SOME CHALLENGES OF THE USE OF COMPUTER SIMULATIONS IN PROBABILITY TEACHING

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The use of computer simulation in probability teaching raise questions about its use that is worthy to search. In this sense, Coutinho (2001) reports some difficulties the students had when several situations were given for building urns models for simulating some probabilistic games. These difficulties are associated with the use of the software, the resistance to use the simulation for solving a problem that can be solved directly by calculation and the difficulty on accept simulation data that has not obtained by themselves in order to estimate probabilities.

We are developing a searching for knowing the understanding that the students generate as a result of an instruction supported on the use of the computer simulation. The first part of this work, besides of looking for students' intuitive ideas about probability, look for the spontaneous ideas they have about the frequentist approach and, in particular, the difficulties they face solving probability problems using the computer simulation. Furthermore, we pretended find the strategies they used for estimating the values of the requested probabilities. Some of the results obtained are the content of this paper (Yáñez, 2001).

Twelve university engineer students in Mexico City participated in this study. The activity was made in four sessions of three hours each. In the two first sessions we started working with Fathom solving some problems with computer simulation. In the third session the students worked in pairs for solving three problems of conditional probability; in the fourth session the students individually solved three problems of conditional probability.

For the results obtained, it is seen that the students have difficulties in the modeling of the random experiment and in its programming in the simulation computer language. Other difficulty deals with the interpretation of the graphics of the relative frequencies for estimating the probabilities.

Almost all of the students used the *last value strategy* that identifies the last value of the relative frequency with the probability requested. Another strategy deals with modeling for solving only the questions and not the random experiment, trying to transfer the theoretical analysis to the simulation computer language. It might be that the students make distinction between a theoretical probability and simulated one, even some of them believe there are as many probabilities as generated values of the relative frequencies.

Coutinho (2001), Introduction aus situations aléatoires dés le Collége: de la modélisation à la simulation d'experiences de Bernoulli dans l'environment informatique Cabri-géometre-II. Doctoral Thesis. University of de Grenoble.

Yáñez, G. (2001), Estudios sobre el papel de la simulación computacional en la comprensión de la probabilidad condicional. Unpublished doctoral project. Cinvestav-IPN, México.