IS THIS DIE FAIR? AN ANALYSIS OF STUDENTS' TECHNOLOGY-BASED EXPLORATION

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Students' development of probabilistic reasoning can be enhanced by the use of dynamic simulation software. Through an analysis of students' interactions with the tool, the task and their partner, we have identified enabling and constraining factors in their construction of understanding of key probability concepts.

Within the context of a larger research study with sixth grade students (Stohl & Tarr, 2002), we are considering how students use a dynamic environment (Probability Explorer, Stohl, 2002) when solving a probability task. Our analysis is focused on the final authentic assessment task of a 12-day unit. We are using case-based methodologies to examine three pairs of students' work as they evaluate the outcomes from randomly generated die in the computer environment.

In the "Schoolopoly" task, students were investigating claims that a company may have produced unfair dice. Their assignment was to collect evidence to support or reject claims with a convincing data-based argument that the die is (or is not) fair and to estimate the probability of each outcome, 1-6. Each pair presented these results to their classmates in the format of a poster and oral presentation. The class was able to ask questions regarding the evidence presented and students had to defend their reasoning.

The results indicate that each of the three pairs had similarities and differences in their approaches and making data-based arguments. Pair 1 was high ability students who were investigating a die that was only slightly biased. Students in Pair 2 had a moderately biased die to investigate and were of average ability. Pair 3, the low ability group, investigated a highly biased die. Pair 2 was the only group that successfully identified their die as biased, provided a convincing argument, and accurately estimated the probability of each outcome. The cross-pair analysis of their social and computer interactions provide interesting insights into their successes and obstacles in approaching this task and developing understandings about the interplay between empirical and theoretical probability.

Our poster will consist of visual displays that include a task description, computer screenshots, images of students' poster presentations, sample episodes, and more detail about our analysis.

References

Stohl, H. (2002). *Probability Explorer v. 2.01*. Software application distributed by author at http://www.probexplorer.com.

Stohl, H. & Tarr, J. E. (2002). Developing notions of inference with probability simulation tools. *Journal of Mathematical Behavior 21(3)*, 319-337.