

THE UNITED STATES OFFICE OF EDUCATION STATISTICAL PROGRAM

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From the standpoint of sheer numbers alone, the magnitude of the Nation's educational program is overwhelming. In the Nation more than 45 million people, or more than one person in every four is either attending some type of school or is engaged in supporting activities. Education is a multibillion dollar business with a huge investment in staff, plant and equipment. Because of the importance of education, the volume of quantitative data that should be collected, analyzed, and interpreted in order to understand and improve the system is enormous. When the need for qualitative data is superimposed upon the need for quantitative data, the total volume of required information begins to defy comprehension.

This brief introduction to a potential statistical program in education indicates that the subject of this paper and its implications for education should be of vital interest to all of us. The current status of our educational system, its problems already defined or requiring definition, the research leading to a better understanding of these problems, and the recent developments and trends in education are all items of far-reaching implications for our future. They are also items provoking statistical inquiry at all levels of responsibility--Federal, State, and local.

The United States Office of Education and in particular the Educational Statistics Branch, with which I have recently become associated, has primary responsibility for the Federal statistical program in the field of education. This is a responsibility beset with many challenges for its proper fulfillment.

During this critical period when our Office must assume an ever-increasing leadership role in education, we face many problems in our statistical program. How well has this program been designed to meet nationwide needs? Does it accord with our 1867 mandate ... "to collect statistics and facts showing the condition and progress of education ..."? Does it meet administrative operating program needs of the Office itself as well as those of other Federal agencies and of private and public institutions? What is the best way to ascertain the magnitude and nature of these needs? How can we determine the priorities of these needs? How can we best unify and coordinate the program?

What personnel and machine resources do we need? How should we organize these resources? Should we develop a functional or a subject-matter approach in the assignment of responsibilities? Centralized or a decentralized approach?

From whom and from what records shall data be obtained? By what means? What can be done to develop and foster the acceptance of uniform

definitions? What is the best way to encourage the establishment of uniform and efficient record systems among suppliers of data? What is the optimum utilization of sampling techniques?

How can data best be verified and processed? What about the non-response problem, especially since most of our surveys need to depend on mail questionnaires? What level of analysis should be applied to the data before publication? What preliminary, tentative, or partial findings should be released?

How can desires and needs of users of data be ascertained with respect to content and manner of presentation? How can the format of our presentations be improved? How can we assure ourselves of rapid and appropriate distribution to those who need the data most?

If we do not satisfactorily answer these and many similar questions in order to become fully aware of the status of education and the magnitude and nature of emerging problems, a national crisis in education may come upon us for which we will be unprepared.

Before proceeding to describe briefly what we have done to answer many of the above questions and what we plan to do in the future, it would appear desirable to make several observations. First, we must recognize the many statistical attainments of the Office of Education. It has served the Nation well for many years. It has developed several series of publications which furnish multipurpose statistics in some of the most important fields of education. For many years the best known of these was the Biennial Survey of Education. More recently, other publications such as those concerning degrees and opening fall enrollment, have also become widely accepted and utilized. These series, combined with several special purpose studies, have provided basic statistics concerning education from the kindergarten through the graduate level.

Second, it is necessary to observe that the U. S. Office of Education is an agency with diverse and broad functions involving many ongoing statistical and operating programs. These functions must be continued uninterruptedly while administrative and technical improvements are made in the statistical and research programs. Other responsibilities involve the administration of grant programs and the performance of vital advisory, legislative, and policy-making functions.

The Office of Education is proud of the fact that it has developed a very high level of rapport with respondents to its questionnaires and has achieved some excellent response rates in a purely voluntary reporting structure.

Without the utmost cooperation of local and State school officials and of responsible personnel in institutions of higher education, we could not have been successful in obtaining valid and reliable data in many sectors of education. Through personal visitation of staff members, this level of rapport is constantly being safeguarded and enhanced.

In verifying and processing returns, personnel in the Office of Education have exercised exceptional care. Careful checks are made for internal consistency. Comparisons are made with previous returns and with a wide variety of available documents. Significant discrepancies are checked with respondents by means of letters, telegrams, telephone conversations, and, wherever feasible, personal visitations. A very well organized follow-up system has also been developed.

We are constantly mindful of the advantages of sampling and are expanding the utilization of samples for many studies. Just recently, our sole mathematical statistician reported that he had worked on 10 different projects involving sampling theory and techniques during the past month. We have also developed or obtained several directories which serve as universes for sampling. Typical of these are the universes of approximately 40,000 school districts and 25,000 public secondary day schools. We are planning to improve and extend our sampling techniques by utilizing the findings from completed studies and from "Project Talent" which is being carried on by the American Institute for Research and partially supported through the Cooperative Research Branch of the Office of Education. We are also planning to develop universe distributions and parameters to aid in our future sample designs.

As many of you are aware, the Educational Statistics Branch conducts many recurring general-purpose statistical surveys of a cross-sectional nature. Recently it has also completed two depth studies concerning beginning teachers and teacher turnover which we hope may become longitudinal. In addition to these functions, the Branch provides statistical and research advisory services and editing and processing operating services for educational specialists in other divisions of the Office who conduct studies. Recent acquisitions to our staff and some reassignment of functions have enabled us to strengthen both of these services. By developing better understandings and closer relationships between these specialists and the statistical personnel in our Branch, we are becoming more rigorous in the application of statistical standards and in extending the principles of sound research design throughout the Office. Much remains to be done, since our research needs have expanded rapidly and statistical services need to be strengthened similarly.

Fortunately we have also recently strengthened the quality of our staff by employing statisticians well versed in the field of

sociology and economics. These individuals are already improving the quality of our products in the Reference, Estimates, and Projections Section. The most recent addition to the staff of the Educational Statistics Branch is our assistant director who is here today. He is a most competent analytical, survey, and mathematical statistician who has had many years of sample survey experience as Chief of the Statistics Branch for the Bureau of Old-Age and Survivors Insurance, Social Security Administration.

Many of the questions posed earlier in this paper remain unanswered. Some have been only partially answered. We must continually strive for a more unified program which eliminates overlaps, reduces the volume of questionnaires, and fills the major gaps. We must develop greater awareness for uniformly high standards of quality by means of inservice training and the establishment of standard operating procedures. Our data, in addition to being analyzed and interpreted in greater depth, must be made available in a form most appropriate to users, with less delay than at present, and with a fuller explanation of their nature and qualifications.

At this point some of you will perhaps be interested in more definite facts about the size of the Office's current statistical program. In the fiscal year ending last June about 50 different statistical surveys, both of a recurring and special type, were processed. This number represented an increase of about one-fourth in our survey volume in the last two years. Owing to the expansion of the Office's specialist staff as a result of new programs begun under the National Defense Education Act of 1958 and other recent legislation, the number of statistical surveys is rapidly increasing. More than 80 survey instruments are expected to be approved during the present fiscal year. Proposed surveys for fiscal year 1962 indicate that the 1961 load will continue and that the average size of the individual survey will expand.

The problem being created by the magnitude of this workload becomes very significant when one considers the small professional staff of the Educational Statistics Branch. Presently the staff consists of about 30 professional members including administrative personnel, only a few of whom are professional statisticians. Materialization of our plans to strengthen the mathematical statistical staff, we hope, will alleviate our problem of keeping pace with the increased demand for educational statistics.

The net result of the above expansion will inevitably be to require a new level of statistical operation not contemplated in the Office a few years ago. Consequently, the Office is presently studying the feasibility of making a radical change in the approach to compiling educational statistics. This plan envisages the collection initially of "basic" items concerning education through an organized system

of data flow. This will include data on students and pupils, faculty members, school and school districts, and institutions of higher education. We hope that these items will create in the U. S. Office of Education a permanent "Bank of Information" that will eventually contain a large number of essential facts about education. By utilizing modern computer capabilities and performing "automatic data processing" we will be able to produce statistical interrelationships never before possible under our present system of questionnaire studies which normally ask for derived data. Time permits but a very limited discussion of the potentialities of this system. As statisticians you can readily visualize the kind of data that could be produced regarding staffing the institutions of higher education in our Nation if you had such basic items as sex, marital status, rank, birthdate, title, highest degree held, salary, major and minor field of preparation, workload, subjects taught, and length of service for every faculty member or even for a sample. Then too, consider the rosters and mailing lists that could be produced rapidly through ADP processing. This system, we hope also will provide almost unlimited possibilities for the storage and retrieval of such types

of educational information as the titles, authors, and abstracts of research in education. There is also much to be done in the field of investigation, for at present it is only on the drafting board.

We are not certain that the educational profession appreciates the need for statistics that can be generalized to the Nation as a whole, since many of our past data collections have been on specific localized problems. Most data that are gathered by associations and institutions tend to be highly oriented toward specific needs. It is our hope that the "basic items" approach will supply data which will make many generalizations possible.

The U. S. Office of Education has set in motion a strong effort to improve its statistical program, in fuller use of sampling, via ADP processing and in modern statistical standards. We will welcome your suggestions during the discussion period of this meeting or at any other time. We hope that many of you will be able to visit our office in Washington. We would like the opportunity of having each of you personally see our operation and meet our staff.