

Statistics Races and Jeopardy Games

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Abstract

The authors engage their students' in two enjoyable statistics classroom activities. For one activity, "statistics races" we divide the class into teams and have competitive statistics races. We give them one statistics problem, and the first team to get the correct answer gets 3 points of extra credit, the second team 2 points extra credit and so on. The second activity is a statistical version of the tv game show "Jeopardy." We will have anywhere from two to five categories of questions and from two to five point values for the questions, depending on the amount of time available. The teams then compete for the win and statistical bragging rights.

Key Words: Pedagogy and Statistics, Undergraduate Statistics Education, Multiple Intelligence Theory

I. DESCRIPTION OF THE ACTIVITIES

a. Statistics Races

Approximately once a week, we divide our classes into teams and have competitive statistics races. The teams are given one math problem, and the first team to get the correct answer gets 3 points of extra credit, the second team 2 points extra credit and so on. Having more than one race a week typically takes too much class time. We prefer the teams to have 3 or 4 members each, class size permitting. If the class has fewer than 6 students then each student is their own team. If a class has exactly 6 students there will be 3 teams each with two students, the last team getting one point if earned. If a class has more than 16 students he permits more than 4 teams and pairs of teams can get the same number of points. (e.g. Second and third place might both get 2 points.)

Friday seems to be the optimal day for this practice, as it helps to keep attendance up. At our institution, Fridays' typically have lower attendance than any other day of the week. Thus, these mathematical races serve the dual purpose of reinforcing recently learned material, and encouraging students to be in class to learn the new material. Because students work in groups, relatively difficult problems are generally assigned for these races and teams must give fully simplified correct answers. On occasion, if attendance is too poor to teach new material, another option would be to have two math races in lieu of teaching new material. While this could be done with grades instead of extra credit, this might take the fun out of the activity, putting more pressure on the students.

As one would expect, this activity tends to "wake a class up" and students have given positive feedback regarding these races.

b. Jeopardy Games

We also have a statistical version of the tv game show “Jeopardy” that is played as time permits during the semester. There are anywhere from two to five categories of questions and from two to five point values for the questions, depending on the amount of time available. For an introductory statistics class, categories might include such things as “measures of central tendency” and “probability.” The harder the question is, the greater its point value.

We break the class up into 3 teams, ideally composed of about six students each. A Jeopardy board is drawn on the blackboard and the students choose the questions they want to attempt in a manner similar to the game show. Students raise hands instead of ringing a buzzer. The first raised hand gets to answer first.

Students are encouraged to work collaboratively, instead of simply as 6 (or so) individuals. Students find the games to be enjoyable and helpful as a review of material.

II. THE PEDAGOGY BEHIND THE PRACTICE

The aforementioned classroom activities are undergirded by well-established pedagogical theory. First, both activities make use of our students’ multiple intelligences (Gardner 1992). Naturally, mathematics classes generally heavily focus on using, measuring, and developing students’ logical-mathematical intelligence. The activities that we use in class also allow students to engage their interpersonal and intrapersonal intelligences (Gardner 1992).

The games that are played in our classrooms also offer the students an opportunity to engage in team learning. Active learning methods such as these have been found to result in outstanding student achievement (Snyder, Sloane, Dunk, and Wiles, 2016). Furthermore, team learning that is led by peers has been found to be especially effective in the academic success of underrepresented minority students (Snyder, Sloane, Dunk, and Wiles, 2016). Finally, as faculty, we find the games to be a good form of formative assessment. One reason for their appeal is the low-stakes nature of these games, which allows our students to focus on skill development without being overwhelmed. Indeed, Killi and Ketamo (2017) find that game based formative assessment results in decreased test anxiety.

III. SUMMARY

In conclusion, the two statistical competitions that we introduce in this paper are easy to implement, and enjoyed by the vast majority of the students. These games provide the faculty member with formative assessment information that are collected in a low-stakes environment that is not stressful for the students. The practice of these games is also well founded in educational theory.

References

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