ANALYSIS OF TEACHERS' ATTITUDES TOWARDS STATISTICS

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Changes within teaching of statistics in elementary education in Portugal, lead to this research on the attitudes of teachers towards Statistics. This study focuses on the measurement and characterization of attitudes towards Statistics of Portuguese teachers from the 1st and 2nd cycles of basic education (ages 6 to 11). With this work we hope that paths may be devised to introduce an attitudes' pedagogy and the interventions to prevent negative attitudes and/or correct them, thus positively contributing for the professional development of teachers as well as students' success in statistics education. The content of the poster will be presented with as much pictorial format as possible and by pointing the context, the research objectives, the methodology, the main research findings and some conclusions of this investigation.

Context: nowadays statistics is recognized as a key knowledge area with gradually integration in the mathematics curriculum, and in particular in Portuguese basic and secondary school levels. Nevertheless, despite the curriculum guidelines, there are factors that may endanger its implementation. On the other hand, in Portugal, research of attitudes towards Statistics has not being done, and there was no research about Portuguese teachers' attitudes towards statistics. So, the main objective in this study was to do a 1st assessment and characterization of Portuguese teachers' attitudes towards statistics, of basic education.

The specific objectives are: Studying this attitudes as a global measure, as well as in their components; Determine if there are significant differences between these attitudes in the two cycles; Inquire about the existence of significant relationships between teachers' attitudes and the demographic and school training variables.

The research method was a mixed study, with a stronger quantitative component, and a concurrent analysis for the countries comparisons. The instrument used is the Estrada's Scale of Attitudes Towards Statistics, EAEE (Estrada, 2002; with a fully English presentation in Martins et al. 2012). It is an attitudes five-point Likert scale with 25 items that was specially design for teachers and presents good psychometric properties. In a cluster sampling from 3 Portuguese regions, 1135 teachers were surveyed resulting in 1098 valid questionnaires. The sample has a variety of cases relevant for the study. For the quantitative analysis the descriptive statistics were computed as well as one-dimensional parametric and non-parametric methods, multidimensional clusters analysis and factorial analysis. To do the analysis of the teachers' explanations the content analysis was used (Martins et al., 2012). This study confirmed the high internal consistency of the instrument, with a Cronbach alpha, 0,869. The multidimensional aspects of the EAEE emerged. Teachers' attitudes towards statistics were positive. This study highlighted in a positive way the

cognitive and social components and in a less positive way the behavioural and instrumental components. The transcultural study reinforced the admissibility of these results (Estrada et al., 2010). Attitudes towards statistics of these teachers: were not significantly related with their gender and were significantly related with the cycle of teaching, the teaching experience, their training area, the training in statistics and the teaching of statistics.

In conclusion, teachers have a clear conception that statistics is useful and they value its role in the citizens' daily life and they also have a clear sense of the importance of including it in current curricula. At the same time they did not emphasize collaborative work and didn't refer sharing statistics difficulties with other teachers. Outside the school, teachers do not see statistics as a tool in their own daily life and they express a feeling of disbelieve towards the use of statistics and the information in television.

As actions to improve attitudes toward statistics we mention the improvement in training (initial and in-service) at several levels and the promotion of the collaborative work amongst teachers. It is also important to guarantee the reinforcement of statistical education in schools, from the early years, as well as in the training of future teachers and of in-service training in statistics for teachers.

Keywords: Attitudes, Statistics, Teachers.

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