

Activity 12: Facebook Friends
Notes to Instructors

Probably no more than about 15% of students don't have a Facebook account (I've done some polling). Make sure each group has at least one member with a Facebook account.

1. The students should probably guess the distribution shape to be right-skewed, but don't tell them right away. Let them discuss it in groups or as a class. Some of my students guessed "normal", so I drew a normal curve on the board with a vertical axis at # of friends = 0 to demonstrate why this might not be correct- the number of friends cannot be negative.
2. From my limited experience, the students tend to guess around 200 to 400 for the average number of Facebook friends per user.
3. In case Google doesn't pull up the result right away, point them to this website:
<http://www.facebook.com/press/info.php?statistics>
In case the website is down, just tell them the average is 130. Last I checked (April 1, 2010), it was 130.
4. Get them to discuss whether their guess for the average seems significantly different (practically and statistically) from what Facebook reports.
5. If their guess is much larger than what Facebook claims, they will probably want to do a right-tailed test. So the hypotheses in this case are

$$H_0 : \mu = 130$$
$$H_a : \mu > 130$$

6. They *must* verify the assumptions:
 - (a) simple random sampling;
 - (b) the data are possibly taken from a normal distribution or the sample size is large;
 - (c) is σ known?Assumption (b) ought to be satisfied since they will end up taking a sample of at least 40 (5 data values per group, at least 8 groups). As for assumption (c), since σ isn't known, they will need to do a t -test. They might think assumption (a) is satisfied. It probably isn't, but that's okay; let them go on and do the test. They can discuss this assumption later.
7. Each group should have at least one member with a Facebook account. Have each group get at least 5 data values by looking up some of their Facebook friends at random and recording how many friends they have. Compile the data for the entire class in a Minitab worksheet at the front of the room. They should compile the data on their own machine as well. This might take a few minutes.
8. Once the data are recorded in Minitab, make a histogram with Minitab and let them compare their guess for the distribution shape with the shape of the sample distribution.
9. –

10. –

11. –

12. This should get them thinking more about the practical significance of their results.

13. Simple random sampling is really probably not satisfied since the sample is of friends of college students, who are perhaps young and more social than others on Facebook. What about the sample size? Perhaps its okay. But, look at the distribution shape. Are the data coming from a normal distribution? Probably not, so you might really need a larger sample before the central limit theorem really begins to work.