

Effectiveness of the Flippen Reading Connection

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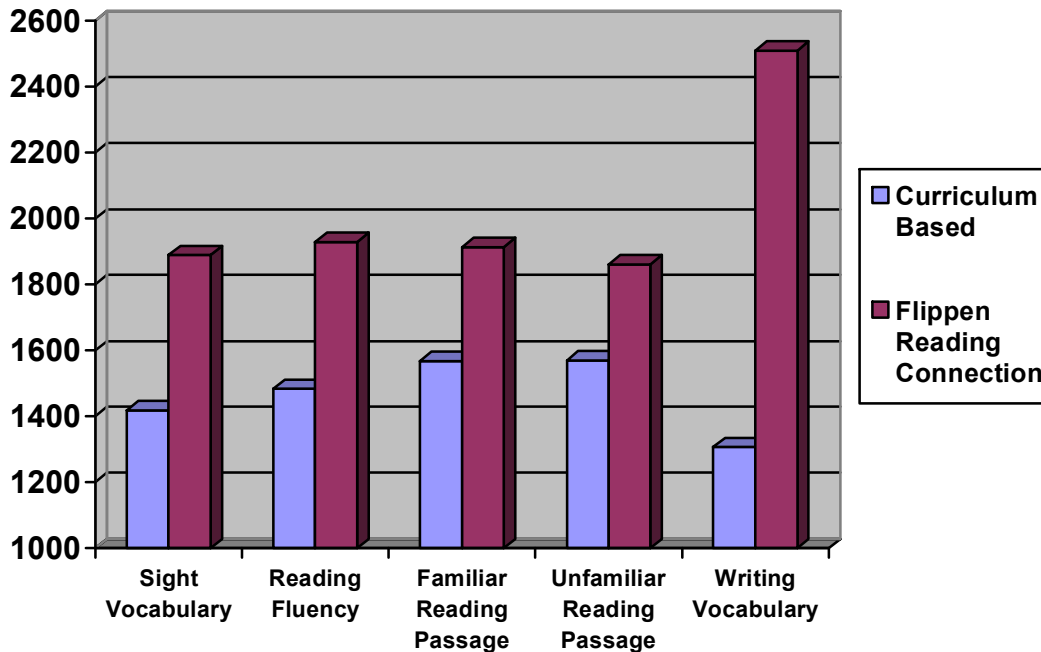
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For clarity purposes, this manuscript has had minor changes made. For example, the name of the intervention was changed after this was written, so the new name is used throughout.

Abstract

Test Score Results

Total Raw Score Difference between Initial & Post Tests



The results of this double-blind research study indicate that the Flippen Reading Connection procedures group scored significantly higher than the curriculum based group in all five areas assessed. The five areas include Sight Vocabulary Accuracy, Sight Vocabulary Fluency, Familiar Passage Reading, Unfamiliar Passage Reading, and Writing Vocabulary. This study gives credence to the fact that the Flippen Reading Connection is a significantly effective intervention when used with learning disabled students and students with varying exceptionalities including attention deficits.

Purpose

The purpose of this study is to measure the effectiveness of the Flippen Reading Connection as compared to the usual and customary curriculum used within self-contained classes for learning disabilities. The self-contained classes included children diagnosed by a public school system with learning disabilities including attention deficit and other varying exceptionalities.

Flippen Reading Connection

The Flippen Reading Connection procedure involves a sensorimotor and psychomotor program. Unlike earlier procedures in the same categories, the Flippen Reading Connection procedures integrate all kinesthetic activities with symbolic language. Visual representation of symbols is simultaneously created and expressed via movement. Mental representations of visual symbols and clusters of symbols are made, matched to auditory symbols (phonemes, morphemes, & words) and extended to symbolic and schematic areas. Major emphasis is placed on conceptual ability (the ability to deal with parts and whole simultaneously) at auditory, visual, motor, cognitive and semantic levels. Basically, new cognitive processing is taught by a physical action procedure. Initially, body inclusion is essential to the intervention but gradually the body is excluded and cognitive processing is completely interiorized.

Study

A double-blind intervention study was conducted within the Orange County, Florida public school system. Eleven self-contained classes for learning disabilities were selected with school system assistance. Grade levels three to five were chosen for this study. The self-contained classes were similar as to types and severity of learning disability and attention deficits, level of intelligence, age, and gender.

Five classes used the Flippen Reading Connection procedures. The teachers who were to implement the Flippen Reading Connection procedures with their classes received sixty hours of training in the classroom instruction involving these specific procedures. All of these teachers volunteered. The Flippen Reading Connection procedures were used for forty-five minutes per school day as a supplement to the usual and customary school day curriculum. Therefore, the procedures were able to be integrated into the school day with no extra time allotment required. The classes designated as curriculum based continued to implement the usual and customary prescribed curriculum for the school day. Six classes used the curriculum based procedures.

Students in all research classes were tested before the Flippen Reading Connection procedures were implemented. The assessment used was the Orange County Curriculum Based Assessment used by Orange County and other counties in Florida. This assessment was chosen by Orange County as opposed to standardized testing because curriculum based assessment relates more directly to actual classroom instruction and can

provide more usable and realistic results. These results can be more easily generalized to other self-contained and resource learning disability classroom settings. The testers that administered the Curriculum Based Assessment were trained and certified to do so by the Orange County school system.

The areas of skill assessed were as follows:

1. Sight vocabulary accuracy
2. Sight vocabulary fluency
3. Familiar passage reading
4. Unfamiliar passage reading
5. Writing vocabulary

Students were not aware that they were participating in a research project. The Flippen Reading Connection procedures were implemented with no special introduction so that these procedures would be perceived as a part of the usual and customary daily classroom curriculum. This controlled the factor of student expectation. The teachers and those administering the Curriculum Based Assessment were unaware of the design and purpose of the study. The teachers were made aware that class performance would not be compared to other classes and that students would be identified by number and not by name. The data analysts were unaware of which students were in the curriculum based classroom or Flippen Reading Connection group until all data had been recorded and correlated.

The students were post tested using the Curriculum Based Assessment by the same testers that administered the pre test. The post test occurred within fifteen days after the conclusion of the research project. This assessment delay was to ensure that any gains demonstrated by the students had become implicit cognitive processes and a part of their long-term working memory.

The research project began in late November 1994 and concluded in early May 1995. The project took sixty-eight school days with the usual holidays and anticipated and unanticipated changes in daily school routine.

The following data was obtained at the completion of the post test assessment. The research project initially had a larger number of students participating. The final study consisted of eighty-three students, forty-three students within the curriculum based group and forty students within the Flippen Reading Connection group. Attrition was due to excessive absences, moving, transfer and sickness at time of testing. Other students were not selected due to not having consistent data for various reasons.

The Kruskal-Wallis H test was the procedure employed to determine if the Flippen Reading Connection procedures group was significantly different from the curriculum based usual and customary procedures group. This analysis involves rank ordering all students for both groups in order to assess the significance of the differences.

Students were assigned to a student number for identification purposes only. The students possess the same identification number for all tables.

The curriculum based groups contained 43 students and the Flippen Reading Connection group contained 40 students. Pre and post score differences are indicated in column two followed by the student's rank as compared to the pre and post score differences.

TABLE 1

Sight vocabulary accuracy was assessed by having the student read starter, primary and content based lists of words. Number of words read correctly, errors and, for fluency measures, a WCM (Words read correctly per minute rating) were used. Scores were recorded for the number of words read correctly. Student scores were obtained for the pre test and post test assessment periods and the difference between the two period scores served as the measure for sight vocabulary accuracy improvements.

Individual students scores on the *Sight Vocabulary Accuracy* for the score difference between Pre and Post assessment periods for both groups.

<u>Curriculum Based Group</u>			<u>Flippen Reading Connection Group</u>		
Student ID#	Pre-Post Difference	Rank	Student ID#	Pre-Post Difference	Rank
1	-74	1	1	+57	66
2	+32	58.5	2	+13	40
3	+46	63	3	+6	19
4	+19	48	4	+40	61.5
5	+66	70	5	+6	19
6	+1	8.5	6	+11	30
7	+25	56.5	7	+19	48
8	+14	42.5	8	+71	74
9	-5	6	9	+17	46
10	-12	2	10	+54	65
11	+10	26.5	11	-6	5
12	+22	54	12	+37	60
13	+22	54	13	+2	11.5
14	+20	50.5	14	+91	80
15	+7	22	15	+25	56.5
16	+7	22	16	+61	67
17	+10	26.5	17	+81	78
18	+22	54	18	+9	25
19	+12	35.5	19	+51	64
20	+12	35.5	20	+4	17
21	+12	35.5	21	+15	44.5
22	+12	35.5	22	+12	35.5
23	+3	15	23	+7	22
24	+1	8.5	24	+21	52
25	0	7	25	+11	30
26	+2	11.5	26	+77	75.5
27	+2	11.5	27	+69	72
28	-4	5.5	28	+77	75.5
29	+13	40	29	+23	55
30	-10	3	30	+65	69

Table 1 (cont.)

31	+14	42.5	31	+11	30
32	+2	11.5	32	+11	30
33	+13	40	33	+6	19
34	-4	5.5	34	+63	68
35	+15	44.5	35	+19	48
36	+11	30	36	+40	61.5
37	+80	77	37	+20	50.5
38	-9	4	38	+12	35.5
39	+3	15	39	+32	58.5
40	+3	15	40	+8	24
41	+85	79			
42	+67	71			
43	+70	73			

$$N_1 = 43$$

$$N_2 = 40$$

$$T_1 = 1417.5$$

$$T_2 = 1888.5$$

The total rank for each group (1,417.5 versus 1,888.5) would appear to be statistically significant. A Kruskal-Wallis H test was performed to answer the question: Is there a significant difference between the two groups in Sight Vocabulary Accuracy?

The results indicated that there was a significant difference between the two groups in terms of sight vocabulary accuracy ($H(1df) = 80 - 145, p < .001$). Therefore, one may conclude that the Flippen Reading Connection group scored significantly higher than the curriculum based group.

TABLE 2

Sight vocabulary fluency was assessed in terms of WCM's (words read correctly per minute) relative to errors made.

Individual student scores on the *Sight Vocabulary Fluency* for the score difference between Pre and Post assessment periods for both groups.

<u>Curriculum Based Group</u>			<u>Flippen Reading Connection Group</u>		
Student ID#	Pre-Post		Student ID#	Pre-Post	
	Difference	Rank		Difference	Rank
1	+29	72.5	1	-2	8.5
2	-4	1	2	+9	8.5
3	+13	48.5	3	+19	58
4	+12	45	4	+32	76
5	+34	77	5	0	12
6	+3	23	6	+17	55
7	+7	33	7	+28	70.5
8	-1	9	8	-2	8.5
9	+22	62.5	9	-3	7
10	+5	29	10	0	12
11	+9	39.5	11	-7	5
12	+14	51	12	+13	43.5
13	+19	58	13	+16	53.5
14	+2	19.5	14	+51	82
15	+2	19.5	15	+40	79
16	+8	36.5	16	+42	80
17	+31	75	17	+25	66.5
18	+1	15.5	18	+19	58
19	+12	45	19	+12	45
20	+8	36.5	20	+26	68.5
21	-8	4	21	+5	29
22	+8	36.5	22	+45	81
23	+13	48.5	23	+7	33
24	-13	3	24	+16	53.5
25	+35	78	25	+22	62.5
26	-31	2	26	+28	70.5
27	+8	36.5	27	+10	41
28	+5	29	28	+18	56
29	+4	25	29	0	12
30	+11	42.5	30	+30	74
31	+5	29	31	+2	19.5
32	+4	25	32	+23	65
33	+13	48.5	33	0	12

Table 2 (Cont.)

34	+7	33	34	+25	66.5
35	+5	29	35	+4	25
36	+1	15.5	36	+26	68.5
37	+22	62.5	37	+21	60
38	-55	1	38	+15	52
39	+2	19.5	39	+29	72.5
40	+11	42.5	40	12	40
41	+22	62.5			
42	+2	19.5			
43	+2	19.5			
	N ₁ = 43		N ₂ = 40		
	T ₁ = 1483		T ₂ = 1929		

The total rank for each group (1,483 versus 1,929) would appear to be statistically significant. A Kruskal-Wallis H test was performed to answer the question: Is there a significant difference between the two groups in Sight Vocabulary Fluency?

The results indicated that there was a significant difference between the two groups in terms of sight vocabulary fluency ($H(1df) = 65.88, p < .001$). Therefore, one may conclude that the Flipped Reading Connection group scored significantly higher than the curriculum based group.

TABLE 3

Familiar Passage Reading ability was assessed in terms of WCM's relative to errors made while reading familiar passages.

Individual student scores on the *Familiar Passage Reading* for the WCM score difference between Pre and Post assessment periods for both groups.

<u>Curriculum Based Group</u>			<u>Flippen Reading Connection Group</u>		
Student ID#	Pre-Post		Student ID#	Pre-Post	
	Difference	Rank		Difference	Rank
1	-13	11	1	+38	75.5
2	+7	42	2	-17	5
3	+15	55	3	+39	77
4	0	29.5	4	+29	69.5
5	+46	78.5	5	-7	18.5
6	-7	18.5	6	+9	45
7	-1	24.5	7	+34	74
8	+7	42	8	+13	50.5
9	-14	9.5	9	-8	17
10	-10	14	10	+26	68
11	-17	5	11	+18	59
12	-17	5	12	+14	53
13	-15	7.5	13	+25	66
14	-1	24.5	14	+24	63.5
15	-15	7.5	15	+32	71.5
16	+11	47	16	-5	21
17	+46	78.5	17	+16	57
18	+17	58	18	+5	39.5
19	+11	47	19	+61	82
20	+8	44	20	0	29.5
21	+25	66	21	-9	16
22	+23	62	22	+3	37
23	+33	73	23	0	29.5
24	+49	80	24	+29	69.5
25	+15	55	25	+15	50.5
26	+13	50.5	26	+13	50.5
27	-4	22	27	+24	63.5
28	0	29.5	28	+4	38
29	+44	78	29	-14	9.5
30	-10	14	30	+54	81
31	0	29.5	31	+2	35.5
32	0	29.5	32	+38	75.5
33	-11	12	33	+15	55

Table 3 (Cont.)

34	-2	23	34	+7	42
35	0	29.5	35	+25	66
36	-19	2	36	+2	35.5
37	+32	71.5	37	+19	60
38	+11	47	38	-6	20
39	+22	61	39	1	34
40	0	29.5	40	-18	3
41	-40	1			
42	+5	39.5			
43	-10	14			

$$N_1 = 43$$

$$N_2 = 40$$

$$T_1 = 1567.5$$

$$T_2 = 1913.5$$

The total rank for each group (1,567.5 versus 1,913.5) would appear to be statistically significant. A Kruskal-Wallis H test was performed to answer the question: Is there a significant difference between the two groups in Familiar Passage Reading?

The results indicated that there was a significant difference between the two groups in terms of familiar passage reading ($H(1df) = 113.32, p < .001$). Therefore, one may conclude that the Flipped Reading Connection group scored significantly higher than the curriculum based group.

TABLE 4

Unfamiliar passage reading ability was assessed in terms of WCM's relative to errors made while reading unfamiliar passages.

Individual student scores on the *Unfamiliar Passage Reading* for the WCM score difference between Pre and Post assessment periods for both groups.

<u>Curriculum Based Group</u>			<u>Flippen Reading Connection Group</u>		
Student ID#	Pre-Post		Student ID#	Pre-Post	
	Difference	Rank		Difference	Rank
1	+31	75	1	+8	41.5
2	-2	16	2	-1	19
3	+22	68	3	+36	78.5
4	+2	26	4	+25	72
5	+36	78.5	5	-2	16
6	-1	19	6	+6	37.5
7	+5	34.5	7	+7	39
8	+1	25	8	-3	14
9	-7	10	9	+4	31.5
10	+2	26	10	+3	28.5
11	-6	11.5	11	+13	47.5
12	-14	3	12	+20	64.5
13	+5	34.5	13	+61	82
14	-1	19	14	+38	80
15	-12	4	15	+17	56
16	+12	46	16	+19	61.5
17	+24	70	17	+20	64.5
18	+3	28.5	18	+3	28.5
19	+20	64.5	19	+15	52
20	-10	5.5	20	+20	64.5
21	+33	76.5	21	-8	8.5
22	+19	61.5	22	+33	76.5
23	+18	59	23	+14	49.5
24	+24	70	24	+14	49.5
25	+8	41.5	25	+8	41.5
26	-10	5.5	26	+18	59
27	+18	59	27	+27	74
28	+5	34.5	28	+17	56
29	+11	45	29	+17	56
30	+15	52	30	+24	70
31	0	22.5	31	+6	37.5
32	0	22.5	32	+16	54
33	+3	28.5	33	0	22.5

Table 4 (Cont.)

34	-4	13	34	+21	67
35	0	22.5	35	-9	7
36	+5	34.5	36	-6	11.5
37	+48	81	37	+10	44
38	+15	52	38	+13	47.5
39	+4	31.5	39	+17	56
40	-22	2	40	-8	8.5
41	-30	1			
42	+26	73			
43	-2	16			

$N_1 = 43$

$N_2 = 40$

$T_1 = 1569$

$T_2 = 1860$

The total rank for each group (1,569 versus 1,860) would appear to be statistically significant. A Kruskal-Wallis H test was performed to answer the question: Is there a significant difference between the two groups in Unfamiliar Passage Reading?

The results indicated that there was a significant difference between the two groups in terms of unfamiliar passage reading ($H(1df) = 104.18, p < .001$). Therefore, one may conclude that the Flippen Reading Connection group scored significantly higher than the curriculum based group.

TABLE 5

Writing vocabulary was assessed in terms of number of words spelled correctly expressed as a ratio of one hundred.

Individual student scores on the *Writing Vocabulary* for the score difference between Pre and Post assessment periods for both groups.

<u>Curriculum Based Group</u>			<u>Flippen Reading Connection Group</u>		
Student ID#	Pre-Post Difference	Rank	Student ID#	Pre-Post Difference	Rank
1	-7	7	1	+28	73.5
2	+13	46.5	2	+29	75.5
3	-5	9	3	+24	60.5
4	+12	42.5	4	+26	67
5	+26	67	5	+13	46.5
6	+18	52	6	+27	70.5
7	+6	32.5	7	+12	42.5
8	-22	2	8	+33	80
9	-3	11	9	+25	62.5
10	+4	26.5	10	+12	42.5
11	-32	1	11	+29	75.5
12	+26	67	12	+2	19.5
13	+2	19.5	13	+7	34.5
14	+4	26.5	14	+9	37.5
15	+11	40	15	+30	77.5
16	+4	26.5	16	+18	52
17	-13	4	17	+27	70.5
18	-6	8	18	+17	50
19	-1	15	19	+4	26.5
20	+22	58.5	20	+1	17.5
21	+22	58.5	21	+37	81
22	+13	46.5	22	+8	36
23	-2	13	23	+3	22.5
24	+1	17.5	24	+25	62.5
25	+28	73.5	25	-10	6
26	+5	30	26	+26	67
27	-4	10	27	+30	77.5
28	0	16	28	+86	83
29	-2	13	29	+27	70.5
30	+3	22.5	30	+43	82
31	+9	37.5	31	+20	56
32	+12	42.5	32	+31	79
33	+26	67	33	+19	54

Table 5 (Cont.)

34	+27	70.5	34	+18	52
35	+14	49	35	+20	56
36	-11	5	36	+10	39
37	+13	46.5	37	+24	60.5
38	+3	22.5	38	+5	30
39	-18	3	39	+6	32.5
40	+5	30	40	+20	56
41	+7	34.5			
42	+2	13			
43	+3	22.5			
	N ₁ = 43		N ₂ = 40		
	T ₁ = 1306		T ₂ = 2508		

The total rank for each group (1,306 versus 2,508) would appear to be statistically significant. A Kruskal-Wallis H test was performed to answer the question: Is there a significant difference between the two groups in Writing Vocabulary?

The results indicated that there was a significant difference between the two groups in terms of writing vocabulary ($H(1df) = 170.92, p < .001$). Therefore, one may conclude that the Flippen Reading Connection group scored significantly higher than the curriculum based group.

Handwriting

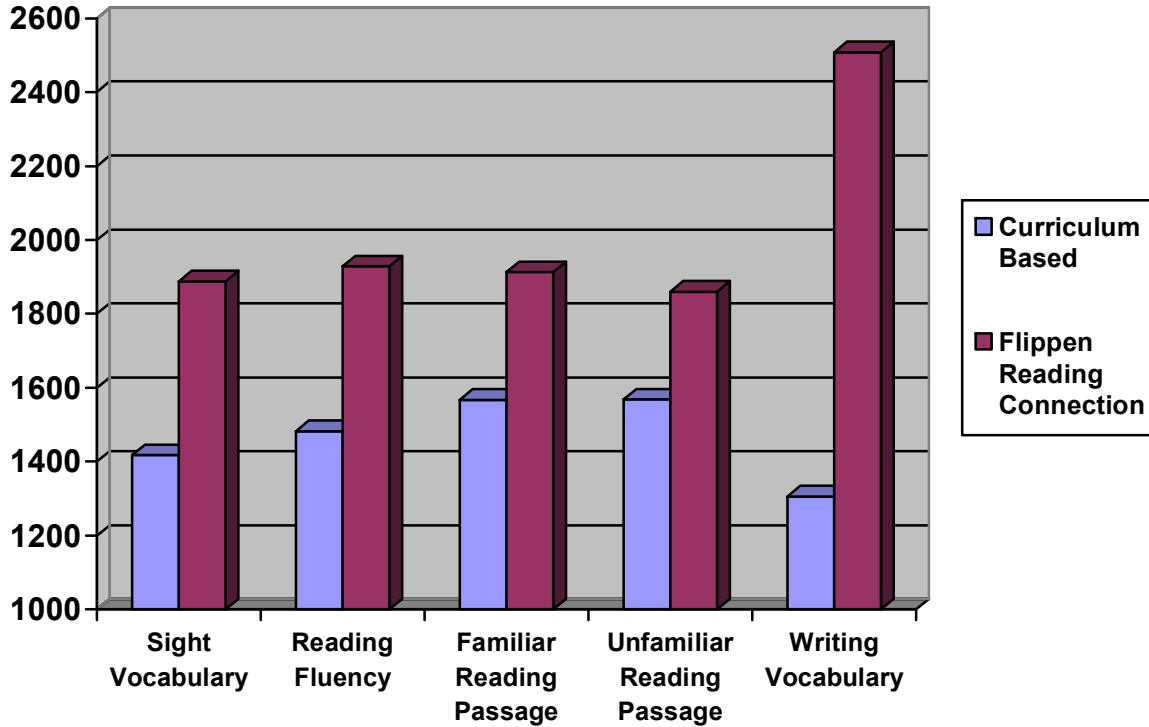
Handwriting improvement is a reflection of improvement with impulse control, perceptual consistency, visual-motor integration, fine motor skills and psychomotor stability.

An analysis of handwriting was completed. A sample of students' handwriting was reviewed and it appears that the Flippen Reading Connection group demonstrated significant growth. Growth was demonstrated in consistency wherein there was a decrease in the mixing of upper and lower case as well as manuscript and cursive configurations. The spacing and sizing of letters improved. A decrease in the use of reversals and inversions was demonstrated. Basically, the students' overall legibility improved. A sampling of the Flippen Reading Connection students' writing as a part of the study is attached. Some improvement was noted in the case of some curriculum based students although the difference did not appear as significant as that of students in the groups using the Flippen Reading Connection.

Summary Graph

Test Score Results

Total Raw Score Difference between Initial & Post Tests



Conclusion

The results of this double-blind research study indicate that the Flippen Reading Connection procedures group scored significantly higher than the curriculum based group in all five areas assessed. The five areas include Sight Vocabulary Accuracy, Sight Vocabulary Fluency, Familiar Passage Reading, Unfamiliar Passage Reading, and Writing Vocabulary. This study gives credence to the fact that the Flippen Reading Connection is a significantly effective intervention when used with learning disabled students and students with varying exceptionalities including attention deficits.

Appendix: Interpretation

An Interpretation of the results of the Flippen Reading Connection study.

In statistics, a Standard Deviation is considered a measure of significance. If a score measuring growth falls at least one standard deviation above or below the starting average (mean) of a group, it can be considered in determining either positive or negative significance.

In statistical analysis, the lowest level of accepted significance for growth shown in raw test scores is .05.

.05 means:

- 1) That the chances of these results being obtained due to error of any kind are one in twenty.
- 2) That the difference in growth between one group as opposed to another is at least 1.65 Standard Deviations.

This is the lowest level of statistical significance, but is still considered to be scientifically significant.

The next higher level of significance is .025. In this case the chances of results being obtained by error are one in forty. The difference in growth must be 1.96 standard deviations. This level of growth is statistically more significant than .05.

The next higher level of significance is .01. At this level, the chances of results being obtained by error are one in one hundred. The difference in growth must be 2.33 standard deviations. This level of statistical significance is considered by statisticians to be very significant.

The next higher level of significance is .005. At this level, the chances of results being obtained by error are one in two hundred. The difference in growth must be 2.58 standard deviations. This level of significance is extremely significant statistically.

The highest level of significance is .001. At this highest level, the chances of results being obtained by error are one in one thousand. The difference in growth must be 2.99 or almost 3 standard deviations. This level of significance is considered to be so high that statisticians do not calculate above this level.

When the growth of the Flippen Reading Connection group between initial and post tests was compared to that of the Curriculum Based Group in the five tested areas, Sight Vocabulary Accuracy, Sight Vocabulary Fluency, Familiar Passage Reading, Unfamiliar Passage Reading, and Writing Vocabulary, it was found that the Flippen Reading Connection group improved significantly more than the Curriculum Based Group in five areas tested. The level of significance in each case was .001, the highest possible level of statistical significance. This means that the possibility of these results happening by chance is less than 1 in 1000. It also means that the Flippen Reading Connection's

growth was, at the least, 2.99 standard deviations higher than the growth of the Curriculum Based Group in all five tests given.

An informal analysis of growth in handwriting was also done by the psychological/educational analysts. Again in this area, the Flippen Reading Connection Group improved significantly more than the Curriculum Based Group, based on the analysis of the analysts. Since this area could not be quantified, it could not be statistically analyzed.

These project results are remarkable for three reasons.

1. There has never been a double blind, rigorously controlled intervention study done in a school setting with a learning disabled population in which any group has shown any significant growth whatsoever.
2. The Flippen Reading Connection group in this study not only demonstrated significant growth but growth at the very highest level of statistical significance.
3. This growth was accomplished in just seventy school days.

Appendix: Addendum

The following addenda arrange and collate the results of the project in terms of percentages and standard deviations.

Included in each Addendum is information of special importance. Note that an analysis of the lowest scores (those of the lowest functioning students from each group) show that the Flippen Reading Connection student's mean growth was 25.6% compared to -4.3% decline for the Curriculum Based group. (Addendum I). Also note that the lowest functioning Flippen Reading Connection students improved by a composite total of 45 standard deviations while the lowest functioning Curriculum Based students declined by a composite total of 3 standard deviations. This indicates that the Flippen Reading Connection is an effective procedure for “jump starting” students who have barely begun to learn after a number of years in school.

Note also that an analysis of the highest scores show that Flippen Reading Connection group improved their mean scores by 112.7% compared to an improvement of 33.9% by the Curriculum Based group. In terms of standard deviations the Flippen Reading Connection students improved by a composite total of 111 standard deviations while the Curriculum Based group improved by a composite total of 46 standard deviations. This indicates that the Flippen Reading Connection intervention is an effective procedure for accelerating the learning of those students who have already acquired basic skills to some extent.

Addendum – Additional Data

The numbers listed to the left of the Initial Mean column refer to a single test administered to one of the six classes in the Curriculum Based Group and to one of the five classes in the Flippen Reading Connection group.

	<u>Curriculum Based Group</u>				<u>Flippen Reading Connection Group</u>		
	Initial Mean	Mean Difference	% Increase		Initial Mean	Mean Difference	% Increase
1	33.7	-9.2	-27.3%	1	37.6	3.8	10.1%
2	28.6	-5.3	-18.5%	2	29.8	2.8	10.6%
3	25.7	-3.0	-11.7%	3	142.9	27.6	19.3%
4	40.7	-0.7	-1.7%	4	67.5	14.1	20.9%
5	35.2	-0.5	-1.5%	5	53.1	13.9	26.3%
6	166.9	0.6	0.3%	6	83.4	26.2	31.4%
7	20.0	0.6	3.0%	7	25.3	8.3	32.8%
8	74.0	2.7	3.6%	8	25.6	8.8	34.4%
9	35.1	1.6	4.5%	9	62.5	21.8	34.9%
10	46.4	2.8	6.0%	10	40.3	14.4	35.7%
11	68.4	4.4	6.4%	11	35.1	14.1	40.2%
12	58.7	4.9	8.3%	12	38.0	15.8	41.6%
13	132.1	11.2	8.4%	13	41.5	17.6	42.4%
14	56.3	8.5	11.7%	14	28.8	15.5	53.8%
15	44.0	5.6	12.7%	15	83.5	49.5	59.3%
16	88.3	11.4	12.9%	16	38.4	23.4	61.0%
17	75.1	10.1	13.4%	17	20.7	15.1	73.0%
18	95.0	12.8	13.5%	18	40.3	36.1	89.6%
19	52.1	8.0	15.3%	19	13.6	13.1	96.3%
20	90.1	15.0	16.6%	20	44.1	43.5	98.6%
21	88.4	15.2	17.2%	21	14.0	14.0	100.0%
22	38.5	9.1	23.6%	22	28.5	29.1	102.1%
23	35.5	9.5	26.8%	23	24.8	31.1	125.4%
24	20.8	5.8	27.8%	24	10.1	17.7	175.2%
25	46.6	14.9	31.9%	25	16.9	34.8	206.0%
26	25.0	8.7	34.8%				
27	108.1	42.7	39.5%	Total:	1046.3	512.1	1620%
28	51.2	21.8	42.5%				
29	32.7	14.5	44.3%	Avg:	41.9	20.5	64.8%
30	28.8	14.7	51.0%				
Total:	1742	238.4	414.6%				
Avg:	58.1	7.9	13.8%				

When we analyze the 50 lowest test scores for both the Curriculum Based group and the Flippen Reading Connection group, we obtain:

Curriculum Based Group

-4.3% improvement over the initial mean scores

Flippen Reading Connection Group

25.6% improvement over the initial mean scores

When we analyze the 50 highest tests for Curriculum Based groups and the Flippen Reading Connection groups, we obtain:

Curriculum Based Group

33.9% improvement over the initial mean scores

Flippen Reading Connection Group

112.7% improvement over the initial mean scores