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Session 1: Statistical literacy

Statistics in Schools: Using Real Life Data to Increase Statistical Literacy Among Students

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INTRODUCTION

The Census Bureau has long understood the importance of emphasizing the value of statistics through educational projects that target elementary and secondary students. Census in Schools was established primarily as a means to reach, educate, and mobilize educators, students and families in support of the decennial censuses. This outreach has grown extensively over the past 60 years.

Throughout the program's iterations, the common belief was children would openly share information that they believed no one else had heard about, especially a parent or guardian. Their sharing of this information among their families and friends would result in increased participation and response rates to the decennial census. As these children became adults and parents themselves, they also would value their earlier knowledge and participation in censuses and surveys.

The evolution of this program has provided the Census Bureau with the opportunity to turn this amazing decennial program into one that provides educators, students, and families with an

understanding of the relevance and importance of the Census in their daily lives. As a means of improving statistical literacy of students and demonstrating the applicability and utility of statistics and statistical concepts in educational activities, it was imperative that this become a continuous program instead of resurrector only to promote a decennial census. As a result, Statistics in Schools was developed.

Statistics in Schools focuses on expanding statistical literacy by providing free dynamic standards-based content, including math and history, using activities with real life Census Bureau data. These activities align to the Common Core State Standards, an initiative in the United States that details what K-12 students should know in English and mathematics at the end of each grade. Approximately 20% of the Common Core curriculum for math in Grades 6-12 aligns directly to statistics, providing a unique opportunity for the U.S. Census Bureau to leverage its vast collection of statistical data.

By increasing statistical literacy among school-aged youth, we help to cultivate a generation that are more likely to further their studies in statistics, work in statistical-related fields, and participate in Census Bureau surveys and censuses, as well as, other Federal surveys. Additionally, we increase the Census Bureau's brand recognition and improve the public's familiarity with the work of the organization.

BACKGROUND

For the 1950 Census, the Census Bureau, in cooperation with the National Education Association (NEA) prepared a booklet entitled *We Count in 1950* that was disseminated to teachers so that they could familiarize students with the census process and stress the importance of the census as a civic duty. This was the beginning of the Bureau's efforts to educate students and promote participation in the census through schools.

Efforts for the 1960 Census included an agreement by several publishers to include a series of articles about the 1960 Census. Publications by Scholastic Magazine, Inc., the American Education Publications, the Civic Education Service, and the National Education Association were just a few.

The 1970 Census provided the opportunity for a larger effort, which included educational materials and the distribution of limited promotional items. Outreach to educators involved the dissemination to schools of *Census Data For Community Action*, a publication demonstrating the use of housing and population data in the development of community action projects. A prototype mini-lesson was used in some school systems during the census, and then again during the local test censuses later in the decade leading up to the 1980 Census. This prototype was developed by the Census Bureau and was limited in subject content. Also, for the first time, particular attention was given to content that appealed to Spanish-speaking and African-American audiences. Census Bureau field representatives were instrumental in the distribution of five million flyers and several hundred thousand lapel buttons to school children.

In 1980, we stepped it up a notch by producing Census 80, a multi-faceted effort to reach educators. This plan included several activities:

- The College Curriculum Support Project (CCSP). In 1977 and 1978, the CCSP published a single-issue 35-page newsletter, "*Updates*", and in 1980 increased the "*Updates*" to three issues annually, adding two special feature sections containing curriculum resources on topics of current interest;
- *Continuing the Fact Finder Tradition*. This booklet, that focused on the use of 1980 census data, was designed for use in experimental undergraduate programs;
- *Product Primers*. This was a series of booklets that introduced Census Bureau data products that could be used in classroom projects;
- "*Newsletter*". This communication highlighted new Census products that contained information useful for educators.

This was also the first time the Census Bureau contracted with a firm of professional educators with specific skills in writing curricula. The census was treated extensively in the materials, distribution was widespread, and materials were developed for grades 4-12, with graduated difficulty and sophistication.

In preparation for the 1990 Bicentennial Census, the Census Bureau began an earlier and more extensive outreach program to the educational community, focusing on elementary school through college. To improve the quality of the intended products, and to gain support from the educational community, the Bureau sent a prototype kit to several educators requesting feed back and indicating a planned national distribution of the revised kit in 1990.

In March, 1989, the Census Bureau officially kicked off its 1990 Census Education Project by sending a letter and order form to school administrators announcing the revised kit, which included the following:

- Ten challenging instructional activities for K-12 teachers in social studies, mathematics, science, and language arts;
- Professionally prepared worksheets;
- Procedural notes;
- Background Census information;
- Glossary;
- Samples of past and current census data;
- Pre- and Post-Census Day announcements in English and Spanish, for duplication to be sent to parents

A total of 224,000 kits were distributed.

Also sent was an eight-page supplement to the kit, "Educator's Guide to the '90 Census," which included teacher notes with extension activities. The National Council of Teachers of Social Studies devoted the November/December 1989 issue of their "*Social Education*" magazine to the 1990 Census. The publication included articles, lesson plans, maps, charts, graphs, and resources. Scholastic, Inc. devoted the January 1990 issue of their nationally circulated classroom student magazine, *Scholastic*, to the Census and included informational articles, maps, charts, graphs, and fun activities in math, civics, language arts, and geography.

Prior to the 2000 Census, the Census in Schools (CIS) office conducted an expansive outreach program that reached the broadest-ever audience of educators and students, ethnic and geographic audiences, and pre-school through adult learners. CIS was designed to provide educators with the tools to bring the census to life for students and to explain the importance and benefits of the census. The Census Bureau contracted with Scholastic, Inc. to assist in the development of the kits, packaging and distribution strategy for the materials. Core materials were prepared for nearly two million educators in public, private, tribal and parochial schools, using national professional standards and goals, and focusing on math, social studies, and language arts skills. The CIS program materials included:

- Grade-specific teaching kits for U.S. Teachers: K-4, 5-8, 9-12;
- Cultural and language-specific teaching kits for Puerto Rico, the U.S. Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, and Guam;
- Kits for each principal in the U.S. Puerto Rico, and the Island Areas;
- Two newsletters for U. S. educators
- Teaching kits (200,000) for instructors of Adult Literacy and Adult English as a Second Language;
- A teaching package for each Head Start Center in the U.S. and Puerto Rico (available in English and Spanish)
- *Everybody Counts*, a set of materials for very young children that included a large, colorful read-aloud book, a set of black and white coloring books, a teacher guide, and an audiotape;
- Take-home materials for each K-8 student in the U.S., Puerto Rico, and all students in the Island Areas;
- Take-home activities (45 million) encouraging census participation distributed to students to share with their families;

Additionally, CIS developed partnerships with 23 national educational associations and government agencies, which resulted in convention endorsements, articles in professional journals, website links to Census, and more. The week of February 21-25, 2000 was designated as "Census in Schools Week" and members of Congress visited schools in support of the CIS

efforts. The week of March 13-17, 2000 was designated as “Teach Census Week”, whereby an emphasis was placed on the use of CIS materials.

The 2000 Census was the first time the Census Bureau had used the internet to distribute information and paid advertising to promote participation in the decennial census. CIS benefitted greatly from the increased awareness generated by the advertising effort. As such, CIS was an integral part of the shift in a decades-long downturn of the response rate, resulting in positive movement of the response rate and one of the most successful censuses in history.

Census in Schools, for the 2010 Census, was modified/revised/updated based upon lessons learned from the 2000 Census. Census continued the work it had begun with Scholastic, creating a scalable program that could quickly, and easily, adapt to changes in funding.

What was different? A focused “top down” outreach and marketing strategy anchored the CIS program. The majority of CIS materials were mailed to principals based on knowledge that they would disseminate limited supplies of printed works to the most appropriate educators within the school building; promote usage; and advocate participation in the 2010 Census across the entire school community.

Concurrently, a complementary digital “bottom up” campaign was executed to reach a broader audience of teachers and specialty educators (topic-specific teachers, department chairs, librarians, etc.) on a mass basis. Printed materials were delivered to reach all K-8 and 9-12 students in the 50 states, Washington, D.C., and in Puerto Rico (in Spanish), as well as students in grades K-8 in the Island Areas.

Additional print outreach was conducted to district-level superintendents, K-8 English Language Learners (ELL), English as a Second Language (ESL) students, Pre-K students, students in grades 5-8 via

the Diversity Program, and children attending any CIS promotional events.

EVOLUTION OF STATISTICS IN SCHOOLS

Based on the success of the 2010 Census in Schools program, the Census Bureau decided to proceed with establishing a decade-long program that would build upon all of the educational programs conducted during the previous decennial censuses. Since this would be an “evergreen” program and would place more focus on improving statistical literacy, the name was changed to Statistics in Schools (SIS). The goals of this program are:

- 1) Educate the public, specifically by improving the statistical literacy of students;
- 2) Demonstrate the applicability and utility of statistics and statistical concepts in educational activities;
- 3) Increase the Census Bureau’s brand recognition;
- 4) Improve the public’s familiarity with the work of the Census Bureau; and

5) Encourage public cooperation in Census Bureau surveys and censuses.

By expanding on the accomplishments made through the previous Census Education programs, the Census Bureau can provide statistical literacy education and outreach from kindergarten to the post-secondary educational level during non-decennial years. This will increase the Census Bureau's brand recognition and familiarity with its work, improve survey response, and ensure the Census Bureau is in a better position to market this program during the 2020 Census and beyond.

A successful program would help alleviate the costs associated with “ramping up” a similar program for the next census, capitalize on what would have been “lost opportunities” for ongoing outreach and support of current Census Bureau programs, and realize the benefits of the Census Bureau’s presence in K-12 schools across the nation.

The SIS program works with staff from all directorates across the Bureau to ensure all programs have the opportunity to be actively involved and positively impacted. Staff also coordinates local implementation through interfacing with the Bureau’s regional staff. This interactive aspect ensures the content is dynamic and includes current data to meet the needs of local educators. Additionally, relationships with the educational community will be built and maintained on a continual basis.

Scalability is extremely important, as this program will grow during the decennial timeframe. Incremental spending across the decade to promote all that we do versus the large outlay of funding specifically to support the decennial census, a singular event, is not only common sense, but much more palatable in the public spending arena. This approach spreads the funding over the ten year cycle.

The SIS program will provide a channel for the continual marketing, outreach and support of current and future Census Bureau products and services. As a marketing tool for census surveys and data products, it provides a permanent dedicated vehicle for promoting and communicating statistical data to users and stakeholders. This ensures that the Census Bureau is cultivating an audience that will be accustomed to both the program platform and the subject matter delivered, thus leading to greater participation in the program overall.

The emerging workforce will not only attain improved literacy in statistical methods, but also will be familiar with particular issues and challenges facing both the Census Bureau and the nation. The program provides a tool for educators to stimulate and revive a lagging interest in math and the sciences by making statistics interactive and engaging – allowing students to explore the relationships between census data and the world in which they live.

The Statistics in Schools program will support the educational system’s goals of providing national standards-based lesson plans focused on advancing scientific knowledge as well as the practical and technological skills sets. Through different educational delivery platforms (i.e.

traditional lesson plans, interactive learning modules, state of the art computer games, webinars, etc.) students and teachers can learn of the types of data available and how data can be used in the classroom and at home.

Students and educators will both learn skills to design and implement surveys. Each gains a greater insight into the importance and use of data in their daily life and in their communities. Both students and teachers build upon their computer skills by utilizing current and future technology which target different styles of learning. The program produces younger data users. Through an ongoing program, students gain greater understanding and appreciation of statistics, geography, math, survey methodology, computer modeling, and economics.

The Census Bureau will gain wider public exposure of its' programs and data products through this program, as well as further promoting itself as the leading source of quality data about the nation's people and economy. By virtue of its presence within the educational landscape, the Census Bureau, through its website, will encourage the public to research and use the many data web tools it develops, such as American Fact Finder (AFF), Local Employment Dynamics (LED), on-line mapping tools like TIGER, mobile apps like America's Economy and Dwellr, and a host of interactive maps.

CONCLUSION

Establishing a long-term relationship with students that makes both the use of surveys and data routine will increase the likelihood of adult participation in surveys and censuses. The Statistics in Schools program will replicate and improve upon the 2010 Census in Schools program's success in reaching hard-to-count populations across the country. It will also provide the Census Bureau with a means to network and develop partnerships with a host of other federal agencies, education associations/organizations, and other countries who disseminate data and education information to educators and students.

Success of the program will be measured based on usage of activities, website metrics, number of active partnerships within the educational community, and feedback on activities and website from teachers and administrators. This is an ongoing and iterative project, which will build upon lessons learned at every stage.