An Overview on the Teaching of Statistics at Schools and University in Argentina.

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University studies on statistics started in Argentina as a course associated to the training of economists in the University of Buenos Aires. This first impulse developed through the years, extending to more ambitious objectives and reaching other universities, almost always in faculties of Economic Sciences. This provided the institutional basis for the training of the first university professionals in statistics and for the transformation of statistics into an academic discipline. Between 1932 and 1948, four university institutes on statistics were created in different regions of the country (1932 in the Litoral, 1938 in Córdoba, 1947 in Tucumán, and 1948 in Cuyo).

The creation of the degree in Statistics in 1948 in the Faculty of Economic Sciences of Rosario(Litoral) was due to the vision of Professor Carlos E. Dieulefait. It was the first course of its kind in Latin America, and the first to be entirely in Spanish. It was also the only degree in statistics until 1999, when the University of Tres de Febrero, located in the outskirts of Buenos Aires created the degree of Statistics Graduate, and also an intermediate degree of Statistics Technician.

The lack of academic offer was not an obstacle, however, for professionals of other areas to embrace statistics practice and research, most of them pursuing postgraduate studies in Europe and in USA.

In our globalized world, more and more intercommunicated and computerized every day, it is vital to know the basic elements of descriptive statistics to interpret and analyze the information presented by the mass communication media.

Computer development has permeated into newspapers, weekly magazines and TV programs, and statistical data rich in diagrams, indices, rates, ratios, tables, and graphics provide material that can be analyzed and interpreted.

Companies that provide light, water and gas supplies, usually include comparative graphics on the history of consumption in their bills.

We agree with Ottaviani (1998) that basic statistics knowledge helps us to achieve our personal development encouraging critical spirit, and trains us to use quantitative data to control our opinions and to interpret others' opinions. Therefore, it is important to acquire methods and reasoning methodologies that allow us to transform these data into tools to solve decision problems and to make predictions.

Although the teaching of statistics in Latin America, and specifically in Argentina, is still in its infancy, the perspectives are promising.

The current Federal Law of Education incorporated statistics in a generalized way into the curriculum of Mathematics of the Basic General Education (EGB) (children from 6 to 14), the Polymodal (15-17) level and the different university specialties.

The EGB introduces students to data analysis and the concepts of random, possibility, impossibility, degrees of probability, etc. applied to problems and situations of everyday life. The objective is that pupils, in the course of their studies, learn to apply statistical data to situations studied in other areas and to everyday life.

In the Polymodal, most of the general considerations of EGB are revisited. The difference lies in the wide range of possibilities that a Mathematics formation with more technical resources may provide at this level, and also in the higher degree of conceptual maturity of the students.

The use of computers for statistics teaching is getting more and more attention from teachers and professors. It provides, among other things, powerful didactic resources such as simulation and graphic representations, which are helpful tools to extend the meaning of statistical concepts specially at the Polymodal.

The problem is serious, since neither EGB teachers nor Polymodal professors have a statistics background, and therefore, this subject is often postponed or even omitted from the curricula.

This motivated the incorporation of the "teaching question" to the meetings of the Statistics Societies of Argentina, Brazil and Chile.

Since 1999, the Argentine Statistics Society devotes an entire session to statistics teaching in the three levels of education (primary, secondary and university) regarding classroom experiences and research.

Sessions of the Latin American Congress of Statistics Societies(CLATSE), held jointly with the Chilean Statistics Society on July 1999 in Mendoza, were opened by Prof. M. G. Ottaviani with her lecture: "A Note on Developments and Perspectives in Statistics Education". The Congress also included lectures, oral and posters communications, a round-table discussion, and short courses for teachers and professors.

In order to ensure the continuity of this activity, Prof. Samprit Chatterji gave the lecture "Teaching Statistics Effectively" in the XXVIII Symposium of the Argentine Statistics Society, held on August 2000 in Posadas, Misiones. There were also oral and posters presentations, and a course for teachers/professors.

A detailed report on the presentations was published by Carmen Batanero in the electronic bulletin of the IASE. It is available for consultation in the following address: http://www.ugr.es/local/batanero/sergroup.htm

As a complement of these activities, our society has associated institutionally to the IASE.

Two other meetings were organized by statistics professors from the Faculties of Agronomy and related faculties, the first in Mendoza in 1998, and the second in Córdoba on October 2000. The latter was a satellite meeting of the V Scientific Meeting of the Argentine Biometrics Group, which is associated to the International Biometrics Institute.

Programs, bibliography and methodology related to the teaching of Statistics were discussed in workshops held during these meetings. Moreover, the bases for future reunions were established.

On October 2000, a meeting of statistics professors from Faculties of Economic Sciences took place in Rosario.

Argentine participation was significant in the International Conference on the Experiences and Perspectives of Statistical Education, organized by the Federal University of Santa Catarina (Brasil), the PRESTA program, and the IASE on September 1999. Thirty-five colleagues presented communications and participated actively in the debates, showing that problems in this field are frequent in all the countries and are intimately related to the role of statisticians within society. This participation shows the concern of our colleagues on the introduction of statistical contents in the different levels and modalities of education, as well as the use of new educational technologies.

The participation in these events and the experience of activities directed to the teaching of Statistics already started with the CLATSE IV in Mendoza allowed us to establish the significance of our compromise as statisticians in the formation and updating of teachers and professors.

The role of the Argentine Statistics Society is of paramount importance in this task since, to date, there are no organic programs of statistics formation for teachers from the first and second cycle because, in general, they are included in the Mathematics courses.

Some personal experiences are promising; teachers are greedy for knowledge, and the offer of official training and updating courses to satisfy their needs is almost scarse.

Therefore, the support given by the IASE to the activities carried out by our societies and the training of our members is extremely important.

The need for well-trained professionals and researchers in statistics stimulated the creation of Masters in different universities of the country.

The first was program in Applied Statistics was created in 1973 at the Faculty of Economic Sciences from the University of Tucumán (Mentz 2000), which, and whose programs and modalities have been modified through the years and became a Master program in 1985. In 1995, the PhD degree was incorporated.

The Master in Biometrics, a joint program between the Faculty of Agronomy and the National Institute of Agricultural Technology started in 1987, and already has thirty-two graduates.

In 1994 the Faculty of Social Sciences, University of Buenos Aires, created a Program to provide training in statistics to social professionals. After two promotios, since 1997, financial reasons abliged to move this program to a private Institute, Institute for Economic and Social Development (IDES), where it continue up to now. It consisted of ten basic and intermediate courses. Two promotions finished this program at IDES.

More recently (1998) two Master were created, one in "Mathematical Statistics" at the Faculty of Exact and Natural Sciences, University of Buenos Aires, and other in "Applied Statistics" at the University of Córdoba. The teaching staff of the last one comes from different faculties: Agricultural Sciences, Economic Sciences and Mathematics, Astronomy and Physics. This master is unique as regards its multidisciplinary character, and consists on a two-year closed program. It already has four graduates.

In the year 2000, the Statistics School of Rosario created a Master, and plans to open a PhD degree.

In Argentina , a degree program is an undergraduate program of about five year long and a Master program is a postgraduate program two years long, that requires a final thesis to obtain the diplom, it´s important to remark the fact that in Argentina a thesis is required, because is not like this in others countries of America, even the United States of America.

In addition, since 1992, a course of Applied Statistics, as continuos education was developed by the Departement of Distance Education of the school of Economics of the Córdoba University.

The availability of computer tools, and frequently of specific software, makes professionals of different disciplines use statistics in their research and work, and realize about the necessity of having a good academic training on this subject. However, sometimes courses are given by non-specialists, mostly by medical doctors or social scientists in a traditional way as well as by internet.

We, statisticians, have to work very hard in order to revert this situation.

References

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Resumé:

Dans ce travail on présente un panorama de l´enseignement de la statistique en Argentine. L´introduction de la statistique dans les écoles primaires et secondaires pose le problème de formation des enseignants. L´utilization de la statistique dans les differents domaines et le besoin croissante de specialistes a conduit a la création des programmes de formation continue et des Master dans differents Universités depuis 1973.