

INDUZIONI

Demografia, probabilità, statistica a scuola

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- INDUZIONI è una rivista rivolta agli studenti ed ai docenti di matematica, storia, geografia, osservazioni scientifiche, economia, statistica... delle scuole preuniversitarie, ma anche ai docenti universitari. Il suo scopo è quello di diffondere idee statistiche nella scuola e di illustrare attraverso esempi come la statistica possa essere di ausilio in diverse occasioni della vita pratica.

Il taglio degli articoli dovrebbe essere operativo ed effettivamente utilizzabile nel lavoro scolastico.

- *INDUZIONI is a review for students and teachers of mathematics, history, geography, scientific observations, economics and statistics at preuniversity schools, but also for university teachers. It aims to spread out statistical ideas in school and to illustrate, through examples, as statistics can assist us in several occasions of practical activities.*

Articles should be operative and actual in classroom work.

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ABSTRACTS

FINDING OUT ABOUT LEARNING: SURVEY, ASSESSMENT, CERTIFICATION, INDICATOR

MARTIN DODMAN

A society needs to know how well it is investing in education in terms of learning outcomes achieved. This paper examines the current situation in Italy in terms of certain key words and concepts – *survey*, *assessment*, *certification*, *indicator* – that are often cause for confusion, and analyses each of them in terms of five questions: *what?* *why?* *who?* *how?* and *when?* A basic distinction is proposed between *survey* (commonly conducted by a national or international agency), seen as an endeavour to gain information about and describe the types and levels of competences developed by a given sample of learners, *assessment* (conducted within a given educational institution), seen as a process of gaining information about and describing types and levels of competences developed as a result of attending a particular course of study (and thereby the efficacy of the course itself), and *certification*, seen as the description of types and levels of competence in terms of a recognised scale of reference (key stages in a national qualifications scheme, European qualifications framework, etc.). While it is essential to separate the characteristics and purposes of each, they have in common one basic feature: the need to identify specific indicators, observable data that give reliable information about the types and levels of competences considered.

AN EXPERIENCE OF TEACHING STATISTICS: RESULTS OF A CHRISTMAS CHARITY SALE AT SCHOOL

LAURA CASTELLANA

This paper reports on a teaching experiment at “A Moro” school in Bari, in which students were involved in carrying out a survey, and on the results they obtained. The process began with designing the questionnaire. It involved students in using Excel to record and organise the data and to calculate statistics based on the data. They used both qualitative and quantitative measures, synthesised results and made presentations in which they explained their statistical reasoning.

THE NEW CURRICULA OF MATHEMATICS AND STATISTICS IN THE ITALIAN SYSTEM OF SENIOR HIGH SCHOOLS

GIORGIO BOLONDI

The implementation of the new mathematics curricula in Italian “Licei” provides an opportunity for discussion of the teaching and learning of statistics and requires a common effort, especially in pre-service and in-service training of teachers, to enable them to use new methods and materials.

NEW MATHEMATICS CURRICULUM GUIDELINES FOR ITALIAN TECHNICAL INSTITUTES AND VOCATIONAL SCHOOLS

EMILIO AMBRISI

This paper presents some critical considerations about the reorganisation of mathematical curriculum of upper secondary schools in Italy. From September 1, 2010, the Italian school system will have new “Licei”, new Technical Institutes, new Vocational Schools, with new learning objectives to be attained all over Italy at the end of each type of upper secondary schools. Guidelines for the new mathematics curricula for “Licei” differ from those for Technical and Vocational (T&V) schools, being based on different principles. The former are more prescriptive about what is to be taught, while those for the latter are better articulated and clearly distinguish knowledge from skills, but the T&V guidelines relate only to the first two years of these upper secondary schools. Both the “Licei” and the T&V guidelines seem to favour the continuation of traditional barriers between areas of mathematics – arithmetic and algebra, geometry, relations and functions, data and previsions. Continuation of strong divisions will discourage the teaching of probability and statistics in schools.

STATISTICS TO ENHANCE PEOPLE’S COMPETENCIES

MARIA PIA PERELLI

In Italy, statistics and probability have been included in the school mathematics curriculum for students aged 6 -13 years for more than thirty years, but in reality the teaching of statistics in class is not widespread. Many mathematics teachers are not motivated to teach statistics. Apart from the basic elements of the discipline, teachers should know the cultural aspects of statistics and probability. The ideas of population variability and event uncertainty are important for understanding the world and for making decisions in the face of uncertainty in everyday situations. Statistics is also important in the development of Science. Understanding variability is crucial to the understanding of modern science. Lack of familiarity with statistical concepts and lack of training in statistical reasoning may explain the reluctance of Italian students to take up studies in science, and their lack of a critical approach to statistical information in the media.

FROM OFFICIAL STATISTICS TO SCHOOLS: SOME PROPOSALS

ALBERTO ZULIANI

SUMMARY: Citizens need statistical data to solve real problems, to make decisions under uncertainty, to understand the real world. So it is important to be able to gather data, to assess their reliability, relevance and completeness, and to be able to synthesise and even to analyse them. To participate fully in citizenship, people need to be able to make use of the official statistics which their taxes are used to produce. National statistical institutes, on their part, must present their statistics to people directly, communicating them in a simple way and showing their usefulness.

THE SCIENTIFIC GRADUATE PLAN 2009-12

DONATA MARASINI

SUMMARY: Statisticians welcome the introduction into the Italian Scientific Graduate Plan (PLS) for 2009-12 of statistics, which takes its place beside physics, chemistry, material science and mathematics. Thirteen universities which have joined the Plan have organised laboratories where school students and their teachers work together with the support of university academic staff on topics such as proportions, mean values, variability and some sample survey concepts. We hope the Plan encourages the teaching of statistics in schools and thereby helps to improve understanding of uncertainty and variability in the family and in society.

FROM THE M@T.ABEL PLAN PROPOSALS: TEN TEACHING UNITS IN STATISTICS AND PROBABILITY FOR STUDENTS AGED 14-16 YEARS

PAOLA RANZANI · GIANPAOLO BARUZZO

The authors, participants in the Italian national plan for the new mathematics curriculum – named m@t.abel, present 10 teaching units in probability and statistics for the first two years of upper secondary level, to be delivered by e-learning to in-service secondary teachers. These units offer less experienced teachers an opportunity to see and understand how statistics and probability may be presented in a mathematics class, how they are useful for problem posing and problem solving oriented teaching and how workshop statistics activities are able to motivate students. They hope the units will help to raise the prestige of probability and statistics relative to other mathematical topics and demonstrate their utility in modern life.

FORENSIC STATISTICS

SILVIA BOZZA

This paper draws attention to the increasing role statistics is playing in the courts. The assessment of scientific evidence is often couched in terms of probabilities as measures of uncertainty. It is crucial that probabilistic calculations are accurate and that common fallacies are avoided. Bayes' theorem and Bayesian Networks are fundamental tools of the kind of probability calculus which is of interest to courts in determining complex cases.

ANALYSIS OF TEXTUAL DATA: FROM NEWS TO INFORMATION

ARJUNA TUZZI

This paper provides an overview of methods of analysis of textual data by applying quantitative measures to two sets of texts. The first is a set of late 20th century Italian novels, and the second is a collection of articles published by four Italian newspapers in 2003-2007 at about the time of the anniversary of the adoption of the *Convention on the Rights of the Child* by the United Nations General Assembly (November 20th). The paper discusses strengths and weaknesses of the approach and tries to explain the reasons why analysis of textual data might be considered a useful tool to link traditional qualitative methods with modern interdisciplinary text mining techniques.

TEACHING STATISTICS IN ITALIAN SCHOOLS

SILIO RIGATTI LUCHINI

This paper examines the development of strategies used for promoting the teaching of statistics at school in Italy. In the context of the statistics and probability part of the mathematics curriculum at the first and second cycle levels it presents some activities designed to increase statistical knowledge, skills and competences.