Increasing Communication and Problem-Solving Skills in a Liberal Arts Probability Course

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Overview

1. Introduction
   - Why teach this way?
2. Course Design
   - Attendance/Participation
   - Homework/Portfolio
   - Individual Research Paper Project
3. Conclusion

Mathematics is dynamic and exciting!

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- Oftentimes, students are exposed to advanced undergraduate mathematics courses (even in the liberal arts setting) in the form of watching a professor lecture at a blackboard.
- Students rarely speak in class, are not given opportunities to work with other students and the professor at the same time, and are passively engaged for long periods of time.

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- This focus was done as my attempt to improve student engagement, develop stronger critical thinking skills, and improve collaboration and communication skills via written and oral work.

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- All students had taken Calculus I with minor knowledge of integration.
- Their only previous probability knowledge came from brief introductions in Elementary Statistics, Pre-Calculus, and advanced physics courses.

Grading Weights

- Attendance/Participation – 10%
- Homework/Portfolio – 60%
- Individual Research Paper Project – 30%

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- Fridays consisted of student presentations of two homework problems for that week and a discussion of the struggles and interesting findings of the week's content.

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- All homework assignments were corrected by me and revisions were suggested.

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  - correct solutions to all homework problems assigned throughout the course, and
  - a cover page, table of contents, and index referring to particular concepts and where they could be found in the portfolio.

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- At the end of the semester, students presented a project overview to the class that summarized the article and their paper.

Papers Chosen

The particular papers chosen by the students were

- Chen, Shiu-Sheng. (2007) Does Monetary Policy Have Asymmetric Effects on Stock Returns? *Journal of Money, Credit and Banking*, Vol. 39, 667-688.
- Newell, G.F. (1959) A Theory of Platoon Formation in Tunnel Traffic. *Operations Research*, Vol. 7, No. 5, 589-598.
- Tversky, Amos, and Gilovich, Thomas. (2005) The Cold Facts About the "Hot Hand" in Basketball. *Anthology of Statistics in Sports*, 16:169.

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- Their initial annoyances with LaTeX turned into appreciation.
- It was very rewarding as the professor to see breakthroughs in understanding of concepts happen in class as I answered student questions and watched them interact with each other.

Thank you for attending!

Questions or comments?