

### III. DIFFERENCES IN EQUIPMENT PROBLEMS BY TYPE OF SCHOOL

Interviews revealed some differences in equipment needs between 4-year colleges, universities, and junior colleges. The equipment problems of the different types of academic institution are summarized below.

#### FOUR-YEAR COLLEGES

As many as 150 colleges consider themselves to be "research colleges," judging by attendance at a recent conference on the subject of undergraduate research.<sup>23</sup> Recently, these schools have been the most vocal discussants of the equipment problems in scientific fields and the need for Federal support. The president of Oberlin College recently proposed that the National Science Foundation recognize the 48 leading research colleges as a distinct subset of schools worthy of special Federal support in the sciences.

Research colleges say the importance of laboratory research for students has increased while the funds that are available to provide that experience have decreased. At these schools, faculty are encouraged to do research that involves students. Because the faculty members are aware of new trends in science, they demand up-to-date equipment for their research and their students. Thus, many professors at research colleges believe that their students may have more opportunities to work on research-grade equipment than at universities, where such instruments are often reserved for graduate students.

These opportunities disappear if research colleges lack the money to purchase new equipment. These colleges believe that their efforts to obtain equipment have been

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23. Chemical and Engineering News, "Undergraduate Research Gaining a Higher Profile," vol. 63, Aug. 19, 1985, p. 17.

hampered by the small number of Federal programs available for undergraduate education. Faculty at research colleges often mention specific pieces of equipment purchased with the aid of Federal programs before 1981, when money was available. Now, however, research colleges have to compete with universities for strictly research grants, which often fund equipment purchases. The colleges say they do poorly in this competition.<sup>24</sup> The lack of federal funds has placed additional strains on the research colleges' budgets, which have shrunk considerably since the "baby bust" began and enrollments declined.

While elite colleges complain about the struggle to obtain equipment, they realize that they are in better shape than less well-known colleges. Smaller, less prestigious colleges appear to have greater difficulty in meeting equipment needs than research colleges. For example, several small schools that belong to the Council of Independent Colleges report dropping majors in physics and computer sciences because of expensive equipment requirements.<sup>25</sup> The emerging field of biochemistry at the college level offers one example of the contrast between research colleges and their smaller compatriots. Beloit College, one of the research colleges, was among the first to setup a biochemistry program 8 years ago. At the less well-known Monmouth College, in Monmouth, Illinois, the three-person biology department offers no such program and is not equipped or staffed to do so.

## UNIVERSITIES

Depending on the State, public universities have generally suffered tight budgets in recent years as a result of fiscal conservatism at the State level combined with declining

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24. Ibid. This trend maybe reversing, according to recent National Science Foundation (NSF) figures. In fiscal year 1984, about 27 percent of the undergraduate research proposals submitted to the NSF were funded, in line with overall funding ratios in most NSF support programs.

25. Meek, op. cit.

enrollments. However, some State universities are reviving their laboratories as a result of recent State appropriations aimed at solving the problem.<sup>26</sup>

Universities differ over whether the existence of a strong research-oriented graduate department is beneficial to undergraduates. While some faculty said that the presence of a graduate research program made more equipment available to undergraduates — particularly honors-level juniors and seniors — others said that graduate departments often closed their doors to undergraduates. Several university faculty suggested that research programs can actually be a liability for the undergraduate program because Federal matching research grants put increased pressure on the equipment budget shared by undergraduate and graduate departments.

The most prestigious private universities, such as the Massachusetts Institute of Technology, have benefited from large corporate donations to update their equipment. Even in these cases, however, faculty from such universities express concern about keeping up with changes in their fields.

For less prestigious large universities, needs for laboratory equipment appear to be similar to those of 4-year colleges. Personal computers, however, appear to be less of a financial problem than for small colleges, because of the promotional discounts and donations made by computer companies to larger institutions.<sup>27</sup>

## JUNIOR COLLEGES

Junior colleges need two kinds of equipment: equipment for vocational education in increasingly technical fields such as auto repair, robotics, numerical control, and computer programming; as well as the same equipment needed at other schools for instruction in biology, physics, and chemistry classes.

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26. Michael Heyman, Chancellor, University of California at Berkeley, Berkeley, CA, interview, 1985.

27. Jules Lapidus, Council of Graduate Schools, Washington, DC, interview, 1985.

In my view, there are severe equipment problems,” states Bernard J. Luskin Executive Vice President of the American Association of Community and Junior Colleges. Although the Association has no data on the age of equipment, it is assumed that most scientific and vocational equipment in use was purchased when the junior colleges opened.

Because junior colleges tend to train technicians directly for jobs in local industry, local companies may be more disposed to donate equipment to 2-year colleges than to their 4-year neighbors. Close company ties can also put strong pressures on 2-year colleges. Snow College, a 2-year college in Ephraim, Utah, with an enrollment of 1,400, recently acquired an IBM mainframe computer at the insistence of nearby employers. “Without that, we had companies saying ‘we’re not interested in hiring your programmers’,~ according to Snow College President Steve Bennion. In addition, some junior colleges may have the advantage of local taxing power over nearby State universities which have been affected by the fiscal constraints placed on them by State legislatures.<sup>28</sup>

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28. Fred Landis, University of Wisconsin at Milwaukee, interview, 1985.