Report on Action Research

An Analysis of the Effects of Selected Instructional Strategies on Student Achievement at Terre Haute South Vigo High School

Prepared by Marzano Research Laboratory

for

Vigo County School Corporation

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MARZANO RESEARCH LABORATORY
www.MarzanoResearch.com
Phone: 812-336-7700 ● Fax: 866-308-3135

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REPORT AUTHOR
Mark W. Haystead

BUSINESS DEVELOPMENT OFFICE
555 N Morton Street
Bloomington, IN 47404
Phone 888.849.0851
Fax 812.336.7790

RESEARCH CENTER
9000 E Nichols Ave Ste 210
Centennial, CO 80112
Phone 303.766.9199
Fax 303.694.1778

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Executive Summary

This report describes the findings of an analysis of a series of action research projects conducted by Vigo County School Corporation at Terre Haute South Vigo High School (hereinafter referred to as South Vigo). During the 2008-2009 school year, 19 teachers at South Vigo participated in independent action research studies regarding the extent to which selected instructional strategies enhanced the learning of students.

Because students could not be randomly assigned to treatment and control groups, all independent action research studies employed a quasi-experimental design, referred to as a pretest-posttest non-equivalent groups design. The pretest scores were used as a covariate to partially control for differing levels of background knowledge and skill.

The average effect size for all 19 independent action research studies was statistically significant ($p < .01$). When corrected for attenuation, the percentile gain associated with the use of the selected instructional strategies is 11 ($\overline{ES} = .29$). A reasonable inference is that the overall effect of a 11 percentile point gain is probably not a function of random factors that are specific to the independent action research studies; rather, the 11 percentile point increase represents a real change in student learning.

Introduction

This report describes the findings of an analysis of a series of action research projects conducted by Vigo County School Corporation at Terre Haute South Vigo High School (hereinafter referred to as South Vigo). During the 2008-2009 school year, 19 teachers at South Vigo participated in independent action research studies regarding the extent to which selected instructional strategies enhanced the learning of students.

Action Research Design

Participating teachers selected two groups of students both of which were being taught the same unit or set of related lessons. However, in one group (the "treatment" group) a specific instructional strategy was used, whereas in the other group (the "control" group) the strategy was not used. Because students could not be randomly assigned to treatment and control groups, all studies employed a quasi-experimental design, referred to as a pretest-posttest non-equivalent groups design. These groups are considered to be non-equivalent, since it is unlikely that the two groups would be as similar as they would if assigned through random lottery.

A pretest and posttest was administered to students in both groups. The pretest scores were used to statistically "adjust" the posttest scores using a technique referred to as analysis of covariance (ANCOVA). In basic terms, the adjustment translates the posttest scores into those that would be expected if students in both groups started with the same scores on the pretest. In effect, it is a way of controlling for students' differences in what they know about a topic prior to the beginning of instruction on the topic. ANCOVA is commonly used when random assignment is not possible (see Technical Note 1). Although ANCOVA was used to statistically equate students in terms of prior academic knowledge, arguments about causal relationships are not as strong as they would be when group members are assigned through a random lottery.

Again, teachers were instructed to teach a short unit on a topic of their choice to two groups of students—one treatment and one control. Instructional activities in both groups were to be as similar as possible except for the fact that the selected instructional strategy was used in one group only (i.e., the treatment group). Directions provided to teachers are reported in Appendix A.

Findings Reported by Teacher

Figure 1 presents the ANCOVA findings and associated effect size for each of the teachers involved in the independent action research studies. The columns labeled “Adjusted Mean” contain the posttest mean adjusted for differences in the pretest scores for the control and treatment groups respectively (number of students reported in parentheses). The column labeled “Sig.” contains the *p*-value for each study computed at a significance level of 5% ($\alpha = .05$). Basically, if the value in this column is less than .05, the effect size reported for the study can be considered statistically significant. In other words, a reasonable inference can be made that the reported effect size is probably not a function of random factors that are specific to each reported study; rather, the reported effect size represents a real change in student learning (for a detailed discussion of the meaning of statistical significance see Harlow, Muliak, & Steiger, 1997). The column labeled “ES” contains the calculated effect size for each study computed as Cohen’s δ. Effect size is the difference in the average score of the control group and the treatment group stated in standard deviation units. Thus, an effect size of 1.00 would indicate that the average score in the treatment group is one standard deviation higher than the average score in the control group. The column labeled “% Gain” contains the percentile gain (or loss) in achievement associated with the treatment (i.e., use of the selected instructional strategy). (For a discussion of effect size and associated percentile gain see Technical Note 2.)

Figure 1: Findings for Individual Teachers

Teacher	Grade	Target Strategy	Adjusted Mean (Control)	Adjusted Mean (Treatment)	Sig.	ES	% Gain
1	11	Graphic Organizer	79.97 (n=33)	81.04 (n=29)	.768	.08	3
2	9-11	Vocabulary Review Game	86.63 (n=22)	90.18 (n=17)	.176	.46	18
3	10-12	Vocabulary Review Game	70.30 (n=12)	67.35 (n=18)	.632	-.19	-8
4	10	Note Taking	71.52 (n=20)	83.06 (n=24)	.059	.61	23
5	11-12	Vocabulary Review Game	72.54 (n=18)	72.90 (n=17)	.927	.03	1
6	9-11	Graphic Organizer	76.61 (n=7)	75.11 (n=7)	.690	-.25	-10
7	10-12	Graphic Organizer	40.89 (n=31)	40.26 (n=28)	.679	-.11	-4

Teacher	Grade	Target Strategy	Adjusted Mean (Control)	Adjusted Mean (Treatment)	Sig.	ES	% Gain
8	10	Vocabulary Illustrations	66.33 (n=28)	73.58 (n=29)	.150	.40	16
9	10	Graphic Organizer	50.87 (n=13)	78.89 (n=12)	.012	1.18	38
10	11-12	Graphic Organizer	69.11 (n=13)	81.06 (n=11)	.259	.51	20
11	9,12	Vocabulary Review Game	77.33 (n=9)	79.67 (n=15)	.568	.26	10
12	10	Vocabulary Notebook	73.70 (n=30)	74.95 (n=20)	.755	.09	4
13	11	Vocabulary Review Game	96.48 (n=22)	97.53 (n=18)	.525	.21	8
14	9-12	Note Taking	87.66 (n=8)	87.19 (n=14)	.850	-.09	-4
15	9-12	Note Taking	71.09 (n=8)	82.36 (n=9)	.091	.97	33
16	10-12	Graphic Organizer	55.54 (n=8)	70.86 (n=16)	.018	1.19	38
17	11	Restate/Peer Share	64.61 (n=10)	72.06 (n=15)	.473	.32	13
18	9-12	Graphic Organizer	81.76 (n=22)	83.73 (n=25)	.665	.13	5
19	10-11	Concept Mapping	65.38 (n=16)	63.47 (n=21)	.723	-.12	-5

Figure 1 presents the findings for 19 independent action research studies conducted at South Vigo. When considering the information displayed in the figure, it should be noted that the data for each study was checked for obvious coding errors, negative gains, and other potential outliers. Typically, when negative gains are excluded one has a better sense of the uniform effects of the treatment. In other words, assuming that students learn more about academic content during a unit of instruction, it would not make sense for a student to know less about the academic content at the end of the unit. “Learning theory and common sense tell us that a student might start a grading period with little or no knowledge regarding a topic but end the grading period with a great deal of knowledge” (Marzano, 2006, pp. 96-97). As such, students who scored higher on the pretest were excluded from analysis.

Of particular interest is the column entitled “% Gain.” Again, this column contains the percentile gain (or loss) in achievement associated with the treatment (i.e., use of the selected instructional strategy). This value was determined by consulting a normal curve table for the area for each reported effect size. Effect size, again, is the difference between the treatment group and control group means expressed in standard deviation units (for a discussion of effect size see Lipsey & Wilson, 2001).

To understand the interpretation of an effect size consider the results reported in the second row of Figure 1. The adjusted mean for the control group was 86.63 (n = 22) and the adjusted mean for the treatment group was 90.18 (n = 17). The percentile gain for this study is 18 (ES = .46). This means that the average score in the treatment group is 18 percentile points **greater than** the average score in the control group.

It should be noted that in some cases the reported percentile gain is negative. This occurs when the adjusted mean for the treatment group is **less than** the adjusted mean for the control group. For example, the percentile "gain" reported in the third row of Figure 1 is negative 8 (-8, ES = -.19). This means that the average score in the control group is 8 percentile points greater than the average score in the treatment group.

Considered in isolation, most of the studies did not exhibit statistical significance ($p < .05$). Again, for an individual study to be considered statistically significant, the reported *p*-value should be .05 or lower (see Murphy & Myors, 2004). According to this criterion, two of the studies can be considered statistically significant. When the results of a set of studies are combined using meta-analytic techniques, the findings considered as a group might be statistically significant even though a number of the individual studies are not significant. Such is the case with the present set of studies. In fact this is quite common in educational research where many individual studies might be deemed non-significant simply because they do not have enough subjects in the treatment and control groups. However, when these studies are combined using meta-analytic techniques the combined finding is often highly significant (for a detailed discussion see Hedges & Olkin, 1985).

Meta-analytic findings are typically reported in two ways—one not corrected for attenuation due to lack of reliability in the dependent measure (i.e., teacher designed assessments of student academic achievement) and one corrected for attenuation. Technical Note 3 explains the method used to correct for attenuation and an interpretation of such corrections. Briefly though, when a dependent measure is not perfectly reliable it will tend to lower the strength of observed relationships between independent and dependent variables.

An independent variable is a factor which is assumed or hypothesized to have an effect on some outcome often referred to as the dependent variable. A dependent variable is an outcome believed to be influenced by one or more independent variables. For this analysis of the independent action research studies, the dependent variable is students' knowledge of academic content addressed during a unit of instruction and the independent variable of interest is the use of the selected instructional strategy. It is always advisable to correct an observed effect size for attenuation (i.e., decrease in observed effect size) due to unreliability of the dependent measure (for a detailed discussion of attenuation see Hunter & Schmidt, 2004). In basic terms, every assessment is imprecise to some extent and this imprecision lowers the observed effect size. Throughout this report, corrected and uncorrected effect sizes are displayed for comparison. When this is the case, the discussion of findings is limited to the corrected results only.

Figure 2 shows the overall average effect size for the 19 independent action research studies. The column labeled "N" contains the number of studies included in the group, the column labeled "$\overline{ES}$" contains the weighted mean effect size for the group of independent action research studies, the column labeled "95% CI" contains the 95 percent confidence interval for the reported weighted mean effect size, and the column labeled "% Gain" contains the percentile gain (or loss) associated with the reported weighted mean effect size.

Figure 2. Overall Effects

	N	$\overline{ES}$	**95% CI**	**% Gain**
Uncorrected	19	.25*	.08 to .41	10
Corrected	19	.29*	.10 to .49	11

* *p* < .01

When the results of the 19 independent action research studies are corrected for attenuation and combined, the overall percentile gain is 11 ($\overline{ES} = .29$). This means that on the average, the instructional strategies used in the independent action research studies represent a gain of 11 percentile points over what would be expected if teachers did not use the instructional strategies (for a discussion of how effect sizes are combined and an overall significance level is computed see Lipsey & Wilson, 2001).

The second column, "95% CI" contains the 95 percent confidence interval for the effect size reported in the first column. Again, the effect size reported in Figure 2 is a weighted average of all the effect sizes from the 19 independent action research studies. As such, it is considered an estimate of the true effect size of the treatment (i.e., use of the selected instructional strategy). The level of certainty with which this estimate accurately represents the true effect size is reported in the next to last column. The 95 percent confidence interval includes the range of effect sizes in which one can be certain the true effect size falls. For example, consider the 95 percent confidence interval reported in the second row, .10 to .49. This indicates a 95 percent certainty that the true effect size for the analysis of the 19 independent action research studies is between the values of .10 and .49. When the confidence interval does not include .00, the weighted mean effect size is considered to be statistically significant (p < .05). In other words, $\overline{ES} = .00$ would not be considered a reasonable possibility. In fact, the p-value associated with the reported effect size is less than .002 indicating it is highly significant in laymen's terms. (For a detailed discussion of the meaning of statistical significance see Harlow, Muliak, & Steiger, 1997.)

Another way to examine the general effect of the instructional strategies is to consider the distribution of effect sizes and percentile gain associated with the effect sizes. Figures 3 and 4 present the distribution of effect sizes and associated percentile gain respectively.

Figure 3. Distribution of Effect Sizes

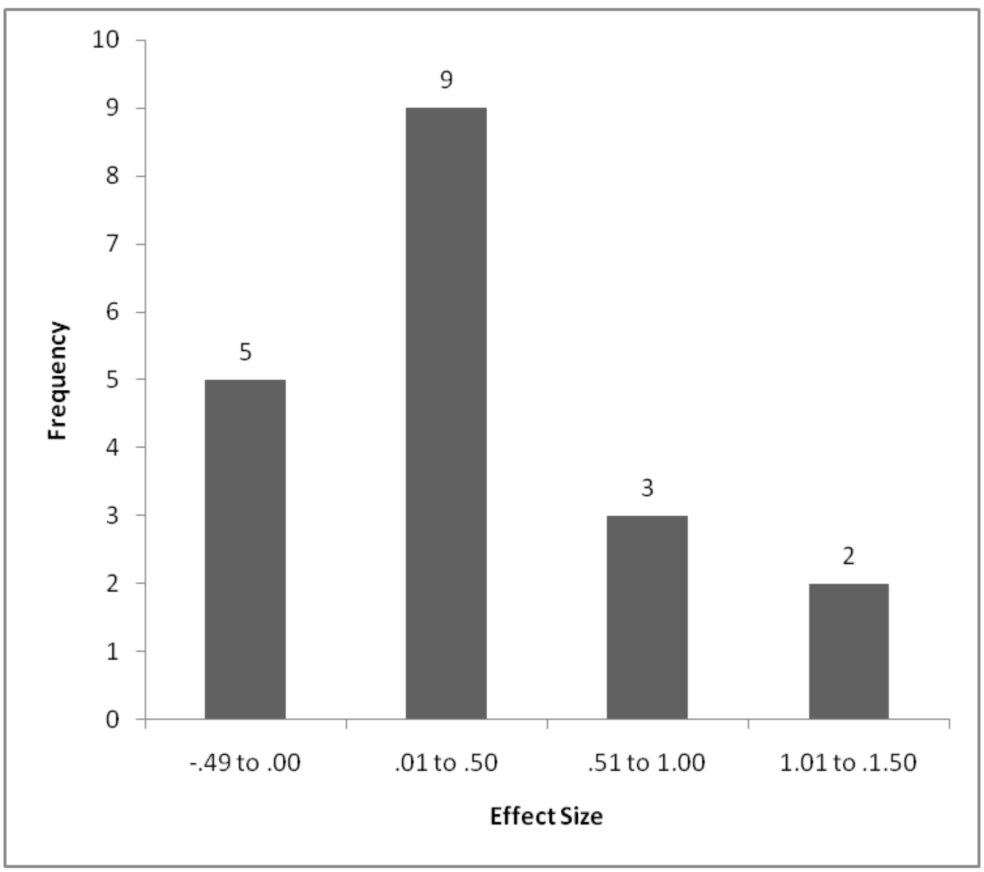

Figure 3 reports the distribution of "groups" of effect sizes across the 19 independent action research studies. Five studies exhibited a negative effect (see first column), nine studies exhibited an effect size between .01 and .50 (see second column), three studies exhibited an effect size between .51 and 1.00 (see third column), and two studies exhibited an effect size between 1.01 and 1.50 (see last column). So, 14 out of 19 studies (or 74%) have a positive effect size.

Figure 4. Distribution of Percentile Gains

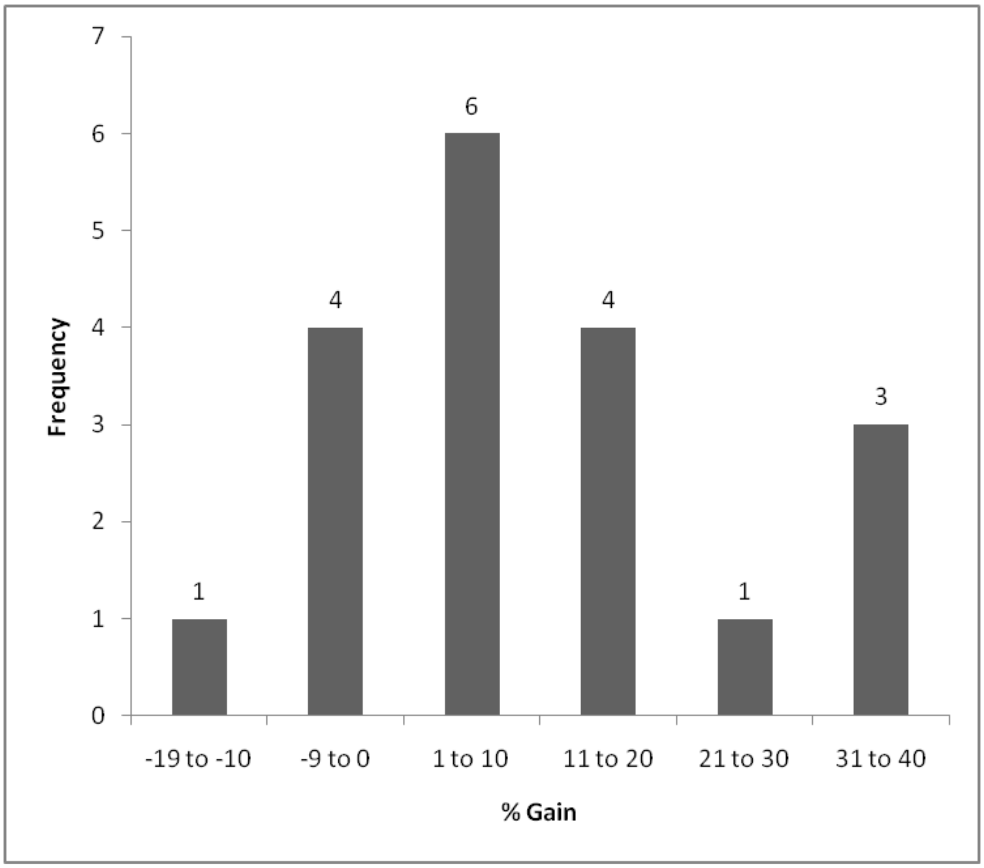

Figure 4 reports the distribution of "groups" of percentile gains associated with the reported effect sizes across the 19 independent action research studies. Five studies exhibited a percentile gain that was negative or zero (see first and second columns), ten studies exhibited a percentile gain between 1 and 20 (see third and fourth columns), and four studies exhibited a percentile gain between 21 and 40 (see last two columns). Again, 14 out of 19 studies (or 74%) have a positive percentile gain.

Findings Reported by Target Instructional Strategy

Another useful way to aggregate the findings from the 19 independent action research studies is by reported target instructional strategy. Figures 5 and 6 present these findings.

Figure 5. Target Instructional Strategy Effects (Uncorrected)

Target Strategy	N	$\overline{ES}$	95% CI	% Gain
Vocabulary	7	.20	-.07 to .46	8
Graphic Organizers/ Nonlinguistic Representations	9	.25*	.01 to .49	10
Games	5	.16	-.17 to .50	6
Note Taking	3	.49*	.03 to .96	19
Restate/ Peer Share	1	.32	-.54 to 1.18	13

Note: See discussion of Figure 2 for a description of column headings.
*$p < .05$

Figure 6. Target Instructional Strategy Effects (Corrected)

Target Strategy	N	$\overline{ES}$	95% CI	% Gain
Vocabulary	7	.22	-.09 to .53	9
Graphic Organizers/ Nonlinguistic Representations	9	.30*	.02 to .59	12
Games	5	.19	-.19 to .57	8

Target Strategy	N	$\overline{ES}$	95% CI	% Gain
Note Taking	3	.56*	.03 to 1.09	21
Restate/Peer Share	1	.37	-.58 to 1.32	14

Note: See discussion of Figure 2 for a description of column headings.
*p < .05

Figures 5 and 6 show the uncorrected and corrected effects for five instructional strategies, vocabulary, graphic organizers/nonlinguistic representations, games, note taking, and restate/peer share. It should be noted that six independent action research studies were included in the meta-analysis for more than one strategy. For example, more than one teacher reported using vocabulary review game as their target strategy (see Figure 1). As such, these independent action research studies were analyzed with other studies that reported using a vocabulary strategy, and then analyzed again with other studies that reported using games. The weighted mean effect size was statistically significant ($p < .05$) for graphic organizers/nonlinguistic representations and note taking. The percentile gain was positive for all five strategies.

Interpretation

There are a number of ways to interpret an effect size. Up to this point, this report has used the expected percentile gain. Another interpretation is the amount of overlap between the treatment and control groups. Consider again that an effect size of 1.00 can be interpreted as the average score in the treatment group being one standard deviation higher than the average score in the control group. Given that the associated percentile gain is 34 (ES = 1.00), the mean of the treated group is at the 84th percentile of the control group (50% + 34% = 84%). Stated differently, the score of the average student in the treated group exceeds the scores of 84 percent of the control group. Only 16 percent of the control group would be expected to have scores that exceed the score of the average student in the treated group. If the treatment and control groups both contained 29 students, the average student in the treatment group (i.e., the one ranked 15th in the group) would have scored about the same as the student ranked 5th in the control group. Figure 7 displays the overall results for the 19 independent action research studies based on this interpretation.

Figure 7. Interpretation of Overall Effects.

	$\overline{ES}$	Percentage of Control Group Scoring Lower than Treatment Mean	Rank of Average Student in Treatment Group (i.e., the Student Ranked 15th in the Treatment Group) in Control Group of 29
Uncorrected	.25	60%	11
Corrected	.29	61%	11

Figure 7 depicts the percentage of control group students who have scored lower than the average student in the treatment group (see next to last column) along with the rank of the student in the control group who would be equivalent to the average student (i.e., the student ranked 15th) in the treatment group (see last column). When corrected for attenuation, the average student in the treatment group (i.e., the group that used the instructional strategy) scored higher than 61% of the students in the control group (i.e., the group that did not use the instructional strategy) and would be ranked 11th in the control group as opposed to 15th in the treatment group.

Summary

The overall effects for all 19 independent action research studies exhibited a statistically significant positive effect ($p < .01$). This level of significance is generally interpreted as an indication that the observed differences could have occurred less than one time in one hundred if there is no true relationship between use of the instructional strategies and student achievement. When corrected for attenuation, the percentile gain associated with the use of the selected instructional strategies is 11 ($\overline{ES} = .29$). A reasonable inference is that the overall effect of a 11 percentile point gain is probably not a function of random factors that are specific to the independent action research studies; rather, the 11 percentile point increase represents a real change in student learning.

Technical Notes

Technical Note 1: Conceptually, analysis of covariance (ANCOVA) can be thought of as using the covariate (i.e., pretest score) to predict students' performance on the posttest and then using the residual scores for each student as the dependent measure. To illustrate, consider an independent action research study for a topic within mathematics. Using ANCOVA, students' posttest scores were predicted using the scores received on the pretest. The difference between the predicted posttest scores and the observed posttest scores was then computed for each student that took both pretest and posttest. This difference is referred to as the residual score for each student. It represents the part of each student's posttest score that cannot be predicted from the pretest score for that student. Theoretically, use of residual scores based on pretest predictions is an attempt to equate all students on the dependent measure prior to execution of the intervention—in this case the use of the target instructional strategy (e.g., vocabulary). However, in actual practice this interpretation may not always be appropriate (see Berk 2004).

Technical Note 2: In Figure 1, the column labeled "ES" contains the calculated effect size for each study computed as Cohen's δ using the following formula:

$$d = \frac{r}{\sqrt{(1 - r^2)(p(1 - p))}}$$

where *p* is the proportion of the total population in one of the two groups (i.e., the treatment group). Partial eta squared (η_p^2) as calculated by SPSS was used to determine partial eta (η_p) as an estimate for *r* (the effect size correlation) by taking its square root. This formula is used to compute the effect size from an effect size correlation (e.g., the point-biserial correlation coefficient) when the treatment and control group populations are not equal (see Lipsey & Wilson, 2001, pp. 62-63). Again, partial eta (η_p) was used as an estimate for the point-biserial correlation coefficient in the formula.

The generic term *effect size* applies to a variety of indices (e.g., *r*, *R*, and *PV*) that can be used to demonstrate the effect of an independent variable (e.g., use of the selected instructional strategy) on a dependent variable (e.g., student academic achievement). As used in this report, effect size means the standardized mean difference effect size. This index, first popularized by Glass (1976) and Cohen (1977), is the difference between treatment and control means divided by an estimate of the population standard deviation.

$$\textit{standardized mean difference effect size} = \frac{\textit{mean of treatment group} - \textit{mean of control group}}{\textit{estimate of population standard deviation}}$$

Consider the following illustration of the use of effect size. Assume that the achievement mean of a group of students in a class that used a target instructional strategy (e.g., graphic organizers) is 90 on a standardized test and the mean of a group of students in a class that did not use the instructional strategy is 80. Assuming the population standard deviation is 10, the effect size would be as follows:

$$ES = \frac{90 - 80}{10} = 1.0$$

This effect size leads to the following interpretation: The mean of the treatment group is 1.0 standard deviation larger than the mean of the control group. One could infer from this that the use of graphic organizers raises achievement test scores by one standard deviation. Therefore, the effect size expresses the differences between means in standardized or "Z score" form, which gives rise to another index frequently used in research regarding education—percentile gain.

Percentile gain is the expected gain (or loss) associated with the effect size expressed in percentile points of the average student in the treatment group compared to the average student in the control group. By way of illustration, consider the same example. An effect size of 1.0 can be interpreted as the average score in the treatment group being about 34 percentile points greater than the average score in the control group. Again, the effect size translates the difference between group means into Z score form. Distribution theory dictates that a Z score of 1.0 is at the 84.13 percentile point of the standard normal distribution. To determine the percentile gain, the effect size is transformed into percentile points above or below the 50th percentile point on the unit normal distribution (e.g., 84% - 50% = 34%).

Technical Note 3: The meta-analytic findings in this report are typically reported in two ways—uncorrected and corrected. The corrected findings have been corrected for attenuation due to a lack of reliability in the dependent measure (i.e., teacher designed assessments of student academic achievement). Hunter and Schmidt detail the rationale and importance of correcting for 11 attenuation artifacts—one of which is random error associated with measurement of the dependent variable (2004, pp. 301-313). They explain:

> . . . error of measurement in the dependent variable reduces the effect size estimate. If the reliability of measurement is low, the reduction can be quite sizable. Failure to correct for the attenuation due to error of measurement yields an erroneous effect size estimate.

> Furthermore, because the error is systematic, a bare-bones meta-analysis on uncorrected effect sizes will produce an incorrect estimate of the true effect size. The extent of the reduction in the mean effect size is determined by the mean level of reliability across the studies. Variation in reliability across studies causes variation in the observed effect size above and beyond that produced by sampling error. . . . A bare-bones meta-analysis will not correct for either the systematic reduction in the mean effect size or the systematic increase in the variance of effect sizes. Thus, even meta-analysis will produce correct values for the distribution of effect sizes only if there is a correction for the attenuation due to error of measurement. (p. 302)

For ease of discussion we consider correcting for attenuation due to unreliability in the dependent measure using the population correlation instead of the population standardized mean difference effect size. The reader should note that the example provided regarding correcting correlations is analogous to correcting a standardized mean difference. To illustrate correcting for attenuation due to unreliability in the dependent measure, assume that the population correlation between the target instructional strategy (e.g., nonlinguistic representations) and student academic achievement is .50. A given study attempts to estimate that correlation but employs a measure of the dependent variable (i.e., a teacher designed assessment of student academic achievement) that has a reliability of .81—considered a typical reliability for a test of general cognitive ability. According to attenuation theory, the correlation would be reduced by the square root of the reliability (i.e., the attenuation factor). In other words, the population correlation is multiplied by the attenuation factor ($\sqrt{.81}$ = .90), thus reducing the correlation by 10 percent. Therefore, the observed correlation will be .45 (.50 x .90) even if there is no attenuation due to the other ten artifacts listed by Hunter and Schmidt (2004, p. 35). When the measure of the dependent variable has a lower reliability, .36 for example, the correlation is reduced by 40 percent ($\sqrt{.36}$ = .60) to .30 (.50 x .60). In order to make a correction for attenuation, the correlation is divided by the attenuation factor (i.e., the square root of the reliability).

For the purposes of this report, an estimate of reliability was used. Osborne (2003) found that the average reliability reported in psychology journals is .83. Lou and colleagues (1996) report a typical reliability of .85 for standardized achievement tests and a reliability of .75 for unstandardized achievement tests. Because the dependent measure in the independent action research studies involved teacher designed assessments of student academic achievement, .75 was used as the reliability to correct for attenuation using the following formula:

$$d_c = \frac{d_o}{a}$$

In the formula, d_c is the corrected effect size, d_o is the observed effect size, and a is the attenuation factor (the square root of the reliability). Using this formula, each effect size reported in Figure 1 was corrected for attenuation to produce the corrected meta-analytic findings considered in this report.

Appendix A: Instructions for Action Research

Thank you for considering engaging in an action research study regarding the effectiveness and utility of specific instructional strategies in your classroom. To be involved in a study you must be willing to do a few things. First you should select a specific instructional strategy and use this strategy in a unit that you teach. For example, you might decide to use nonlinguistic representations during the unit, or you might decide to have students engage in comparison or classification tasks as forms of identifying similarities and differences. Next, you must administer and score a pre-test and post-test for the unit. For example, if you teach mathematics, you might select a four week unit on linear equations to employ nonlinguistic representations. At the beginning of the unit, you would administer a pre-test on linear equations. At the end of the unit you would administer a post-test which might be identical to the pre-test, or it might be different. The important point is that you have a pre-test and a post-test score for each student on the topic of linear equations. Ideally the pre-test and post-test are comprehensive in nature. Additionally, you must deliver the same unit to another group of students. This, of course, means that you are teaching the same unit to two different groups of students. You would administer the same pre-test and post-test to this other group of students; however, you would not use the selected instructional strategy. In this case, you would not use nonlinguistic representations with this second class. Finally, you would score the pre-test and post-test for both groups of students and record their scores on the attached forms. You don't have to identify students by name (in fact, it is preferable that you don't). The unit can be as short or long as you wish, but it must be completed and the data submitted by ___________________.

When you have completed the study please fill out the forms below and submit them to the action research team leader for your school. That individual is ________________________.

Note that the first form asks you to provide general information about your school, the instructional strategy you used and so on. It also asks you to provide a personal ID number as opposed to your name. This is because the results of the action research projects will be reported in an anonymous fashion. Only you will know which results apply to your students.

Thank you for considering involvement in an action research project.

School ___________________________

Personal ID number _____________________________

Subject and grade level taught __________________________

Topic addressed during the unit ________________________________

Instructional strategy you used _______________________

General comments about the project:

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