

IPM60 – Statistical education using flexible learning approaches

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Learning statistical concepts is quite different from learning concepts of other subjects because of the peculiarity of statistics. The learning process requires at the same time to be able to manage data and to "grasp" reality as well as the capacity of abstraction necessary to refer to models that describe phenomena and generate observations. This is whatever school level, for basic or advanced statistics.

J.B. Ramsey has discussed some of the reason Statistics appears so "mysterious" and often "unconceivable". He also presented the main difficulties that students encounter while getting used to think of processes or models that may have generated observations. Ramsey underlines the fact that it is important for the teacher to respect a logical sequence to present statistical concepts and methods, having in mind the specificity of statistical reasoning so that students can be able to justify by themselves, step by step, the meaning of the concepts and the reasoning involved. Thus the learning process should be more coherent.

We cannot disagree with the approach and the steps suggested by Ramsey which are crucial to guarantee that students benefit from the teaching and, more important, that they develop a positive attitude toward statistics. In addition, my personal experience suggests that if the students are required, at the end of each topic, to work in small groups to analyze a set of data and finally present their results to their peers, they get much more involved and more interested in understanding the phenomena to be able to support their results. This is indeed the basic principle of the "cooperative learning" pedagogical model.

The TILE system realized by Nolan & Lang seems to be a powerful environment for Labs activities and it is innovative in many senses. The authors have adapted some of the more powerful tools and ideas either from the software or from the teaching point of view. What I have been able to see appears friendly, powerful and free of the more common mistakes. The authors take into account pedagogical aspects so that, in my opinion, their system can be included among the more accurate ones for teaching purposes.

However, considering how many teaching tools we are releasing today, there still is a question that remains unanswered. The risk is that this kind of software, requiring a great effort to be developed, could be obsolete as soon as they are completely finished and ready to use. Moreover even if I, personally, have contributed to the general effort for developing such tools, I'm not sure that they can really help students in their learning process of statistical concepts. Probably the question can only be answered after some serious experiment designed to evaluate whether and how much students can really benefit using such tools.