PROBABILITY PROBLEM SOLVING IN TRAINING MATHEMATICS TEACHERS. THE CAVE PROBLEM.
M. Pedro Huerta

Departament de Didàctica de la Matemàtica, Universitat de València, Spain.
Several years ago Shaughessy (1992) emphasised the close ties between the two areas of research I consider here, stochastics (probability and statistics) and problem solving. He also pointed out the unfortunate situation of teaching probability and statistics in primary and secondary schools, citing one of the possible issue that hinder the effective teaching of stochastics the preparation of the mathematics teachers.

The Cave problem is a problem I used as a context in teaching and learning probability and statistics in training primary and secondary teachers. The problem-situation talks about 27 explorers that are into the cave in a randomise situation. There are three paths into the cave but only one let a explorer to leave the cave in one hour walking, but not the other two paths, coming back to cave inside after 2 days and 3 days walking. Each explorer has meals for 6 days as maximum. The question is how many explorers will leave the cave?

As we know, problem solving can be situated in several worlds (Puig, 1996). One of them considers problems in relation to the mathematical sign systems (MSS) (Filloy, 2001) with which they are solved. In this context, learning probability and statistics is seen as a process to gain competence in continuos stratums of the MSS that solve this problem or others. Teaching probability and statistics, consequently, will organise the step from a stratum of the MSS to a new stratum of the MSS from which the first is seen as more concrete and with which what was previously describe as separated or unconnected is described the same way, and therefore, are produced as new concepts and new signs.

In solving Cave Problem I identify three stratums of the MSS mentioned. The more concrete one uses signs from the play that solves the problem. The intermediate one uses signs from the representation systems and associated rules and, finally, the more abstract one uses signs from the more formal representation in mathematics. The use of each stratum can be associated to learning process at different school levels: primary school, secondary school and college.

References.

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