



Writing with Technology



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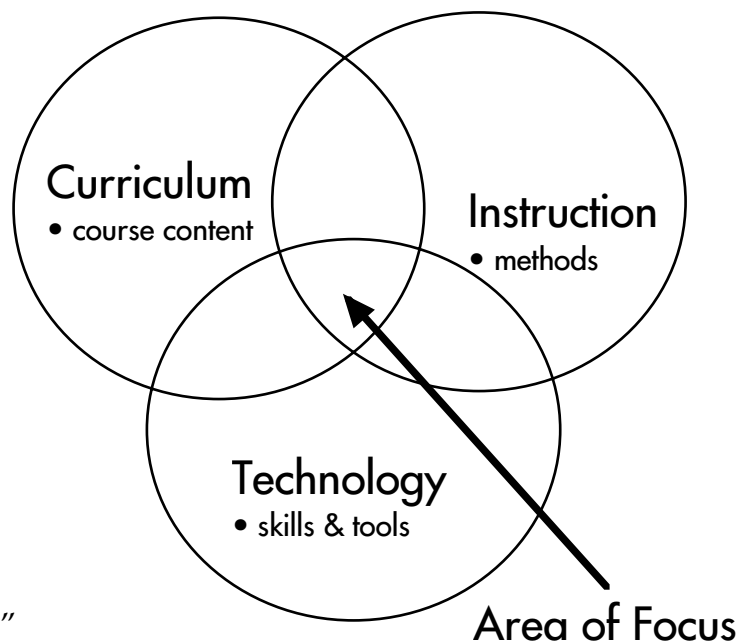
Denver Public Schools • Department of Educational Technology • Shannon Hagerman

Project Summary

Research* has shown that technology can have a significant impact on students' abilities to write. In an attempt to promote and develop the use of technology for writing across the curriculum, the Denver Public School's (DPS) Department of Educational Technology set out to design and implement a program that would not only support the integration of technology and writing at the Elementary School level, but that would also train teachers to incorporate various forms of technology into their daily instruction.

The design of the Mobile Writing Lab Pilot Study concentrated on three main areas: Curriculum, Instruction, and Technology. The interconnected nature of these elements led to the development of a program whereby the following four goals could be achieved.

1. Provide Elementary School Teachers with on-site, real-time technology and curriculum integration training.
2. Study the impact of technology integration on students' motivation to write.
3. Investigate whether or not the quality and quantity of student writing can be improved with the use of AlphaSmarts and computers.
4. Effectively teach computer related productivity skills (i.e. keyboarding and desktop publishing) through the consistent use of technology for writing rather than directly teaching the subject of "technology."



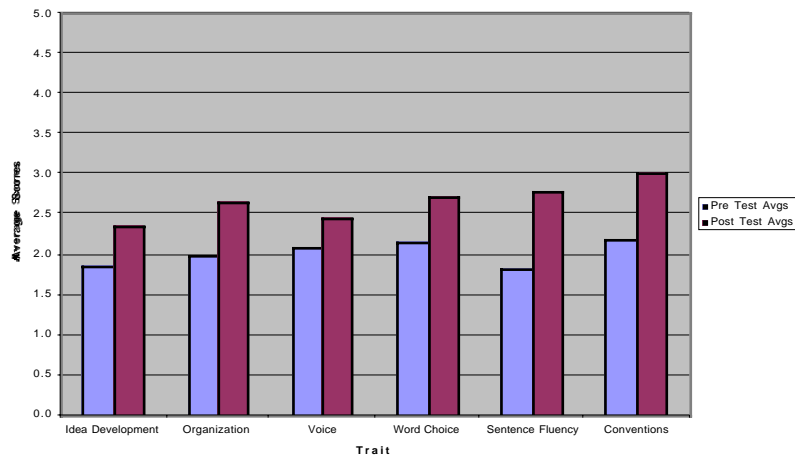
A mobile writing lab consisting of five classroom sets of AlphaSmarts (150 units), eight iMac computers, four color deskjet printers and four LCD projection units was purchased by the Department of Educational Technology. For the purposes of the pilot, the equipment was assigned to two third grade classes and two fourth grade classes for a period of four months. During the pilot study, a technology trainer worked with each of the four classes for ninety minutes a week. The trainer modeled whole group instruction using the Six Trait Writing model while incorporating technology. For the remainder of the week, teachers and students incorporated the technology into their daily instruction and activities.

* A bibliography of examined research is available upon request.

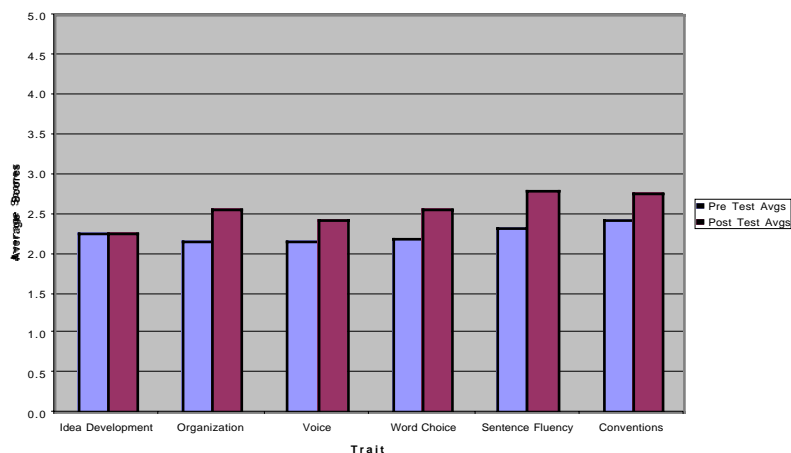
Project Results

At the outset of the project and prior to the introduction of any technology components, students submitted a writing sample in response to a Six Trait writing prompt. This sample was completed using paper and pencil. At the end of the project, students completed another writing sample in response to a different Six Trait writing prompt and this time, used the AlphaSmarts to compose and submit their pieces. Due to the timing of the pilot study and the number of participating classes, completion of a writing sample with a control group was not possible. As the data shows, student scores in all Six Trait assessment areas for both third and fourth grade classes improved from the pre-assessment to the post-assessment. This is not to imply that the Mobile Writing Lab Pilot was solely responsible for all student improvements; however, it does indicate that using technology throughout the writing process, on a daily basis, did not have deleterious effects on student performance.

3rd Grade - Six Trait Performance



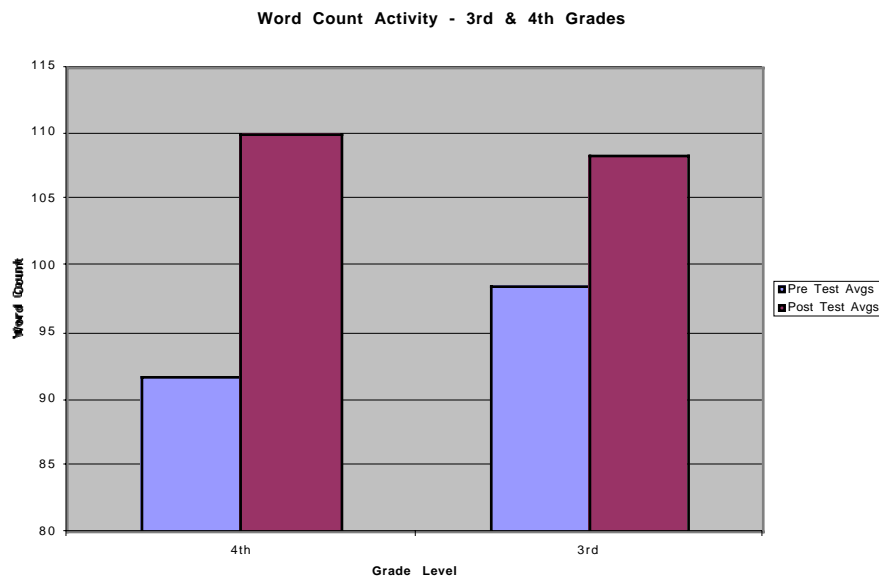
4th Grade - Six Trait Performance



Additionally, the categories of Organization, Sentence Fluency and Conventions showed the most significant growth from pre-test to post-test. Research indicates that when computers are used for composition, students are more inclined to engage in the revision and editing processes. The student growth in the three aforementioned categories supports these findings.

Project Results (continued)

Increases in writing sample word count were also evident at both grade levels. As seen in the graph below, the word count average for fourth grade student samples on the pre-assessment was 91.73 words. The fourth grade post-assessment word count average was 109.87 words. This constituted an increase of approximately 18 words. A similar situation was evident as third grade average word count scores increased from 98.49 words to 108.26 words, a difference of approximately 10 words.



The word count activity data shows the most marked improvements between pre and post test scores. This appears to support research completed on the motivational effects of using computers in the writing process as it has been found that students are often inclined to write more when they compose on computers. Evidence from this pilot study corroborates these findings. It is possible that with more exposure to keyboarding prior to the pilot, the students' word count increases may have been even larger.

Anecdotal Evidence

In informal research situations such as the Mobile Writing Lab Pilot Study, comments and changes in behavior are observed along the way. It was felt these remarks also served as key success indicators. On several occasions, students would comment on how much they enjoyed using the AlphaSmarts for writing. Teachers also noted changes in some students' willingness to write as the pilot continued. Once resistant or hesitant writers were becoming intrigued by the technology and were then motivated to write. At the end of the pilot one third grade student announced to the class that he liked writing so much now, he was going to be an author when he grows up!

Throughout the pilot, ET staff was pleased to see the excitement of not only the students but also the teachers. Significant strides in using the technology for instruction were made by the participating teachers. As their comfort levels with the technology improved, they became willing to change their instruction to incorporate the technology. By the end of the pilot, all four teachers were using the LCD projection unit and computer to present lessons on a regular basis.

Current Practice

After assessing the results of the Mobile Writing Lab Pilot Study, the Department of Educational Technology has modified and expanded this program throughout the Denver Public School District. Schools interested in learning how to more successfully integrate technology and writing, register to participate in the program. Six weeks is spent at one school with the trainer working in the various classes once a week for approximately ninety minutes. A different trait from the Six Trait model is focused on during the instructional component each week. Simultaneously, teachers gradually learn to incorporate the technology into their daily instruction with the help and guidance of the trainer.

Suggestions

Using technology to impact writing can be done in many ways. Since one of the the main focuses of this program was to offer on-site, real-time technology integration training to teachers, it was necessary to purchase the equipment to assemble a mobile writing lab. If the intent is to integrate technology and writing, this may not be a mandatory component. A possible solution may be to purchase enough AlphaSmarts to allow access to each student within a class (e.g.. thirty units.) Access to computers and printers is necessary for the final publishing piece. While the LCD projection unit was helpful for whole group instruction, it is not a required component. The following breakdown summarizes the approximate costs involved in replicating this model for one class. *NOTE: This equipment can be shared by multiple classes given that AlphaSmarts and computers can be used by several different users. Therefore, it is not necessary to purchase the following equipment for each participating class.*

30 AlphaSmarts (including cart)	\$ 6000.00
2 iMac computers	2500.00
1 Printer	500.00
1 LCD Projection Unit	<u>2500.00</u>
TOTAL	\$11,500.00



Contact Info and Resources

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