**Feedback on Applet #4 Interviews & Focus Group**

Six students were interviewed over weeks 8 and 9 of the second winter term, 2016/17 academic year. In addition, seven additional students participated in a focus group in week 10. All students involved had completed STAT 300 (a second course in statistics that re-visits concepts typically met in introductory courses, expanding further into topics such as power and type II errors). The intro course taken varied, with STAT 200 (eight students) being the most common.

The one-one interviews permitted close viewing of how the students interacted with the applet, as well as allowing each student to give a running commentary of their thinking while working through the activity. The latter aspect was more successful in some cases than others, as some students were nervous or otherwise unwilling to share their thoughts. Pleasingly though no student in either interview or focus group either failed to complete the activity or struggled greatly using the applet.

Feedback on the applet was very positive. The students clearly appreciated the visualisation of the test and the interactivity. There were suggestions for modifying the applet, largely prompted by what was required in the accompanying activity. The key issue raised (relating to the use of the “Faster” button) is better addressed by modifying instructions in the activity. Hence our conclusions resulted in only two modifications to the resources:

* *Modify part 7 of the activity to discourage use of the “Faster” button*: The learner is requested to observe the simulation of fifty tables and see how many result in a type I error. Although this takes less than a minute all students observed used the “Faster” button, but in doing so had difficulty stopping at exactly fifty. The hope was that the students would observe carefully what was occurring, allowing time to understand the graphics and output. It was decided to add to the instructions the sentence “The "Faster" button speeds up the rate of simulations, but do not use that for now so that you can look carefully at the simulations to ensure you understand what you are seeing.”.
* *Modify the applet display when the P-value is very small*: Originally when the P-value was less than 0.01 the graphic showed “P = 0.00”. One student astutely pointed out that this could be confusing, as the P-value is never zero. We suggested the applet shows “P < 0.01” for cases where the P-value is between 0 and 0.01.

Attempts to gauge possible learning gains from use of the applet were based on a set of eight CAOS/ARTIST concepts questions students attempted both before and after completing the activity. One of the eight questions (Q3) was deemed to be flawed, and better removed from the analysis (and all but one student answered this incorrectly on both attempts). In summary of the thirteen students involved, seven improved their scores pre to post and only one scored lower. Of the six students who had the same score in both tests, three answered all correctly on both attempts. Oddly perhaps Q’s 7 and 8 proved the hardest, with five students getting both wrong both pre and post. At first sight these two questions may seem to test no more than a recall of the definitions of type I and II errors, but correctly transferring the ideas is also required.