

Executive Summary of Summer I Evaluation Study
Project SEED (1968-1994)
July 1996

Introduction. The purpose of the Project SEED Evaluation Report is to provide the American Chemical Society with an analysis of the impact of Project SEED from 1968 through 1994. This evaluation was conducted by PS International, an independent company located in Annapolis, MD. The project began in March 1995 and was completed in July 1996. The report is based on four major sources of data: 1) survey of former Project SEED students; 2) indepth interviews with 10 selected SEED students; 3) non-respondent student survey (validity check); and 4) survey of Project SEED mentors. The methodology and results for each of these four areas is briefly summarized here. The full written report includes complete analyses, statistical graphs and tables, as well as transcripts of narrative survey comments and interviews.

Students. Former Project SEED students were located by matching social security numbers from ACS records to a national database maintained by TRW Corporation. The 1,678 social security numbers resulted in 813 associated addresses, for a 48.5% hit rate. TRW described this hit rate as remarkable, where hit rates are typically between 8% and 10%. Preliminary strategies for locating Project SEED participants included direct phone contact using directory assistance, and a 1995 "Select-Phone" database from ProCD with 80 million names and address.

Standard survey practices were followed. Student surveys were mailed out in November 1995 with a postcard reminder in December 1995. In addition to this standard follow-up postcard, PS International conducted a second complete mailing to non-respondents in January, 1996. Three hundred and ninety-seven student surveys were returned. When "non-deliverable" surveys are subtracted out of the counts, a final response rate of 49% was achieved. This excellent return rate of 49% across the 26 year program as well as the non-respondent survey ensures that the data yields meaningful and unbiased results.

The results from the 397 returned surveys yielded strong evidence of the positive impact of Project SEED. First, 67% of the sample reported that their college major was in the sciences (including medicine, nursing, biology, psychiatry, pharmacology and computer science.) Second, the attitude subscales registered a positive attitude, particularly toward Project SEED itself. That is, when the attitude data was examined relative to three subscales, (Project SEED itself; Activities; Mentors), the first subscale (i.e., Project SEED) registered the most positive opinion (just below 4.0 on a 5 point scale) whereas the third

subscale (i.e., Mentors) registered a relatively lower opinion (just above 3.0). Further substantiating these results is the finding that 91% of the responses from the non-respondent survey rated Project SEED as good or excellent.

The survey sample of 397 participants was half female. Sixty-one percent fell into the minority category (i.e., non-White). Slightly more than half (i.e., 55%) of the surveys came from the *later years* cohort, 37% from the *middle years* cohort, and the remaining 8% from the *early years* group. This return rate across the cross-sectional division was proportional to the original distribution based on obtained addresses. The predominant educational level achieved by participants was the Bachelors degree (63%), with the Masters degree next at 12.6%. Finally, approximately half of the sample engages in science related reading or viewing activities (i.e., once a week or more).

The narrative data from the student surveys supported the finding that participants thought highly of Project SEED itself. Despite several mentor related issues (e.g., not available to help student), the narrative data was overwhelmingly positive. For example:

“Above all, what I remember most was what the experience as a whole meant to me as a Black youth from the inner city: 1) employment; and 2) a chance to see something different. What I received was an experience exceeding my expectations, made possible by an environment in which I worked with first-rate people who grew to be my friends.”
(Year: 1983)

“The biggest influence Project SEED has made upon me has to do with my personal views and insights regarding myself and life in general. ... It helped me. It gave me an inner intensity that has kept me with a burning desire to succeed and accomplish.” (Year: 1969)

Several themes emerged from the student narrative and interview records: 1) Project SEED as a program; 2) SEED activities (e.g., lab work); 3) mentors; 4) career decisions; 5) women in science; 6) self-esteem, particularly during the high school years; and 7) communication. Project SEED itself got consistently excellent comments: *“With this experience I learned how much fun it would be to go to college and how much fun learning about science can be”*, (1969). The day-to-day SEED lab activities were often mentioned as helping provide a sense of the scientific method and a realistic view of science. Mentors got a generally positive but mixed review, with some participants describing a need to see mentors more frequently. Participants spoke directly about Project SEED’s influence on career decisions: *“The biggest influence of Project SEED was on my career decision in being a Pharmacist”*, (1971). For several participants, the summer internship was the first time that they had seen women in science. Many

discussed SEED's positive impact on confidence and self esteem during a time (i.e., high school) of self doubt. Finally, the issue of communications emerged in which former participants sought ways to keep in touch over the years with others from Project SEED.

Success Stories. Ten former Project SEED students were selected for an extensive phone interview. Cases were selected on the basis of success in career, where the definition of success was not limited to a professional career in chemistry or science in general. The interview questions were distributed across three topic areas: 1) high school years and personal development; 2) early career; 3) current career. Two major findings which emerged from these case studies were the impact of Project SEED on self esteem and the impact of Project SEED on the use of scientific thinking in and out of the laboratory.

Non-respondent Survey. Four hundred forty-four non-responding former SEED students were surveyed with a four question postcard. Seventy-one postcards were returned (a 16% return rate). These "non-respondents" rated Project SEED as *excellent* (44.6%), *good* (46.2%), *fair* (7.6%) and *poor* (1.5%).

Mentors. In the final major data area, 160 mentors were surveyed, where 120 names were randomly selected from existing ACS data listings for the years 1992 through 1995, and the remaining 40 (25%) were selected from PS International's mentor database. Surveys were mailed in April 1996, with two postcard reminders. Fifty-three surveys were returned yielding a 33% return rate.

A majority (81.1%) of the 53 mentors were from the later years only (i.e., 1988 through 1994). Most mentors were White (78%) while 12% were African American, 6% Asian and 4% Hispanics. Mentors were at universities (87%) and the rest were approximately equally divided between government and industry settings.

Mentors felt that major aspects of Project SEED met, or exceeded their expectations (percentage range: 75.5% to 90.5%). The mentor survey narratives showed an appreciation for the opportunity to work with young people: *"It has been very rewarding to see young people grow scientifically, but more importantly develop self-confidence and maturity."* Fifty-five percent of the mentors mentioned funding. For example, *"...it is important that the student stipends be increased to match other programs of this type and to be consistent with industry standards as they pertain to high school students who are regularly employed by our institutions during the summer"*. Also, some mentors mentioned the need for follow-up meetings or newsletters.

The Project SEED Evaluation Report provides further details for each of the four major data areas. The report concludes with several recommendations.