Developing a Web Site for SOL Review for Algebra I Students
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Introduction
I began my teaching career the same year the Standards of Learning (SOL) exams were first introduced in Virginia. The Standards of Learning were developed to ensure that all graduates from schools in the state of Virginia achieve proficiency in four core subject areas. There are nineteen standards for the Algebra I course. An end-of-course exam is given in May to all students taking an Algebra I course. Like many schools in Virginia, Wakefield has not attained the required 70% passing rate on the Algebra I exam.

Currently I am a second-year teacher at Wakefield High School in Arlington, Virginia. Wakefield is an extremely diverse school. Over 60% of our students are non-native speakers of English. At Wakefield, I teach Algebra 1 and Geometry in the ninth grade Foundations Program. The Foundations Program is based on the middle school teaming approach. All of the freshmen are divided into one of four groups, known as houses. Each house consists of five core class teachers. The house has math, biology, history, English, and technology teachers and approximately 100 freshmen. The technology class is designed to be interdisciplinary and the other core teachers may assign work that is to be completed in the technology class.

Feeling the pressure to increase scores, I wanted to create an interesting and interactive way for students to review the course prior to the SOL test. The most common method of review for algebra is worksheets. I wanted a review that would engage the students and allow them to use the technology that was available to them. I decided to create an Internet website featuring multiple choice questions covering the Algebra I topics.

Background
In order to create the Algebra I review website, I first needed to learn how to design a website. I contacted the Instructional Technology Coordinator (ITC) at my high school for help. The ITC designed an after school course that gave an overview of the basics. With just an hour’s worth of training I was able to begin creating the site.

To create a response form for the website I used a free on-line site, response-o-matic.com. In order to use this form, my website needed to be published on the Internet. This would also allow students access to the site from locations outside of school. However, I did not want to require students to have outside access since many students do not have computers at home. Thus, I
chose a standard length of ten questions for each review hoping that the students would have enough time to complete it during technology class.

My next task was to write all of the multiple-choice questions. I completed ten questions for nine of the nineteen Algebra I Standards of Learning. I entered the questions into the response-o-matic form on the computer. The form was designed so that students selected the box next to the letter of the best answer. (See Appendix 1) At the end of each review, the students were asked to rate the difficulty level of the review on a scale of 1 to 5 in order to facilitate in-class review. The design of the response-o-matic form allowed a list of answers to be emailed to my school email address when the students pressed the submit button. I could thus correct the answers and track how many students completed the exercises and how well they did. The website can be found at the following address: www.arlington.k12.va.us/schools/wakefield/academ/homepage.htm

Method

Strategies/Activities. During the third grading period I administered a pre-test practice SOL exam to my three Algebra I classes to obtain preliminary scores. The pretest consisted of 50 multiple-choice questions covering all of the SOL content. Thus there were questions on topics we had not yet covered. Several of the multiple-choice questions were taken from the 1998 SOL released items. (See Appendix 2)

The following week, I began assigning reviews from the website. I chose topics for review that many students had missed on the pretest. Each week students were assigned two review topics to complete, a total of 20 multiple choice questions. When I received an email, I graded the responses and recorded a score. In order to encourage participation in the review, students were graded for completion and correctness at ten points each.

Prior to the SOL test, the students completed nine of the nineteen Algebra I objectives on the Internet website. They also reviewed in class for four class sessions using review packets with multiple choice questions. Since I would not receive SOL scores before the end of my project I administered a post-test. The post-test was the same test I gave as a pre-test.

The students were also given a post-SOL survey to obtain their reactions to the SOL test, the Internet review, and the in-class worksheets. The survey can be seen in appendix 3.

Data

The results of the practice SOL test are encouraging. Fifty students took both the pre-test and the post-test. Of the fifty students, forty students (80%) improved their score. The average test score improved by 3.6 points. (See appendix 4) In the table below the results are shown.

<table>
<thead>
<tr>
<th>Number of Reviews Completed</th>
<th>Percentage of Students Completing Reviews</th>
<th>Improved Score</th>
<th>Same Score</th>
<th>Lower Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>all 9 reviews</td>
<td>28%</td>
<td>86%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>6 to 8 reviews</td>
<td>34%</td>
<td>82%</td>
<td>0%</td>
<td>18%</td>
</tr>
</tbody>
</table>
The Post-SOL survey given to the students asked for students' reactions to the on-line review site. While students agreed that the website was easy to use and that the difficulty level of the questions was appropriate, many did not like completing the on-line reviews. The majority of students preferred reviewing from the in-class packets and felt that they learned more from the in-class packets than from the Internet review. Students felt prepared for the SOL test and agreed that the material covered in the Algebra 1 class was contained on the SOL exam. (See Appendix 5)

### Analysis of Data

The results of the survey were disappointing. I had hoped the students would have a positive reaction to the website since the post-test scores showed such improvement. In talking with the students, I discovered several reasons why the students did not like the website review. Many students felt they did not have enough time in their technology class to complete both of the assigned reviews in a week. Some students had the option of doing the reviews at home on a personal computer, but not all had that opportunity. Although computers are available during lunch and after school, most students did not choose to use their personal time to complete the reviews.

Students were disappointed that the website was not capable of giving them a score for their work when it was submitted. It was difficult for the students to put meaning to their work without an immediate response. Similarly, the site did not have any sample questions or examples for the students to view. I was not in the computer lab during technology class when they completed the reviews and could not answer questions for them. Since all of the review material was from the beginning of the year, many students had forgotten how to solve the problems and had to guess because they could not get help. The students felt they benefited more from the in-class review because they could ask me questions.

While the survey showed the students did not like the website review, the post-test scores showed overall improvement. This positive result of the on-line program was due to the fact that the students got practice viewing and answering multiple choice questions. Since the SOL test is all multiple choice, it is important for the students to have practice with the type of questions asked. Many students said they felt more comfortable with the questions asked on the SOL after the practice they received on the website.

The survey asked students to give suggestions for review for my classes next year. The students suggested competitions, more cumulative review throughout the year, review for a longer period of time, and to break down the steps of the problems.
Reflection

After analyzing the data, I determined that the website review needs some revision. Enough students gained knowledge of multiple choice questions from the website that it should be used as a supplemental learning tool in the future. Since not all students enjoy using the computer, both in-class and website review are important activities to prepare students for the SOL test. I plan to begin review on the Internet earlier next year so that students will have fewer questions to answer each week. This should reduce the number of students who do not have enough time in technology class to complete the assignment. Also, by beginning the website earlier, students will be more accustomed to using it and it will allow them time to cover more of the standards.

I plan to revise the website this summer to improve its utility for the students. Each review will describe the objective that is covered and give several sample questions to review concepts before they answer the questions on their own. This should help students to recall the old material and give them a chance to see an example.

The revised site will give the students immediate feedback as to their score on the ten questions. When they submit their answers, the next screen will give them their score. As the survey indicated, students are curious about how well they do. At the end of each week's review I will go over the questions in class so that students can see the problems worked out.

I observed that students frequently forgot to complete the assigned reviews for the week. Even though the review for the week was written on the classroom blackboard and listed on my homepage, students were constantly asking which reviews were due that week. I plan to list on the assignment sheet when each on-line review is due. This should help remind students to check the website and complete the reviews on time.

Overall, I believe the review website is a useful method of reviewing the Algebra I content. Algebra is a topic that constantly builds upon prior knowledge. Students need to practice old concepts throughout the year so that they are prepared to move onto the next level of math and to help retain material that will be tested on the SOL test.

Appendices available upon request