

The following are reduced versions of the overheads used in Dr. Shakashiri's presentation:

### **NATIONAL GOAL**

By the year 2000, U.S. Students will be  
First in the world in mathematics  
and science achievement.

### **COMPONENTS OF CHANGE AND REFORM**

Content

Staff & Staffing

Conditions for Learning

Governance

Resources

### **NATIONAL STRATEGY**

Goals

Standards

**NATIONAL GOALS**

Student Achievement

Teacher Qualifications

Environment for Learning

Quality of Curriculum

Effectiveness of Curriculum

**NATIONAL STANDARDS**

Establish at each grade level in  
pursuit of national goals

**RESEARCH UNIVERSITIES**

**COMPREHENSIVE UNIVERSITIES**

**FOUR-YEAR COLLEGES**

**TWO-YEAR COLLEGES**

**PRIVATE SECTOR**

**STATES**

**SCHOOL SYSTEMS**

**GOVERNORS**

**NATIONAL GOVERNORS' ASSOCIATION**

**EDUCATION COMMISSION OF THE STATES**

**STATE EDUCATIONAL AGENCIES**

- Chief State School Officers
- Boards of Higher Education

**URBAN SCHOOL SUPERINTENDENTS**

**OTHER PLAYERS**

States

School systems

Communities and Parents

Rich Source Institutions

Teacher Sources

Human Service Agencies

National Resource Organizations

**NSF'S STRATEGIC ROLE**

Science Literacy for All Students

Best Preparation for Careers

Increase Representation

Support Experimentation

Generate Change

Assist Implementation

MATH

HEALTH

ENVIRONMENT

Mathematics cuts across all

disciplines and all levels of

education

NCTM Standards

"Everybody Counts"

HUMAN BIOLOGY

NUTRITION

DRUG EDUCATION

Physical Sciences

Biological Sciences

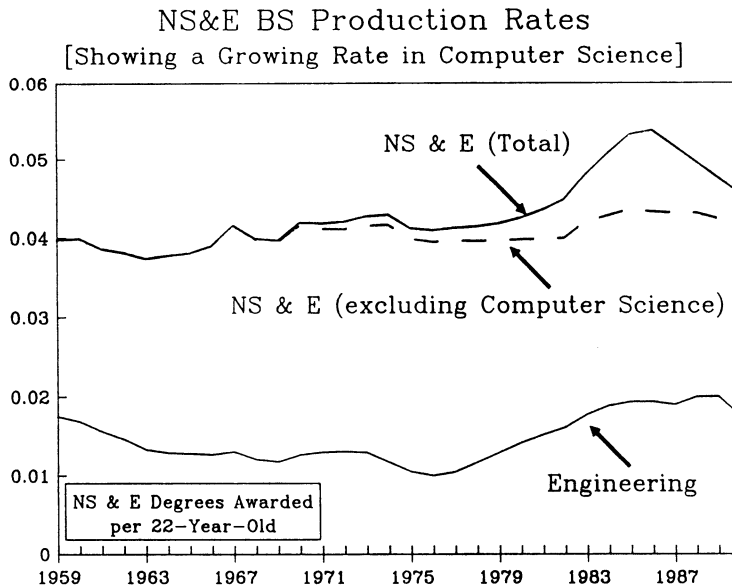
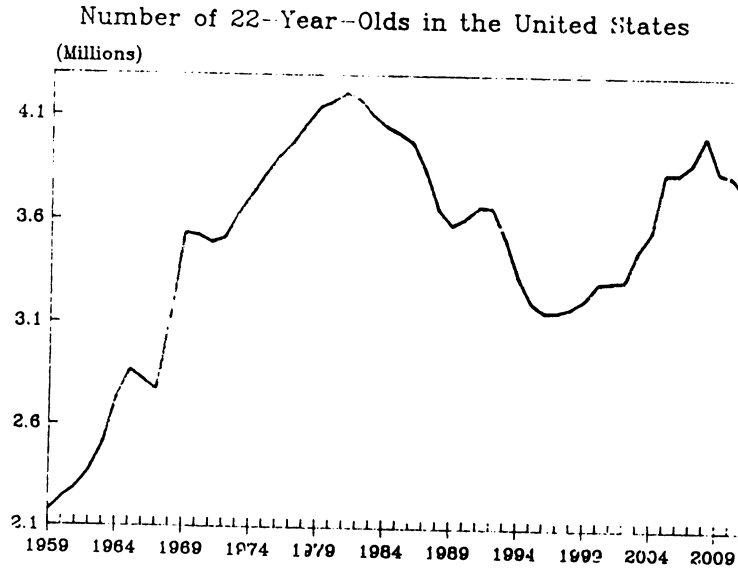
Earth Sciences

Engineering

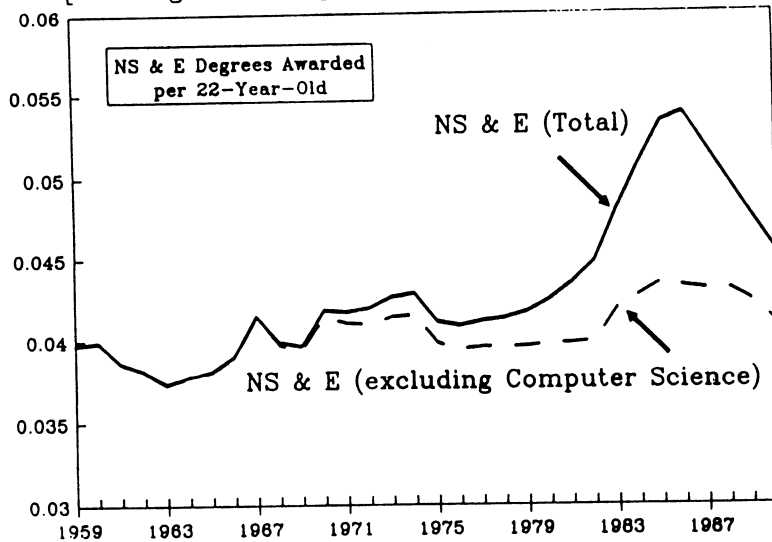
etc.

**SCIENCE, MATHEMATICS, AND ENGINEERING**

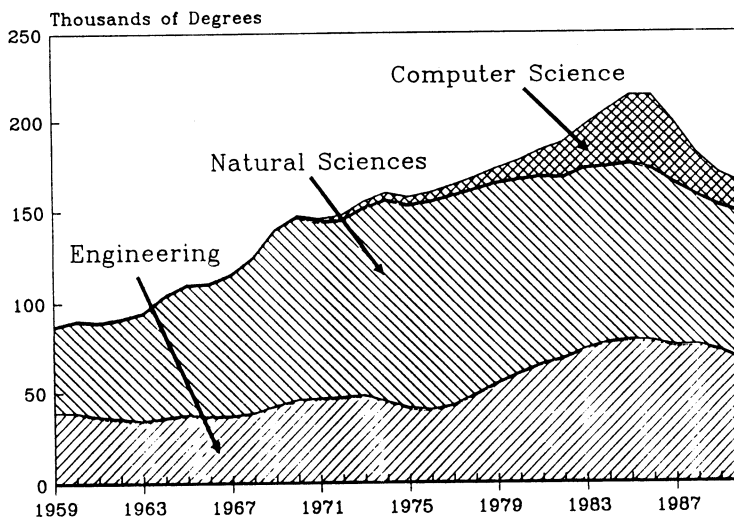
- National Security
- Economic Security
- Effective Democracy
- Personal Reasons
  - Enlightenment
  - Joy
  - Job
  - Etc.



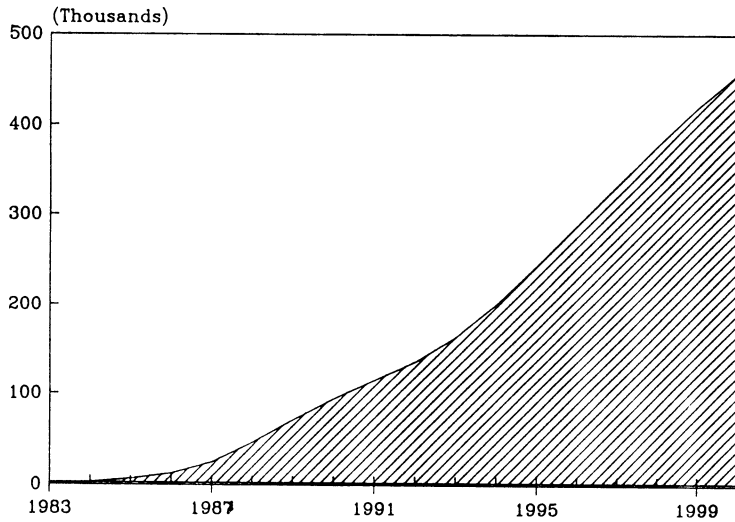
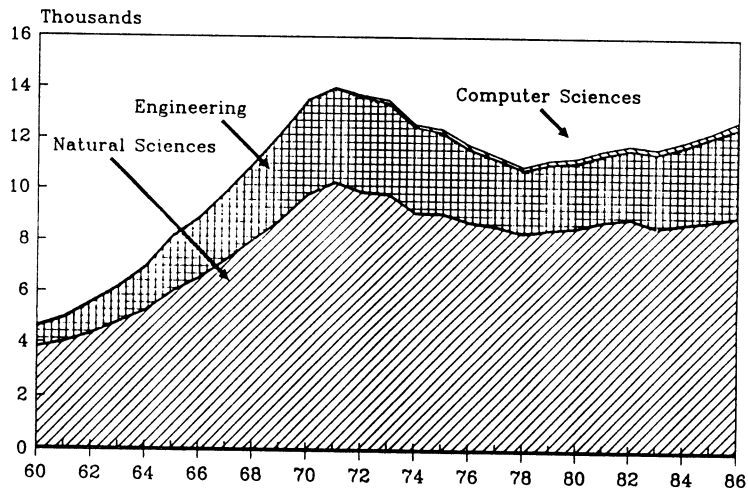
NS&E BS Production Rates  
[Showing a Growing Rate in Computer Science]



NS&E BS Production  
[Showing Expected Effects of Freshman Intentions]

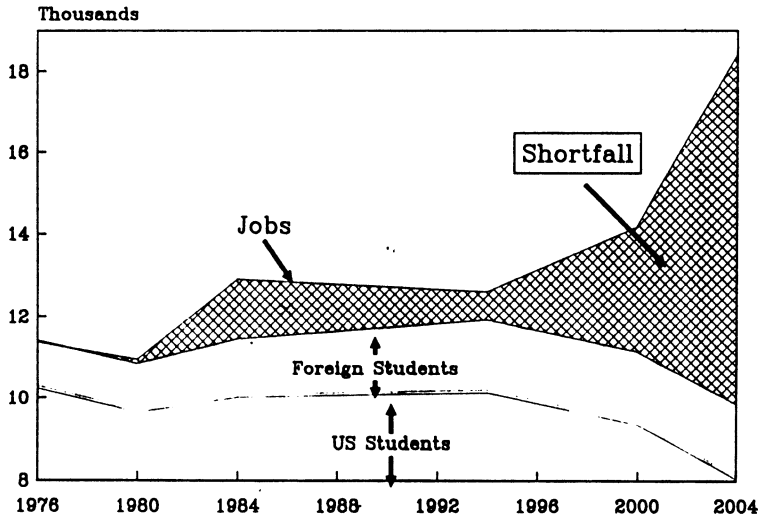


## NS&amp;E Cumulative Shortfalls: BS Degrees

PhD Degrees in  
Natural Science and Engineering

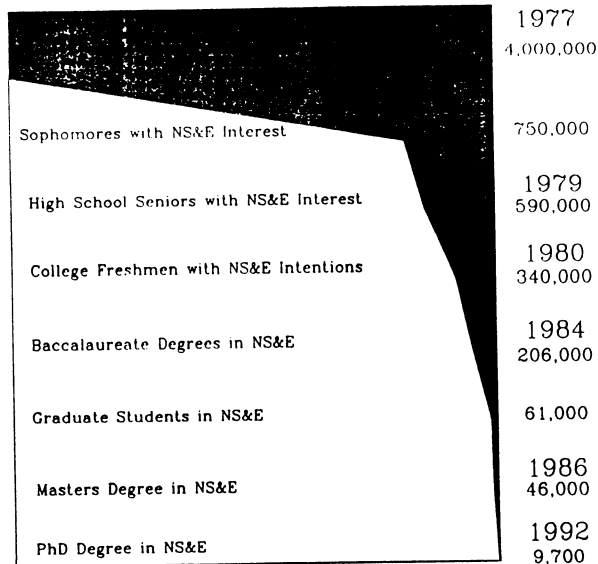


# Average Annual Production of Ph.D.s NS & E Ph.D. Degrees from U.S. Institutions



## Persistence of NS&E Interest from High School through PhD Degree

← All High School Sophomores →



(The Pipeline)

