

## STATISTICAL EDUCATION AND TRAINING FOR WORKERS OF THE PUBLIC ADMINISTRATIONS: OBJECTIVES, ISSUES, STRATEGIES

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*This paper focuses on education and training for the workplace in the public administration units, and discusses the relative main issues: (i) the need for quantitative skill in the public administration management and, in particular, for statistical literacy and education of the personnel; (ii) how to define the objectives of the education and a plan of training, in order to cope with the problems and challenges; (iii) the strategies, issues and evaluation of some specific experiences implemented in Italy, both for non-statistical staff of public administration and for staff members of the Italian National Statistical System (SISTAN). The paper will show that the preparation of a strategic plan of training actions has been developed using a matrix of learning and training goals to find out training priorities as well as implementing a training model to pass from focus on training to focus on professional identity, human resources development and learning.*

### STATISTICAL LITERACY AND EDUCATION AMONG THE STAFF MEMBERS OF THE PUBLIC ADMINISTRATIONS

#### *The needs*

In a modern society based on information and even more global, complex, and in rapid transformation, the government, the public administration units, all the economic and social operators and also the citizens need to use a lot of statistical information, giving correct interpretation to the data and using statistical reasoning and methods for the analysis of phenomenon and, above all, to make their decisions. In this situation, the development of statistical literacy, culture and education in the public administration is a strategic engagement for two main reasons.

First, in the organisation and management of public administration units (PAUs) there is now, at least in Italy, a new model of production that comes from the push towards decentralisation, the development of the autonomy of each unit and from the introduction of responsibility of managers for the results obtained. This requires the development of the functions of planning, management control and evaluation at the different levels at which the decision processes are formalised. It is easy to show that this asks for pertinent *statistical information systems* and each phase of the process requires appropriate statistical information and indicators and the use of appropriate statistical methods to carry out the requested analyses (through costs, efficiency and effectiveness measures; simulation and impact analysis; users' satisfaction analysis; etc.). At the same time consciousness of upgrading skills and abilities in statistics as well as in programming through statistics is becoming wider and wider. For some staff members of public administration there is a clear need for statistical skills, while for the most of them such as for the general staff and for the directors the statistical literacy and culture are enough. Second, a correct development of statistical culture among the workers of the public administration units, causing a change of their mentality and behaviour, should also affect the more general process of statistical literacy dissemination for the members of the civil society, and in particular for the policy makers and citizens that have continuous and daily contacts with those workers.

#### *The preparation of a strategic plan for the dissemination of statistical literacy and training*

As explained in Biggeri and Zuliani (1999), there is not a *standardised "menu"* for the dissemination and training of statistical culture and education, whilst it is important to *tailor a specific "menu"* and specific educational strategies for the different needs, whether linked to statistical literacy needs or to more professional statistical education. Therefore, it is important to involve all the actors of the educational process in the preparation of the training strategic plans. At this end, it is useful and necessary to construct *two matrices*: the first referred to the different

*groups of recipients of educational actions by kinds of their statistical needs*, that shows the content of the necessary knowledge and educational actions; the second regarding the *relationship between spreaders of statistical culture and literacy and recipients*, that shows the diffusion process, the potential issues and the possible actions to overcome them and the means to be used. For example, with reference to the public administration units the need for statistical training differs according to different staff and, above all, we have to distinguish between the preparation or training required to the new employees and the training necessary for the personnel in service (for the directors it will be useful to organise specific seminars and/or short courses or workshops). It is also important to take into account the needs for knowledge in different *subject matter disciplines* in connection with statistical needs.

## THE PREPARATION OF A PLAN FOR STATISTICAL EDUCATION AND TRAINING IN ITALY

*The organisation of public administration and official statistics in Italy, and consequences on the plan for training*

To carry out the above-mentioned kind of exercise, it is necessary to refer to the true situation and organisation both of the public administration units and of the organisation of official statistics, inside of the public administration in the involved country. In Italy, many public administration units exist at different levels - national, regional, provincial, municipal – that besides the current activities have also some different statistical or pseudo-statistical duties for collection and analysis of data. Moreover, the *National Statistical System* (SISTAN), that was established by a decree-law in 1989, includes the *Italian National Statistical Institute* (ISTAT) and the statistical offices created inside of the public administration units both at national level (in the ministries and in the national public bodies) and the territorial level (in the regions, provinces, chambers of commerce, municipalities). In the local administration units, particularly of the small municipalities, the official statistical officers frequently have other administration duties and/or the civil servants also have the official statistical duties.

As far as the training for the personnel of the above mentioned units, there are various institutions that are giving training in different fields (administration, juridical matters, economics, statistics, etc.) for the personnel of specific public administration units and public statistical offices. The most important *training units* in the field of our interest are the following:

- High School for Public Administration (SSPA), that provides training mainly of juridical-administrative type for the civil servants, particularly for directors, and has a central national unit at the government level in Rome and some units located in other provinces;
- Institute FORMEZ that provides training particularly for the personnel of the public administration units located in the south of Italy;
- Consortium FORMSTAT, established in Rome by the ISTAT, SSPA, Italian Statistical Society (SIS), FORMEZ, Training Institute of the Union of the Chambers of Commerce (Istituto Tagliacarne) and University of Rome “La Sapienza”, that is a specific public organisation for statistical training, particularly for the personnel of the units belonging to SISTAN;

but also some specific training units are organised by universities and other bodies at national and/or local level for implementing specific courses for public administration personnel.

It is important to point out that in Italy exists an impressive system of schools but, up to now, the different training units are specialised in the different fields without any co-ordination, especially in the dissemination of statistical culture and education, and there is not exchange of information on the objectives, common issues and products of the education processes.

Notwithstanding the decided changes in the management of the public administration, the main responses made by the Public Administration (P.A.) to the modernisation have essentially been technological, with the introduction of new apparatus and personal computers, without enough implementation of plans for training of the personnel towards the innovation, and particularly the statistical education.

Actually, the Ministry for Public Administration stated in 1995 that, as in all the modern countries, the training processes have a strategic role inside of the PAUs and solicited the training for:

- *directors of PA*, to let them to learn the use of statistical data for the decisions;
- *cadres*, for a correct understanding and analysis of data;
- *other civil servants*, for the collection, entry and elaboration of data.

The statement of the Ministry also specifies the statistical fields of training:

- design of surveys;
- organisation of the collected data in archives;
- choice and use of the most appropriate statistical techniques of analysis;
- evaluation of the results.

But this statement has not been implemented for many years, and the changes in the fields of training have been towards, sometimes, the management and, more often the informatics.

#### *The preparation of a strategic plan for statistical education and training*

Taking into account the explained situation, it is evident that in preparing the strategic training plan for the dissemination of statistical culture and education in Italy, some general challenges have to be faced:

- i. it is important to cause a cultural change, from a lack to a more quantitative approach and culture, as well as to implement actions to foster the dialogue among different cultures;
- ii. the statistical education and training whatever be the institution involved should be done using the same terminology and methods to guarantee quality and standard of data and the easy dialogue and discussion among the personnel of the different administration units and at the different territorial levels; therefore, it is important that the *various organisations* (national and local statistical agencies, school for public administration directors, universities, statistical society, etc.) *work together* to implement the requested training by co-ordinating their work and experiences;
- iii. the staff members of the official statistical agencies need more specific and more appropriate and deep statistical education and so it is obvious that specific training courses have to be arranged for them; however we have to consider that the staff involved in the collection and dissemination of data could and should become *intermediary spreaders* having an important role in the educational process; in fact, most of them are frequently in contact with the workers of the public administration units to organise statistical surveys or to collect administrative data to be transformed in statistical information; it is therefore obvious that their behaviour can be very important and useful for the dissemination of statistical literacy among the workers of the public administration, and it is necessary to teach them to do it adequately.

Starting from this achievement, ISTAT and FORMSTAT (Burgio 1998; Biggeri & Zuliani 1999; ISTAT 2001) consolidated their commitments and prepared and implemented a plan of training in the statistical field for the workers of the public administration, included the official statistical offices, that involve the following personnel of different institutions: Directors and Deputy Directors of the national (central) public administration units; Directors and other personnel, including statisticians, of the local administrations units at the level of municipalities; Personnel (statisticians and non-statisticians) of the Italian National Statistical System.

In the preparation of the plan, the training model has been developing significantly, in particular through the following transition phases:

- *From personnel training to the development of human resources*: this means that the value of human resources is fundamental to reach the good of the P.A. units and that the development of a single individual is based on the investments made in his/her professional life quality standards, in order to reach professional growth.
- *From training to learning*: this means to emphasise the perspective of a person who learns by considering the institution that offers the training as a fundamental (but not exhaustive) subject.

- *From learning to personnel responsibility*: this means that personnel must be addressed to consider the training as an *investment on themselves*, in order to grow in their profession and to give a sense to their professional identity. In conclusion, to find a better way to benefit from their working position.
- *From one to more training models*: training models - that's to say, the opportunities to learn - have changed, as well. User needs and ways to learn may change. Particular contents may require specific models of learning.

The definition of the training projects have been done through *programming and identification of priorities* and through the definition of *training needs by professional families*. In order to achieve quality initiatives in personnel training and to ensure a satisfactory learning process, it is necessary that all users - organisational structures and personnel - offer their significant and consistent contribution as well. Units have been invited to determine:

- ◆ Middle-term strategic aims
- ◆ Features of necessary professional profiles
- ◆ Development of competencies
- ◆ Compatibility and priorities

A consultation was open to the units of the central public administration and of the SISTAN to know their training needs. As a consequence of that, a recognition of employees' training needs has produced an overwhelming demand: *596 units* replied for a request of about *2,100 training courses*. Taking into account the limited resources available, it was decided to select the courses analysing the different training needs. We used the central concept of *professional identity* to drive the evolution and implement a quality training, in order to pass from focus on training to focus on professional identity. This concept helps to define the training needs of a unit or Department and determines the offer. The competencies necessary to carry out the different tasks have been highlighted through an analysis of the various working processes. The programming was based on a specific tool: the *matrix of learning objectives and training goals*, to grow within one's own professional identity. The matrix is obtained by combining the main working processes of each profession (knowledge, skills, attitude and professional features) with the fundamental competencies, the specific competencies and evolutionary aspects. This is how training objectives can be determined, i.e. the good questions to which the professional development must be able to give an answer. Good questions are the basis for a more effective interaction between users and training experts and a deeper understanding with the teachers and the training institution.

The analysis of requests showed that *four main training processes* were important for the development of:

- *statistical literacy and basic statistical culture*, where the former means the capacity for statistical reasoning and interpreting statistical information (Biggeri & Zuliani, 1999; Moore, 1997) and statistical education is based also on became familiar with handling statistical data; the course users should acquire the basic knowledge of the statistics in PA, the facility in dealing with numbers and quantitative problems and the importance of thinking in term of probability and variability; but also the ability to find the good sources of data for the problem under analysis and to recognise the nature and limits of statistical information in order to use them adequately; awareness of a good use of statistical information is a complex notion meaning a number of different things: understanding what is a re-definition of series, formats, definitions, understanding the importance of harmonisation; adjustment of expectation to a more adequate understanding of the pros and cons of public statistics (index numbers, rather than absolute level; data rather than comments); reliability as a typical notion of statistics and not of accounting.
- *first degree of statistical professional identity*; the aim is to develop the identity and the role of the statistician inside of the administration units that have to acquire the capability to design and conduct a statistical survey, to get and use the statistical information from data-base and data-warehouses and finally to know the main statistical tools for the analysis of data and to work with simple statistical software.

- *high level statistical profession*; the courses are devoted to staff members that already have a good knowledge of statistical methods in order to deepen specific advanced statistical methods and models for the estimation and for the analysis of data and/or to deepen fields of specific interest in their own work programs (economy, health, environment, etc.).
- *organisation and management skills*; the courses are devoted to the development of an integral capacity to plan, program, manage, control and evaluate the activities.

The common aim of the four training processes is prepare staff members that become protagonist of the process of the analysis of phenomena of interest of the unit and organisation where he/she is working to foster the policy making functions to be carried out. Each training process has to be organised in a set of different courses and the user can choice a different path of courses (specific menu) more adequate to his/her professional needs.

#### THE IMPLEMENTATION OF THE TRAINING PLAN AND THE EXPERIENCES DONE

Taking into account the impressive requests formulated by the public administration units, a phase of interpretation of demand was conducted and pointed out a list of institutional problems as well as a list of hypothesis of solutions. The executive training design has been discussed with the people responsible of the areas in which the personnel have to work. Then a lot of courses have been organised and implemented for national and local units by ISTAT and FORMSTAT for the different mentioned profiles and different levels of the recipients (directors, middle management and researchers, secretary personnel, professional families of statisticians, ICT experts, survey network operators, dissemination and communication workers, etc.).

Just to give some information ISTAT (that has about 2,500 employees in 2001) organised in 1998-2000 the following actions:

- ◆ training for human resources and organisational-institutional personnel and for managers (350 training events and 5,000 learning days were organised, for approx. 500 users of these professional areas are involved in training programmes every year).
- ◆ training for statisticians (more than 120 training sessions on methodological and interdisciplinary topics, with over 3,000 learning days and more than 150 participants per year were organised; more than 5,000 learning days on statistical methodology were organised with approx. 900 participants; approx. 300 operators – statisticians and ICT operators-are trained on statistical software every year).
- ◆ ICT training (office automation training) is offered by continuous learning methods; the operators learned at their work-place by modules of 7 or 14 weeks: therefore the personnel are trained on the job and use data referred to their daily work; about 250 employees used this methods in 2000, for a total of 750 learning days).

Particular attention was also devoted to the training of survey network operators and to the data dissemination staff that have continuous contacts with the personnel of the public administration, in order to develop their communication skills to give good statistical assistance (and general teaching) to that personnel. In fact, particularly important are the ways of disseminating current statistics and the need of integrating dissemination and communication policies, included policies of education.

In any case, in relation to the particular content of the training the traditional courses in classrooms have been supported by other opportunities as well, such as seminars, meetings, training on the job, action learning, stages, tutoring, in an environment which is rapidly improving. Development of appropriate materials, and successful programmes have been prepared. Some training programs have been disseminated by distance learning network, with a network of local tutors co-ordinated at central level. The teachers were consulting and training company experts, university professors and ISTAT researchers.

Moreover, workshops and seminars for specific workers, and stage programs have been organised. For example: for statistical staff of some municipalities, endowed by the comprehension of the importance of the statistical function in the administration units and the individualisation of training for adult and high professional staff; for directors of 25 central administrations to show the integration between the knowledge of the sector under analysis and

the sources of statistical data. A specific course has also been carried out by the SSPA devoted to the future directors, with 130 hours lectures on innovation technology and the treatment of information for programming and control. Besides, many training actions have been implemented by different training units (permanent or temporary) at the local level.

#### CONCLUDING REMARKS: MAIN CRITICAL POINTS AND SOME SOLUTIONS

The statistical training and education activities carried out in Italy have been important and gave a lot of experience, but actually the results are not as expected, especially for non-statistical personnel of the public administration units. These efforts have yielded only little improvement in the level of statistical literacy as beliefs never lasted long enough.

The *personnel of the public statistical offices* followed a lot of training activities with good results and improvement of their skills and professional capacity. However, too many courses have been conducted, especially at local level *without enough co-ordination among the different training units*. Other *critical points* are: non-stability from the administrative point of view; modification in the local governments; difficulties of interaction between the statistical offices and the other offices. It is therefore necessary to implement actions to sensitise the administrations and the mayors. In any case, a common professional culture among all of the players is the most important factor that should be nurtured.

The *personnel of the other public administration units* actually followed few training processes. The *main general problem* is that training actions disjointed by a strategic engagement of the high level directors are partial or can be circumstances where there are disconnection and incoherent fulfilment. It is necessary that the training actions be joined with actions in different fields which have to be carried out by the directors (for example, stressing the importance of quantitative analysis in the working processes and on the use of statistical data and analysis in preparing the reports).

*Other problems* must be related to the growing national official system, to the institutional variability due to the recent reform process of civil administration, to the frequent change of role and responsibility of civil servants, to wide perception of marginality of statisticians in civil administration.

Solutions could be scouted in planning - necessarily in co-operation and inside the SSPA - in training paths with the aim of strengthening professional skills, in emphasising the role of statistics and of the statisticians, in planning and controlling within the civil administration the definition of the aims. Other interesting actions to be conducted could be, as in other countries: education of the politicians by workshops for national and regional assembly members; statistical appreciation seminars held for top chief executives and for ministers and permanent secretaries; wide dissemination of the main statistical products to the above mentioned persons.

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