

ACADEMIC VERSUS APPLIED TRAINING IN STATISTICS: APPROACHES USED BY THE U.S. BUREAU OF THE CENSUS

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1. The Role of Census Bureau Statistical Training Programs

A major role of training programs such as those conducted by the International Statistical Programs Center (ISPC) at the U.S. Bureau of the Census, is to fill in the gaps, both real and perceived, between those theoretical courses taught at most universities (or other institutions of higher learning) and the overall, more general topics of data collection and statistical methodology needed to operate effectively as a statistician in a government agency. There is a great difference between solving statistical problems as presented in textbooks and those that arise in the "real world", particularly in developing countries. In addition to devoting time to the practical aspects of topics which are included in some university sampling courses, ISPC's training programs also include courses on the more general phases of a survey or census. Each of ISPC's three training programs culminates (or will eventually culminate) with an actual survey (usually of several hundred housing units), in which participants have the responsibility of planning for and executing all phases of the operation.

2. The International Training Program

The international training program of the Bureau was established 40 years ago. From the beginning, its main goal was to impart practical skills needed by statisticians and data processing specialists in statistically less developed countries. The Bureau's training program emphasizes not only the practical aspects of conducting surveys and censuses, but also presents theory and principles as a basis for making decisions. By teaching basic analytical and problem-solving skills, the program enables participants to apply what they learn in the United States to the work they do in their own countries. Several different approaches are used to combine practical applications and theory in the Bureau's international training program: (1) linking of training and in-country technical assistance, (2) use of the case study workshop approach, (3) carrying out a demonstration survey as the culmination of the training, and (4) offering of joint ISPC-university master's degree programs.

2.1. Linking of Training to In-Country Technical Assistance

When the international program of the Bureau was formally established in 1946, its goals were: (1) to provide technical assistance to officials of developing countries in taking censuses, (2) to train personnel from developing country statistical offices, and (3) to assist in the integration of cen-

sus statistics into the regular statistical programs of the developing nations.

Training can be seen as the central element in an integrated assistance program. In setting up training, ISPC first identifies the specific needs to be met. Ideally, this involves the participant, his or her supervisor, and the sponsoring agency. Long- and short-term technical advisors can also help to determine with some specificity and precision what a country's level of statistical development is and what training is needed to enable it to advance. Training can then be arranged to meet these requirements.

It is crucial to follow-up on training. Former ISPC participants constitute a network of contacts for technical assistance initiatives of ISPC and other agencies. By working together, they help the graduate apply to practical problems the skills he or she acquires at ISPC. By evaluating the counterpart's capabilities on the job, the technical advisor can provide feedback enabling the training staff to improve the effectiveness of training given to future participants. In-country follow-up is also important because, through it, the training staff can determine how relevant the training was to the duties assigned to the participant when he or she returns home.

2.2 The Case Study Workshop Approach

The term "case study" refers to a model adopted in the mid-1960's to provide a detailed, step-by-step exposition of procedures for conducting surveys and censuses. For each of the ISPC case studies, a mythical country has been created. The national statistical office of the country is assumed to be in the process of planning a survey or census. Procedural guidelines, questionnaires, tables, sampling and data processing plans, and training guides are illustrated. The case study manuals describe how each of the problems faced in planning and implementing a particular statistical activity are solved from a particular, consistent point of view. Participants are encouraged to solve similar problems by adapting the lessons of the case study to their own situations.

Many times these workshops are linked to other technical assistance provided to the country in preparation for an upcoming census or survey. The outcome of one of these workshops may be a preliminary questionnaire, an interviewer reference manual, or a data processing system design.

Staff of the long-term training program are occasionally asked to serve as instructors for portions of these workshops which deal with their area of specialization. This is beneficial for two reasons. First, it provides the instructor an opportunity to experience the physical and cultural conditions which prevail in a particular developing country; enabling the instructor to better understand and deal with problems a participant from that country may experience when he or she comes to the U.S. for training. Secondly, it affords yet another opportunity for follow-up with former ISPC participants.

2.3 Demonstration Surveys

Demonstration survey field exercises can be seen as the ultimate embodiment of the principle of learning by doing. This activity involves participants in all stages of planning, preparing for, and implementing a small-scale survey. Each year since 1969, ISPC has done a demonstration survey as the culmination of its 1-year training program. These have been carried out in various counties in central Pennsylvania. It should be emphasized that ISPC does not assume that the lessons learned in doing a survey in a semi-rural area of the U.S. exactly model conditions participants will face in their own countries, but the practical lessons learned are directly applicable in another sense. The experiential learning of the analytical and problem-solving skills used by the participants in doing their demonstration survey equip them to use the same skills when they must cope with the problems of designing and implementing a survey in their own countries.

2.4 Combined Degree Programs

In 1976, ISPC established the first of its joint master's degree programs with a university. The Social and Economic Statistics Degree Program enables a qualified candidate to combine his or her participation in one of the 1-year diploma specializations offered by ISPC with courses offered by the Graduate School of The George Washington University. At the end of a 16-month period of study he or she can earn a Master of Science in Social and Economic Statistics from The George Washington University (as well as a diploma from ISPC).

Combined degree programs truly incorporate practical, experiential training with theoretical, academic education. Participation in the master's degree program in no way diminishes the objectives of the ISPC program, since the degree candidate takes the full curriculum offered in his or her area of specialization. In addition, the Social and Economic Statistics Degree Program includes university courses in management and staff development, statistical methods and sampling, and economic and social development.

Since 1976, ISPC has instituted two additional combined degree programs – a Demography Degree Program with Georgetown University and a Management Information Systems Degree Program with The George Washington University. These and other ISPC training programs are described in the ISPC training booklet which is published annually (e.g., Bureau of the Census, 1986a).

3. ESAYTEC - Origin and Program Description

The Bureau is now launching a new program to provide Spanish-language training specifically aimed at the needs of the Latin American countries. This new program is referred to as ESAYTEC, which is the Spanish acronym for School for Applied Statistics and Data Processing Technology (Escuela de Estadística Aplicada y Técnicas de Computación).

The statistical training needs of most Latin American countries differs somewhat from those of most countries in Africa and Asia. Therefore, ESAYTEC's training program will have a different focus than the English-language program, concentrating mainly on courses and workshops designed to teach statisticians how to facilitate user access to their data products and to train users how to better define data needs and to analyze data effectively. A detailed description of the training program is published annually (e.g., Bureau of the Census, 1986b).

4. PSDP - Origin and Program Description

Recruiting and retaining top-notch professionals is a challenging task in today's competitive marketplace in the United States. The Professional Skills Development Program (PSDP) is a new, innovative program designed to meet this challenge. As a side benefit, newly hired professionals will be ready much more quickly to contribute to the multitude of tasks that face a statistical organization such as the Bureau of the Census.

Modelled in part on the Bureau's international training program, the program covers basic census and survey concepts, and culminates with a demonstration survey. However, since PSDP participants are employees of the Bureau, emphasis is placed on methods for conducting surveys in the U.S. rather than in developing countries.

5. Summary

The goal of ISPC training programs (both international and domestic) has been, and will continue to be to promote personal and organizational statistical development by equipping statisticians and data processing specialists with the practical skills and conceptual background to enable them to adapt the latest technologies to the circumstances and needs of their countries or organizations. As the development needs of members of the world statistical community change, as new technologies emerge, and as new instructional methods become feasible, the ISPC training programs must continue to adapt to these challenges and opportunities.

6. Recommended Reading

Bryson, K.R. (1979). The contributions which international statistical training centers can make to the development of national household survey capabilities. Paper presented at the Fourth Meeting of Directors of International Statistical Training Centers, Rabat, Morocco.

Kindel, K.K. (1985). International training at the U.S. Bureau of the Census: An insider's view. U.S. Bureau of the Census.

Linder, F.E. (1952). Important elements in an effective international training programme in statistics. Estadistica, 36, 387-395.

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