Chapter 6

The Provision of Education in the United States

Access to new information technologies can be provided In a number of, and In many nontraditional, ways. In the Oxford School District, Oxford, Mass., computer programs are provided by bus throughout the school district

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Within all societies there is an educational system that is both central to and dependent upon the rest of society. Its role, its functions, and the resources available to it are determined by the very social institutions for whose maintenance and effectiveness it is responsible.[1] Thus, while all societies educate, the particular form that any educational system takes will depend in large measure on the nature of the society of which it is a part.[2] How a particular educational system evolves will also depend on the nature of the decisions made about it. For within the constraints established by the socioeconomic order, there are a variety of possible educational outcomes.

Findings

- Recent social and economic developments have fostered a reevaluation of how education should be treated—as a public or as a private good.
- Because they are capable of providing specialized educational services to narrow segments of the educational market, the new information technologies will make it easier to produce and distribute education in the marketplace.
- If education is increasingly treated as a private good, and decisions about education are made in the market instead of in the governmental arena,
  - — individuals and groups that can afford to buy educational services may be more satisfied with the kind of education that they receive, but
  - — fewer social resources may be made available to support what traditionally have been regarded as the public benefits of education.

Social Change and Education in America

All societies educate; education is necessary to either maintain or to structure the social order. Education mediates between individuals and society. It is the means by which societies transmit acquired knowledge, attitudes, values, skills, sensibilities, and symbols from one generation to the next—and thus the means by which individuals learn the skills and roles necessary to function in and to act upon societies.[3]*

Individuals and societies have differed with respect to how they believed educational deci-

[1] Lawrence A. Crernin, *Public Education,* Basic Books, 1976.

[2] Herbert A. Thelen, and Jacob W. Gretzels, "The Social Sciences: Conceptual Framework for Education," *The School Review,* vol. LXV, No. 3, autumn 1957, p. 346.

[3] Ibid; see also, Charles Weingartner, "Redefining Education in a Changing Present for an Uncertain Future," paper presented at meeting of Chief State School Officers, Orlando, Fla., winter, 1980; and Charles E. Bidwell, "The School as Formal Organization," *Handbook of organizations,* James G. March (cd.) (Chicago: Rand McNally & Co., 1965), pp. 972-1,969.

*Societal factors may affect an educational system in any number of ways. Factors such as population size and structure, family and social organization, working patterns, patterns of

(continued next page)

sions should be made. Plato and Aristotle believed that education was so important it should be monopolized and controlled by the state. Rousseau, on the other hand, was opposed to all formal schooling, believing that nature was the best teacher. John Stuart Mill took a middle position. Strongly in favor of public support for education, he feared the consequences of public control over education. Mill said, for example:

> The objections which are urged with reason against State education do not apply to the enforcement of education by the State, but to the State's taking upon itself to direct that education; which is a totally different thing. That the whole or any large part of the education of the people should be in State hands, 1 go as far as anyone in deprecating. All that has been said of the importance of individuality of character, and diversity in opinions and modes of conduct, involves, as of the same unspeakable importance, diversity of education. A general state of education is a mere contrivance for molding people to be exactly like one another; and as the predominant power in the government-whether this be a monarch, a priesthood, an aristocracy, or the majority of the existing generation.[4]

Writing in 1859, Mill expressed an attitude toward public education that was greatly at odds with the one then prevailing in the United States, where the crusade for public schools was at its height. If Mill were to write these words today, however, he would find a more receptive audience. For today, serious question is being given to the question of whether or not education should be treated as a public or a private good.

In the United States, education has traditionally been treated as if it were a public good.* Most educational decisions have been made in the political arena; and most educational activities have been supported, if not financed, with public funds. This practice of treating education as a public good reflects, in part, the traditional American belief that education plays an essential societal role. Contrasting the attitude of Americans towards education with that of Europeans, Alexis de Tocqueville, the well-known commentator on American society, noted in 1831:

> Everyone I have met up to now, to whatever rank of society they belong, has seemed incapable of imagining that one could doubt the value of education. They never fail to smile when told that this view is not universally accepted in Europe. They agree in thinking that the diffusion of knowledge, useful for all peoples, is absolutely necessary for a free people like their own, where there is no property qualification for voting or for standing for election. That seemed to be an idea taking root in every heads

The public benefits that Americans have associated with education have changed over time and in different historical circumstances. In the earliest years of American history, education was, for example, considered essential for the survival of the new democratic Nation. Later, with the need to acculturate immigrants into society and to unite a divided Nation in the aftermath of the Civil War, it was considered the means for building a Nation of citizens. At the turn of the century, education was expected to train and socialize American youths for participation in a modem, industrialized society. More recently, Americans have

social and economic mobility, the availability of leisure time, and personal resources all serve to establish who, in a society, will be educated. Similarly, the level and configuration of social organization determine, in part, the kinds of institutions that are adopted perform the educational function; while the level of economic, social, and cultural development determin e, in part, the idea of what, in a given society, constitutes literacy.

[4] John Stuart Mill, On *Liberty.*

*Public goods refer to those goods whose benefits are available to everyone and from which no one can be excluded. These goods will not be produced privately, and thus they must be produced by government. There are only a few pure public goods, one example being national defense. There are, however, some goods, like education, that are impure public goods. These combine aspects of both public and private goods. Although they serve a private function, there are also public benefits associated with them. Impure public goods may be produced and distributed privately in the market or collectively through government, How they are produced is a societal choice of significant consequence, If decisions about impure public goods are made in the market, on the basis of personal preferences alone, then the public benefits associated with them may not be efficiently produced or equitably distributed. Edwin Mansfield, *Macroeconomics Theory and Applications, New* York, 1970.

[5] Alexis de Tocqueville, *Journey to America,* translated by George Lawrence, J. P. Mayer (cd.), Anchor Books, 1971.

seen in education the solutions to some of the Nation's thorniest social problems.

To guarantee that these public benefits would be provided, Americans established a whole range of public institutions-elementary and secondary schools, 4-year and community colleges, libraries, and museums. Moreover, to assure that private educational institutions served public goals, they supported and regulated them.

Americans were able to treat education as a public good because, having similar needs and agreeing essentially upon the rules by which they lived, they were able to agree upon the kind of education that they wanted to pass on from one generation to the next.[6] Given this consensus, there was little conflict between what was a public or a private educational interest, or between what was a local or national educational goal.

Although highly institutionalized, the American educational system has been quite successful in adapting to meet the changing needs of society. It has been transformed from a system designed to meet the needs of an agrarian society to one tailored to meet the needs of an urban, industrialized society. It has been changed, moreover, from a system structured to meet the educational needs of a privileged few, to one more structured to meet the diverse and sometimes conflicting needs of a growing and heterogeneous population.

Today, however, society is undergoing changes that may affect the nature of the system itself. Some of these changes originate within the educational system; others stem from the profound changes taking place in the larger social environment. Among these developments are:

- an increase in the level of education that individuals need to participate effectively in society;
- an extension of the period of time during which individuals can and need to be educated;
- an increase in the diversity of the educational clientele and thus an increase in the diversity of the demand for education;
- a decline in the public resources available for education, resulting in part from:
  - — an increase in the cost of producing education,
  - — a questioning of the public benefits associated with education, and
  - — a loss of confidence in the institutions providing education;
- the emergence of new institutions that, under new circumstances, find it profitable to market education; and,
- the development of the new information technologies that allow educational institutions to provide specialized services to specific sectors of the market.

These developments, taken together, will have a major impact on the educational system and on the institutions that have traditionally been responsible for providing educational services. Taking advantage of the developing market for special kinds of educational services, new profitmaking institutions are emerging to provide education. To compete in this growing and increasingly segmented market, many traditional educational institutions may have to curtail some of the services that they provide, retaining only those that have the greatest economic and political return. Changes such as these are, in fact, already occurring in almost all sectors of the educational system.

[6] Rush Welter, *Popular Education and Democratic Thought in America (New* York: Columbia University Press, 1962); David Tyack and Elisabeth Hansot, "Conflict and Consensus in American Public Education," *America Schools: Public and Private, Daedalus*, summer 1981.

Elementary and Secondary Education

Public Schools

The traditional American belief in the public virtues of education is nowhere better illustrated than in the historical commitment to a system of public schooling. It is highly symptomatic, therefore, that today serious questions are being raised about whether or not elementary and secondary education would be best served if it were provided through the mechanism of the market.

A legacy of the past, the public school system is a unique and typically American institution. For, while educational institutions are publicly supported in many societies, in no other country have they been established with such deliberate purpose and public expectation or been conceived of as being such an integral part of the political, social, and economic order.

Clearly recognizing the important role that education could play in building a nation, the Founding Fathers did not leave its development to chance. They strongly advocated public support for schooling.[7]* In fostering education, however, they made little distinction between its public and private aspects. If American youth were provided with the knowledge necessary to preserve their liberties, all schooling, it was believed, would serve the public interest.

The American commitment to public schooling grew in the wake of the Civil War. This commitment was so intense that it gave rise to a national crusade to establish public schools. Concerned about the problems of reconstruction in the South, the influx of Catholic immigrants, and the advent of industrialization in the North, Americans saw public schooling as a way of preserving the social, economic, and political system. By educating American youth in common, public schools, they hoped to inculcate them with a common set of patriotic, Protestant, and republican values.[8]

With the industrialization and urbanization of American society, it was expected that schooling would serve not only to prepare American youth for a common political role as citizens, but also to prepare a growing number of people from increasingly different social, economic, and ethnic backgrounds for an increasingly differentiated set of economic roles. To perform this economic function, the public schools were restructured in accordance with business principles.[9]* Vocational education and guidance were introduced as part of the educational curriculum. Assuming that the majority of Americans would be working at industrial jobs, educators believed that vocational education would serve not only the best interests of the individual, but also the best interests of society.[10]

In the period that followed World War II, support grew for the view that the social and

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[7]Bernard Bailyn, *Education in the Forming of American Society (New* York: W. W. North, 1980); Lawrence A. Cremin, *Traditions in American Education,* Basic Books, Harper 1976.

*There was very little formal schooling in America until after the Revolutionary War, Throughout colonial times, education was conducted informally in the home and in the church. The formal schooling that did exist was of marginal significance, serving only those who were training for specific roles.

*Welter, op. cit.; Tyack and Hansot, op. cit.; Robert A. Carlson, *The Quest for Conformity: Americanization Through Education,* John Wiley & Sons, 1975; " Public Education as Nation Building in America: Enrollments and Bureaucratization in the American States, 1870-1930, " *American Journal of Sociology,* vol. 85, No. 3, November 1979.

[9]David K. Cohen and Barbara Neufeld, "The Failure of High Schools and the Progress of Education, " *America Schools: Public and Private, Daedalus,* summer, 1981; Tyack and Hansot, op. cit.; and Sol Cohen, "The Industrial Education Movement, 1906- 1917," *American Quarterly,* spring 1968, pp. 95-1 10; Martin Trow, "The Second Transformation of American Secondary Education, ' *International Journal of Comparative Sociology,* vol. 7, 1961.

*To unify the school system and to make it more efficient, educational reformers began to standardize textbooks and curriculum, to grade classes, to train teachers in approved methods, and to improve the supervision of the schools. Businessmen played an important role in bringing about these changes. Viewing education as a public good, businessmen looked to the public schools to expand wealth and improve productivity. Concerned about strikes, labor turnover, and increasing worker absenteeism, many businessmen hoped that public schooling, and vocational education, in particular, would socialize a growing number of irnmigrant youths for the workplace.

[10]I bid.

economic well-being of the Nation depended not only on the efficient production of goods and services, but also on their equitable distribution. As a growing and upwardly mobile school-age population began to compete for educational rewards, the question of distribution and access became central to the educational system.[11] This new emphasis on equity had a profound effect on the American school system. For, in addition to fulfilling apolitical and an economic function, the American public school system was increasingly called upon to serve as an agent of social change.[12]* To implement the extensive goals provided for in the legislation of this period, the Federal Government became increasingly involved in the funding, operation, and 'administration of school activities.[13]

Status of the American Public School System

The American public school system is a relatively large enterprise. In the school year 1978-79, it included 16,014 school districts in which there were 53,192 elementary schools, 12,020 middle schools, and 16,639 secondary schools including high schools[14] (see table 13).

Public education accounts for a significant portion of public expenditures. In 1977-78, $84.9 billion was spent on elementary and secondary education. Of this total the Federal Government contributed about $8 billion, or about 9.5 percent[15] (see table 14).

Table 13.—Number of Public Elementary/Secondary Schools and Estimated Percentage Distribution, By Level of instruction and Grade Span Served: School Year 1978-79

Level[a] and grade span	Number	Percentage distribution
Total schools .,	87,006	**100.0**
Elementary schools[b]	53,192	61.1
Preprimary only	902	1.0
Preprimary to 2nd	1,052	1.2
Preprimary to 3rd	2,215	2.6
Preprimary to 4th	2,920	3.4
Preprimary to 5th	8,116	9.3
Preprimary to 6th	25,618	29.4
Preprimary to 7th	790	0.9
Preprimary to 8th	7,229	8.3
4th to 6th	746	0.9
Other spans with highest grade preprimary to 6th	3,604	4.1
Junior high or middle schools	12,020	13.8
5th to 8th	928	1.1
6th to 8th	2,888	3.3
7th to 8th	2,132	2.4
7th to 9th	3,790	4.4
Other spans with highest grade 7th to 9th	2,282	2.6
Secondary schools including high schools	16,639	19.1
7th to 12th	4,045	4.6
8th to 12th	417	0.5
9th to 12th	7,584	8.7
10th to 12th	2,813	3.2
Other spans with highest grade 10th to 12th	*1,780*	2.1
Combined elementary/secondary schools (preprimary to 12th)	1,145	1.3
Schools not classified by lowest and highest grade[c]	4,010	4.6

[a] Level of schoolisa classification by highest grade served Elementary includes schools with no grade higher than 8th Junior high and middle schools have no grades higher than 7th, 8th, 9th and no grade lower than 5th, 6th, or 7th Secondary schools have as the highest grade 10th, 1 lth, or 12th

[b] Lowest grade of elementary schools may include prekindergarten, kindergarten, or 1st grade

[c] Schools in this category have grade spans that are unspecified, ungraded, or unclassified

NOTE' These national estimates are based on information reported in 1978 by all States except California, Georgia, and Massachusetts. Each category was inflated equally to represent a known national total of 87,006.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD) 1978-79 Survey, unpublished tabulations

Measured by the goal of providing universal public education, the public school system has been a reasonable success. Americans today are better educated than ever before. Moreover, many of the barriers to education that once served to limit an individual's access to the socioeconomic benefits of society have been removed. However, despite the central role that the public school has played in American society and the numerous accom-

[11] Cohen and Neufeld, op. cit.

[12] Cohen and Neufeld, op. cit.

*This was, for example, the goal of the Elementary and Secondary Educational Act of 1965, the most comprehensive and significant educational legislation passed during this period. Conceived of and marketed not only as an education bill, this act was a major piece of antipoverty legislation. Between 1958 and 1978, for example, Federal expenditures on education increased sixfold. The Federal Government became so involved with the operational activities that it presented an unprecedented challenge to the authority of the States and localities to control public school programs.

[13] Steven K. Bailey, "Political Coalitions for Public Education," *America Schools: Public and* Private, *Daedalus,* summer 1981; Tyll van Geel, *Authority to Control the School Program* (Lexington, Mass.: Lexington Books, 1976).

[14] *Digest of Education* Statistics, National Center for Education Statistics, May 1980.

[15] Ibid.

Table 14.— Revenue and Nonrevenue Receipts of Public Elementary and Secondary Schools, By Source, 1977-78 (amounts in thousands of dollars)

Total revenue and non revenue receipts	Revenue receipts							Non revenue receipts
	Total	Federal		State		Local and other		
		Amount	Percent of total	Amount	Percent of total	Amount	Percent of total	
$84,969,058	$81,440,326	$7,699,042	9.5	$35,005,584	43.0	$38,735,700	47.6	$3,528,732

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest* of *Education* Statistics, 1980

plishments that can be attributed to it, the American public is becoming increasingly disenchanted with public schools (see fig. 3).

Several explanations have been suggested for this loss of support." It has been suggested, for example, that the school system has suffered from:

- a general loss of confidence in and support for all public institutions;
- the association of public schooling with unpopular social policies such as busing and desegregation;
- the decline in overall school performance as measured by traditional indicators such as test scores;
- the public backlash against what appears to be the unprofessional behavior of some unionized teachers;
- the concern about inflation and increased taxation;
- the dissatisfaction with American youth and their culture; and;
- the disintegration of the political coalition that has traditionally provided support for the public schools.

The loss of a common base of support for the public schools has had a negative effect on the conditions under which they have had to operate. Forced to appeal for their support to a number of increasingly distinct and diverse interests, the public schools have had to take on a multitude of new and often conflicting tasks at a time when they face the prospects of reduced economic and human resources.

"Michael W. Kirst, "Loss of Support for Public Secondary Schools, " *Schools: Public and Private, Daedalus,* summer, 1981; Bailey, op. cit.; Patricia Albjerg Graham, "Literacy: A Goal for Secondary Schools, " *America Schools: Public and Private, Daedalus,* summer 1981.

Future of the American Public School System

Many educational commentators have argued that if public schools are to survive, educators will have to adopt a more limited set of goals, which, although less ambitious, will be more likely to gain public support." Success in this endeavor will depend, to a large degree, on future societal developments. The prognosis according to educational futurists is not particularly good. Instead of providing the basis for a national consensus in support of public schools, demographic, economic, and societal trends may, in fact, serve to intensify the centrifugal tendencies already at work in the educational system.[18]

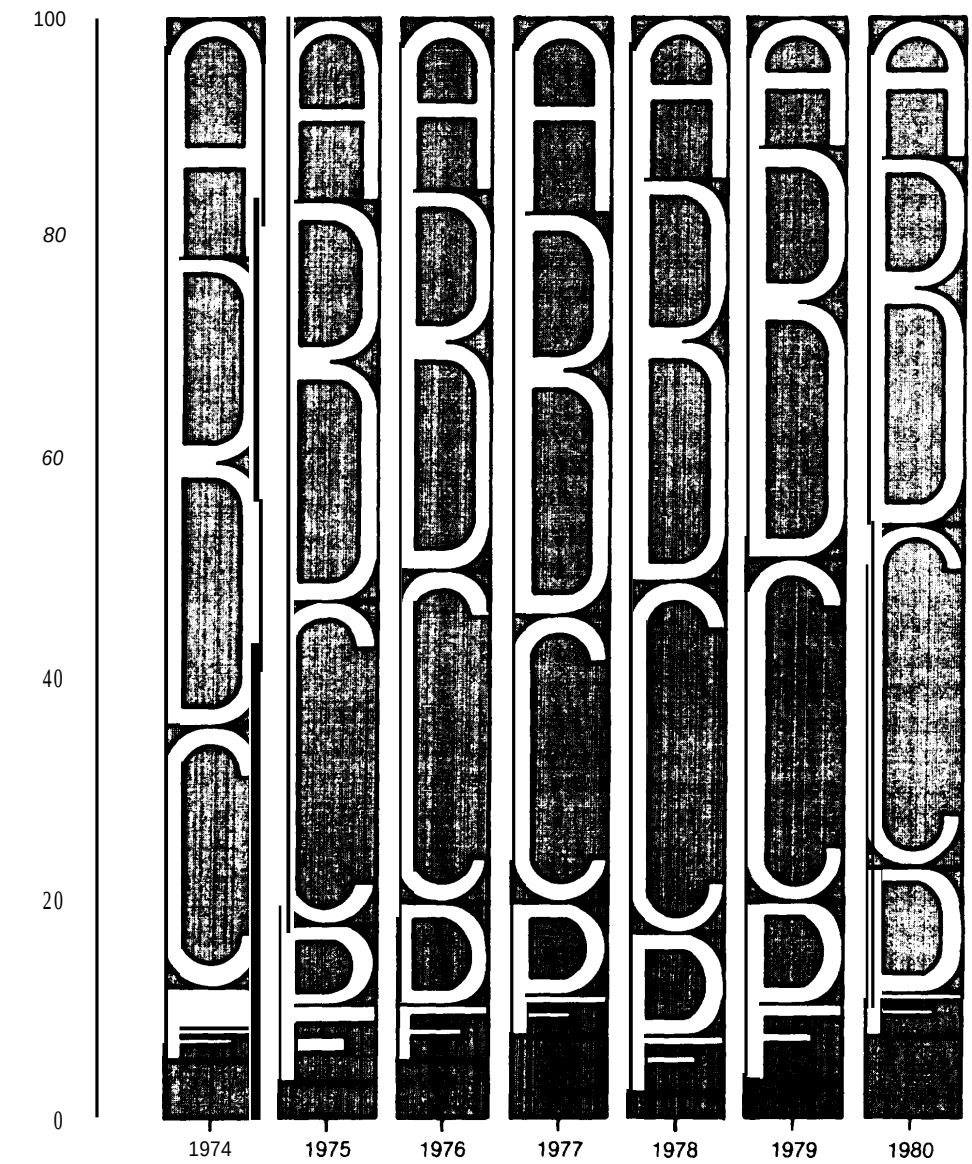
Forecasts of demographic trends suggest, for example, that Hispanics, Asians, and other cultural groups with specialized needs will soon comprise a major portion of the school population. Moreover, the increase in the number of school-age children living with a single parent or two working parents will force schools to provide more supervision and socialization. Instead of cutting back on their educational activities, schools will have to cater to a growing variety of educational needs.

Economic forecasts also cast doubts about the future of public schools. If economic growth rates remain slow, and inflation and interest rates continue to be high, the schools will be in intense competition with other service sectors for reduced human and economic resources. Faced with the loss of personal income because of increased levels of inflation

"Graham, op. cit.; Tyack and Hansot, op. cit.; Bailey, op. cit.
'Christopher Dede, *Potential Clients Technology,* unpublished report prepared for the Office of Technology Assessment, March 1981.

Figure 3.—Quality of the Public Schools: Opinions of Parents With Public School Children

"Students are often given the grades A, B, C, D, and F (FAIL) to denote the quality of their work, Suppose the public schools themselves, in this community, were graded in the same way. What grade would you give the public school here—A, B, C, D, or F?"



SOURCE. "The Condition of Education, " 1981, National Center for Education Statistics

and high energy costs, the American public is, in general, less willing to finance educational expenditures through additional taxation. This reluctance is likely to increase as the number of families with school-age children declines and the number of those beyond childbearing age increases.

Faced with their own problems of increasing costs and shrinking resources, Federal and State governments will be unable to fill in the financial gaps. Continued high inflation will also reduce the economic resources available for public schools. Because of inflation, the costs of education are increasing twice as fast as the rate of increase of revenues for education. Thus, in 10 years, if inflation continues at its present rate, educational institutions will have only one half of the revenues (in real terms) that they have now.[19]*

The problem of scarce economic resources will be matched by a problem of scarce human resources. The problem of human resources is, however, not so much a problem of numbers—for the supply of teachers may very well exceed the demand-as it is a problem of quality. A decline in highly qualified educators is already evident. Few entering-college freshmen select a career in teaching, and, more significantly, those that do are generally among those who have the lowest academic qualifications.[20] Increasingly, there are fewer incentives for well qualified individuals to enter the teaching field.

Given the financial problems facing schools, a career in teaching is no longer considered to be secure. Given the loss of public support for education, a career in teaching is less likely to provide the rewards of public status or personal esteem. Since teaching salaries are not competitive with those in private industry, many of the most highly qualified teachers—especially those with qualifications in math and science—will give up teaching to sell their skills on the open market. Well qualified women—a traditional source of high quality educators—are particularly likely to seek out the wider range of employment opportunities now available to them.[21]

Private Alternatives to Public Schools

Conflicts over public and private control of education have always existed. While reserving for itself the dominant role in educational matters, government in the United States has always recognized that private individuals have an interest in the outcome of educational policy decisions. It has generally been recognized, for example, that parents have certain rights—based on notions of liberty and privacy—in determining the education of their children.

In order to take into consideration both public and private concerns, the responsibility for educational policy and administration has traditionally been allocated to the States and to local jurisdictions where, given more homogeneous populations, public decisions about education would be most likely to reflect private concerns.[22] Parents whose needs were not adequately met by public education were allowed the option of sending their children to private schools.

This arrangement, which served in the past to reconcile public and private educational needs, is thought to be increasingly less effective, as the assumptions upon which it is based become increasingly less realistic. For example, as the Federal Government assumed more authority over educational policy, the character of schooling has become less subject to local influence and control. Moreover, since

[19] Ibid; Kirst, op. cit.

*While all public schools likely to suffer a loss of economic resources, the problems created will be greater in some areas than in others. The urban schools in the Northeast will be the most seriously affected because the recent migration of people away from the area has caused a significant loss of taxable resources. The economic problems in the area of the sunbelt, on the other hand, will be ameliorated by an influx of population which will increase the area's tax base.

[20] "Introduction," *America Schools: Public and Private, Daedalus,* summer 1981; J. Myron Atkin, "Who Will Teach in High School," *America Schools: Public and Private, Daedalus,* summer 1981; Dede, op. cit., 1981.

[21] Atkin, op. cit.

[22] Van Geel, op. cit.

many local communities are no longer comprised of homogeneous populations, there is also less likelihood that public decisions-even when they are made at the local level—will be synonymous with private, individual needs.[23]

Conflicts over public and private educational interests have grown along with the enhanced importance of education in American society. Because education has come to be regarded as the essential means for gaining access to socioeconomic rewards, individuals now believe that they have more of a stake than ever before in the outcome of decisions about it. In this sense, individual interests are likely to diverge from those of government. For whereas government is committed to providing equal access to educational opportunities, an individual, if he is to compete successfully for socioeconomic rewards, must gain an educational advantage.[24]

Private dissatisfaction with public decisions about education has led some people to seek alternatives to public school education. Traditionally, that alternative has been the private or independent school. Although such schools have always provided a considerable proportion of all elementary and secondary education, they are today experiencing a revival of interest .[25]

There are today in the United States 14,300 private elementary and 4,700 private secondary schools.[26] Of these schools, 85 percent are religiously affiliated, and 65 percent of these are associated with the Roman Catholic Church.[27]

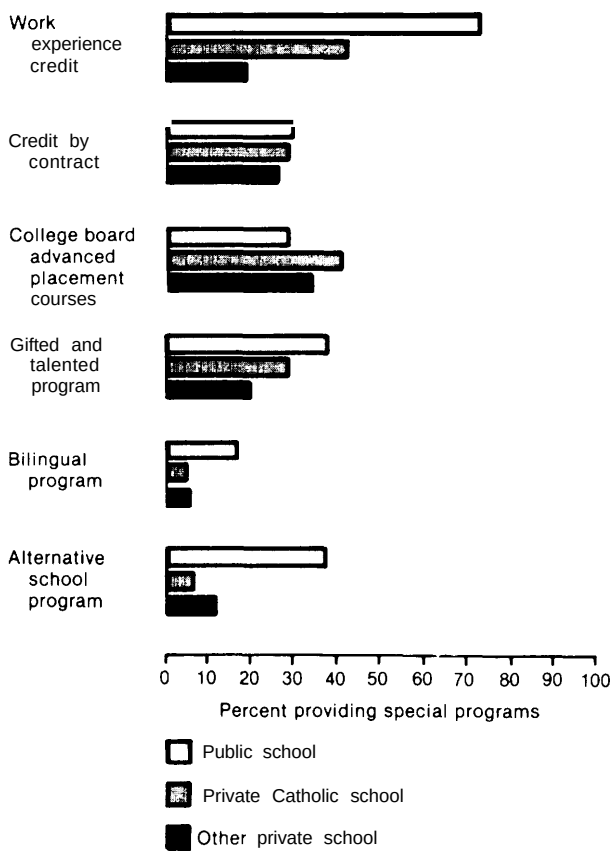
Private schools provide educational services to one out of every nine students. Enrollment in the fall of 1978 totalled 5,000,158. Having declined substantially since the 1960's, enrollment is more stable today. Declines in enrollment have been greatest in Roman Catholic schools, a considerable number of which have closed due to lack of resources.[28]

Unlike public schools, private schools are relatively independent of public control. Accountable to a governing board of trustees, they are free to determine their own objectives and the means by which they pursue them. Although the types and levels of courses vary significantly between schools, private schools are generally distinct from public schools inasmuch as they offer less work experience, less bilingual education, and less alternative schooling (see fig. 4).

Demand for private school education appears to be also related to the quality of public school alternatives. Private school enrollments

[23] 1bid.
[24] Cohen and Neufeld, op. Cit.
"William A. Oates, "Independent Schools: Landscape and Learnings," *American Schools: Portraits and Perspectives, Daedalus,* fall 1981; James Coleman, "Private Schools, Public Schools, and the Public Interest, *The Public Interest.*
[26] *Digest of Educational Statistics,* op. cit.
[27] Oates, op. cit.
[28] *Digest of Educational Statistics,* op. cit.

Figure 4.—Secondary Schools Providing Special Programs



SOURCE' "The Condition of Education," 1981, National Center for Education Statistics

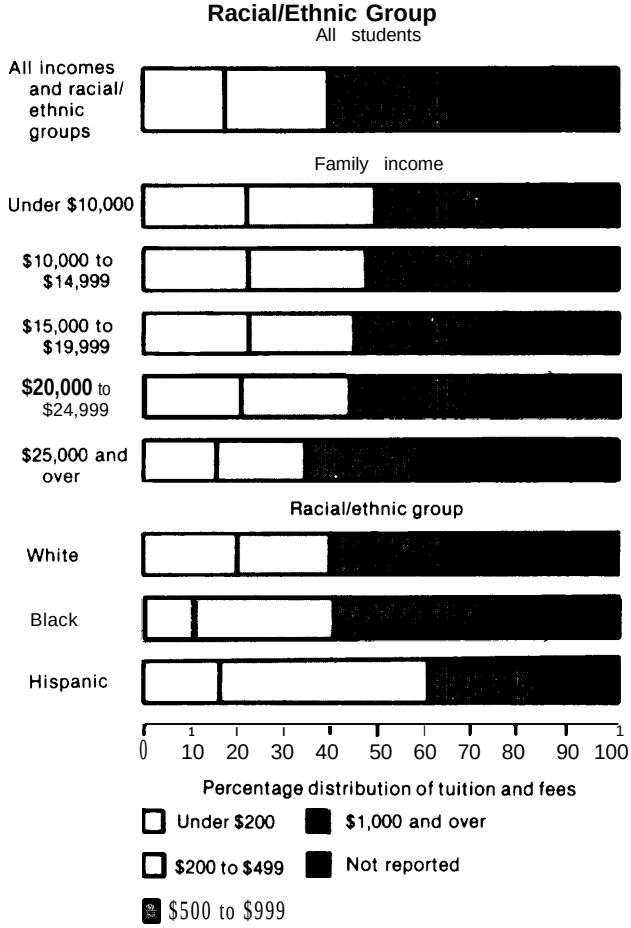
are highest in those areas where public schools are experiencing the most severe problems. Private school enrollments are highest in the metropolitan cities of the Northeast, where 21.3 percent of all students attend private schools. Of all students in the North Central Region, 11.5 percent attend private schools as compared with rates between 7.8 and 7.9 percent for the West and the South. The lowest rate of private school attendance, 2.8 percent, is in the nonmetropolitan areas of the West.[29]

Demand for private school education is also related to the ability of individuals to pay for it. Levels of family incomes distinguish those students who are enrolled in private schools from those who are enrolled in public schools, and those students who attend religiously affiliated schools from those who attend the more expensive, unaffiliated schools (see fig. 5). While 21 percent of all public school students come from families with annual incomes of $25,000 or more, as many as 37 percent of all private students do. And, whereas 35 percent of the students attending religiously affiliated schools come from this income bracket, there are over 56 percent in unaffiliated schools who do. Students coming from families of this income level are also among those who are most likely to spend $1,000 or more on tuition and fees.[30]

Because cost is a major factor inhibiting individuals from choosing private alternatives to public education, much of the discussion about public and private school education has focused on public policy options that call for public subsidization of private educational costs. The options that have been most frequently proposed and considered are the tuition tax credit and the educational voucher.

The educational voucher has generated such diverse interest and support in part because it is a general concept for which there is no one particular model. Included under the rubric of an educational voucher could be, for example, any sum of money (or financial credit, such as a tax credit) provided by any class or group

Figure 5.— Private Elementary/Secondary School Tuition and Fees by Family Income Racial/Ethnic Group



SOURCE" "The Condition of Education, " 1981, National Center for Education Statistics.

of individuals for the purpose of buying any type of educational service in the market. The nature and potential impact of any particular voucher would vary, therefore, according to who receives how much money, from whom, under what conditions, and for what purposes.

Although not a new idea, the educational voucher has only recently become a topic of public debate in the United States. Interest in the voucher has grown with the public's increased disillusionment with the public school system. Initially championed during the 1960's as a way of providing aid to parochial schools and of circumventing desegregation rulings, during the Nixon administration, it was proposed as a way of providing education-

[29] *The Condition of Education, 1981,*
[30] I bid.

al assistance to disadvantaged groups. Today it is receiving attention, if not the support, of a wide variety of diverse interests each of which seeks to bring about structural changes in the educational system.

Although many different versions of the voucher idea have been proposed, all educational voucher proposals have one essential element in common. They all assume that education should be treated as a private, rather than a public good. While acknowledging that education merits public support, voucher advocates would generally argue that the present system of public schools, responsible as it is to a political body, produces poor-quality education. They see the voucher as a way of allowing government to continue to support education without having, at the same time, to sacrifice quality and diversity to public conformity. They argue that if parents were to be given public vouchers with which to buy educational services in the marketplace, then schools, forced for the first time to compete for students, would have not only to improve the general quality of their educational services but also to tailor these services more specifically to meet the needs of their clientele.[31] By providing diversity and accountability as well as the encouragement of high-quality education, the educational voucher would, according to its proponents, benefit both individuals and society.

Voucher proposals have been strongly criticized on the grounds that, once implemented, they would recreate many of the same problems that the public school was established to rectify. In encouraging diversity, critics argue, the voucher system may exacerbate socioeconomic disparities and cleavages. They contend that a voucher system would discriminate against the poor, because in an unregulated market, educational services would be distributed according to *one's* ability to pay. Opponents are concerned, moreover, that vouchers might be used, as they have in the past, to facilitate segregation.[32]

Acknowledging these problems, some proponents have suggested that the voucher be regulated to prevent them.[33] To assure open access to private schools, regulations have been proposed, for example, that would set limits on tuition and that would guarantee that a certain proportion of the student bodies of all schools be selected at random. However, a basic problem with the regulated educational voucher would be that the more complex the regulations, the less likely that individuals participating in the system would be able to take full advantage of whatever benefits it offers. This could be one reason why the proposals for the regulated vouchers have received less public attention and support than those for unregulated ones.

In 1978, a tuition tax credit bill was approved in the House of Representatives, and gained 41 new votes in the Senate. In 1980, the Republican Party supported the voucher concept in its party platform, and the concept has clearly gained in popularity. Most recently, the Reagan administration has proposed its own tax tuition plan. Dissatisfied with the private benefits of the public school system, more and more Americans regard the voucher as a way of reducing the costs of educating their children in private schools.[34]

Designed as it is to cater more specifically to particularistic needs, the voucher is an idea that should be well received in the segmented educational market that will characterize the future. Public pressure to adopt some kind of a voucher system will probably increase.

[31] George La Naoue, *Educational Vouchers, Concepts and Controversies*, Teachers College Press, 1972.

[32] Ibid.

[33] Ibid.

[34] Jean Rosenblatt and Hoyt Gimlin, "Tuition Tax *Credits,* " Editorial Research Reports, Aug. 14, 1981.

University and the Four-Year Colleges

As semiautonomous communities of faculties and students, universities are organized for learning and for research. Although they still retain many of the institutional features of their medieval heritage—a name, a central location, a degree of autonomy, a system of lectures, a procedure for examinations and degrees, and an administrative structure organized around faculties—universities have evolved over time to meet changing societal needs .[35]

American colleges and universities were able to monopolize the field of higher education because they were relatively autonomous, economically self-sufficient, and comprehensive in scope-capable of serving the multiple goals of higher education.[36] Today, they no longer enjoy these advantages. As knowledge has increasingly come to be viewed as an important economic resource that can be bought and sold in the market, colleges and universities, faced with increasing costs and with competition from private, profitmaking institutions, have had to consider undergoing some radical changes.

Public Role of Higher Education

Although originating in the private sector,[37]* American universities have become semi-public institutions, regulated and supported, to a large extent, by government. This development occurred near the end of the 19th century, when Americans began to regard colleges and universities as having a unique societal role.[38] Unlike institutions of elementary and secondary education, which were expected to prepare the general population of youth for adult roles in society, institutions of higher education were expected to recruit those who qualified for leadership positions. And, whereas elementary and secondary education schools were designed to transmit the general, or popular, culture from one generation to the next, colleges and universities were expected to transmit the total knowledge base of society. They were to be responsible, moreover, not only for the transmission of knowledge, but also-through the pursuit of research-for its creation. Believed to have a special understanding of society, universities were called on to bring about its improvement.[39]*

Two events–the land-grant movement and the alliance during World War II between the universities and the Federal Government—strongly influenced this development, giving the American university a distinct character. Involving the university in the daily life of the Nation, both of these events served to reinforce the public aspect of the university's role and to enhance the public's involvement in the affairs of the university.

Democratic and populist, the land-grant movement called on the universities to extend the benefits of education to all segments of society. Responding to the Nation's rapid industrial and agricultural development, it called

[35] Clark Kerr, *The Uses of the University* (Cambridge, Mass.: Harvard University Press, 1972).

[36] Edward Shils, "The Order of Learning in the United States From 1865-1920: The Ascendancy of the Universities, *Minerva,* vol. xvi, No. 2, summer 1978.

[37] Shils, op. cit; and Martin Trow, "Elite Higher Education: An Endangered Species?" *Minerva,* vol. xiv, No, 3, autumn 1976; Ernest L. Boyer and Fred M. Hechinger, *Higher Learning in the Nation's Service* (Washington, D. C.: The Carnegie Foundation for the Advancement of Teaching, 1981).

*The first Universities to be established in the United States followed the traditional European model. Serving primarily the wealthier members of society, they were specifically established to educate youth for leadership positions in the fields of theology, law, and education.

[38] Shils, op. cit.

[39] Ibid.

*American colleges and universities were particularly well suited to play the role prescribed for them. Bringing together faculty members from all disciplines, they were unique centers of intellectual stimulation. The income they derived from teaching made them economically self-sufficient. And because their work was not circumscribed by practical necessities, faculty members were free to work on basic research in areas of their own intellectual interest, Notwithstanding a growing focus on research, the multidisciplinary nature of the university prevented it from becoming limited in scope and helped to foster a public belief that the pursuit of knowledge was, in and of itself, an important societal goal and one that the colleges and universities were alone capable of achieving.

on the universities, moreover, to expand beyond their traditional role of training gentlemen as preachers, lawyers, and doctors, and—through applied research-to develop the more practical applications of education. Provided for under the Merrill Act of 1862,[40]* land-grant colleges, open to children of all backgrounds were established to provide education in fields such as agriculture, engineering, home economics, and business administration. Unlike the traditional colleges, the land-grant colleges were not isolated communities. Through their agricultural experiment stations and their service bureaus, their activities were designed to serve the State.[41]

Although the land-grant movement established the Federal Government's interest in higher education and served to legitimate the university's involvement in public affairs, there was no significant interaction between Government and the academic community until World War II, when several major universities were enlisted to conduct research for national defense. This wartime collaboration established a precedent by which the Federal Government began to look to the universities for help in executing national goals. In exchange for its assistance, the Federal Government provided the academic community with financial aid.[42]* An increasingly important source of funding, the Government came to exert a considerable influence on university affairs.[43]*

While continuing to support research, the Federal Government, in the late 1960's, also began to provide funds to assure that all qualified students would have access to higher education.[44]* In fiscal year 1978-79, the Federal Government spent approximately $14 billion to meet these goals.[45] Today, nearly 40 percent of all students receive Federal aid, and 75 percent of all university expenditures for scientific research are federally funded.[46]

Measured in accomplishments, it is clear that the alliance between Government and the university has been quite successful. American universities have been responsible for many of the Nation's most significant achievements. Since World War II, for example, American scholars have received more than half of all the Nobel Prizes awarded for science. And American research dominates the world's scientific and technical literature, accounting for approximately 40 percent of the articles written each year.[47] Moreover, the American university system has been remarkably successful in providing extensive and varied educational resources to a broadly based and increasingly diverse clientele.

[40]The Merrill Act of 1862.

*"[T]" his law provided land to the States, the proceeds of which were to be used to teach in the fields of agriculture and mechanical arts. Subsequent legislation provided Federal financial support for research and the operation of the land-grant colleges.

[41]Kerr, op. cit.

[42]Kerr, op. cit.; Patrick M. Morgan, "Academic and the Federal Government," *Policy Studies Journal* vol. 10, 1981; D. Bok, "The Federal Government and the University," D. Bok, *The Public Interest*, winter 1980.

*Federal involvement in higher education increased markedly after World War 11. By 1960, the academic community was receiving about $1.5 billion from the Federal Government, 100 times as much as it had received 20 years before. Most of these funds were spent on research-related activities, and were channeled to a limited number of universities and to a limited group of departments within universities.

[43]Kerr, op. cit.

*Federal funding was used to support research in about 10 major universities. Most funds were spent for research in the physical and biomedical sciences and in engineering. Only about 3 percent were used to support research in the social sciences, and almost nothing was spent for the humanities. University decisions to accept Federal funds for research occurred outside of the normal academic decisionmaking process, and often determined how the universities would distribute their own funds and facilities.

[44]Morgan, op. cit.

*Th, Civil Rights Act of 1964, the National Education Act of 1965, and the Educational Amendments of 1972 provided the legislative basis for increased Federal involvement in academic affairs. In this legislation, the Federal Government endorsed the view that higher education was a vital national resource and one to which all Americans should have equal access.

[45]Sloan Commission on Government and Higher Education, 1980 Report.

[46]Morgan, op. cit.

[47]Boyer and Heckinger, op. cit.

Status of American Colleges and Universities

Today there are in the United States approximately 1,957 4-year colleges and universities, 549 of which are public and 1,408 private. Reflecting the pluralistic nature of American society, they include a wide variety of institutions. All together they enroll about 4,115,000 full-time students.[48] Over the past 10 years, institutions of higher education have expanded rapidly in size, in number, and in the kinds of services that they render.[49]* During the same period, higher education has been made available to a much broader section of the population.[50]*

The expansion of colleges and universities to meet the growing demands for education has, however, affected their future viability. American colleges and universities are, for example, no longer semiautonomous institutions. Heavily supported and regulated by government, they have lost considerable control over some of of their own internal affairs. In recent years, the Federal Government has come to determine such issues as who should be taught what, by whom, and how.[51]

The American university is, moreover, no longer economically self-sufficient. Funds derived from teaching can no longer be used to subsidize university research. In fact today the reverse is true. Revenues from research now pay the overhead for many of the university's more traditional functions. As a result, more than ever before, departments are being designed to suit the needs of research, and faculty members are being selected more on the basis of their ability to attract research contracts and grants than on their ability to teach or even to publish.[52]

Once the undisputed center of research efforts in the United States, American universities are today competing strenuously with one another and with business and governmental research institutes for money and resources. In the present economic and educational climate, most universities are finding it difficult to compete. The cost of equipment for advanced scientific research is extremely expensive to buy and to maintain.[53] Faculty members, drawn by the superior research opportunities and financial benefits offered by private firms and government, are leaving the universities and taking their research teams with them.[54]

To make themselves more financially independent, many universities and colleges have begun to sell their educational services to new clients and to deliver them in new forms. In an effort to capture some of the growing adult market for education, universities, as early as 1963, began to develop programs of continuing education. Many colleges and universities now offer degree courses through correspondence programs. To compete more effectively with proprietary educational institutions, several colleges and universities have shifted the focus of their curricula from the arts, culture, and leisure activities to vocational needs. Taking advantage of some of the new information and communications technologies, several universities have, moreover, begun to broadcast courses over cable TV and to package instructional materials on video disks and video cassettes for sale to businesses or to other educational institutions.[55]

[48] *The Condition of Education,* Op. Cit.

[49] Ibid.

*During the 1970's, the number of institutions of higher education increased by 241 percent, the number of students attending these institutions increased by 290 percent, and the number of degrees conferred upon graduates increased by 251 percent,

[50] I bid.

*Increased access to institutions of higher education is indicated by the changed racial and ethnic composition of the student body. For example, the difference between the percentage of blacks in the total population and the percentage of blacks in the student body decreased significantly during these years. This changed composition of the student body can also be seen in the increase in the number of degrees that were conferred upon female and minority students.

[51] Bok, op. cit; Morgan, op. cit.

[52] Stephanie Yanchinski, "Universities Take To the Market Place," *New Scientist,* December 1981; Will Lepkowski, "Research Universities Face New Fiscal Realities," *Chemical and Engineering News, Nov. 23, 1981.*

[53] "Graduate Universities-A New Model," *Science,* December 1981.

[54] Lepkowski, op. cit.

[55] Patsy Vyner, *Telephone Survey on Use of Telecommunications Technologies at Post Secondary Institutions* unpublished paper, 1982.

Operating more and more in the market sector, universities are also beginning to sell and to patent the results of their research.[56]* Many of these arrangements are being made with the cooperation of business. Moreover, several faculty members acting independently have joined with suppliers of venture capital to establish new companies in fields such as genetics and electronics.[57]*

If universities are to keep pace with their competitors in the profitmaking sector, it is clear that, given diminished Government funding, they will have to make some new financial arrangements with industry. This development has caused some concern within the academic community. Meeting in Rome, Italy, a number of biologists recently identified some of the issues that might arise if universities become deeply involved in commercial ventures. To preserve their proprietary rights, universities might, for example, begin to restrict the free exchange of information, a process upon which so many of the university's traditional functions depend. In an effort to preserve traditional values, some academics are now trying to develop guidelines for collaboration.[58]

Today, as the demand for knowledge and the cost of its generation increase, many colleges and universities are finding it more difficult to be all-purpose "multiversities."* Unable to obtain Government or industry funding, many small liberal arts colleges, for example, can no longer afford to pursue major research efforts. And many larger institutions have had to curtail some of their research departments. Others are beginning to shift their educational focus from one that emphasizes the liberal arts to one that prepares students for careers in a great variety of new and expanding technical, semiprofessional, and managerial occupations. This public/private development may have far-reaching consequences. If more and more colleges and universities begin to function as single-purpose organizations, they may find that they face much stiffer competition from the growing number of other single-purpose institutions now seeking to provide education in the marketplace.

Information and communication technologies have potential applications for all aspects of higher education. They can play an important role, for example, both in providing a liberal education as well as in training individuals for specific roles in society. They can serve, moreover, to facilitate research and the storing, retrieving and sharing of knowledge. Many of the ways in which the new technologies can be used will be of special interest to those universities which, in the face of shifting demands and shrinking resources, are searching for new ways to become more economically and socially secure.

They might be used, for example, to provide faculty support in routine and remedial learning situations. The need for such support is likely to increase in the future, given an increase in the costs of providing higher education, an increase in the number of college students who will come from minority backgrounds, an increase in number of adults seeking higher education, and an increase in the need for job retraining. Many colleges and universities are already using and developing new ways to apply information and communication technologies for these purposes. At North Carolina State University, for example, students and faculty members worked together to develop a successful video tape instructional program that teaches strategies for studying and learning.[59]

[56] Lepkowski, op. cit.

*For example, Stanford University recently sold the design of their software chip of a music synthesizer, developed by one of their music professors, to Yamaha of Japan for $700,000.

[57] "The Academic-Industrial Complex," *Science*, vol. 216, May 28, 1982.

*For example, Hoechst AG, a German pharmaceutical firm, recently provided $70 million for the founding of a new department of molecular biology at the Massachusetts General Hospital. In exchange for this contribution, the Massachusetts General Hospital has agreed to grant Hoechst exclusive worldwide licenses to any patentable developments that result from company-sponsored research. Harvard Medical School has a similar agreement with E. I. du Pent de Nemours. In exchange for a $5 million contribution to build a new genetics department, Harvard has agreed to grant Du Pent licenses to market any commercially useful research for which it has paid.

[58] 1 bid.; and Yanchinski, op. cit.

*The term "multiversity" was coined by Clark Kerr. It refers to university communities where teaching and research activities coexist but are performed in and by different sectors of the university.

[59] *Telescan: The Digest of the Center for Learning and Telecommunications, VOL* 1, issue 1, October 1981.

The new technologies can also be used to extend the boundaries of the university to provide teaching facilities to those who would otherwise not have access to them. Many colleges and universities have, for example, joined with public broadcasting stations to broadcast college credit telecourses as part of a new Adult Learning Service to be coordinated nationally by the Public Broadcasting Services.[60] Members of the health community have, moreover, used video teleconferencing to provide continuing medical education to professionals throughout the country.[61]

Communication and information technologies can also be used to distribute scarce teaching and faculty resources across many campuses. Recognizing the potential for sharing,

[60] Ibid.

[61] James J. Johnson, "A Case Study: The Health Pulse of Medical Video Teleconferencing," *Satellite Communications*, May 1981, pp. 19-23.

Columbia University graduate students with allotted mainframe time are working at the consoles (top). Their work is cranked into their department's information and stored for further processing at the Unversity's Mainframe Computer Center

several colleges and universities have formed consortia to advise and assist them in the use of media-based materials. A telecommunications task force was recently formed at the National Association of State Universities and Land Grant Colleges,[62] for example.

While the use of computers in college and university teaching has traditionally been limited to the fields of math and science, it is increasingly being extended to other areas as well. Viewing computer literacy as an essential element of any general education, a number of liberal arts colleges, such as Harvard and Wells, now require that all of their students become familiar with the computer. Faculty members and students have experimented in using the computer to teach a wide range of courses including drama, English literature, psychology, and the classics.[63] Where students on a campus have ready access to computers, they are using them more and more not as an adjunct to, but as an integral part of their learning routines.[64]*

By facilitating sharing, information and communication technologies can help reduce the costs of and increase the resources available for performing university research. Networks to transmit data, voice, and video between universities are already being established. Some will provide individual users access to library resources and scientific data bases, while others, like Bitnet, will allow faculty members and students to communicate with their colleagues at different colleges and research institutions and provide an environment in which they can exchange ideas and information, and even coauthor papers.[65] By extending their traditional boundaries, the new information and communications technologies may help the universities to adapt to the changed needs and circumstances of an information age.

However, at the same time, and for many of the same reasons, they may also serve to undermine those aspects of the university that have traditionally set it apart from–and above—the rest of society. Semiautonomous communities' universities were expected to operate by a special set of rules and standards that would foster the development and the preservation of knowledge as a goal in and of itself. And members of the academic community, assumed to be loyal to these goals, were called on to serve as independent observers and critics of society. The widescale deployment of information technologies may affect the university's ability to perform this role. Increasingly linked to outside groups, the university community may be less able to function as an independent source of knowledge and as independent observer of society.

[62] *Telescan,* May/June 1982.

[63] "The Wired University Is On 1ts Way," *Business Week,* Apr. 24, 1982.

[64] Ibid.

*Last year, for example, 60 of the entering students at Rennselaer Polytechnic Institute were given computers as an experiment to see how they would be used. Within a short period of time, these students became very comfortable with them, using them as extensively as students who had brought their own computers to campus.

[65] Bitnet Links Yale University, City University of New York, Columbia University, Princeton University, Rutgers University, Penn State University, Brown University, Boston University, and Cornell University.

Two-Year and Community Colleges

More than any other educational institution, the American community college has exhibited an ability and willingness to adapt rapidly to changing societal needs and circumstances. Experienced in reaching out to provide nontraditional services to new categories of students, community colleges may have a special need for, and be particularly suited to take advantage of, the new information technologies.

Community colleges emerged at the end of the 19th century to accommodate the growing number of youths who, seeking some kind of postsecondary education, either were unprepared for or could not find room in the tradi-

tional college and university system.[66] Some of these new colleges were extensions of secondary schools; others were 4-year colleges converted to 2-year programs. Referred to as junior colleges, they provided a general college curriculum designed to be transferable to 4-year colleges and universities.

Today, as the change in their name suggests, community colleges offer a curricula more oriented towards the needs of local communities. Having continually added new functions as the need arose, community colleges now provide a wide variety of educational services. These include:[67]

- academic transfer programs;
- terminal general education programs;
- technical productive skills programs;
- life skill programs not related to employment;
- remedial programs;
- cultural, social, and recreational programs; and
- counseling.

To provide such a wide variety of programs and services, community colleges have employed untraditional organizational structures and educational techniques. Willing to adapt the institution to the needs of their students, they have followed policies of open admissions, made use of the special skills of nonacademic, part-time faculty members, allowed flexible scheduling, and offered courses off-campus in such remote places as nursing homes, prisons, and storefronts.[68]

Because of their organizational flexibility, their open-door policies, and their aggressiveness in recruiting new students, community colleges benefited more than any other institutions of higher education from the postwar baby boom and from the national emphasis during the 1960's on providing equal educational opportunities. Their growth during this period was phenomenal. Enrollment increased by 930 percent, and, on the average, one new college was established every week.[69]

Today there are 1,194 2-year community colleges in the United States, approximately three-quarters of which are publicly supported. Together they constituted in 1979a $52-billion enterprise.[70] In 1980, community colleges enrolled 1,718 full-time and 2,733 part-time students, and employed about 87,000 full-time and 115,400 part-time faculty members. Although their distribution varies from State to State, they account for a substantial proportion of higher educational enrollments in all of them. In 1979, one-third of all students, and 27 percent of all full-time students were enrolled in community colleges.[71]

Although a large portion of all students of higher education are enrolled in community colleges, community college students differ significantly from those who have historically attended 4-year colleges and universities. As compared with those in the more traditional institutions, community college students are more likely to be older, registered part-time and in noncredit courses, to come from lower economic backgrounds and from minority groups, and to be in greater need of remedial instruction.[72]

Because of their demonstrated ability to adapt to change, and to attract new groups of students, community colleges, unlike most other institutions of higher education, are predicted to grow throughout the 1980's. Their future will, however, not be without problems.

As total levels of enrollment decline, all educational institutions will begin to compete for the same categories of students. Once alone in marketing their service to nontraditional groups of students, community colleges may,

[66] For a history of community colleges, see Ralph R. Fields, *The Community College Movement (New* York: McGraw Hill, 1962).

[67] Clark Kerr, "Changes and Challenges Ahead for the Community College, " *Community and Junior College Journal,* vol. **50,** May **1980.**

"Barbara Guthrie-Morse, "Agenda for the 80s: Community College Organizational Reform, " *Community College Review,* spring 1981, pp. **O-8.**

[69] D. W. Breneman and S. C. Nelson, *Financing Community Colleges:* An *Economic Perspective* (Washington, D. C.: The Brookings Institution, 1981).

[70] Ibid.

[71] Ibid.

[72] Ibid.

in the future, have to compete with high schools to provide adult basic education, with area vocational centers and proprietary institutions to teach vocational and commercial skills, with company-based training programs to provide job specific instruction, and with 4-year public and private colleges and universities to teach part-time and general education courses .73

Community colleges will also have to compete with other institutions for scarce public resources. Charging relatively lower tuition fees than other institutions of higher education, community colleges are more dependent than most on public funding.

In recent years, State governments have assumed greater responsibility for and control over community college affairs.[74] In a period of increased costs and declining revenues, State policymakers, now responsible for a much broader area of educational activities, may have to reevaluate the rationale according to which educational funds are allocated. Community colleges may be particularly vulnerable in such a reevaluation, since there is less general recognition of, and no longstanding tradition to publicly finance, many of the functions that they perform.[75]

"S. V. Martorana and Wayne D. Smutz, "State Legislation, Politics, and Community Colleges, " *Community College Review*, winter 1980; S. V. Martorana and W, Cary McGuire, "Recent Legal Action Affecting Community Colleges: A National Survey, " *Community College Review*, fall 1976.

[74] Breneman and Nelson, op. cit.
[75] Ibid.

Proprietary Education

Proprietary educational institutions are profit-seeking institutions that offer programs closely geared to preparing students to enter specific jobs and occupations. Over the years, four types of proprietary institutions have evolved, each appealing to a distinct educational market. They include trade and technical schools, licensed occupational schools (e.g., cosmetology and barbering), independent business schools, and home study schools. Most private and profit-seeking, preschool, elementary, secondary, and preparatory schools are not considered part of the proprietary educational system, perhaps because they are less occupation-oriented and their curriculums tend to be more traditionally structured.

Status of Proprietary Schools

Proprietary schools have existed as distinct institutions in the United States since the 1880's. Many were typical small businesses of the time—established by individual entrepreneurs or as family operations.[76] The overwhelming majority of these schools are still individually owned today, but corporate ownership is now the most common form of proprietary school organization.[77] Most schools are small. The average private school enrollment (includes nonprofit) in 1978 was 153, compared with an average enrollment of 556 during the same year for public postsecondary, noncorrespondence schools.[78]

According to biennial surveys of postsecondary schools that offer occupational programs, conducted by the National Center for Education Statistics (NCES), the number of

"Donald E. Mellon, *The Role of the Entrepreneur-Educator in* Private *Business Education in the United States From 1850 to 1915: A Study in Conditioned Entrepreneurship, 1975* doctoral dissertation, New York University, Graduate School of Business Administration.

"Steven M. Jung, *Proprietary Vocational Education* (Columbus, Ohio: National Center for Research in Vocational, The Ohio State University, 1980).

"Evelyn R. Kay, *Enrollments and Programs in Noncollegiate Postsecondary Schools, 1978* (Washington, D. C,: National Center for Education Statistics, 1979).

proprietary schools had increased from 5,814 in 1978 to 6,141 in 1980, of which 4,151 (67.6 percent) were accredited.[79] Of the 1.5 million students enrolled in 1978 in all public and private noncorrespondence postsecondary schools, 61 percent (or 928,000 students) attended proprietary institutions.[80] An unpublished NCES survey indicated in 1980 that total postsecondary occupational enrollments had increased to 2.4 million and that the number of students attending all types of noncorrespondence proprietary schools had risen as well. (No comprehensive enrollment figure for 1980 is available at present.) Cosmetology/barber schools, business/commercial schools, flight schools, and trade schools were the largest groups of proprietary institutions operating in 1980 (see table 15). As indicated in table 16, more of these schools are accredited than any of the other types of proprietary institutions.

There are an estimated 250 home study schools in the United States. The 70 of these that are accredited have some 1.5 million students enrolled annually.[81]

It has been suggested that vocational education began to evolve when those seeing the need for additional and expanded occupational training attempted to join two separate educational systems—craftsmen education, which prior to that time had been in the hands of the craftsmen themselves, and academic education, which had developed around the concept of scholarship. Attempts by educationally innovative individuals to place the preparation of craftsmen in the same context as academic education met resistance from more traditional educators. However, the need for occupational education remained.

Vocational education developed as a separate branch of what was then the traditional education system, but traditional academic school standards-such as length of programs and methodology-were superimposed on this new type of educational experience. This resulted in a vocational program that was too abstract and" . . . lacked the desired technical knowledge and practical skill."[82]

While public and nonprofit vocational education programs continued to develop over the years, the need to which proprietary education had become at least a partial response began to take shape. A study of personality characteristics of 19th to early 20th century private business school founders indicates that those

[79] "Statistics of Postsecondary Schools With Occupational Programs," *National Center for Education Statistics Early Release,* September 1981.

[80] Kay, op. cit.

"Interview with Michael P. Larnbert, Assistant Director, National Home Study Council, fall/winter 1981.

[82] Melain L. Barlow, "Our Important Past," in *The Future of Vocational Education,* Swanson, Gordon I. (cd.) (Arlington, Va: American Vocational Association, 1981).

Table 15.—Number of Postsecondary Schools With Occupational Programs, By Control and By Type of School: Aggregate United States, 1980 (universe data)

Type of school	Total schools	Public	Private	
			Proprietary	Independent nonprofit
Vocational/technical	689	591	85	13
Technical institute	107	2	96	9
Business/commercial	1,388	3	1,348	37
Cosmetology/barber	2,128	3	2,125	0
Flight school	928	1	926	1
Trade school	773	8	739	26
Arts/design	250	0	233	17
Hospital school	859	171	51	637
Allied health	384	117	220	47
Junior/community college	1,116	905	86	125
College/university	647	260	11	376
Other	224	0	221	3
Total	9,493	2,061	6,141	1,291

SOURCE: "Statistics of Postsecondary Schools With Occupational Programs," *National Center for Education Statistics Early Release,* September 1981.

Table 16.—Number of Postsecondary Schools With Occupational Programs, By Control and By Type of School: Aggregate United States, 1980 (accredited schools only[a])

Type of school	Total schools	Public	Private	
			Proprietary	Independent nonprofit
Vocational/technical	661	591	64	6
Technical institute	92	2	83	7
Business/commercial	743	3	731	9
Cosmetology/barber	1,713	3	1,710	0
Flight school	714	1	712	1
Trade school	420	8	398	14
Arts/design	146	0	136	10
Hospital school	809	171	39	599
Allied health	301	117	161	23
Junior/community college	1,112	905	84	123
College/university	647	260	11	376
Other	25	0	22	3
Total	7,383	2,061	4,151	1,171

[a]Includes all schools accredited by a nationally recognized accrediting association, whether institutional or specialized, or eligible for participation in certain Federal programs

SOURCE: "Statistics of Postsecondary Schools With Occupational Programs," *National Center for Education Statistics Early Release,* September 1981 "

who were successful in their ventures possessed both educational expertise and business know-how. More often than not, in the early years, ability as an educator was subordinate to that of entrepreneur.

At the end of this period, however, the entrepreneur without considerable sophistication in educational matters was unable to compete in the industry.[83] Perhaps the entrepreneurial skills of these early business educators and their counterparts in trade and technical schools enabled them to identify significant markets, while their educational skills enabled them to translate market needs into educational programs.

Some view proprietary education as filling a vacuum in occupational training that was created by the failure of continued development of apprenticeship education and the public vocational education system in the United States. In Europe, where these two types of educational experiences are thriving, no private vocational school system has evolved .84

[83]Mellor, op. cit.

"Dorothy Kile Cann, *proprietary Vocational Schools: An Alternative Lifestyle for the Disenchanted/Disadvantaged,* paper presented at the National Center for Research in Vocational Education's Employability Conference, Columbus, Ohio, October 1981.

Characteristics of Proprietary Schools

Perhaps the most distinctive characteristic of proprietary schools is their flexibility. Because they are operated as businesses, they are constantly monitoring the needs of their respective markets, for their survival depends on how well they meet the needs of their clients who are seeking adequate preparation for employment. The balance that must be maintained between providing suitable training and making a reasonable profit results in continuous assessment of and changes in operation and instruction.[85]

Proprietary schools are totally dependent on student tuition income. Rarely if ever are they endowed or do they provide student scholarships. As a result of the Education Amendments of 1972, their enrollees are eligible for financial assistance from such Federal programs as Basic Educational Opportunity Grants and Federally Insured Student Loans. In comparisons of the costs of private versus public vocational education programs, including Federal and State assistance to public institutions, proprietary school programs are

[85]A. Harvey Belitsky, *Private Vocational Schools and Their Students: Limited Objectives; Unlimited Opportunities* (Cambridge, Mass.: Schenkman Publishing Co., Inc., 1969).

less costly, although tuition for students enrolled in private, profit-seeking institutions is higher.[86]

The *course* offerings of these institutions tend to be shorter than those of their publicly funded counterparts, and liberal arts requirements are usually not a part of their curricula. Because enrollments are much smaller than those in publicly funded vocational schools and their administrative structures are less complex, they can develop materials and introduce new courses more quickly in the occupational fields that are in demand in the industrial job market (e.g., data processing). More often than not proprietary schools include as course content only those principles which are directly related to and necessary for mastery of a specific occupation. A year-round schedule of day and evening classes is common.[87]

Instructors in proprietary schools tend to be selected because of their work experience and craftsmanship rather than on the basis of their experience in the classroom or their academic degrees. They are not tenured employees, and are constantly evaluated in terms of their achievement of student satisfaction and graduate employability .88 In some proprietary schools, instructors also serve as placement counselors. This is seen by some school administrators as yet another way to ensure that what is taught in the classroom is appropriate preparation for entry or reentry into the job market .89

Another characteristic of proprietary school education is its emphasis on the development of what might be called widely accepted work behavior in enrollees. Students are expected to attend classes or risk suspension, to complete assignments in a timely fashion, and, especially in business school programs, dress according to common business standards, since all these characteristics are seen as necessary for successful, long-term employment.[90]

Markets Served by Proprietary Schools

A 1980 study that used 1975 data suggests that, in general, proprietary school students share the following characteristics:

- A larger percentage are female and black as compared with students in community colleges;
- They are more likely to come from lower income backgrounds and be older, married, and out of high school for a longer time; and
- They are more likely than community college-freshman to receive financial aid-from Federal funding sources. The most frequent source is the Basic Education Opportunity Grant, which supported 4 out of 10 students. The greatest source of dollars is the Guaranteed Student Loan Programs.

Further comparisons in the study of students within the proprietary school sector reveal their diversity:

- The enrollees in independent business schools are largely women, while enrollees in trade and technical schools are considerably older and are comprised of a high proportion of veterans, married students, and minorities.
- More trade and technical school students come from wealthier families than do those in business schools.
- Independent business school students are more likely to participate in college work study programs, and trade and technical school students are more likely to support their studies through GI benefits and money earned from full-time work.[91]

[86] Jung, op. cit.
[87] Belitsky, op. cit.
[88] Cann, op. cit.
[89] Interview with Stephen Friedheim, President, Association of Independent Colleges and Schools, fall/winter 1981.
[90] Ibid.
[91] Marci L. Cox, *Characteristics of Students Proprietary Schools and Factors Influencing Their Institutional Choice, 1980* doctoral dissertation, University of California, Los Angeles.

A study of proprietary schools and colleges conducted in 1975 found that students who attend proprietary schools are, for the most part, ignored by institutions of higher education. Proprietary schools do not compete for students with colleges and universities, but instead meet a specific market need. Their greatest potential impact on higher education is in diverting Federal assistance from collegiate institutions.[92]

In the 1978 survey of postsecondary schools with occupational programs conducted by NCES, 32 percent of men and 38 percent of women attended private schools (includes nonprofit). The survey results show that, during the period 1974 to 1978, more women than men were enrolled in private (includes nonprofit) schools. As illustrated in table 17, female enrollments fluctuated from 52.9 percent to 54.2 percent. Enrollments for males in private schools increased significantly from 61 percent to 67 percent during the same 4-year period. Increases in enrollment levels in private schools from 1974 through 1978 accounted for most of the enrollment growth in postsecondary occupational education.

While individual enrollees represent the primary target audience for all types of proprietary education programs, business and industry, as well as State and local education agencies, have been looked on by some segments of the profit-seeking educational system as important markets. Prior to and during World War II, for example, extensive amounts of training for industry were carried out by trade, technical, correspondence, and home study schools. After the war, however, there was a dramatic drop in the volume of contract training, as companies who had not already done so began to establish their own in-house training capabilities.[93]

Although relations between proprietary school educators and nonprofit educators have been and continue to be strained due to their different views about the profit motive in education, State education agencies and local school districts are beginning to approach profit-seeking institutions to operate special programs. The Vocational Education Act of 1963 cleared the way for public agencies to establish contractual relationships with proprietary schools where such schools can " . . . make a significant contribution to attaining the objectives of the State plan for vocational education and provide substantially equivalent training at a lower cost; or provide equipment or services not available in public institutions."[94]

Despite this enabling legislation, contracting between public and proprietary institutions remains at fairly low levels. In 1977, contracting between local school districts and private vocational schools made up between 0.6 and 1 percent of Federal outlays for vocational education under Part B of the Vocational Education Act. Barriers identified to more extensive utilization of proprietary schools included a distrust of the profit motive, a concern over highly publicized abuses of Federal student loan programs by some profit-seeking institutions, and the absence of administrative systems that would encourage more working agreements.[95]

[92]J. Michael Ervin, *The Proprietary School: Assessing Its Impact on the Collegiate Sector* (Ann Arbor, Mich.: University of Michigan, Center for the Study of Higher Education, February 1975).

Table 17.—Percent Distribution of Men and Women by Control of School

Control	Total	Men	Women
Public	100.0	58,5	41.5
Private	100.0	47.1	52.9
Total, 1974	100.0	51.0	49.0
Public	100.0	54.7	45.3
Private	100.0	45.8	54.2
Total, 1976	100.0	48.8	51.2
Public	100,0	53.1	46,9
Private	100.0	45.8	54.2
Total, 1978	100.0	48.0	52.0

SOURCE Evelyn R Kay, *Enrollments and Programs in Noncollegiate Postsecondary Schools, 1978* (Wash ington, D C Nat ional Center for Education Statistics), p 5

[93]Interview with William A. Goddard, Executive Director, National Association of Trade and Technical Schools; Interview with Michael P. Lambert, fall/winter 1981.

[94]Educational Testing Service, Education Policy Research Institute, *Private Schools and Public Policy* (Washington, D. C.: Office of Education, September 1978).

[95]Ibid.

Applications of Information Technology in Proprietary Education

All proprietary education industry leaders and school administrators interviewed in this investigation expressed awareness of the increasing role of information technology. However, differences of opinion exist as to how useful such technology is in specific types of proprietary institutions. It is interesting to note the applications of information technology within a group of institutions forced to be wary of high administrative costs, and known for their ability to be flexible and responsive to frequently changing needs in their respective markets.

Trade and Technical Schools

Little or no use of any form of information technology is being made by accredited trade and technical institutions. This type of proprietary school tends to be highly instructor-oriented, to emphasize learning by doing, and to restrict the amounts of theory presented in the classroom to that which is directly job-related. Video tapes are sometimes used to demonstrate equipment operation and to provide individuals with performance feedback. Costs associated with the use of educational technology are cited as a reason for its limited use. Data processing schools are the only possible exceptions.

Licensed Occupational Schools

To date, schools of cosmetology and barber colleges have made very little use of information technology in their occupational programs. The most commonly utilized forms of technology in the cosmetology field tend to be video tape, used to record remarks of visiting instructors or to demonstrate particular processes and/or techniques, and audio cassettes, used to record instructor presentations. Although the potential for the use of educational technology is recognized, the relatively small size of most licensed occupational schools and the investment required for equipment and software result in few applications.[96]

Proprietary Business Schools

Video tape, closed-circuit television, computer-managed instruction (CM I), and computer-assisted instruction (CAI) are all in use at present in profit-seeking business schools. Video tape is by far the most common form of technology being applied, closely followed by CMI, which is used for tracking applications, enrollments, financial aid, grading, and placement.[97] At Johnson and Wales College in Providence, R. I., closed-circuit television is used to link two classrooms and to provide better viewing of cooking demonstrations for students attending the culinary arts program.

An electronics school affiliated with Johnson and Wales also makes use of closed-circuit television in selected classroom sessions. Although cost remains a major deterrent to further use of these and other technologies, the administrator of this school feels that proprietary business schools will be forced to make greater applications of technology in the classroom, given what he calls the "video orientation" of today's students.[98]

Coleman College, located in LaMesa, Calif. and founded in 1973, offers programs in data processing and computer electronics to a student body of 800. Closed-circuit television is utilized in every course offered. The college has two large viewing rooms as well as individual viewing stations for student use, and its own video tape studio. Video tape is used to record lectures prior to delivery, and then to highlight them with graphics. Coleman has a CM I system used to monitor student progress, to select appropriate readings, and to administer testing.[99]

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[96] Interview with Gerald Donaway, Executive Director, National Association of Trade and Technical Schools, fall/winter 1981.

[97] Interview with Stephen Friedheim; also interview with Jack Yena, Executive Vice President, Johnson and Wales College, fall/winter 1981.

[98] Ibid.

[99] Interview with Coleman Furr, Chairman of the Board, Coleman College, fall/winter 1981.

Home Study Schools

At present, the home study industry remains very print-oriented. The National Radio Institute (NRI), a wholly owned subsidiary of McGraw-Hill, Inc., and the largest technical correspondence school in the country, with an average annual enrollment of 60,000, uses a CMI system that permits student examinations to be graded, annotated with personalized comments and mailed back to the enrollee within a 24-hour period. The admissions and financial records of NRI have just recently been converted to a computer format. Lesson-grading records will be automated in the next phase.

As part of a video cassette repair course now offered by the school, two instructional video tapes have been developed that soon will be distributed to enrollees. Plans for 1982 call for the addition of CAI to the microcomputer technology course, which begins by taking the student through basic electronics and ends with microtechnology. A TRS-80 computer, included in the cost of the course, is shipped to each student after successful completion of a certain number of lessons on basic electronics. Enrollees learn how to repair the computer and how to develop and run simple software programs. Through CAI units, to be added next year, students will learn how to do elementary programing in BASIC. Cost is a major deterrent in conversion of additional courses to CAI, video disk, or any other form of technology. [100]

Future Uses

By far the segment of the proprietary school industry doing the most to encourage additional applications of information technology in future education programs is the home study group. A recent review of current practices in home study suggested that greater use of educational technology is one way to ensure regeneration of the industry.[101] In May 1981, the National Home Study Council (NHSC) established a forum for educators known as the Green Chair Group to predict what shape home study will take by 2000.

In addition to a series of papers produced by selected individuals, the end-product of the effort will be a predictive model, developed from a Delphi survey series administered to group members. From the first round of papers submitted to NHSC in 1981, it is clear that these educators see extensive use of information technology in "distance education"—the new name they have coined for home study–in the very near future. While they see the continued use of print media, some predict that in most homes there will be interactive video and voice units with hard-copy capability that may be utilized by distance educators. Others feel that home study students will be offered a choice of straight lecture or interactive systems similar to today's PLATO. There is speculation that laser-based holography will be perfected to the point that it will be used to bring the instructor—life-sized and three-dimensional-into the home. There will also be interactive computer simulation capability.

Some see enrollment as a process that will be handled through home-based electronic devices or through home study industry-sponsored centers set up for this purpose. Industry-supported regional counseling centers will operate as nonprofit cooperatives. Counselors will be trained and compensated by distant education suppliers who are cooperative members. Satellites will be the most likely mode of transmission and will create a climate in which transnational education programs will be commonplace.

Technologies currently available, such as video tape, video disk, CAI on microcomputers, and cable will increase in use. One panel member expressed the view that in the future information technology will allow distant educational institutions to offer their students personalized instruction and services comparable to those of residence training programs, while at the same time continuing to allow them " . . . to study at their own pace and to have a full-time job while they are pur-

[100] Interview with John F. Thompson, President, National Radio Institute; also interview with Louis Frenzel, Senior Vice President, Product Development, National Radio Institute, fall/winter 1981.

[101] Louis E. Frenzel, "Ten Reasons Why Home Study May Not Survive the 80's," *NHSC* News, fall 1981, pp. 11-18.

suing a program of study. " One representative cautioned however, that the major problems in application will come, as they have to date, from " . . . enthusiasts for technology who are long on fervor and short on understanding, not from those who resist its utilization.[102]

Future Uses by Other Industry Segments

While cost will remain a prohibiting factor for the foreseeable future, other proprietary educators, especially business schools, are speculating on how existing technologies will be applied in the future in their institutions. For example, local television stations may be used to broadcast courses emanating from independent business schools.[103] One business college administrator suggested that his institution might adapt its culinary arts program for delivery to the home market via television. Another business school official feels that within 3 to 5 years, video disk will become practical for acquisition, due to considerable cost reductions. He also hopes that increased availability of video teleconferencing equipment through local telephone company offices, plus cost reductions associated with its use, will make application of this technology feasible.

[102]Green, Chair Group, *Unpublished Papers* (Washington, D. C.: National Home Study Council, 1981).

[103]Interview with Stephen Friedheim.

Education in the Home

The family household has always been a center of learning, and its members have always played a key role in providing educational services. Grounded in the social and economic order, the family household mediates the culture, helping to provide the behavioral and cognitive skills members need to perform effectively in society.

Learning within a household is a loose and informal process. Family members act as both teachers and learners. By interacting with one another, they adopt roles, acquire personality traits, form values, and pattern their behavior.[104] Of all of the institutions that educate, the family is the most versatile and the least restricted with respect to the educational methods and the technologies it can use. Given this versatility, the household may provide a particularly suitable environment for using the new information technologies. If widely used for educational purposes in the home, the new information technologies could make the household an increasingly important center of learning.

Status of Education in the Home

Although most people receive most of their formal education in institutions outside their homes, the home has always played an important role in education, particularly in the education of the young. For even though family members are not primarily responsible for the instruction of cognitive skills, their behavior in the home strongly affects attitudes about learning. Recent studies have shown that the home environment is the most significant single factor that determines academic achievement.[105]

Adults also learn in the home, either indirectly through interaction with others or through deliberate efforts to acquire certain kinds of knowledge and skills. Books, magazines, radio, and television can all be used at home as learning resources. Some adults may continue to receive formal education in their homes through correspondence courses.[106]*

[104]James Garbarino, "The Family: A School for Living, " *National Elementary School Principal* vol. 55, May 1976.

[105]James S. Coleman, *Equality of Educational Opportunity,* Amo Press, 1979.

[106]Dede, op. cit.

*The National Home Study Council estimates that there are 4 million correspondence students in the United States. Because

Today the American family is undergoing some radical changes that could significantly affect its ability to provide educational services in the home. At present, for example, about 40 percent of all American families are structured or operating in a way that markedly varies from the traditional norm. Since 1960, there has been, for example, a 100-percent increase in the number of single-parent families, and, since 1970, a 33-percent increase in the number of households headed by women.[107] Because single parents have less time and fewer resources to spend in or on the home than do couples, these changes may seriously reduce the ability of some families to provide for the educational needs of their children. A recent study found that children from single-parent families fare less well in school, both socially and academically.[108]

The educational needs of the family are also changing. Until recently most people had by the end of their childhood developed and acquired the skills and resources they needed to operate effectively in society. Today, however, with the explosive growth in the fund of knowledge, people are becoming increasingly dependent on continuing education for both their social and their economic welfare. It has been estimated that the average American growing up today will have to be retrained four times during his working life. He will also need more education if he is to participate in making decisions about his life and environment, and if he is to make effective use of his increased leisure time.[109]

How well families of the future can meet these enhanced educational needs will depend not only on the organization of the family and on its relationship to the rest of society, but also on the kind of technologies that are available to assist them. Printing and the mass publication and circulation of books, newspapers, and periodicals, for instance, have greatly improved the possibilities for learning in the home. And the invention and widescale deployment of radio and television has also had an extraordinary impact with respect to who learns, and what is learned at home.[110]

Many new educational technologies such as cable, video disks, and the personal computer are now being made available for use in the home at more affordable costs. In 1981, there was a market for about 1 million personal computers. It is estimated that by the late 1980's as many as half the families in the United States will have them in their homes. It is predicted, moreover, that, by the end of the 1980's, the percentage of homes wired for cable will increase from the present 28 to 50 percent.[111]

Because the widespread deployment of information technologies will significantly affect how members of a family interact and use their time together in the home, it will have a significant effect on education. It is difficult to predict, however, what that impact will be.

The new information technologies could significantly improve the learning environment for children in the home. Parents often lack the time and expertise necessary to effectively supplement their children's education at home. Traditional resources such as books, television programs and recordings are essentially passive and cannot be tailored to meet individual needs. The new technologies are individually oriented and interactive. Because they can rapidly process information, they can be used, moreover, to assist parents in diag-

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education in the home is such an informal process, it is difficult to determine its extent. A number of recent surveys have concluded, however, that nearly 90 percent of all adults undertake at least one major project a year.

[107]"Winifred I. Warnat, "Future Families as Household School Institutions," *Education: A Time for Decisions,* Kathleen M. Redd and Arthur M. Harkins (eds.), selections from the Second Annual Conference of the Education Section of the World Future Society, 1980.

[108]David Melendez, "A Developing Paradox: The Role of Family Education, Clearing *House,* vol. 55, No. 5, January 1982.

[109]Katherine Patricia Cross, *Adults as Learners (San* Francisco: Jossey-Bass Publishers, 1981).

[110]Clark C. Abt, "what the Future Holds for Children in the TV Computer Age: Unprecedented Promises and Intolerable Threats to Child Development," an adapted version of the keynote address to the National Council for Children and Television Symposium on Children, Families, and the New Video Computer Technologies, Princeton, N. J., Mar. 10, 1980.

[111]Inclement Bezold, *Home Computers and Telecommunications Children,* May 1980, for the Foundation for Child Development by the Institute for Alternative Futures.

A family leaves a store in Yonkers, N. Y., with a computer and software to be used by an oceanographer father and his high-school-age children

nosing learning problems and in developing creative approaches to remedy them.[112]

If they enhance the household resources available for instruction, the technologies will make it easier for the growing number of parents who, dissatisfied with formal educational institutions, would prefer to educate their children at home.[113]* The technologies may make it easier for parents to meet the educational standards required by many State compulsory education laws.

While the new technologies may serve to enhance the possibilities for learning in all households, they could be of special educational value to those individuals who have traditionally found it difficult to learn in formal educational settings or institutions. Many adults, for example, have often been inhibited from participating in traditional educational programs because they felt too self-conscious or because such programs were too expensive, time-consuming, or inconvenient. Educational services delivered directly to the home could overcome such barriers. In addition, children living at home with a single parent who works, and handicapped individuals, confined more than usual to the home, may also find that the new information technologies have, for them, a special educational potential.[114]

On the other hand, it is possible that the technologies may actually diminish the opportunities for home education. Like television, they may be more of a technological than a cultural success. Instead of increasing individuals' access to information, and providing new ways of problem-solving, they may, in fact, lead to an unproductive use of time, provide children access to pornography and violence, and replace formal learning activities with much less valuable ones.[116] Moreover, if the technologies are primarily designed for and made available to middle-class families, they could increase rather than diminish the gap between the educationally advantaged and disadvantaged.

[112] Victor Walling, Thomas C. Thomas, and Meredith A. Larson, *Educational Implications of In-Home Electronic Technology,* SRI prepared for the Department of Health, Education, and Welfare, Washington D. C., May 31, 1979.

[113] Leah Beth Ward, "What Happens When Parents Turn Teachers," *The New York Times Winter Survey of Education, sec. 13,* Sunday, Jan. 10, 1980.

*The number of parents who choose to educate their children at home is difficult to estimate, since many parents do it clandestinely so as to avoid court battles. According to the National Association for the Legal Support for alternative schools, the number of families, now about 1 million, is rapidly growing.

[114] Walling, op. cit.

[116] Abt, op. cit; and J. Weizenbaum, "Once More-A Computer Revolution," *Bulletin of the Atomic Scientists,* vol. *34,* September 1978, pp. 12-19.

Libraries

As institutions that acquire, store, manage, and disseminate information, libraries provide a variety of educational services. The learning environment in a library is unstructured. Individuals of all ages are free to come and go as they please; to learn on their own, and at their own pace. Information is presented in general terms so as to be most relevant to a

broad, undifferentiated clientele. The traditional medium by which learning takes place is the printed word.

Today, libraries are at a turning point. They must make some major decisions about whether and how they should employ the new technologies-decisions that will significantly affect their ability to perform what has been their traditional educational role. Taking advantage of these technologies, libraries might increase and/or enhance the educational activities that they provide. On the other hand, libraries might use these technologies as the means of shifting their role from one of providing public services such as education to one of providing information on a fee-paying basis.

Education in the Library

In the United States, libraries have always been regarded as popular, educational institutions. Like the public schools, they derived their support from the public education and reform movements that developed after the Civil War.[116] Traveling libraries were founded to bring news and reading materials to rural areas where book deposit stations were set up in grange halls, neighborhood stores, fire stations, and women's clubs. In the cities, libraries were established not only to provide access to books but also-like the settlement houses —to provide a haven and adult education programs for a growing number of working-class immigrants. These libraries developed rapidly during the post-Civil War period, and even continued to thrive in the depression years.[117]

More recently, libraries have tried to provide programs, materials, and services that could help all individuals, whether they could read or not, to attain their educational goals. The National Commission on Libraries and Information Sciences, for example, recently adopted the goal of:[118]

> . . . providing every individual in the United States with equal opportunity of access to that part of the total information resources which will satisfy the individual's working, cultural, and leisure time needs and interest, regardless of the individual's location, or social or physical level of achievement.

The important educational role that libraries perform has been recognized and supported by the Federal Government. Federal aid to libraries was first granted, in fact, as part of the Federal Government's efforts to enhance and equalize educational opportunities.

Status of Libraries

There are in the the United States today 29,446 individual libraries, some publicly and some privately supported. These include 14,390 public libraries or library branches, 4,676 academic libraries, 489 military libraries, 1,451 civilian government libraries, 5,294 special libraries, 429 law libraries, 1,705 medical libraries, and 1,012 religious libraries. In addition, there are library media centers in 85 percent of the public schools.[119]

Not all of these institutions provide educational services. Unlike public libraries, special libraries, for example, are supported and maintained to provide a specific kind of information to a particular clientele. They are not necessarily open to the public.

Although libraries were once a major center of activity in many communities, they have become increasingly irrelevant to many Americans. Television and the inexpensive paperback book have replaced the library as a major source of information and entertainment. Now only about two-thirds of the population of a typical community use the public library. Another third have never used it at all.[120]

Lacking public support, many libraries operate under severe economic constraints. Most negatively affected are those that provide educational services—public libraries, school libraries, and universities. Public libraries, for example, are dependent for their financing and

[116] V. H. Mathews, *Libraries for Today and Tomorrow* (Garden City, N. Y.: Doubleday & Co., 1976).
[117] Ibid.
[118] Ibid.
[119] *The Bowker Annual of Library and Book Trade Information*, 25th cd., 1980.
[120] Mathews, op. cit.

support on local communities that are themselves experiencing severe economic difficulties. Approximately 81 percent of their financing comes from local property taxes, funds for which many social services compete. Of these funds, public libraries typically receive less than 1 percent. Unable to meet increased costs with declining budgets, many libraries have had to cut back their services, buy fewer materials, shorten hours and share resources.[121]

Also vulnerable are academic libraries—some of which have, over the last decade, had to reduce their expenditures for materials by 20 to 40 percent.'" To meet the rising costs of operations, the Firestone Library at Princeton University is now considering charging fees for all nonaffiliated users.[123]

The major research and special libraries have had fewer of these problems. Because they have a more clearly defined and economically valued role in their institutional environments, they are more financially secure.

The growing demand for information and the development of information technologies offer libraries an opportunity to establish a new rationale for their existence and a new basis of economic support. Demographic changes, new lifestyles, and changing values may create new library users with greater and different information needs, and the new information technologies may provide possible ways of meeting them.[124]

Taking advantage of these developments, some libraries are already moving ahead to define a new role for themselves as information brokers.[126]* If they are to move in this direction, many libraries may, however, have to reconsider their traditional policy of providing free services to the public. To compete effectively with the growing number of other information enterprises, they will have to restructure their operations to meet the specific needs of their paying clientele. Unless libraries receive increased public support or subsidies from their private operations, fewer human and economic resources will be available to provide educational services to the public.

Not all libraries will use the new technologies to compete in the information market. Some libraries are trying to regain a base of popular support by using the new technologies to enhance the public services that they perform.[126] In the Plattsburg public library in upstate New York, for example, a microcomputer has been used successfully to develop

[121] Ibid.
[122] Ibid.
[123] *Princeton Alumni Weekley,* Apr. 19, 1982.
[124] Leigh Estabrook (cd.), *Industrial Society (Oryx Press, 1977); Into the Information Age: A Perspective for Federal Action on Information* (Chicago: American Library Association, 1978); Robert Taylor, "Professional Education and the Information Environment," *Library Journal,* Sept. 15, 1979, pp. 1871-1875.
[125] Estabrook, op. cit.; Taylor, Op. cit.

*Electronic technologies are already beginning to reshape the traditional library as software becomes commercially available for carrying out overall library operations.

'*Into the Information Age,* op. cit.

*competing with libraries in the information market are a growing number of profit-making institutions that, taking advantage of the new information technologies, provide a broad range of information services for a fee. Describing themselves as information brokers or as information specialists, they provide such services as supplying bibliographies and documents, and, in some cases, conducting substantial research. Large organizations bill their clients at about $100 per hour; the smaller ones at about $25 to $35 per hour. The business of providing information is a thriving one, and one that is predicted to double in volume over the next 10 years.

At the Trediffrin Public Library, Trediffrin, Pa., the public pays for access to the computer

computer literacy among rural children. *[127] If public libraries are to expand their educational programs in this way, they may need some additional support. Given the recent poor support for libraries, the economic situation in many communities, and the limited awareness of the potential use and value of the new technologies, libraries may find it impossible to raise the initial capital needed to undertake new programs of this sort.

Whether because they lack funds or because they lack initiative, some libraries will not utilize the new technologies at all. Using in-house information and traditional means of delivery, they will continue to provide free educational, recreational, and cultural services in local library buildings to those citizens who value them. If libraries follow this path, however, they may become less and less relevant to a public that increasingly values information and is computer-literate. As on-line information takes the place of books, these libraries will have less that is of interest to the public. It is conceivable, moreover, that as the proprietors of nonprint media are paid fees for the use of their materials, the authors of books housed in public libraries may seek greater compensation for the use of theirs. *128 With diminished public support and a shrinking clientele, these libraries may be unable to generate the economic resources necessary to maintain even their traditional services.

*The new technologies will, moreover, allow libraries to serve better as centers of information. The Los Angeles County Public Library, for instance, now uses cable to provide information services in over 100 libraries to the 2.6 million residents of Los Angeles County. These services are designed for both the traditional library user and the nonuser, including the nonreader. As part of this program, librarians continually learn how to assess the informational, cultural, and recreational needs of their communities, and the best methods for handling, retrieving, storing, and disseminating information (Los Angeles County Public Library Draft Cable TV Policy Statement).

'*'Anne F. Remans and Stanley A. Ransom, "An Apple a Day: Microcomputers in the Public Library, " *American Libraries,* December 1980.

*This program has been quite successful in meeting its goal. Attracted to the computer, more and more children are becoming regular library visitors. Adults use the computer on off-hours to try out their own programs or to develop software for business use.

[128]B. Benderly, "Libraries Do Exploit Authors, " Letters to the Editor, *The Washington Post,* June 26, 1982, p. 15.

Museums

The museum is an institution that houses a collection of objects of cultural and scientific significance. The museum documents, orders, and preserves these objects for others to examine. It often helps to interpret and to explain them and to provide a context in which they may be best understood and enjoyed.

Museums in their current form are only about 200 years old. They were established for a variety of purposes: members of royal and aristocratic families built them to house their treasures; religious orders established them to enhance their places of worship; governments used them to cultivate national sentiments; scholars and artists established them to foster research and to publicize their achievements; manufacturers and industrialists used them to publicly display their wares; and wealthy individuals built museums as memorials to themselves .*129

Museum Education

Although education has never been their primary function, all museums possess valuable educational resources. The objects from museum collections can be used not only as self-contained exhibits, but also as illustrations for courses, lectures, and other educational purposes. Designed to be relevant to a diverse lay public, museum education is relatively un-

*English authors are compensated, for example, in accordance with how often their books are borrowed from public libraries. Since the money to pay the authors comes from the government, the books are freely available to the public.

"[8]United Nations Educational, Scientific and Cultural Organization, the Organization of Museums, Paris, 1960.

structured. Visitors can come and go at will, drawing whatever they please from the experience. The exhibits they view are not always ordered in a typical pedagogical fashion; that is, sequentially and according to a lesson plan. More often, their arrangement is designed to enhance a particular display.[130]

Museum education is also more active than the passive education that takes place in a classroom. It facilitates individual participation, interaction, and response.[131] Museum visitors are, for example, often encouraged to interact with museum guides, to make drawings of art objects, to feel the texture of materials, and to pull the levers on machines.[132] In its varied purposes, its lack of educational structure, and its openness to the public, the museum is similar to the library. In fact, together they have been described as constituting the two halves of the public's memory. But museum education, while similar in purpose, is different in method. It is more sensory, using experience itself as a pedagogical tool. In comparing the two it has been said, for example, that whereas the museum represents the right half of the educational hemisphere, the library represents the left.[133]

In the United States, museums have always been conceived of as having an important educational function. Education was considered to be so important, in fact, that in some museums educational programs were set up even before buildings were built or before collections were assembled. Many museums were expected to provide vocational training together with more general educational services.[134] The Cleveland Museum, for example, was required by its charter to maintain an industrial training school.[135] Several other museums began conducting vocational counseling and training during the depression years. Today, American museums have substantially increased their educational offerings to the public.

Status of Museums*

There are approximately 1,821 museums in the United States. Of these, 62 percent are organized around a historical theme, 34 percent around an art theme, and 34 percent around a science theme. A large majority offer some educational programs. The most common programs involve school children and are jointly sponsored by museums and State and local educational departments.[136] Programs directed at elementary and secondary schools often entail museum visits designed to acquaint children with a museum's resources. Some museums also provide classes for individual students at this age level. For junior and senior high school students, there are classes in special subject areas. Museum programs for university students and postgraduates are least well developed.[137]

Museums also provide educational services aimed at other members of the community. These programs include adult educational programs and some special programs designed to meet the unique educational needs of particular groups such as the economically disadvantaged or the blind.

The ability of museums to provide educational services is circumscribed by the limited resources available to them. Most museums are small, operating with budgets of less than $50,000. Only 10 percent have operating budgets of $1 million or more. Museum resources are, moreover, relatively insecure. For example, two thirds of all museums in the United States rely on private sources for financial support, and more than half provide admissions free. Museums must also rely heavi-

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[130] *Museums and Education,* Eric Larrabee (cd.) (Washington, D. C.: Smithsonian Institution Press, 1968).

[131] Ibid.

[132] Barbara Newson, "The Museum as Educator and the Education of Teachers, " *College Record,* February 1978, vol. 79, No. 3.

"gIbid.

[134] Ibid.

[135] Barbara Newson and Adele Silver (eds.), *The Art Museum as Educator* (Berkeley, Calif.: The Council on Museums and Education in the Visual Arts, University of California Press).

*As defined by the National Council for the Endowment for the Arts in their study, MUSEUMS USA 1974.

[136] Ibid.

[137] *Museums USA,* National Endowment for the Arts, Washington, D. C., 1974.

ly on volunteers, who outnumber the full-time and part-time professionals working in museums.[138]

Because much of their distinction and appeal derives from their ability to communicate in a sensory, unstructured fashion, museums may be particularly vulnerable to competition from the new information technologies that will have a similar appeal. On the other hand, by their very nature, they may be particularly well-suited to acquaint the public with these technologies. Some museums are, in fact, already offering the public first hand experience with microcomputers and video disks. The extent to which museums will be able to continue to provide this service will depend not only on the amount of resources that they have at their disposal. It will also depend on the readiness of both museum leaders and the public to view museums as relevant and dynamic institutions.

[13a] Ibid.

In the Capitol Children's Museum, Washington, D. C., children are provided with their first contact with the computer, They take their first steps tentatively but soon find that the computer itself is an interactive teacher, rewarding them immediately for the right moves

Business and Labor[139]

Advanced training and education are assuming special roles in the lives of Americans employed in all sectors of the economy, but especially among those who work in business and industry. Continuing breakthroughs in technology and their subsequent applications in the workplace change the working lives of professional employees, skilled craftspeople, semi-skilled workers, and office support personnel. Such change may take the form of slightly modified practices and procedures or even of entirely new job functions for which individuals must be retrained. This process now occurs as often in older industries such as steel, rubber, and auto, as it does in the newer high-technology firms, even if the degree of change and the reasons for it differ significantly.

Both groups are faced with the need to constantly reexamine methods and processes in order to improve efficiency and remain competitive in the marketplace. This reevaluation is especially necessary when the markets are international in scope and when competition

[139] Beth A. Brown, *Characteristics of Industry-Based and Labor-Based Training and Education Programs, Including Uses of Information Technology in Such Programs: An Overview* (Washington, D. C.: OTA, 1981); and Beth A. Brown, *Characteristics of Industry-Based Training and Education Programs, Including Uses of Information Technology: Selected Case Studies* (Washington, D. C.: OTA, 1981).

must take into account many variables such as wage levels, government subsidies to business and export levels. The day is fast approaching when career-related training and education at all occupational levels will be a lifelong process and possibly a mandatory one.

Role of Education in the Workplace

Even in periods when there are no major changes, work force expansion and employee turnover require that training and education programs be provided by companies for new personnel. In addition, current staff must be provided with opportunities to upgrade their skills and to acquire new ones if they are to be effective in the jobs or to prepare themselves for advancement opportunities. Companies sometimes also provide special programs for employees wishing to make major career changes. Whatever events or policies make it necessary, more and more corporate resources are being earmarked for instructional activities.

The delivery of educational services to employees in business and industry is accomplished in a number of ways. A large portion of it is provided through established public and private, nonprofit and for-profit educational institutions, either by contract or in the form of cooperatively designed and administered programs. But an equally large portion is being sponsored, designed, and operated by companies themselves. Labor unions and labor organizations also are heavily involved in work-related training and education, both as cosponsors and as initiators.

Some say that the movement of industry and labor into the educational arena reflects their dissatisfaction with existing educational structures and is a comment on educators' lack of responsiveness to the needs of individuals for some degree of work preparation prior to employment. Others feel that traditional educational institutions cannot be expected to keep up with rapid changes in equipment and procedures. Still others argue that the sheer size of the task of necessary training, retraining, and professional development has demanded that industry and labor become more deeply involved, and that a little healthy competition among a broader base of alternative education providers can do nothing but improve the quality of education overall. However one views the situation, all the signs point to increased involvement of industry and labor in training and education.

Industry-Based Training and Education

Growth in industry-based training and education has been particularly pronounced since the end of World War II, although most larger firms have been engaged in some forms of instruction since their founding. While no one actually knows how many employees participate in instructional programs each year, some measures of the degree and scope of activities are available. The American Society for Training and Development (ASTD) estimates that corporations spend $30 billion annually for programs, staff, and materials. ASTD has also calculated that in the United States there are at least 75,000 individuals engaged full-time in-house training and development activities, plus another 75,000 who are employed on a part-time basis. Approximately two-thirds of ASTD's 40,000 members are employed in the private sector, either as training consultants, as staff members within corporate training departments, or as managers, directors, or vice presidents of those departments.

A Conference Board survey of industry education conducted in 1974 indicated that 75 percent of the 610 companies responding provided some in-house courses for employees; 89 percent had tuition refund programs; and 74 percent authorized and paid for selected employees, usually managers and other professionals, to take outside courses during working hours. The Conference Board estimates, moreover, that, among the 32 million individuals employed by companies that responded to the survey and that had staffs of 500 employees or more, about 3.7 million-or

11 percent—took part in in-house courses sponsored by their firms during working hours, and approximately 700,000, or another 2 percent, participated in company courses delivered during nonworking hours. Exempt employees were more frequent enrollees than those in the nonexempt category. Only those firms that had 1,000 employees or fewer appeared to place greater reliance on hiring pretrained personnel or to utilize on-the-job training.[140]

Broad estimates of worker participation are probably lower than the estimates that might be found today, especially given the present trend within U.S. factories towards installing computer-assisted design and computer assisted manufacturing systems (CAD/CAM), and the retraining requirements that accompany their use. In a study comparing the effects of technological change on the need for human resources in the chemical and allied products industries in the United Kingdom, Japan, and the United States, it was predicted that major U.S. companies, in order to meet their need for retrained production workers, would be compelled within the next 5 years to set up special training schools to provide "craftsmen' level instruction to their process operators. [141]

In addition to these changes, one can also expect that the increased use of robots and other forms of computer-assisted production may result in widespread restructuring of established occupational groups. This may, in turn, create a need for more job-related instructional programs.

Today's corporate training programs cover almost all aspects of company operations, not just manufacturing. Typically, instructional offerings address the following skills and corporate program areas:

. manufacturing and technical;
• specialized skills development;
• sales and marketing;
• safety;
• data processing;
• management and executive development;
• clerical and secretarial;
• basic education (remedial programs in math and oral and written communications for hourly as well as salaried employees);
• tuition assistance (now considered by most companies to be part of the instructional program, rather than just an element of the corporate benefits package);
• trainer's training (which is offered in firms with many small or broadly scattered installations where supervisors and others must assume responsibility for administering training packages or managing some form of instructional program); and
• retraining.

Trend Toward Decentralized Instruction

The size of the work force, the numbers of persons to be trained, the existence of multiple facilities, and the complexity of instructional needs have all led to the decentralization of corporate training operations. While some firms maintain control of training design, development, and delivery functions at the corporate level, others handle some or all instructional responsibilities at the divisional or plant level. In these situations, the role of the corporate-level training group is usually one of encouraging the sharing of information among all personnel involved in the development of human *resources*. Industrial training activities tend to be based in the personnel, industrial relations, or engineering departments. Sometimes three or more departments share the responsibility for instructional development, focusing on one or more of the following staff groups:

• production line (unskilled and semiskilled);
• skilled trades;
• technical (usually engineering, data processing, and R&D);

[140] Seymour Lusterman, *Education in Industry* (New York: The Conference Board, 1977).

[141] Frank Bradbury and John Russell, *Technology Change and Its Manpower Implications: A Comparative Study of the Chemical and Allied Products Industry m the U. K., U. S., and Japan,* Chemical and Allied Products Industry Training Board, 1980.

- management;
- supervisory (first-line); and
- professional (specialists who are not technical staff and who may not supervise or manage operations).

Training: Investment v. Expense

In companies that have a staff of over 500, size does not appear to be important in determining perceptions about employee education. If training is viewed as an investment that has a long-term payoff, even firms that have experienced economic difficulties may be willing to provide adequate financial support for instructional programs. Some corporate training groups, when they have the support of top management, are able to obtain the resources necessary to expand into new instructional areas and to use the latest equipment. Management has recognized a direct correlation between training, reduced turnover, and higher productivity. In some companies, however, training personnel have small budgets. They have to prepare in-depth justifications for refunding even at current levels of expenditures, and to prepare elaborate documentation for proposals to expand instructional activities and to utilize new equipment.

Relationship With Local Educational Institutions and Industry-Sponsored Educational Institutions

One-third of the 50 companies that OTA contacted in the course of this study, have established some sort of working relationship with high schools, vocational/technical schools, and colleges and universities in order to train or educate employees.

Companies and educational institutions jointly develop and administer programs, for which the firms provide ongoing financial support and donations of equipment. One company works with 10 local vocational/technical schools and community colleges to deliver entry-level, production-line training on an as-needed basis. Another firm has established its own in-house associate degree program, with assistance from several local colleges. In yet another case, a corporation has been the major force behind the establishment of an independent, degree-granting institute that offers graduate-level instruction in software engineering to personnel of high-technology firms in the New England region, as well as to other interested individuals in the United States and abroad.

It has been suggested that such corporate-founded institutions compete with, and will thus detract from, established college and university programs. Predictions have been made, for example, that as many as 300 colleges may close their doors during the 1980's due to declining numbers of high school graduates, at a time when 300 company-sponsored institutions of higher learning will begin operations.[142] However, companies do not see themselves as being in direct competition with traditional institutions of higher education. They maintain that they have established their programs to meet needs that the traditional education community never addressed; that their needs are so specialized that they must be met in-house; and that traditional institutions do not have the capacity, either in terms of resources or in terms of scheduling flexibility, to provide for their needs.

Information Technology in Corporate Instruction

Communications technology is being applied to a limited extent in the instructional programs of both centralized and decentralized corporate training operations. However, the trend toward the decentralization of training in larger firms has increased the potential for more widespread use. First of all, while the front-end development time may be increased, the use of technology allows more standardization in instructor-dependent designs than

[142] Henry M. Brickell and Carol B. Aclanian, "The Colleges and Business Competition," New *York Times Survey of Continuing Education,* Aug. 30, 1981.

could otherwise be achieved, especially in cases involving the direct transfer of large amounts of knowledge. Second, while the cost of development and the expenditures for equipment are greater, the low costs of reproducing the instructional package for distribution to the field offices or plants, or of the computer time necessary for field staff to access a centralized instructional system, makes the utilization of the technology an attractive option.

Third, especially in the case of self-instruction packages, there is greater flexibility in the scheduling of training sessions and more opportunities for employees to participate, regardless of the nature or location of their work site. Also, travel cost for employees attending centralized instructional programs are eliminated, and greater integration of instructional programs with actual worksite operations becomes possible.

One company has developed an instructional package for production-line equipment maintenance personnel that is run on a microcomputer integrated with a video disk unit that allows for both graphics and text display. The package is used in classroom instruction sessions, but several units have been installed on the production line, where the maintenance and repair staff are assisted on an ongoing basis. Finally, in both centralized and decentralized instructional settings, technology-based training modules or programs, (particularly those that are computer-assisted) may be used to bring course participants to a desired level of competency or to determine initial competence levels for designing classroom instruction.

Factors That May Affect Instructional Use of Technology

While communications technology has achieved acceptance within industry-based instructional programs over the past few years, there are still a number of obstacles to be overcome before more widespread utilization will be achieved. Cost is most frequently cited as a major deterrent, particularly for computer-based instructional systems and newer forms of technology such as video disk, teleconferencing, and closed-circuit television.

Another problem area is that of hardware-software compatibility, especially for corporate trainers who want to purchase commercial courseware but who have in-house computer capabilities on which they want to build. Many companies have made the decision to develop their own instructional packages rather than invest in a new system of hardware on which commercially available courseware would run. The frequency with which instructional programs must be modified—as, for example, in R&D-related training-may make the use of computer-based programs and video disk impractical.

Even the type of instruction itself may preclude the use of technology. For example, computer-assisted instruction has, to date, been found to be of little value in advanced engineering and software development courses, as well as in apprenticeship skills training. This is due to the complexity of the information that must be conveyed and, in the case of apprenticeship, to the need for repeated demonstration by a knowledgeable instructor who can respond to a trainee's questions and who can demonstrate on actual equipment. Many corporate trainers still feel that classroom instruction is the best approach. Others resist the use of technology in their programs because they feel that they are often being sold technology for technology's sake, rather than as a tool to be utilized within the framework of an existing instructional system.

Computer-Based Instruction

Computer-assisted instruction (CAI) appears to be a commonly utilized technology for industrial training. A recent survey of the uses of microcomputers in the training programs of selected Fortune 500 companies revealed that, of the 56 firms responding, about 50 percent were utilizing either mainframes or microcomputers. [143] In companies contacted by

[143] Greg Kearsley, Michael J. Hillesohn, and Robert J. Seidel, *The Use of Microcomputers for Training: Business and Industry* (Alexandria, Va.: Human Resources Research Organization, March 1981).

OTA for this study, technical personnel such as entry-level engineers, field service representatives for computerized equipment, development programmers, and applications programmers are frequently trained using CAI packages.

Some companies develop their own CAI software; others purchase commercial packages. The airline industry makes extensive use of this mode of instruction for ground personnel. Some particularly interesting applications may be seen in pilot training, where CAI is used in combination with video disk to replace more expensive flight simulators. The insurance industry is beginning to utilize CAI courses with selected field office staff, such as their claims representatives and premium auditors. Occupational groups most infrequently mentioned as potential trainees are administrative/secretarial personnel and production-line staff.

Computer-managed instruction (CMI), unlike CAI, is rarely found in the industrial setting, although there are cases where it is used in airline and insurance companies. Corporate training personnel may not yet appreciate the possible advantages of CMI; they may feel that functions are best handled by instructional staff; or they may view CMI as being too costly an application.

Video Disk

The most controversial form of technology for use in corporate training is video disk. Many firms have investigated its potential application, but few seem to be utilizing it at present. One automobile manufacturer has developed a video disk program to train auto dealer mechanics on how to repair the new car models. A computer hardware and software company uses video disk in training its customer service engineering staff. It has recently converted all of the instructional programs used in its 60 field centers for customer and staff education from video tape to video disk.

Most corporate training representatives who are enthusiastic about video disk mention its random access capability and its ability to expand its utility through integration with a microcomputer. However, many instructors do not believe that the differences between video disk and video tape warrant the additional investment, especially if video tape equipment has recently been purchased. Other concerns have to do with the cost of video disk equipment, the cost of producing master disks relative to the number of copies required, and the inability of revising a video disk program once it has been created. It appears that it will be several more years before many industrial training applications of video disk will be realized.

Teleconferencing

At present, teleconferencing is of limited use in industry-based training and education programs. Industry representatives feel, for the most part, that costs are still too high to make applications feasible unless the technology has been acquired for other uses, such as business meetings, and is accessible at a subsidized rate. One firm, experimenting with audio teleconferencing to link an instructor with a group of trainees assembled several hundred miles away, found that the lack of visual stimuli distracted many of the participants who, in this case, were midlevel managers.

Another company, engaged in hotel, motel, and food service operations, uses a full teleconferencing system, initially established among 70 of its facilities for convention clientele, for in-house quarterly business performance conferences. Some firms have tentative plans to experiment over the next few years with teleconferencing in field staff training.

Satellite Communications

Applications of satellite technology within corporate training and education programs are rare, but many companies with extensive na-

tional or international field office networks place it high on their lists for future use, once costs come down and they are more certain about how it can be more effectively used. The technical instruction group of one major high-technology firm is now looking into how satellite technology might be used to beam classes that originate at the corporate engineering and development installations around the world.

Another high-technology corporation, having looked into the use of satellite communications for initial and repeated instruction of marketing personnel based in various parts of the world, decided against pursuing the project because of the cost and the uncertainties involved in securing information transmitted in this way.

Implications

There is considerable potential for the more widespread application of communications technology in instructional programs within business and industry. Training requirements will increase tremendously through the year 2000 and beyond, and there are sufficient financial resources to invest in equipment and courseware. However, the presence of computers and other equipment in the plant does not necessarily guarantee that educational and instructional applications of the technology will be made. Neither the level of sophistication of the training system nor the degree of corporate support for employee education ensure that the technology will be used. Those who are employing the computer, the video disk, and other forms of technology in their instructional programs seem to have taken their own initiative to find out how these tools might be most effectively applied.

The educational technology industry has not yet developed a comprehensive sales strategy to use with the corporate market. A number of training administrators who have contacted sales representatives reportedly felt that they were being sold technology for technology's sake rather than as an instructional tool. If broader and deeper utilization of technology in corporate instruction is a future goal, present marketing strategies may have to be reviewed and altered significantly.

Union-Sponsored Training and Education

Labor unions and labor organizations have a long history of involvement in training and education. The American Federation of Labor (AFL) began to provide such services to members in 1881, the year of its founding. In 1921, the AFL was instrumental in establishing a Worker's Education Bureau, a separate body that carried out programs for its affiliate unions. By 1929, the Bureau had become the formal education arm of the AFL. In 1936, 1 year after its establishment, the Congress of Industrial Organizations (CIO) created an education department.

When these two labor groups merged in 1955 to form the AFL-CIO, the emphasis on training and education was continued. A new education department was formed, and eventually the Human Resources Development Institute (1968) and the George Meany Center of Labor Studies (1968) were created to address the expanded needs for apprenticeship recruitment and instruction and to train union members to assume leadership positions within the labor movement.

At present, the AFL-CIO has 102 affiliate unions which, together with a few independent unions, constitute the labor movement in the United States.[144]

Education Programs

The majority of the educational programs offered, sponsored, or otherwise supported by the labor movement, fall into one of three categories:

1. *College Programs:* These are usually 2- and 4-year degree programs in labor stud-

[144]"Interview with Edgar R. Czarnecki, Assistant Education Director, AFL-CIO, fall/winter 1981.

ies offered through community colleges, colleges, and universities. In some cases they are single for-credit courses jointly developed by unions and local postsecondary institutions around such subjects as collective bargaining or leadership techniques.

2. *Apprenticeship Programs:* Apprenticeship programs usually entail specialized training in a skilled trade, craft, or occupation that is provided at the worksite and in off-the-job instruction of some type. Most of these programs are operated by the unions themselves or are jointly sponsored by unions and industry. However, a fair share are now offered by community colleges under contract or via joint ventures with unions. All 17 of the building trade unions offer apprenticeship programs, as do the maritime trade unions for those engaged in shipbuilding, machining, and seafaring.

   Other unions with apprenticeship systems include those who represent molders, pattern makers, and upholsterers, to name a few. According to figures supplied by the Human Resources Development Institute, there were, at the close of 1979, 323,866 persons enrolled in apprenticeship programs. Of this number, 18.2 percent were minorities, 6.4 percent were female, and 23.7 percent were veterans. The Labor Department's Bureau of Apprenticeship and Training has set a long-range goal of having 500,000 registered apprentices by 1984.
3. *Special Programs:* The largest number of training activities available to union members are special, or noncredit, courses offered by the education departments of individual unions to representatives on various levels—from that of shop steward to local president. Collective bargaining techniques, labor law, and parliamentary procedures are popular subjects.

Tuition assistance programs provided by management under negotiated contracts with unions are not considered to be a part of the training and education programs provided by the labor movement. However, thousands of unionized workers take advantage of this benefit every year and enroll in courses, most of which are required by companies to be job-related.[145] Because of the availability of these benefits, a number of college programs have been established in union halls and other facilities near industrial plants. Classes are offered at hours that will allow workers to attend on hourly shifts.

Courses are offered year-round, and the existence of weekend classes permits participants to earn bachelor's degrees in 4 years while they continue to work full-time.[146] The first such program, Wayne State University's "Weekend Worker College" (Detroit), was developed in conjunction with the United Auto Workers. The curriculum consists of 1 year of humanities, 1 year of social sciences, 1 year of physical sciences, and a fourth year devoted to a major field. A 2-year associate degree is also offered.[147] Some 20 programs of this kind were expected to be under way by the end of 1981, and the American Federation of Teachers is now trying to establish similar projects in six other locations.[148]

Other Types of Instructional Programs

Various unions have been active in providing other training and educational services to their memberships and to the community as a whole. Unions and companies in some areas of the country have cosponsored training designed to prepare individuals for advancement from entry-level positions or what would otherwise be considered jobs with no promotional opportunities. Funding, in most cases, has been provided by the Comprehensive Employment and Training Act (CETA) title II and title III grants, although some pro-

[145] Interview with John Carney, Education Director, United Steelworkers of America, fall/winter 1981.

[146] Interview with Jane McDonald and John Good, Human Resources Development Institute (AFL-CIO), fall/winter 1981.

[147] "Worker V: More Colleges Offer Programs for Blue Collar Employees," *Wall Street Journal,* May 12, 1981, p. 1.

[148] Interview with Edgar R. Czarnecki, fall/winter 1981.

grams have been privately funded by labor, by industry, or jointly by labor and industry.

Where other jobs are available within a reasonable geographic range, unions have also engaged in the retraining of members who have lost their jobs due to plant closings and site relocations. The "Mass Layoff Job Search Club" was formed in Midland, Pa., to provide such assistance to 300 former Crucible Steel workers whose jobs were eliminated. The program is jointly sponsored by the United Steelworkers local and Crucible Steel. In St. Louis, Me., a joint labor-management committee has been formed through which local unions, businesses, educational institutions, and community-based organizations are working together to identify ways of dealing with the large numbers of displaced workers in the area. On the campuses of local community colleges, career readjustment and reemployment centers have been set up to handle the needs of an expected 1,000 participants.[149]

For several years, the AFL-CIO's Human Resources Development Institute has operated a nationwide apprentice outreach program for minorities and women to recruit and prepare them for available apprenticeship slots. Many AFL-CIO affiliates and independent unions conduct preapprenticeship training sessions and basic education programs for young people who wish to improve their reading, math, and other skills so that they might qualify for participation in apprenticeship programs. Career education and vocational exploration programs sponsored by local school systems and others also receive substantial support from labor unions and labor organizations. [150]

Information Technology in Union-Sponsored Instruction

There is no evidence in the literature or in the interviews conducted by OTA with labor education directors to suggest that unions are taking great advantage of information technologies. These technologies may be considered inappropriate to the apprenticeship system. The importance of the individual instructor, the duration of the apprenticeship period, lasting usually 4 years, and the unique funds of information that must be conveyed, such as local building codes which differ from area to area, tend to discourage the use of technology such as computer-assisted instruction.

In the college programs and special programs, there is also little use of information technology. One reason for their infrequent use is that the lecture method has generally been considered to be successful in labor education programs. Films, slides, and video cassettes were most often used by those who were interviewed. The United Steelworkers of America, for example, uses video tapes and cassettes in mock arbitration exercises at the union's Linden Hall Residential Training Center, but they use no other form of technology. The cost of computer-based learning systems was cited as a deterrent to their use. [151]

A national AFL-CIO training representative stated that most member unions were just beginning to use video cassettes in arbitration simulations and for circulating messages of their presidents to State and local chapters. He also described a model communications project, "To Educate the People Consortium, " which was staged by Wayne University as a part of its local instructional program. To stimulate interest in using the medium as an educational device, union representatives in 100 cities across the country were connected by a network via two-way, closed-circuit television. The demonstration was so successful that another model broadcast, "Safety and Health for Women, " is now being planned.[152]

A Texas State AFL-CIO representative reported that video cassettes were used in education programs, but he indicated that none of the other newer forms of technology were being used because they were inappropriate for the kinds of programs offered–mostly

[148] Interview with Jane McDonald and John Good, fall/winter 1981.
[149] Ibid.
[151] Interview with John Carney, fall/winter 1981.
[152] Interview with Edgar R. Czarnecki, fall/winter 1981.

workshops—and because they were too costly.[153] A Dallas AFL-CIO representative could identify no applications of technology. He regards classroom training with lectures as the most popular format. However, he hopes to use cable television once it becomes available in the Dallas area as a way of more effectively reaching the membership (1985).[154] The United Rubber Workers do not use educational technology either, and they have not thought about it for the future.[155]

The International Brotherhood of Electrical Workers (IBEW) employs computer systems to track apprentices in training. It has established some joint information systems with the Department of Labor's Bureau of Apprenticeship Training. In addition, an IBEW representative reported that video disks are used in labor education seminars. Unions that are using video cassettes in training packages include the United Carpenters and Joiners of America and the American Postal Workers.[156]

In contrast to industry-based instructional activities, there seems to be less potential for applications of information technology in union-sponsored training and education programs, primarily because such programs are still highly instructor-centered and classroom-oriented. However, the success of closed-circuit television experiments initiated by the labor movement suggests that this form of technology might achieve more acceptance and be utilized for national and regional educational sessions in the future. Perhaps union association with colleges and universities that utilize educational technology in labor education courses and degree programs may result in more widespread application in union-sponsored training and education activities.

[153] Interview with Ruth Ellinger, Education Director, Texas State AFL-CIO, fall/winter 1981.

[154] Interview with Willie Chapman, AFL-CIO, Dallas, Tex., fall/winter 1981.

[155] Interview with James Peake, Education Director, United Rubber, Cork, Linoleum and Plastic Workers, fall/winter 1981.

[156] Interview with Kenneth Edwards, Director, Skill Improvement Training, International Brotherhood of Electrical Workers, fall/winter 1981.