

“Are we Teaching Significant Contents on Statistics?”

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I begin my work emphasizing when a content is significantly learned.

We have to teach not only conceptual but factual knowledge that will interact with the attitudes and procedures that the pupils have and they have to integrate the new information with the previous knowledge they have for their comprehension acquiring new concepts and significances.

Statistics is a signature where the pupils participate in the apprenticeship with more autonomy in the definition of objectives and activities to do than others.

A good teacher of statistics encourages the take on consciousness of his pupils about their own ideas so they can change them. He bases the school knowledge in situations of the daily life, so the discipline not only shows like truthful but also helpful.

For example when we are teaching the mean in students we have to emphasize not only how to solve it with various data, but also they have to interpret it correctly. Often this is a common error in university students. Pollatsek & Cols (1981) describe mistakes employing the statistical formulas. Li & Shen (1992) indicate that when data is aggregated in intervals, students forget that each group must be weighted in a different way when we are solving the mean.

We see, all these mistakes are because these concepts are not comprehensive for pupils.

Strauss & Bichler (1988) investigate the evolutive development of the comprehension of the motion of mean in pupils between 8 and 12 years.

It's difficult for students the conceptions of media, as we could see.

Russell and Mokros analyze 4 categories in which they classify the conceptions of students about means:

- The mode, the most frequent value
- The most reasonable value
- The point in the middle
- The statistical formula

Each aspect can be true in one context but not in another.

We can see that if students only acquire the computational knowledge it's probable to do predictable mistakes.

As teachers often explain means but not the variable characteristics, pupils ignore the variation of data when we realize comparisons between 2 or more samples or populations like Campbell (1974) have studied.

Loosen and Cols (1985) note that a lot of text books emphasize the heterogeneous between the observations rather than the deviation respect the central position. They also note that the words employ, variation, different, fluctuation are open to different interpretations.

This interpretation is very clear for professors but not for students when these words are referred to the diversity relative to the mean or in absolute terms.

All these situations of apprenticeship must have an intrinsic motivation so that learn and understand will be a satisfactory goal in itself.

The comprehension must be progressive, gradual, involved in a vertical and coherent curriculum with an inside conceptual organization with logic connection and a conceptual net of hierarchical manner.

Nowadays the study of statistics of order takes importance because the explorative analyses and data is based in this statistics because they are robust, this is less sensible to little changes in data and to atypical values. The study of this statistics of order present difficulties not only in the concepts but also in the procedures.

Schuyten (1991) have pointed out the differences between the conceptual knowledge of the median and the method of calculation that it is used to obtain its value.

Ban (1980) shown the fault of comprehension of students between 17 and 21 years about the median.

Because of this, it's necessary to consider the characteristic of students to whom we are teaching to recognize how the previous knowledge have been formed, like personal constructions in a spontaneous manner in their daily lives, the interaction of their social environment and the need of activate knowledge by analogy.

We must use different techniques to know what students know: questionnaires about concrete themes, establishment of problems – situations, group or personal interviews.

The investigation about judgment of association have been studied in psychology and have been linked with studies in uncertainty situation (Scholz, 1987).

Piaget and Inhelder (1951) have studied the reasoning about statistic association and they showed that the idea of association involved probability and proportion.

So, teachers must take this in account when they teach this to students.

We also must take account that we have to evaluate at the beginning, the analysis of previous knowledge and in all the process too, with indirect techniques.

About inference, we must teach remembering Moses (1992) who said that thinking about statistic inference is like thinking a collection of methods to learn of the experience.

The comprehension of the idea involves the adequate balance between two apparently antagonist ideas: the sample representativity and the sample variability studies of mistakes referred to samples have taken great importance in the psychology field, in the context of taking decisions.

To understand this, teachers must give examples of the daily life and must motivate students so learning will be easy for them.

Referring to hypothesis contrasts, the best way to students to learn them, is when they participate in classes with the help of the teacher who has the responsibility of taking in conscience the importance of this theme in their futures.

Serious difficulties appear when we are teaching statistics, but if we give significative contents to pupils, they will do the best to learn thinking.

Like Green (1992) said “statistics concepts provide an area of fascinating exploration. What is so obvious and simple to statisticians has been the product of the experience of various generations of the most capable minds. It's too much to wish that this legacy can be transmitted without any efforts by our own part”.