

A COMPUTARIZED ADAPTIVE TOOL TO ASSIST STATISTICAL LEARNING

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This research explores the potential of the Computerized Adaptive Learning (CAL) technology to support an active learning class in a statistical inference course for students studying industrial engineering. The distinguishing feature of CAL systems is that each student receives a different and personalized set of items. A student's skill/knowledge is measured from responses to the items, and new items are given to each student based on their skill/knowledge as measured from their responses from prior items. The CAL system proposed here includes a bank of 50 items on the topic of hypothesis testing. The tool is applied through employment of the open-source Concerto adaptive-testing platform. The first item is assigned at random to each student; the student performance is measured based on a two-parameter logistic item response model; and the criterion to select the next item is based on the Kullback-Leibler information.

The tool was applied in two sections of an Econometric course belonging to the Industrial Engineering program at the Universidad Diego Portales during the second semester 2022. One section included 26 students, and the other included 21 students. The scheme of application for the two sections involved:

- 5 minutes explanation
- 20 minutes using the CAL tool
- 20 minutes of feedback, where in the first section the feedback included a formal explanation of the topic based on students' performance results provided by the tool, and in the second section the teacher only answered students' questions
- 20 minutes using the CAL tool
- 10 minutes answering a satisfaction survey.

Preliminary results suggests that the activity was enjoyed by 50% of the students and that satisfaction was similar in both sections. However, clear differences were observed between sections. In the first section in which students were provided with expositive feedback, students' answering times were reduced, and the tool moved to more difficult question stems. For the second section in which the students received 'answering questions' as feedback, students did not improve results after feedback.