College Algebra: Can Minor Changes Make a Major Difference?

Presenters:
Joni Pirnot, Mary Beth Headlee, Cathy Panik
State College of Florida
Borda Count Method

- It is a form of preferential voting where candidates are ranked in order of preference.
- Candidates score 1 point for last place, 2 points for second to last place, and so on.
- The candidate with the most points is declared the winner.
Borda Count Method

- Named for the 18th-century French mathematician and political scientist Jean-Charles de Borda
- Used throughout the world in a variety of ways including selection of the Heisman Trophy winner in college football
- Uses all the information provided and produces a good compromise candidate
Question

When reflecting on past Halloweens, which circumstances led to an embarrassing moment?
Rank the following four items from 1<sup>st</sup> place (most embarrassing) to 4<sup>th</sup> place (least embarrassing or not applicable):
W: wardrobe malfunction
R: running out of candy for visitors
P: prank gone awry

Get off my lawn!
O: overindulgence
And the winner is

- Wardrobe malfunction: $33(4)+14(3)+17(2)+9(1)=217$
- Prank gone awry: $15(4)+27(3)+16(2)+15(1)=188$
- Running out of candy for visitors: $13(4)+19(3)+15(2)+26(1)=165$
- Overindulgence: $12(4)+13(3)+25(2)+23(1)=160$
Question

What do you feel most helps you complete a math course successfully?
Rank the following four items from 1st place (helps you the most) to 4th place (helps you the least):

- H: consistent completion of homework
- T: reviewing of old tests
- Q: regular quizzes
- A: assistance from others
# Standard Classes: Start of the Semester

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### Changed Classes: Start of the Semester

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CHANGE:

Use a smartpen to enhance student learning from reviewing old tests.
Motivation

- Today’s students are technologically savvy.
- Today’s students gravitate toward obtaining information online in video format.
- Struggling students often don’t understand a written solution without a verbal explanation.
Experiment

**Standard Class:**
After each test, the class was given a written answer key with a detailed solution to each problem.

**Changed Class:**
After each test, the class was given a pencast video answer key with a detailed solution to each problem.
Student Quotes

- “I wanted you to know that your videos have been extremely helpful. I have watched the first two tests and have been able to understand the concepts better.”
- “I loved the videos.”
- “I loved the test answer key videos. They were extremely helpful.”
Reflections

- Basic mastery achieved quickly
- Other uses for smartpen
- Demonstration
CHANGE:

Collect written homework each class period to emphasize the importance of paper and pencil homework.
Motivation

- The trend has been leaning toward the convenience of online homework, but is this enough practice?
- Do students perform better when required to complete paper and pencil homework?
- Should homework match the test format which is paper and pencil?
**Experiment**

Standard Class:
Students completed weekly online homework through a course management system. Written homework was assigned but not collected.

Changed Class:
In addition to the weekly online homework, written homework was collected and graded each class.
“Professor does assign a lot of outside work, but unlike most classes, you can see a direct benefit from doing the outside work.”

“I appreciate that she took the time to grade our homework every day. It forced me not to get behind.”
Reflections

- Grading homework can be done quickly and efficiently
- Enhance rapport with students
- Raise students’ level of commitment
CHANGE:
Emphasize the importance of receiving assistance from outside the classroom such as interactive online resources.
Motivation

- Introduce online options into a traditional course.
- Encourage students to be active participants in their own education.
- Provide multiple opportunities for diverse learners.
Experiment

Standard Class:
Students have an “employability” grade based on homework and attendance.

Changed Class:
“Employability” grade also includes study groups, review sessions, and online practice.
Reflections

- Give students responsibility for finding online resources
- Utilize on-campus resources
- Unexpected benefit
“I really miss you in class because the sub is so different… but I have been getting help from the ARC with the homework.”

“What I liked the most about Dr. Pirnot is that she is so thorough when it comes to teaching. By the time the final came around, I knew how to study and felt totally prepared.”
Student’s Favorite Websites

- http://www.purplemath.com
- http://coolmath.com
- http://www.khanacademy.org
Student Attitude Survey

- The thought of taking a math course makes me anxious. (Strongly agree)
  - Before: 6%
  - After: 16%
Student Attitude Survey

- To be successful in a math course I need to study 2 to 3 hours outside of class for every 1 hour inside of class. (Strongly agree)
- Before: 22%
- After: 33%
Student Attitude Survey

- I view tests and quizzes as a learning opportunity.  
  (Strongly agree)
- Before: 15%
- After: 29%
Student Attitude Survey

- My math teacher has a substantial impact on my performance in the class. (Strongly agree)
  - Before: 66%
  - After: 67%
Successful Outcomes

- Student appreciation
- Classroom atmosphere
- Collegiality supports change
### Standard Classes: End of the Semester

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