**Bottleneck Lesson Plan- Probability and Significance**

**PSYCH 200 Elementary Statistics in Psychology, 200, primarily psychology majors but some other humanities majors require it as well.**

Briefly outline your answers to the following:

1. **The bottleneck—What are students unable to do?**

* there is a misconception of how to think about probability, so I will rename it p value/Sig.
* often they think of statistical probability in terms of "will a baby have a birth defect or not".
* the p-value/sig definition is- did this effect happen by chance?

1. **Mental Action—What mental actions does the expert perform to get past the bottleneck?**

* he expert would take the value and look it up on the chart or visualize where the p-value/sig would be on the chart.
* If the value was in the tail, the expert would conclude that it is significant

1. **Model the thinking—What analogy will you use to model these mental actions?**

* p-value/sig is more like a horse race, betting on a horse, will my horse win? it either wins or not.
  + there are lots of chances for the horse to not win (values under the hump)
  + and very few chances for the horse to win (values under the tail)
* finding a $100 bill on the way to class
  + very unlikely, lots of chances for you not to find this (values under the hump)
  + very few chances for this to happen (values under the tail)
* they tell me some analogies

1. **Practice and Feedback—How will the students practice these mental actions? How will they receive feedback to make improvements?**

* worksheets
* grading and sharing with each other
* graph the effect of what they think will happen and what did happen

1. **Motivation—What will I do to hold students accountable and disrupt ritual ways of learning?**
2. **Assessment—How will I assess student mastery of the mental actions?**

pre and post test

graph the frequency scores % answer right

numerical concepts they should have to explain in words

verbal concepts they should have to draw a picture

make up your own experiment- if it is sign what does that mean?

If it is not sign, what does that mean?

Prepare a brief summary of the results of the pre- and post CATs—including, if possible, some quantities. What inferences can you draw from the data? For example, “On the pre-test, 33% were able to do XXX, while on the post-test, 57% did XXX and 22% still could not. These results show a 24 improvement, though about one-fifth of the class are still struggling with XXX.” Or “The majority of students correctly answered 5 of the 8 test questions on the bottleneck concept.”

1. **How will you share what you learned?**

In a paper with Joan.