



In the spring of 2008, the Harbor Beach Community Schools (HBCS) in Harbor Beach, Michigan decided to test BrainWare Safari (BWS) to see if they could achieve results comparable to the results reported in the initial published study of the program's effectiveness.¹ The district purchased BrainWare Safari with 10 user accounts and proceeded to replicate the study with students selected because they seemed to have learning issues. This study was under the supervision of one of the certified Speech and Language Pathologist from the Huron Intermediate School District. For the pre- and post-tests, HBCS used the same subtests of the Woodcock Johnson® III Cognitive Battery (WJIII) as in the published study. The district was satisfied that any improvements would be due primarily to the use of BrainWare since the published study had a control group, and did not establish a separate control group. The students worked on BrainWare for 45 minutes, 4 days a week for 10 weeks, in the computer lab under the supervision.

Results

The average age of the 10 students in HBCS was 11 years 1 month \pm 3 years 3 months, with the oldest student at 16 years 1 month and the youngest at 7 years 0 months (see Table 1). The subjects in the published study (PUB) were in a similar age range, having an average age of 10 years 0 months \pm 2 years 0 months, with the oldest at 13 years 3 months and the youngest at 6 years 7 months. BrainWare usage between HBCS and PUB also was similar. Table 1 shows that the number of levels completed, the number of weeks of BrainWare use and the number of sessions of BrainWare are all in the same range.

Average Intellectual Achievement of each of the groups is also shown in Table 1. The HBCS average improvement was 3 years 1 month \pm 2 years 1 month. This is of the same magnitude of as the improvement in demonstrated by the PUB subjects.

Table1: Comparison of BWS Usage and Test Results

	Harbor Beach (n=10)	Phase I published (n=17)	Phase II published (n=11)	Control published (n=15)
Avg. Chronological Age at Pre-Test (years.months)	11.1 \pm 3.3	10.0 \pm 2.0	10.2 \pm 1.5	9.8 \pm 1.7
Max age at Pre-Test (years.months)	16.1	13.3	12.0	11.10
Min Age at Pre-Test (years.months)	7.0	6.7	8.3	6.11
BWS Levels Completed	129\pm 28²	131 \pm 26	131 \pm 29	N/A
Max BWS levels	168	168	164	
Min BWS levels	97	87	80	
# weeks BWS	10	12	12	
# sessions of BWS	32	Approx 30³	Approx 30	
Avg. Intellectual Improvement (years.months)	3.1 \pm 2.1	4.3 \pm 3.0	4.0 \pm 4.7	0.4 \pm 1.3
Max improvement (years.months)	7.11	8.1	6.3	2.5
Min Improvement (years.months)	1.6	0.3	1.1	-2.6

1. Helms, D. Sawtelle S.M. "A Study of the effectiveness of cognitive therapy delivered in a video-game format." *Optom Vis Dev* 2007; 38(1): 19-26.

2. One Harbor Beach students continued using BrainWare past the time of the post-test, resulting in a slight overstatement of the number of levels completed by that student.

3. Session numbers are a new feature of BrainWare Safari since the time of the original study.

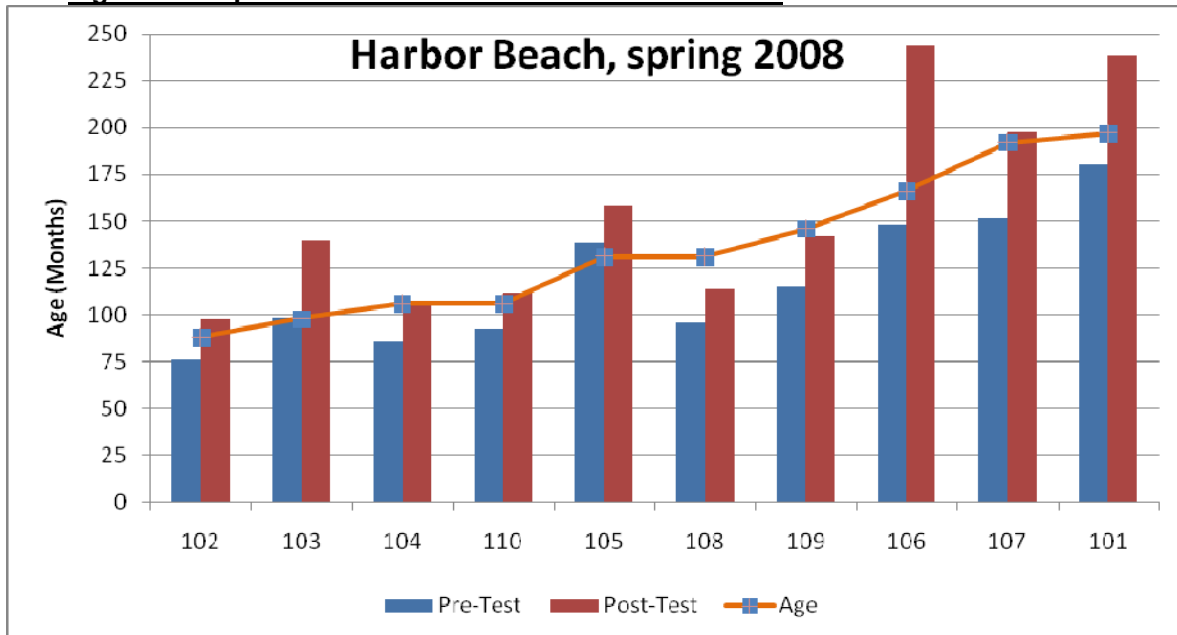


Individual results for each of the HBS students are shown in Table 2 and Figure 1. As in the published study, each HBCS student who used BrainWare Safari increased in intellectual ability. The maximum improvement overall was experienced by a 13 year 7 month-old student who initially tested as a 12 year 5 month-old. After using BrainWare Safari, this student tested at an intellectual age of 20 years 4 months. The minimum improvement was experienced by a 10 year 7 month-old who pre-tested at the intellectual age of an 8 year-old before BrainWare. This student, following 10 weeks of using BrainWare Safari, tested as a 9 year 6 month-old – closer to his/her actual age.

Table 2: Individual HBCS Student Results

ID	Pre-test Age		Pre-test		Post-test		Improvement	
	Months	Years.mo	Months	Years.mo	Months	Years.mo	Months	Years.mo
101	193	16.1	180	15.0	238	19.10	58	4.10
102	84	7.0	76	6.4	98	8.2	22	1.10
103	94	7.10	98	8.2	140	11.8	42	3.6
104	103	8.7	86	7.2	105	8.9	19	1.7
105	128	10.8	139	11.7	159	13.3	20	1.8
106	163	13.7	149	12.5	244	20.4	95	7.11
107	189	15.9	152	12.8	197	16.5	46	3.10
108	127	10.7	96	8.0	114	9.6	18	1.6
109	143	11.11	115	9.7	142	11.10	27	2.3
110	102	8.6	93	7.9	112	9.4	19	1.7

Figure 1: Graph of Individual Results for HBCS Students





The average results on the sub-tests of WJIII, as shown in Table 3, are also comparable between the HBCS study and the original published study.

Table 3: Comparison of Average Student Performance on individual WJIII Sub-tests

Table with 5 columns: Sub-test, Harbor Beach (n=10), Phase I published (n=17), Phase II published (n=11), Control published (n=15). Rows include Visual Auditory Learning, Spatial Relations, Concept Formation, Visual Matching, Numbers Reversed, Auditory Working Memory, and Decision Speed.

Observations

Teachers and administrators within HBCS began to notice changes in the students even before the end of the ten weeks and before the post-test results were finalized. In describing students who were using BrainWare, teachers made comments such as the following:

- He seems to be paying attention better.
• He is getting his homework completed.
• She got the first A of the year. What are you doing to change her study habits?
• He seems to be more interested in class.
• He is behaving better, I think it's because he's paying attention.

Not only do the adults notice changes, but the students themselves are aware of them, making comments such as:

- I got my first A ever!
• Why is school getting easier?
• It's easier to take notes in class.

These teacher and student comments are typical of the kinds of changes observed whenever BrainWare Safari is implemented according to the company's recommended schedule.

Conclusion

The Harbor Beach Community Schools study of 2008 was a successful validation of BrainWare Safari's impact on students using the program consistent with the schedule recommended by Learning Enhancement Corporation (3-5 times a week for 30 to 60 minutes over 12 weeks).

As in previous studies, both the published study referenced above and subsequent work, some of which is in preparation for submission for publication, each individual who has used BrainWare Safari has exhibited improvement in his or her intellectual ability. It is also important to note that individual results vary significantly, as individual cognitive weakness and strengths differ from subject to subject.

The study is confirmatory of results from previous studies.