The Role of Daily Quizzes in an Introductory Probability and Statistics Course

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In this spotlight session we report on our experience teaching an Introduction Probability and Statistics course to freshmen at Babson College. Babson, a business oriented college located near Boston, has about fifteen hundred undergraduate students. For a number of years we have been giving daily paper quizzes at the end of each class. We use these quizzes to focus attention on important topics, review the class, and to test student understanding of the material. Although we have small classes, there is significant overhead in administering, collecting, grading, and returning the quizzes.

At Babson College all freshmen are now issued laptop computers with built in internet capabilities. Our wired class rooms allow all students to have internet access. For several years we have been requiring students to bring their lapstops to class, so that they can access materials on the Internet, take notes, and perform statistical calculations using Minitab. Last year we began experimenting with giving with web based quizzes using the EDU platform.

We want our quizzes to both assess and to assist student learning. Therefore, we design our quizzes with random parameters. Each time a student accesses a quiz they are given a slightly different version. This prevents casual cheating and allows students to retake a quiz until they demonstrate mastery.

During the last ten minutes of a ninety minute class, we activate the quiz. After each student takes the quiz and submits their answer, they receive immediate feedback. They have until 8 AM the next morning to retake the quiz as many times as needed. Students are encouraged to help each other with the quizzes. The quizzes are graded on a ten point scale. Each time a student takes a quiz one point is subtracted from their best grade on that quiz. We give over twenty quizzes during a semester, but only about half have been converted to an electronic form. The others are still paper based.

It is very interesting to observe the difference in student behavior at the end of classes having electronic quizzes and those that don't. There is significant amount of enthusiastic animated interaction between the students as they try to explain to each other how to do a quiz. When there is no electronic quiz, this interaction is missing.

During the first few classes, there is some hostility towards the electronic quizzes by a few students. The quizzes require that the students pay attention during the class and then demonstrate their understanding. After a few weeks of quizzes, the students appreciate their value and express dissapointment should some technical problem prevent access to the quizzes.

The major difficulty in using this type of quiz is the work required to program the quiz. Once a quiz is programed and debugged, it of course can be reused. We are in the process of expanding our quizz coverage and by next year we hope to have complete course coverage.

Two sample quizzes are given below. During the spotlight session, we will demonstrate how the quizzes change each time they are generated dynamically, how students enter their answers, and how the quizzes are graded. We will also illustrate the admininstrative tools used to track the results of multiple retakes for about thirty students in each of several sections.

Histogram of C1 **N = 50**

Midpoint...	Count ...	
190	7	*******
230	7	*******
270	2	**
310	8	********
350	9	*********
390	5	*****
430	8	********
470	4	****

This question is based on the character histogram above. The data has been put into 8 categories and the midpoint of each interval is as shown. One of the intervals with a midpoint of 390 is shown below. Complete the cells using the information in the character histogram above. For the interval with midpoint 390 determine the missing values and enter them in the cells provided.
Enter the numerical values. Do NOT enter the % sign.

This question is composed of ten parts.
An employee of Consolidated Industries has been instructed to authorize payment for a shipment of peaches if he finds evidence with 98 % confidence that the average weight of the peaches in the shipment is greater than 60 grams . A random sample of 20 peaches is selected from the truck load of peaches . The weights are normally distributed with a known standard deviation of 8.57 grams . The mean weight of the 20 peaches in the sample is 62.96 grams .

1) Formulate the null hypothesis Ho
2) Formulate the alternative hypothesis Ha
3) Identify the rejection region and determine the critical value of Xbar
4) Find the observed value of Xbar
5) Determine the critical value of Z
6) Determine the observed value of Z
7) Determine the probability, p, that we will get a value as extreme as the test statistic, assuming that Ho is true
8) The significance level, alpha, is
9) The correct conclusion concerning Ho is
10) The correct conclusion concerning authorization is that the shipment

Formulate each hypothesis using the two menu choices and the text box.
When you enter a numerical value, it must be correct to two decimal places (0.01).

The work associated with the electronic was made possible by a grant from the Davis Educational Foundation.