

**Technology Integration
Teacher Post-Observation Questions**

Teacher: Barbara Thompson	
Subject: Honors Algebra II Period: 2	No. of Students: 19
Observer: Diane Bennett	Date of Observation: 2/26/02
Length of Class: 90 minutes	No. of Computers Used in Lesson: 7

<p>Brief Lesson Description: Students “created” a new cereal by choosing two cereals made by Kellogg’s, which must meet certain criteria of mineral content and be cost efficient. To do this the students were to go to predetermined websites to collect the data needed to make their selections. The students then had to write equations and inequalities from this data, graph these equations, find the point of intersection and derive the cost per serving of the cereal. Students must use their understanding of linear programming to accomplish this task.</p>	<p>Curriculum Standard Applied: <u>Standard Number: 3.0 Patterns, Functions, and Algebraic Thinking.</u> 3.11 interpret results of algebraic procedures; 3.12 apply the concept of variable in simplifying algebraic expressions, solving equations, and solving inequalities; 3.13 interpret graphs that depict real-world phenomena; 3.14 model real-world phenomena using functions and graphs; 3.15 describe the domain and range of functions and articulate restrictions imposed either by the operations or by the real-life situations which the functions represent; 3.16 use linear programming to solve real-world problems.</p>
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To what extent do you feel this technology lesson increased the depth of student understanding and learning engagement for this curriculum standard?
In the mathematics classroom students are often too focused on getting the “right” answer. But in the real world, answers to the problems encountered in the work place often do not have just one “right” answer. This webquest helped the students understand how to apply their mathematical knowledge to obtain a solution to a real world-manufacturing problem and to realize that there are often several solutions to the same problem.

How have students been impacted by using technology for this lesson? Has the efforts to integrate technology impacted student achievement, had no impact, or negatively impacted student achievement?
Students were excited because they had to analyze the information to determine which cereals would make the most cost efficient combination. At the beginning they just picked the cereals they liked, but quickly realized that there was much more involved in their selections. Without using the websites, the information they needed for this project would have be too tedious and probably would have required a trip to the supermarket. This project has helped students to be more aware of the decisions needed in manufacturing and may help them in deciding if business or engineering would be a career choice for them.

What did you expect to see in your classroom that would indicate effective use of technology? Did it happen? If so, why? If not, why not?

I expected the students to search the websites to feel in the information needed to complete the “Information” worksheet. In fact, I was afraid they would think this assignment was a little boring. The students quickly learned the websites and could navigate the websites easily. I did not expect the students to become excited and have real “discussions” on why they should pick certain cereals. The technology was truly a “tool” for this lesson; it did not do the work for them. They had to analyze the information and make decisions. They used the laptops much like they used the graphing calculators to find the points of intersection. Technology simply made the information real to them and helped them to understand the complexities of the decision making process.

Identify how this technology lesson has impacted your ability to teach this curriculum standard. Has the experience been positive or negative? Why?

The linear programming standard is usually a “boring” concept for students. Normally the textbooks simply give a list on constraints and the students graph them. The points of intersections are usually at “nice” points. By “nice” I mean that the points usually contain integers not messy fractions. Even when I give application problems the answers are usually fairly obvious. But with this linear programming project, I have been able to show how manufacturers can use this standard in their decision-making process. While some students still did not “like” doing all the processes necessary to reach a realistic conclusion, all appreciated the fact that these processes are used daily in the real world of manufacturing. Sometimes the questions they asked me as they were doing this project made me stop and reanalyze how to solve a particular problem. I think this exercise was good for all of us.

Did your professional development training prepare you to implement this technology lesson? If so, how? If not, why not?

YES. Without the training I would never have searched the web and discovered this idea on how to implement this project. Also, as I stated earlier, without the technology available, this project would have required out-of-class research, (a trip to the supermarket) which many students probably would not have done or would not have been comfortable doing.

Check all that apply.

In preparing and implementing this lesson, I used the following types of technology:

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|---|------------------------------------|
| <input checked="" type="checkbox"/> Word | <input type="checkbox"/> Excel |
| <input type="checkbox"/> Internet | <input type="checkbox"/> e-mail |
| <input type="checkbox"/> PowerPoint | <input type="checkbox"/> gradebook |
| <input type="checkbox"/> video/audio | <input type="checkbox"/> CDROM |
| <input type="checkbox"/> Access | |
| <input checked="" type="checkbox"/> TI-83+ Graphing Calculators | |

Engaged Learning Indicators:

Indicator	Evidence
Did your students take responsibility for their learning with technology? Did they meet, exceed, or not meet your expectations?	<input checked="" type="checkbox"/> Yes The students did not hesitate to use the laptops. They were very comfortable with them as they were with the graphing calculators. I had to do very

	<p>little after I explained the project.</p> <p><u> </u> No</p>
<p>Did your students develop, define and/or modify problem-solving strategies using the technology basics you gave them?</p>	<p><u> x </u> Yes This was very evident in the graphing process. They used the graphing calculators to quickly graph their equations, so they could find the point of intersection. If that point was not in the 1st quadrant, it was back to the beginning. They had to analyze why their lines were not intersecting in the 1st quadrant in order not to make the same mistake again.</p> <p><u> </u> No</p>
<p>Did learning with technology energize students? Did they remain motivated? Did they take pride in their work?</p>	<p><u> x </u> Yes The students delighted in naming their cereal and competing with the other groups to “discover” the most cost efficient cereal. One group even made up samples of the “new” cereal to give out to the class. They were very creative in their names and some even gave their product slogans.</p> <p><u> </u> No</p>
<p>Did your students work collaboratively to understand the technology task to plan, implement, and evaluate their assignment using technology?</p>	<p><u> x </u> Yes Since each person in the group was assigned certain duties, all students worked together. They checked each other’s work, especially with the calculators, and made decisions collaboratively.</p> <p><u> </u> No</p>
<p>Did the technology tasks your students accomplish bear resemblance to real world problems in the home and/or workplace?</p>	<p><u> x </u> Yes Although this assignment was much more simplified than a real-world problem in the manufacturing world, it gave students an opportunity to see how many decisions must be made even for a simple task.</p> <p><u> </u> No</p>
<p>Were the technology tasks challenging to the students? Did they need to stretch their thinking skills to be successful?</p>	<p><u> x </u> Yes Using the internet to find the data was not the challenging part of this assignment. Using the information found to solve a problem was the real purpose of this assignment. Students had to listen to their classmates’ opinions and then analyze which decisions were best for the final product. They had to reason why the lines must intersect in the 1st quadrant, what the</p>

	<p>point of intersection meant and how to estimate what the cost per serving of their new product would be. All of these decisions required higher-order thinking skills.</p> <p style="text-align: center;">No</p>
<p>Were there additional skills which were required to accomplish this technology lesson?</p>	<p><u> x </u> Yes. Students had to understand basic mathematical concepts in order to complete this assignment. This required being able to translate equations and inequalities from written data, graphing lines, finding points of intersections, understanding domains, and evaluating expressions.</p> <p style="text-align: center;">No</p>

Additional Comments:

Overall, I was very pleased with this project. The students were enthusiastic about being able to apply what they were learning in the classroom to a real-world manufacturing problem. It opened their (and my) eyes as to what is needed in the classroom-more applications that aren't just the same old word problems. It made students think "outside the box". Learning took place even after the projects had been evaluated. After I handed back the projects, we discussed where the mistakes had been made and what this could mean in the manufacturing world. I feel that the students gained a lot of insight by doing this project and will do it again with next year's classes.