University Research Equipment Expenditures Above $350 Million in 1980

Universities and colleges spent between $350 million and $400 million for separately budgeted research equipment in fiscal year 1980. This represented approximately 6 percent of all their separately budgeted research and development expenditures. This proportion ranged from 8 percent of the total academic R/D expenditures in the physical sciences to 4 percent in the social sciences. Federal funds accounted for two thirds of these 1980 research equipment purchases, although the federal share differed significantly by science and engineering field.[1]

A recent NSF-sponsored study of four science and engineering subfields (organic chemistry, cell biology, solid-state physics, and electrical engineering) in 38 institutions produced the following data on the stock, condition, and use of research equipment in these subfields as of fall 1981.[2] The data pertain to items costing at least $5,000.

About one-fourth of research equipment in the four subfields combined was at least ten years old, a fourth was five to nine years old, and half was less than five years old. This pattern did not change significantly among the subfields except for electrical engineering, there, two-thirds of the research instruments were less than five years old.

Most institutions in the study had common facilities or pools containing significant amounts of research equipment. Among the larger research performers surveyed, 87 percent of the departments reported such facilities. The more expensive items tended to be located in these pools, where sharing among investigators could be maximized. Major items—research instruments costing at least $50,000, such as mass spectrometers and electron microscopes—accounted for more than 70 percent of the aggregate value of equipment items with a purchase cost of at least $5,000. Items in shared facilities represented 60 percent of the cost of all reported instruments.

Department heads, in describing the condition of equipment in large central pools, reported that about 10 to 12 percent of the items were in "poor" condition; 20 to 25 percent were in "fair" condition; 30 to 40 percent were in "good" condition; and 28 to 33 percent were in "excellent" condition.

In all four subfields sampled, research equipment located in investigtors' own laboratories was highly shared. In those laboratories, items costing at least $50,000 tended to have more users (seven to ten) than the average reported for all pieces of equipment (four to six). However, because of the greater demand for time on more expensive equipment, investigators reported a higher level of difficulty in gaining access to such items.

More than three-fifths of the research equipment purchases in the sample were wholly financed with federal funds, one-fifth solely with institutional funds, and one-tenth from other single sources. In addition, about one-tenth of the purchases were funded by a combination of funding sources; joint funding accounted for about 20 percent of the purchases in the $50,000-or-more category.

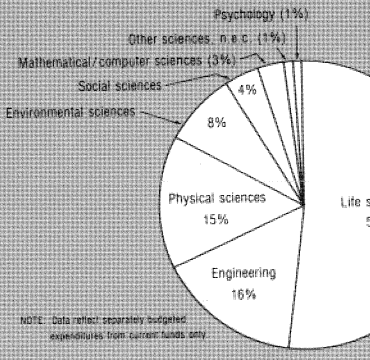
Five-sixths of research instruments in investigators' laboratories experienced less than 20 percent downtime from equipment failure. About two-thirds of investigators in the four subfields spent less than 5 percent of their research budget on maintenance and repair; one-fifth spent 5 to 10 percent, and one-tenth spent 10 percent or more, with available maintenance and repair resources tending to be applied to the more expensive items.

About 7 percent of all items were locally assembled. Researchers most often indicated that they had built their own equipment because no commercial equivalent existed.

[1] Data are derived from NSF's *Survey of Scientific and Engineering Expenditures at Universities and Colleges, FY 1980*. The data represent equipment purchases from current funds only and do not include research equipment purchased from plant (capital) funds, as in the case of newly constructed laboratories stocked with research instruments.

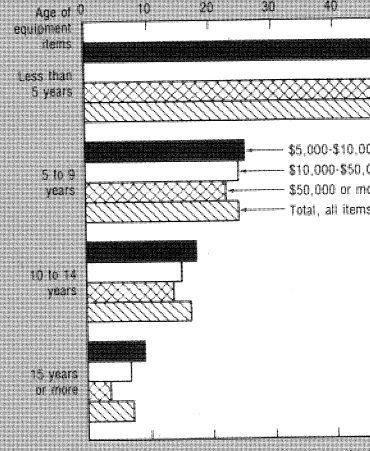
[2] NSF will do a full-scale survey during FY 1983 to acquire equipment data that are representative of the entire academic sector. The survey will cover engineering and computer and physical sciences; other fields will be surveyed during FY 1984.

Research equipment expenditures at universi and colleges by field: FY 1980



NOTE: Data reflect separately budgeted expenditures from current funds only

Age distribution of research equipment ite in sampled departments as of 1981 by cost ca



[1] Subfields sampled include cell biology, organic chemistry, solid s
nical engineering

SOURCE: National Science Foundation