day Program started the year in the At-Risk category.

Figure 1 represents the average SRI score during the second trimester for each class, with the minimum and maximum score achieved. Figure 2 is the same information for the third trimester testing.

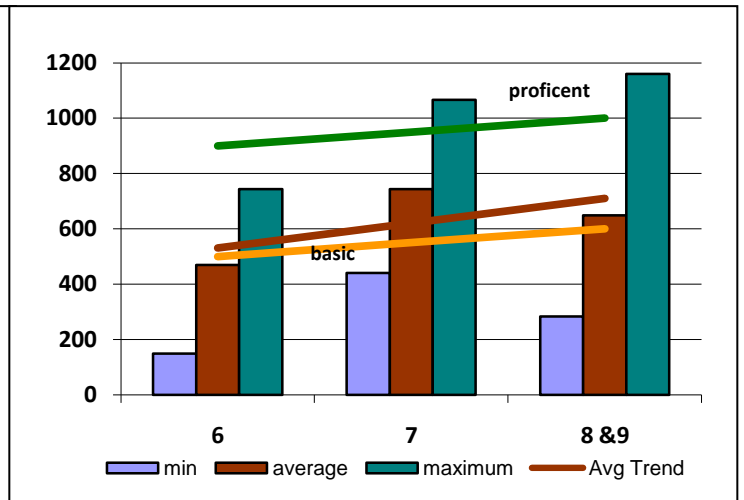
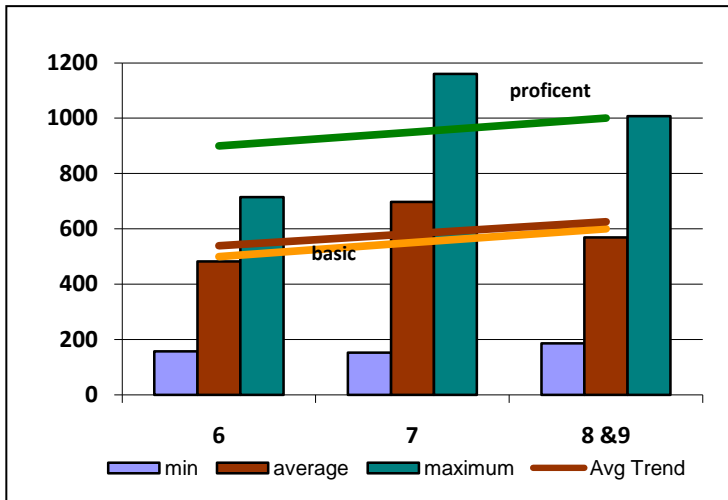


Figure 1: 2nd Trimester Lexile Averages by Grade

Figure 2: 3rd Trimester Lexile Averages by Grade

Figure 1 shows that the LEP students in this program started the third trimester performing barely at the Basic level. The trend line (brown line) indicates the difficulty students have of raising their performance on the SRI assessment, given their limited language skills from year to year. The wide disparity between the lowest score and highest scores in each grade is also apparent. Figure 2 shows the end of the year (third trimester) results following a year of the SCH bilingual program and using BrainWare Safari during the last 8 weeks of the trimester. The trend line is more positive and begins to separate from the Basic level (orange line).

Figure 3 compares the growth between the first and second trimesters to the growth between the second and third trimesters, an increase in the number of students improving their scores is noted. 13 of 21 students (41%) increased their SRI scores between the first two tests. 21 (66%) increased their scores between the second two.

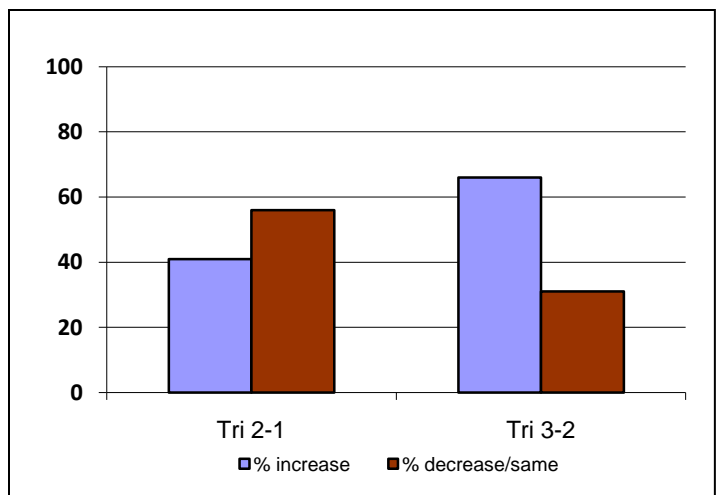


Figure 3: percentage improvements – all



Grade 7²

Figure 4 shows the trimester scores for the 7th grade LEP students in the All-day Program. The 7th grade students' scores decreased slightly on average between the first and second trimesters (-16 points). Between the second and third trimesters, their average score increased by 47 points.

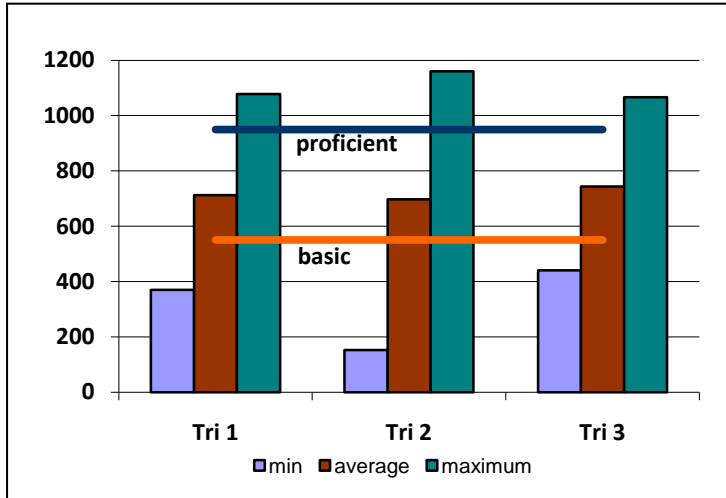


Figure 4: Trimester Lexile Scores Grade 7

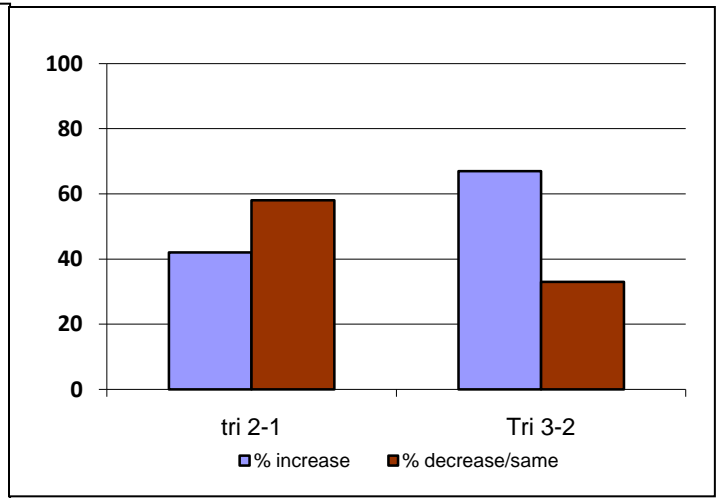


Figure 5: 7th grade percentage

Another way to compare the progress for the time that these students were using BrainWare Safari is to look at the percentage of students that increased their scores between the trimesters. Figure 5 shows that the percentage of students improving their scores following their use of BrainWare was 67%, compared to 42% improving their scores over the preceding trimester.

Grade 8 & 9

LEP students in the 8th grade scored below the basic level on the SRI exam at the first trimester test. Their average scores improved 25 points (half of the expected) for the second trimester test and increased by 80 points in the third trimester. Figure 6 shows the average lexile scores for these students at each trimester. They finished the year on average above Basic rating.

The 9th grade student's score decreased by 123 points between the first and second trimester and then rebounded 109 points at the third trimester.

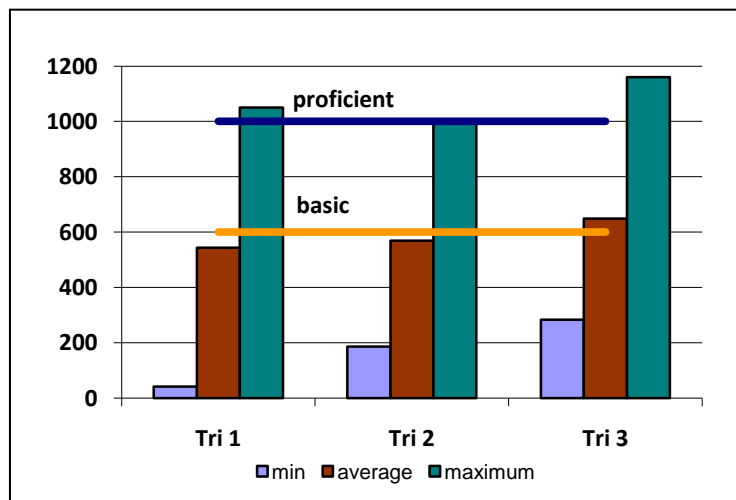


Figure 6: Trimester Lexile Scores Grade 8 & 9

2. Grade 6 academic results were basically flat. This is most likely due to the fact that the SRI may not be the correct assessment for this group of students so close to finishing cognitive development.

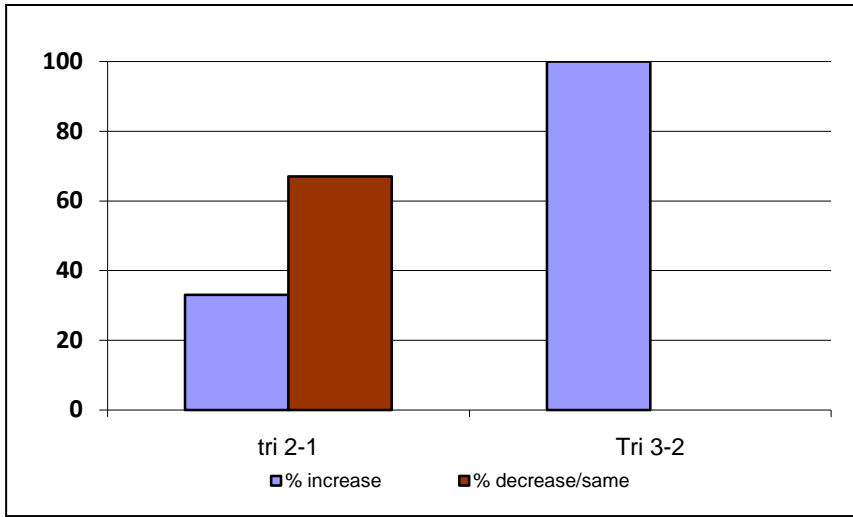


Figure 7 shows the difference in the percentage of students who improved their scores between the second and third trimesters compared to the earlier period. All of the students in these grades (100%) improved their scores following their use of BrainWare Safari, compared to only 33% between the first and second trimesters.

Figure 7 8th & 9th grade percentage improvements

Teacher Comments

Some of the teachers provided comments on the students' experience with BrainWare Safari:

- This program has been a positive force in developing the students' abilities and potentials.
- I have noticed improvements academically with my students. There was more effort and they were more focused.
- I think this is an excellent way to improve memory, visualization, and strategizing. All of my students thought of it as a game, it kept their focus, and they showed improvements all around.

Next Steps

These results of the pilot are compelling. Ongoing performance of these students on language proficiency tests, as well as other academic tests, should be monitored, as stronger cognitive ability can enhance ongoing knowledge and skills acquisition. Continued usage of BrainWare Safari for LEP students within SCH, especially for any students new to the bilingual program, is warranted.

Further, SCH should consider broader usage of BrainWare Safari within the district, with the potential for improved student performance on a more extensive basis.