

Blue Springs School District
Instructional Strategies Project:
Final Report
April, 2005

Introduction

The Blue Springs School District Instructional Strategies Project began in the fall of 2004. It is designed to be a two to three-year project, the purpose of which is to “institutionalize” effective instructional practices. The goals for the first year are to: 1) provide training in a set of instructional practices, 2) conduct action research studies and a survey of teaching staff to determine those instructional practices that are most useful to students and acceptable to staff, 3) articulate a clear vision of the project’s intended outcome, and 4) reach a decision regarding the projects continuation into year two.

Goal #1

Provide Training in a Set of Instructional Strategies

Training in selected strategies from the book *Classroom Instructional that Works* (Marzano, Pickering, and Pollock, 2001) was provided in the fall of 2004. The training days were generally well received and focused primarily on strategies involving: note-taking, generation of nonlinguistic representations, and identifying similarities and differences.

Goal #2

Conduct Action Research Studies and Survey Teaching Staff to Determine Those Instructional Practices Most Useful to Students and Acceptable to Staff

After training was provided in instructional strategies from *Classroom Instruction that Works* teaching staff from both high schools were presented with an invitation to participate in an action research project that involved experimental and control classes (See attachment for a description of the directions presented to teachers). In all, 25 teachers accepted the invitation and data were collected from their classes in the winter of 2004-2005. The data from the action research projects conducted by these teachers were analyzed and reported back to the staffs from both schools. In all the action research projects involved 25 teachers, 50 classes, and 1,343 students (712 students in experimental classes and 631 in control classes).

The general findings from all studies across all classes are reported in Figure 1.

Figure 1: Summary Findings for All Studies

Data Set	% passing strategies not used	% passing strategies used
All included	50%	58%
Ceiling effects excluded	50%	60%
Ceiling effects & outliers excluded	50%	65%
Best case	50%	94%
Worst case	50%	18%

Note: Findings in all rows represent statistically significant results ($p < .05$)

To interpret the findings in Figure 1, consider the first row of the figure, entitled “all included” and the second column of that row entitled “% passing, strategies not used.” This column represents the reference point for all results depicted in the figure. All entries in this column are 50%. This simply means that the reference point is a test on which 50% of students would be expected to pass and 50% would be expected to fail. The third column of Figure 1 entitled “% passing, strategies used” depicts the expected passing rate when the instructional strategies were used by teachers participating in the action research studies. The row of Figure 1 entitled “all included” indicates that aggregating the findings from all 25 studies, one would expect 58% of students to pass a test that otherwise has an expected passing rate of 50%. That is, the 25 studies taken as a group indicate that 8% more students would be expected to pass the test when the instructional strategies are used, or in concrete numbers, on a test where 500 students out of 1,000 would be expected to pass if the strategies were not used, 580 out of 1,000 would be expected to pass if the strategies were used.

The 8% improvement in passing rate does not take into consideration the fact that some of the studies involved in the project employed post-tests on which many (or even most) of the students received a perfect score. This phenomenon is referred to as a “ceiling effect” and can mask the differences in the performance of experimental versus control students. That is, the ceiling effect can artificially make experimental and control group students appear to perform equally on the post-test when, in fact, their respective understanding of the content is different. The row in Figure 1 entitled “ceiling effects excluded” presents the findings across the action research projects when those studies that involved ceiling effects are excluded. As Figure 1 indicates, the expected passing rate when the instructional strategies are used increases to 60%.

The row of Figure 1 entitled “ceiling effects and outliers excluded” presents the findings when those studies are also excluded that have findings considered to be “statistically different” from the other findings among the set. That is, some studies had findings that were much

higher or lower than the others in the set. These are referred to as outliers. Typically when outliers are excluded, one has a better sense of the uniform effects of a set of strategies. As reported in Figure 1, when outlier studies and those with ceiling effects are excluded the expected passing rate when instructional strategies are used increases to 65%.

Finally, the last two rows of Figure 1 entitled “best case scenario” and “worst case scenario” report the findings for those studies that exhibited the highest increase in passing rate for students (i.e. best case scenario) and the largest decrease in passing rate (i.e. worst case scenario) when the strategies were used. Specifically, for one study the expected passing rate increased to 94%. However, in another study the expected passing rate decreased to 18%.

The results reported in Figure 1 aggregate the findings across all 25 studies. The findings for individual teachers are reported in Figure 2.

Figure 2: Findings for Individual Teachers

Teach#	Strategy	Adjusted Exp Mean	Adjusted Control Mean	Prob	Exp N	Control N	Corr	Ceiling	Effect Size	PGAIN
1	Graphic Organizer	82.49	78.63	.28	44	15	.15	N	.29	.12
2	Nonlinguistic	88.89	90.89	.24	57	57	-.05	Y	-.09	-.04
3	Nonlinguistic	88.42	75.29	.16	15	20	.25	N	.51	.20
4	Note-taking	80.03	71.76	.02	41	40	.26	N	.53	.20
5	Nonlinguistic	85.51	85.11	.92	32	36	.03	N	.06	.02
6	Note-taking	13.13	12.13	.33	25	13	.16	N	.33	.13
7*	Nonlinguistic	87.91	87.45	.91	18	15	.03	N	.06	.02
8	Nonlinguistic	79.88	77.24	.41	27	22	.12	Y	.25	.10
9	Nonlinguistic	7.92	7.99	.87	61	36	-.03	Y	-.06	-.02
10	Nonlinguistic	7.66	4.80	.00	18	25	.42	N	.93	.32
11	Note-taking	67.32	70.27	.53	24	24	-.09	N	-.19	-.07
12	Nonlinguistic	86.87	73.68	.02	13	26	.39	N	.84	.30
13	Nonlinguistic	82.70	87.81	.24	21	19	-.19	N	-.39	-.15
14	Graphic Organizer	94.62	94.48	.95	20	22	.03	N	.06	.03
15	Comparison	76.56	78.35	.56	43	39	-.06	N	-.13	-.05
16	Comparison	9.58	8.17	.02	22	26	.34	N	.72	.27
17	Nonlinguistic	4.07	5.35	.21	25	21	-.19	Y	-.39	-.15
18*	Note-taking	12.98	12.03	.95	27	23	.03	N	.06	.02
19*	Note-taking	61.94	49.96	.00	17	24	.62	N	1.59	.44
20*	Nonlinguistic	25.13	24.53	.43	23	23	.12	N	.25	.10
21*	Kinesthetic	78.21	48.20	.19	4	3	.62	N	1.60	.44
22*	Nonlinguistic	19.05	19.50	.92	13	15	.03	N	.07	.03
23*	Historical Invest	65.09	73.80	.01	14	23	-.42	N	-.93	-.32
24*	Effort	5.41	5.93	.01	19	19	-.42	N	-.93	-.32
25	Nonlinguistic	81.79	77.96	.18	89	45	.12	N	.24	.10

Adjusted exp mean: the post-test mean of the experimental groups adjusted for differences in the pre-test scores.

Adjusted control mean: the post-test mean of the control group adjusted for differences in the pre-test scores.

Prob: the probability of observed differences between adjusted means under the assumption of no true differences between means (i.e. the null hypothesis)

Exp N: the number of students in the experimental group

Control N: The number of students in the control group

Corr: the Pearson Product Moment correlation representing the relationship between the use of instructional strategies and student achievement on the adjusted post-test scores

Ceiling: Y indicates that the study involved ceiling effects; N indicates that it did not

Effect size: the standardized mean difference between experimental and control groups

P Gain: the percentile gain or loss indicated by the effect size

*: the asterisk indicates that some outlier scores for students in the experimental and/or control classes were excluded

Figure 2 presents the findings for all 25 studies. The column headings are explained in the footer of Figure 2. Of particular interest in interpreting Figure 2 is the fact that many of the 25 studies did not exhibit statistical significance ($p < .05$) when considered in isolation. This can be observed in the column entitled Prob. For an individual study to be considered statistically significant, the value in the column must be .05 or lower. However, when the results of a set of studies are combined using meta-analytic techniques, the findings considered as a group can be considered statistically significant. Such is the case with the present set of studies As indicated in Figure 1, aggregating the findings in variety of ways produced statistically significant results.

One useful way to aggregate the findings from the 25 action research studies is by type of strategy employed. Figure 3 presents the results for five types of strategies.

Figure 3: Findings for Specific Strategies

Strategy	% passing, strategies not used	% passing, strategies used
Nonlinguistic Representations (including graphic organizers & kinesthetic activities)	50%	60%
Note taking	50%	68%
Comparison	50%	62%
Historical Investigation	50%	18%
Effort	50%	18%

Note: Findings in all rows represent statistically significant results ($p < .05$)

As indicated in Figure 3 strategies involving nonlinguistic representations, note taking and comparison exhibited an increase in the expected passing rates of students. However, strategies involving historical investigation and reinforcing effort exhibited a decrease in expected passing rate. It should be noted, however, that these later two categories involved single studies only, whereas the categories of nonlinguistic representations, note taking and comparison involved multiple studies.

As described above, the disposition of the teaching staffs at both high schools regarding specific instructional strategies were also sought via a 24 item questionnaire which employed two questions per item.

- 1) This practice is important enough that we should all use it when appropriate.
- 2) To what extent do we engage in this behavior or address this issue?

Both items employed a 4-point Likert scale with 1 representing the lowest value and 4 representing the highest value. Figure 4 presents the findings from the 166 teachers who completed the questionnaire.

Figure 4: Findings from Survey Study

Item	This practice is important enough that we should all use it when appropriate.	Rank	To what extent do we engage in this behavior or address this issue?	Rank
Begin instructional units by presenting students with clear learning goals.	3.66	1	2.92	6
Systematically provide students with specific feedback on the extent to which they are accomplishing the learning goals.	3.61	2	2.91	7
Systematically emphasize the importance of effort with students.	3.60	3	3.16	2
Assign in-class and homework tasks that require students to practice important skills and procedures.	3.53	4	3.33	1
Prior to presenting new content, ask questions that help them recall what they might already know about the content.	3.50	5	2.91	7
Systematically provide specific feedback on the homework assigned to students.	3.44	6	3.06	4
End their units by providing students with clear feedback on the learning goals.	3.42	7	2.77	9
Prior to presenting new content, provide students with direct links with what they might already know about the content.	3.42	7	2.83	8
Systematically recognize students who are making observable progress toward the learning goals.	3.28	8	2.72	10
Ask students to represent new content in nonlinguistic ways (e.g., mental image, picture, pictograph, graphic organizer, physical model, enactment).	3.26	9	2.64	12
Ask students to take notes on new content.	3.25	10	3.10	3
Prior to presenting new content, provide ways for students to organize or think about the content (i.e., use advance organizers).	3.17	11	2.60	13
Organize students into cooperative groups when appropriate.	3.16	12	2.99	5
Prescribe in-class and homework assignments that require students to compare and classify content.	3.16	12	2.70	11
Ask students to construct verbal or written summaries of new content.	3.10	13	2.51	15
Prescribe in-class activities and homework assignments that require students to generate and test hypothesis regarding content.	3.06	14	2.54	14
Ask students to revise and correct errors in their notes as a way of reviewing and revising content.	3.05	15	2.35	18
Systematically ask students to keep track of their own performance on the learning goals.	3.02	16	2.12	21
End their units by recognizing and celebrating progress on the learning goals.	3.00	17	2.42	16
Ask students to revise and correct errors in their nonlinguistic representations as a way of reviewing and revising content.	2.99	18	2.32	19
End their units by asking students to assess themselves relative to the learning goals.	2.94	19	2.12	21
Prescribe in-class and homework assignments that require students to construct metaphors and analogies.	2.94	19	2.39	17
Begin instructional units by asking students to identify personal learning goals that fit within the learning goals presented by the teacher.	2.82	20	1.94	22
Organize students into groups based on their understanding of the content when appropriate.	2.63	21	2.27	20

Figure 4 lists the 24 items in terms of their rank order relative to the first question for each item (This practice is important enough that we should all use it when appropriate). Taken at

face value this ranking represents the perceived importance by staff of various instructional strategies. One might conclude that the top 10 (or so) strategies might be those that faculty members believe are important enough to form the basis of institutionalized effective practice. Interestingly nonlinguistic representations, note-taking and reinforcing effort (for which action research projects were conducted) are among the top 10. However, use of comparison and historical investigation (for which action research projects were conducted) are not among the top 10.

The last column in Figure 4 depicts the average score for each item on question 2 of the questionnaire (To what extent do we engage in this behavior or address this issue?) along with the rank for each item relative to the average response to this question. In general, those items that are perceived as important (i.e. high scores on question 1) are also perceived as addressed by the staff (i.e. high scores on question 2). One notable exception to this pattern is the strategy of organizing students into cooperative groups, which is ranked 12th on question 1, but ranked 5th on question 2. This indicates that the strategy is employed quite frequently by staff but not as highly valued by staff as other strategies.

Goal #3

Articulate a Clear Vision as to the Projects Intended Outcome

The intended outcome of the project is to design and implement a system that institutionalizes effective instructional practices in both high schools. In the spring of 2005, the leadership teams from both high schools convened and were presented with a framework for using classroom-level anonymous feedback on the use and effectiveness of selected instructional strategies, student effort, motivation and understanding of content presented in classes. That framework involved teachers: 1) using specific instructional strategies in selected classes, 2) gathering self-report data on the extent to which instructional strategies were used effectively, 3) gathering data on students' knowledge gain by administering pre-tests and post-tests, 4) gathering data about students perceived effort, motivation, and understanding of content by administering short questionnaires to students. All information from teachers and students would be gathered and reported anonymously.

The data obtained from this effort would be used to generate reports relative to the use of the selected instructional strategies and the impact of the instructional strategies on students' knowledge gain, effort, motivation and perceived levels of understanding. These reports would form the basis for systematic (e.g. monthly) sessions in which teachers would share their experiences and offer suggestions for improved strategy use and enhanced student effort, motivation, perceived understanding and measured knowledge gain. In effect, the reports would form the basis for institutionalized reflective practice.

The framework described above was presented to the leadership teams from both high schools. Each member of each leadership team was asked to respond to two questions regarding the possible continuation of the project:

Question #1: Given the intent of this project, do you support its continuation?

Question #2: Is there enough faculty support to continue this project?

The responses by members of each leadership team are presented below:

Blue Springs

Question #1: Given the intent of this project, do you support its continuation?

Yes: 96% (N=24)

No: 4% (N=1)

Question #2: Is there enough faculty support to continue this project?

Yes: 88% (N=22)

No: 12% (N=3)

General comments:

- We should continue this provided that we have clear leadership and training.
- Yes, let's do it, but there will be some resistance
- Yes, there is support to do this. People want to become better, but we need strong incentives from the administration.
- Yes, but there will be some obstacles to overcome.
- I think many faculty members are skeptical, especially with such a big turnover in administration. This will live or die by the behavior of these leaders.
- Yes, eventually the enthusiasm and positive results will grab the others.
- We don't have the support to continue yet, but people can be lead to implement and believe.
- We need to educate those who are not on board. We need to lead by example.
- Yes, but more work needs to be done to convince the outliers.
- The support will be there if enough direction is given.

Blue Springs South

Question #1: Given the intent of this project, do you support its continuation?

Yes: 94% (N=17)

No: 6% (N=1)

Question #2: Is there enough faculty support to continue this project?

Yes: 67% (N=12)

No: 33% (N=6)

General comments:

- We should absolutely continue. We need to institutionalize improvement. Professionals do that. We need to be professionals.
- The amount of support needed will be variable. There is a core of “nay-sayers” and “non-doers”—and we need to work on that.
- Yes, we have support, but not 100%—maybe 50% to 75%. It’s hard to tell. I think there is a lack of understanding still about the project.
- Yes, we should continue, but we need to present the issue to the whole faculty and get their opinion before proceeding.
- We should proceed only with a great deal of encouragement, support and pressure. The freshman center needs help to get on board.
- Yes we should proceed but we need specific explanations and stated objectives.
- No, we don’t have the support from the faculty. We need to sell this to the staff as something that will help students.
- I’m not sure if we have the support of the faculty. We should survey each faculty member directly. I don’t want to speak for them.

In general, the members of the leadership teams from both high schools demonstrated highly favorable reactions to continuing the project (i.e. question 1). However, the perceived level of support by other faculty members is not as strong or as straight forward. It might be said that the leadership teams from both high schools believe that a heightened level of support and guidance from school leadership is necessary for the successful continuation of the project.

Goal #4

Reach a Decision as to the Project’s Continuation into Year Two.

The fourth goal of the first year of the project has yet to be accomplished and must be undertaken by the administration and teaching staff from both high schools. Specifically, based on the common experiences over the past year and the information presented in this report, the two high schools in the Blue Springs District must decide whether to continue into the second year. It is recommended that the project be continued only under the following conditions:

- Leadership communicates strong support for the project and articulates specific ways in which the project will be supported.
- Data (as described in the discussion under goal 3) is gathered twice per year—once in the fall and once in the spring of the 2005/2006 school year.
- All staff members are required to participate in gathering data.

- Specific goals are set for the school and for individual teachers for improvement in student effort, motivation, perceived understanding and measured knowledge gain.
- A system of monthly meetings is established to discuss progress regarding school-level and teacher-level goals regarding student effort, motivation, perceived understanding, and measured knowledge gain.

Attachment

Instructions for Action Research Project

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 from the set that has been presented to you 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. 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 send these scores to Robert Marzano at 7127 S. Danube Court, Centennial, CO 80016 (303-796-7683). You don't have to identify students by name (in fact, it is preferable that you don't), but you do need to specify which of the two groups the students belong to—the group that used the instructional strategy or the group that did not—and the pre-test and post-test score for each student. The unit can be as short or long as you wish, but it must be completed and the data submitted by the end of 2004.

If you wish to be involved in an action research study and can meet the requirements above, please complete the information below and send this form to the address specified above. More information will be sent to you shortly. Thank you again for considering an action research study.

Name _____

Subject and grade level taught _____

Topic to be addressed _____

Instructional strategy you will use _____

Daytime telephone number _____

Mailing address _____
