THE ITALIAN CENSUS AT SCHOOL ®

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The first aim of this project was improving the knowledge of the censuses and their function and importance for the Country. The second aim was disseminating numeracy among the students of primary and secondary schools. ISTAT organized a simulated census asking students to answer a questionnaire that contains special questions for children (how many times can you bound back a balloon in fifteen seconds?) and other real official statistics questions, easy enough for children (way of reaching school in the morning; what was eaten at breakfast, atcivities in the free time). The students followed every step of the collecting process, even making exsercises using their own figures, then they sent the figures to ISTAT using an electronic form filled in on- line by Internet. ISTAT is now collecting the figures to give back statistics to the schools who participated in the project.

1. HOW THE ACTIVITY BEGAN

Because of past experiences in Germany and the Netherlands, where large strata of the population gave manifest signs of refusal during the census, other countries adopted alternative systems of general survey. As Sten Johansson, general director for Statistics in Sweden pointed out in 1987: "A population census is best achieved when participation is a well understood and widely accepted civic duty. To be counted in the census is then a manifestation of citizenship, of being one in and of the nation. Everyone's participation is desired, rich or poor, regardless of any other merit than being. No one is counted for more than anyone else. This, of course, is part of the rhetoric of the official statistician. If it is only empty rhetoric to the citizens at large, if it cannot be said and understood at least implicitly, because of apathy, cynicism, distrust or fear among the citizenry, then the census is in trouble. A nation that cannot carry out a census for these reasons is a nation in trouble in other ways as well."

The general census of the population, in our country, is carried out once every decade. The interest of the nation for this significant statistical operation, for this "national ceremony", becomes more prominent only in proximity of the census and is generally not one of the interests that schools focus on. A paper written by Sharleen Forbes (1996) appeared in *Teaching Statistics* and was taken up by the review *Induzioni* (Forbes, 1997) attracting the attention of the Italy's National Institute for Statistics (ISTAT). In particular Forbes gave a clear account of the Census at School experience that had been organised in New Zealand, highlighting its aims, describing briefly how it was organised, and producing some of the most interesting results[1].

Subsequently and in different moments in time, the Italian Society for Statistics, the Ministry for Public Education and the Italian Mathematics Union all began to recognise the possible benefits of such an activity. Together with ISTAT, they jointly promoted a number of preparatory activities that would define the modes of implementing a Census at School and foster discussion on the teaching objectives that could be correlated to this censuary excercise.

One of the effects that the Census at School is expected to produce, besides promoting among young pupils and their families the next general Census that will be carried out in Italy this year, is the output of interesting statistical data that can become an important resource for teaching. It should be noted that the current mathematics syllabus for elementary and intermediate schools in Italy, already includes a part dedicated to the introduction of concepts related to statistics and probability. Therefore the data produced in the Census at School can become an important resource for teaching. In addition, since statistics is not a subject on its own but is taught as part of the mathematics program, the way it is taught mostly depends on the proneness to and knowledge that each teacher has of the subject, considering that these teachers very rarely receive any training related to statistics.

The Census at school experience was designed to involve all the pupils of the 4th grade in elementary school and the 2nd grade of intermediate school, on a voluntary basis. The classes that

took part in the experiment gained the opportunity not only to analyse and use the survey questionnaire, they also the know-how of organising the data they produced (which they analysed and then transmitted in a standard format, through the Internet, to the National Institute for Statistics).

It should be noted that in October 2001 there is Census at School in South Africa (for information see the web site: (www.censusatschool.org.za/index.htm), and that a similar experiment has been conducted in Queensland (www.oesr.qld.gov.au/censusatschool/home.htm), as well as in England (www.censusatschool.ntu.ac.uk). Norway has also developed a similar initiative (www.ssb.no/skolesider). It is not perchance therefore, that the population censuses which were recently carried out nearly all over the world, between the year 2000 and 2001, brought various countries - each on its own account and according to their own timing, ways of implementation and resources - to take up the path indicated by New Zealand (which had led the way). The fact that this has happened is evidence of a widespread atmosphere pervaded by similar needs and by a common sensitivity.

2. DEVELOPMENT OF THE PROJECT

An exercise to be carried out in classrooms on a voluntary basis in order to allow young learners to personally *experience* the activities connected to census surveying. This is the concept around which ISTAT, the National Institute for Statistics, and the Italian Society for Statistics, built a well-strucutred project, bringing about 190,000 children and youths – of 9,000 classes in elementary and intermediate public and private schools – to carry out the Census at School on the 21st March 2001, and have direct experience of all the phases connected to a real census, both in the days immediately before and in the months after the event.

The cooperation of the Ministry for Public Education was fundamental in making the implementation of the project successful, since the Ministry could inform all the schools and encourage volunteers to participate. The joint committee MPI-UMI-SIS (set up at the Ministry and consisting of representatives of the Ministry itself (MPI), of the Italian Mathematics Union (UMI) and of the Italian Society for Statistics (SIS) and tasked with proposing teacher training activities in the fields of Mathematics and Probability) signed the official start up of the project. The project turned out to be an opportunity of cultural growth not only for the young learners involved, but also for their teachers. The overall cost of the project was of about 200,000 Euro; a relatively low cost considering the number of schools and pupils that were involved over the whole national territory. The whole project started at the beginning of 2000 and ended at the end of 2001.

2.1 ACTORS INVOLVED AND THEIR ROLES

The strategic management of the initiative was by a working group with participants from the Ministry of Public Education, ISTAT, the Italian Society for Statistics and the Italian Mathematics Union. The task of the group was to define the detailed aspects of the project, to define competences, responsibilities, human and economic resources made available by the various organisations, and to provide for monitoring of operational activities.

ISTAT was assigned the task of the operational management of the project and a group of three people completely dedicated to the project was set up. It supplied the participating schools with all the material required to implement the *Census at Sschool* project and offered technical assistance to the teachers involved. The Ministry for Public Education gave the project its official standing by assuring the circulation of the initiative and by encouraging voluntary participation on behalf of the schools. The Italian Society for Statistics circulated knowledge of the initiative amongst its members by means of its newsletter. The building of a solid network of relations was the essential element that made the project turn out to be successful. Each of the actors involved played a crucial role in promoting and supporting the initiative.

2.2 MODE OF IMPLEMENTATION

The Census was implemented by handing out a simple questionnaire to the pupils - the one for younger pupils also had a physical capability excercise which consisted of making an inflatable ball bounce. Schools were given a grid for a data matrix to record the information

gathered in every classroom, and the teachers were provided with a guide explaining how to use the data gathered in teaching activities. In the days following the Census day 21st March 2001 – with the help of their teachers, the pupils were able to transmit to ISTAT the data they had gathered, by using a form available on the Internet. The materials needed – questionnaires, tools necessary for the responses, the teacher's guide and a poster to testify to their participation in the census – were all sent to the schools a few weeks before the day planned for the census, so as to give the teachers the opportunity to read the guide and prepare their pupils beforehand, helping them to ponder on the features of the questionnaire and on what the meaning of what a census is. The organisers intended the day of the event to unfold with no improvising and with an awareness of what was happening in the classrom that day.

2.3 PRELIMINARY OPERATIONS: PRE-ENROLMENT OF THE SCHOOLS

Though there had been many signs indicating the interest of teachers in the teaching of Statistics subjects, an element that had repeatedly emerged in the sections of the SIS conferences dedicated to teaching statistics, and also in a series of activities organised by CIRDIS (InterUniversity Research Centre for the Teaching of Statistics Subjects), we had no idea of how favourable schools would be to the initiative. Schools, therefore, were asked to pre-enrol for the project, by means of a note issued by the Ministry for Public Instruction. In May 2000 – about a year before the event - schools were asked to declare their availability to participate (within 30 days). The pre-enrolments were not binding in any way and every school was free to participate, even if only with one class. The pre- enrolment could be given in two ways: by filling out a form on a web-site through the Internet, or by sending a fax to a specially reserved number.

The extraordinary number of un-readable faxes that were received made it evident that, first of all, communication with the schools had to be done through a single channel only and secondly, there had to be a limit in the number of participants, since the human and economic resources available were not sufficient for such a high number of participants to be managed. It was decided, therefore, that only the classes of the year before the final year for each level of school (elementary and intermediate) would be allowed to participate[2].

2.4 ROLE OF THE INTERNET

The computer was the tool used to keep contact with the participants (including data transmission to and from the schools) and also to spread news about the initiative, to tutor the teachers involved and finally to allow the operation to be repeated in other times and contexts; by making all the instruments used available on the web.

An e-mail address was created (censiamo@ISTAT.it) which allowed teachers to direct questions to ISTAT regarding the organisation of Census at school or the use of the supporting tools. This also allowed ISTAT to send general instructions simultaneously to all participants on how to manage the day of the census. It helped monitor the arrival of the material in all the schools, maintain a relationship with the participating schools alive as time went on and with a minimum expenditure, and was manageable by a group of three people. This process changed only in the months just before and after the census – in March and April 2001- when for every region ISTAT appointed a regional reference person who was always available through e-mail.

Each school needed to have its own e-mail address as *conditio sine qua non* for participating in the project. The use of the Internet, therefore, defined the boundaries of the initiative, making it inaccessible to schools that were not sufficiently equipped with computers. However, some of these schools did take part thanks to certain teachers who used their home computers. In some cases the lack of experience on the web did not allow some of the data containing the information gathered in the classrooms to be transmitted to ISTAT. In other cases, since the whole questionnaire was on the web, filling out the form on line took much more time than the schools had available. On the other hand, having designed the form this way, allowed the information to be gradually gathered directly into a database that was immediately available for use.

2.5 THE TEST

In May 2000, together with the pre-enrolment request forwarded to the schools, a test of the effectiveness of the questionnaire – in terms of the interest it provoked – and the fine-tuning of the questionnaire itself and of related activities, was carried out. The test involved four Italian cities located at different latitutdes: Rome, Palermo, Cagliari and Perugia. In order to fully involve pupils, it was decided that filling out the questionnaire would also involve carrying out some sort of physical activity: the older pupils were asked to measure the height of all the pupils in the class, while the younger ones were not only asked to measure the heights, but also to make a ball bounce as many times as possible in 15 seconds.

The instruments needed to give the responses to the questionnaire were also tested: they needed to be functional and easily fit into a pack to be sent to participating schools (together with the questionnaires, the guides for the teachers and the posters). A flexometer used by architects was put in for the height measurements, a sand-glass to count the 15 seconds and an inflatable ball for the bouncing test. The pilot test gathered suggestions which resulted in the reformulation of certain questions; in particular, those relating to the free-time activities and what pupils ate for breakfast where a source of surprises.

2.6 THE INVOLVEMENT OF THE SCHOOLS

Of the 1,831 schools that subscribed to the project, 1,555 actually filled out the questionnaire on-line, thus contributing to the construction of the data bank. Compared to the number of initial subscribers, the number of candidates who were actually fully involved in the project was very high (an overall percentage of 85%, which never went below 73% at the regional level). Both the elementary and intermediate school pupils involved totalled 126,536 from an overall school population of 1,170,000 pupils (considering that only the pupils in fourth grade elementary and in second grade intermediate were invited to participate). The result, in quantitative terms, relating to the number of participants, can also be considered positive as, although the initiative was voluntary it nevertheless involved a large number of students.

2.7 THE HANDLING OF THE MATERIAL

Two different types of questionnaire were prepared, one for the smaller pupils and one for the older ones (4^{th} grade in elementary and 2^{nd} grade in the intermediate, aged respectively 9 and 12 years). In addition, two different booklets were prepared as teachers' guides, one for elementary schools and one for intermediate schools. We now give a brief description of the two questionnaires, containing 10 and 9 questions and subquestions, meant to cover the interests of both boys and girls.

The first part was the same both for the elementary pupils and the intermediate pupils and consisted of personal data (8 questions): sex, age, place of birth, height, number of people in the family as well as questions relating to any brothers or sisters. A second part relating to aspects of every-day life consisted of two identical questions put in both questionnaires: means of transport used to go to school and type of breakfast eaten before going to school (both were closed questions).

After this the two questionnaires started to differ. For the elementary pupils, the questions related to the pet/pets they had (closed question); the pleasure felt in watching television (answers with values 1-4). Finally there was a question that asked pupils to play a game and make a ball bounce for 15 seconds counting how many times the boy/girl made it bounce, with the rule that in case of mistakes, he/she would have to start again. For the intermediate schools, the questions related to the most frequent activities (I see my friends, play at the computer, …) favourite activity; and in the last question, the number of non-school books read during the past year.

Then came the teachers' guides, both for elementary and intermediate schools. These first presented a brief history of census in time and in the world. The teacher was then reminded of the main requirements that a general population census should satisfy. This was in order to help facilitate teachers in preparing lessons dedicated to this subject, and to enable them to answer questions that pupils came up with in the classroom. The booklets also contained the main points to be remembered to ensure a correct survey process during the Census at School exercise in the

different classrooms. Specific advice was also given for some of the questions, and there was also information on how to organise and transmit the information gathered to ISTAT.

An important aspect of these guides is that they contribute to enriching the language of the teachers in that they introduce and give a definition of the statistics lexicon when referring to the data gathered, and in the step-by-step presentation of the techniques of contruction of the tables and graphs, both for quantitative and qualitative variables. There is also a focus on relevant aspects related to the mathematical training of boys and girls in order to make sure that the statistical activities are well integrated in the mathematics syllabus and complete the fulfillment of the teaching programs currently applied in our schools. Concepts relating to classification are thus introduced underlining the relationship with natural language and certain ideas of the theory of sets. Other concepts introduced (highlighting the critical aspects and the meaning to be given to the statistical parametres) are those relating to percentages, for a correct comparison between collectives differing in number, Cartesian coordinates, mean and median.

2.8 WAYS OF RETURNING DATA

Different ways were adopted to return and disseminate data to the schools that participated, and to all the other schools, as well. At the time of writing, several approaches are still being taken into consideration. The first form of restitution, programmed to coincide with the day of the General Population Census (October 21, 2001), involved statistical charts referring to the results of the questionnaire broken down according to sex, geographical area and type of municipality (the size of the area covered by the municipality). These charts are available on the census at school web site: “Censimento a scuola”.

The second step involved the implementation of an interactive database, allowing every user to build customised charts for every item of the questionnaire, using four criteria of intersection simultaneously (the four criteria being: sex, type of school, geographical area and type of municipality). The data were disseminated in such a fashion as to guarantee the protection and privacy of the information relating to the boys and girls involved. Another possibility is under study for the distribution of two standard files of 100 records each, one for elementary and one for intermediate schools, that can be downloaded from the Internet and used for practice in the classrooms.

3. CONCLUSIONS AND FUTURE DEVELOPMENT

The Census at School was an important aspect of the statistics teaching activity in schools; both because it allowed the pupils, their teachers and their families to become aware of what the general population census consists of, and because the data gathering activity in schools was in the form of a questionnaire related to particular aspects of interest to the pupils. It thus helped promote among students awareness of themselves and of their class as a group, as well as allowing comparisons with other students residing in the same region, or with other Italian pupils residing elsewhere, who had also been involved in the project.

This activity also provided interesting outcomes for the institutions that were involved. For the Ministry of Public Education, for the Italian Society for Statistics and for the Italian Mathematics Union, it provided the opportunity for a stimulating work experience and opened a new window on an aspect that had been practically ignored in schools up to then. For the Italian Society for Statistics, it meant implementing part of its statutory mission as a Scientific Society: dissemination of statistical knowledge and awareness among young students. Finally, for the National Institute for Statistics, it meant giving many people (students, teachers, school personnel) the opportunity to do some thinking on what a census means and to gain deeper knowledge of the history and purpose of the fundamental exercise of exhaustive surveying. The activity also promoted the emergence of a higher awareness of the importance that such surveys can have; in brief, an indirect and effective means of diffusion that can contribute to making this type of survey more acceptable to the population.

This experience should not, however, be considered as having ended with the completion of the survey activity. The survey material itself remains available on the ISTAT web site, thus giving other schools the opportunity to use the Census questionnaire for their internal teaching activities, in years to come.

Finally, it is worth mentioning, that this Census at school experience was the first occasion that allowed the introduction of official Italian statistics in many schools, thus allowing their dissemination throughout the whole national territory. It also established an important network of relations between the schools, the Ministry for Public Education and the National Institute for Statistics, creating a platform for future interventions.

NOTES

1. I would like to personally thank Sharleen Forbes for having sent me specific information on the New Zealand Census at School and the material used on that occasion.

2. The Census at School was carried out in May. The information gathered was given back to the schools when the general population census was carried out in October of the same year. The pupils of the second last year, therefore, had the opportunity to participate both in the data gathering and in the data dissemination, over two different school years.

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