

RESEARCH BRIEF

Impact of Differentiated Visual Tools Writing Instruction on High-stakes Writing Assessment Performance

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A series of school-based program evaluation studies have examined the effects of Differentiated Visual Tools (DVTs) specifically designed for supporting process writing in elementary, middle, and high schools on performance on state-mandated high-stakes writing assessments.

The following summarizes these studies.

Use of Differentiated Visual Tools in Elementary Schools

Two studies have evaluated the effect of DVT-based writing instruction in elementary schools.

The first study examined the relative impact of using DVT-based Writing Instruction in 26 elementary schools differentiated by their prior performance history on a statewide high stakes writing assessment. The assessment is designed to evaluate students' ability to write coherent, organized narrative, descriptive, and expository essays and apply conventions of print correctly. All schools implemented DVT-based Writing Instruction during the period between the start of the school year until the annual high-stakes assessment was administered (approximately 5 months). Data in Table 1 reflect the mean percentage of students in each category that met or exceeded standards on a state writing assessment before and after implementing the DVT-based Writing Instruction. The data show mean scores in each category of schools dramatically increased. The data also suggest that schools with histories of poor performance on the state writing assessment made the most marked gains, whereas schools with prior histories of good performance made more modest gains. Although this study did not employ a control group (school), statewide mean performance during the same period reflected .05-percentage point gain.

Table 1: Performance of Schools Prior to and Following PWS Instruction

Classification based on prior history of performance	Elementary schools in this group	Mean % of students meeting or exceeding standards	Mean % of students meeting or exceeding standards	GAINS
Type of School		BEFOR PWS	AFTER PWS	
Very-low performing	9	21.6	49.24	27.67
Low performing	8	38.83	62.41	23.08
Moderate performing	7	58.39	74.81	15.67
Good performing	2	73.02	82.68	9.79

The second study utilized a longitudinal (5 year) multiple-baseline research design to examine the impact of DVT-based Writing Instruction on 5th grade student performance in rural elementary schools relative to statewide performance on a high-stakes writing assessment. The research procedures require that baseline performance of a school be established and either is stable (not changing) or declining. In other words, it must be demonstrated that the school is not improving its performance prior to introducing the experimental intervention (DVT-based Writing Instruction). Once a stable baseline is established, the intervention is implemented, and then performance is assessed to determine its impact. A second school serves as a form of control group. Thus, the experimental intervention is not introduced until after the first school demonstrates increased performance. Before implementation of PWS instruction, performance of Elementary School A was tracked for Year 1 and 2 to establish baseline scores. Data in Table 2 reflect the percentage of 5th grade students that met or exceeded the state writing standards. School A's performance decreased following Year 2 of the baseline period. During Year 3, School A was provided PWS instructional materials and professional development in their application. Table 2 shows that performance in the state-wide writing assessment increased from 28.08% of the students to 51.43% following Year 3, and then increased again to 81% following Year 4.

Table 2

	Year 1	Year 2	Year 3	Year 4	Year 5
School A	Before PWS 36.1	Before PWS 28.08	After PWS 51.43	After PWS 81.0	After PWS 75.0
School B	-	Before PWS 22.0	Before PWS 10.0	After PWS 62.24	After PWS 71.0

Baseline performance during Year 2 and 3 of School B shows that this school's performance decreased from 22% to 10% during the same period

that School A demonstrated marked improvement in performance when DVT-based Writing Instruction was implemented. DVT instructional resources and professional development was then provided to School B during Year 4. Subsequent performance on the high-stakes writing assessment of School B increased from 10% to 62.24% following Year 4, and increased again to 71% following Year 5. Results of this study support validation of PWS as a writing intervention that may dramatically improve 5th grade student performance on high-stakes writing assessments.

Use Differentiated Visual Tools Visual Tools in Middle Schools

Two studies have investigated the effectiveness of using DVT-based Writing Instruction in middle schools.

The first study compared the relative impact of DVT-based Writing Instruction in rural and suburban 7th grade performance on a statewide high-stakes writing assessment. The two schools were matched based on the percentage of 7th students in each school that met or exceeded state writing standards for 7th grade on the most recent state assessment. Thus, the performance of both schools was similar prior to implementing the DVT-based Writing Instruction.

DVT instructional resources and professional development was provided to Language Arts faculty in both schools, and then DVT-based Writing Instruction was implemented for approximately 5 months. Data in Table 3 show that both schools made dramatic and very similar gains in the percentage of students who met or exceeded state writing standards after the schools implemented PWS.

Table 3: Percentage of 7th grade students meeting or exceeding standard on a statewide writing assessment before and after Process Writing SMARTvisual implementation

	Pretest	Posttest	Gains
Rural 7 th grade	33%	58%	25
Suburban 7 th grade	38%	61%	23

7th grade pre-test performance in three middle schools was matched so that all were performing similarly prior to implementation of PWS in one of the schools. Thus, two schools served as comparison, control groups (Schools A & B) and one school served as the experimental group (School C).

Table 4 shows that School A, B, & C were performing on the statewide writing assessment at similar levels prior to the intervention. The aggregated data depict the percentage of 7th grade students in each of the respective schools who met or exceeded state writing standards for 7th grade.

Table 4: Aggregate data of 7th grade performance of students meeting or exceeding standard on a statewide writing assessment

	Pretest	Posttest	Gains
School A (Control)	43.79%	41.62%	-2.17
School B (Control)	35.55%	28.5%	-7.05
School C (Experimental)	37.65%	60.51%	22.86

Language Arts teachers in School C received DVT instructional resources and professional development. Post-test performance of aggregated data shows that while the performance in Schools A and B declined, School C made significant improvements during the same time period as evidenced by a 22.86 percentage point gain from the previous year.

Table 5 provides the pre-test / post-test performance of students who are African American in the three schools. These de-aggregated data show that the gains (16.75 percentage point gain) made by students who are African American and received DVT-based Writing Instruction were considerably greater than their counterparts in the control schools, but not as great as that of the general population of 7th grade students receiving the DVT intervention.

Table 5: De-aggregated data of 7th grade performance of students who are African-American meeting or exceeding standard on a statewide writing assessment

	Pretest	Posttest	Gains
School A (Control)	34.6%	27.5%	-7.1
School B (Control)	35.55%	23.4%	-12.15
School C (Experimental)	27.08%	43.83%	16.75

Table 6 provides the pre-test / post-test performance of students with disabilities (with the exception of those with severe cognitive disabilities) in the three schools. These de-aggregated data show that while students with disabilities who received PWS instruction made gains, they were not

proportional to the gains made by the general population of 7th grade students. In this study, data was not further de-aggregated so that performance of different disability groups could be analyzed.

Table 6: De-aggregated data of 7th grade performance of students with disabilities meeting or exceeding standard on a statewide writing assessment

	Pretest	Posttest	Gains
School A (Control)	19.35%	15.56%	-3.79
School B (Control)	6.52%	3.13%	-3.39
School C (Experimental)	14.21%	20.0%	5.79

Use of Differentiated Visual Tools in High Schools

One study has investigated the effectiveness of using DVT-based Writing Instruction in high schools.

This study employed a pre-test / post-test with control group design to evaluate the effects of instruction in the use of the DVTs on 10th grade semi-rural high school students' high-stakes writing assessment performance. Two high schools with similar prior histories of performance were used in the study. Table 7 shows that in both schools, 51% the 10th grade students met or exceeded state standards prior to the intervention. Students in the control group high school received traditional 10th grade English class writing instruction. During the same period, students in the experimental group school received DVT-based instruction. Post-test scores indicated that 77% of these students subsequently met or exceeded state standards.

Table 7: Aggregate data of 10th grade performance of students meeting or exceeding standard on a statewide writing assessment

	Pretest	Posttest	Gains
School A (Control)	51%	53%	2.0
School B (Experimental)	51%	77%	26

Summary and Discussion

Evaluation of the affects of instruction using DVT-based Writing Instruction on high-stakes writing assessment performance in elementary, middle, and high schools provide evidence that these are potentially very robust tools. The aggregate data suggest that schools using DVTs have demonstrated increases in high-stakes writing test performance ranging between 23 and 52 point increase in percentages of students who meet or exceed state standards with an overall average increase of around 25 points whereas performance in comparison schools not utilizing DVTs tended to regress during same time period. The regression is likely due to increased rigor of the high-stakes assessments from year to year. Thus, schools implementing DVTs tended to make marked gains under the same increased-rigor conditions.

While these data evidence the potential of DVTs, considerable more research is needed. These data were not subjected to statistical analysis, thus it relative effect size is known. It may be that schools with prior histories of relatively poor performance may be most responsive to DVTs, perhaps due to the "ceiling effect" associated with higher performing schools. What is unclear is whether the marked performance increases demonstrated by low performing schools were due to the unique characteristics of DVTs, or whether similar results would be forthcoming with other interventions that explicitly focus on increasing writing skills and are accompanied with professional development. It is notable, however, rural, semi-rural, suburban schools seemed to respond in similar positive ways to DVTs. The nature of the data provided, however, is not conducive to drawing more definitive conclusions about the role demographic variables may play in the effects of DVTs.

There is evidence that middle school students who are African Americans may be responsive to DVTs, the actual effect size is unknown. Thus, the limited evidence suggests there is good potential, but just how good is unknown. Likewise, the de-aggregated data concerning students with disabilities suggests that DVTs may hold some promise for this group, studies are needed about the affects of PWS on specific types of disabilities because the cognitive characteristics and acquired background knowledge among the disability population can be markedly different and thus be a key interacting variable with the effect of PWS.