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ABSTRACT

The Office of Technology Assessment (OTA) is undertaking a comprehensive assessment of literacy in the United States. The assessment will examine how technology offers new resources and creates opportunities to reach learners and improve productivity of learning. OTA will identify ways to increase learning access in existing programs and overcome economic, social, institutional, and technological barriers. In assessing new roles for technology, the study will analyze the changing requirements for skills and knowledge. In this effort, OTA will incorporate existing data and information about what people know, how they learn, and what they need to know in the workplace, the home, and the community. The assessment will look at the current base of adult education and family literacy services in schools, community colleges, community-based organizations, volunteer networks, libraries, and businesses. OTA will examine how these programs work, who is being reached, and what opportunities can be created by new institutional arrangements and emerging technology. Literacy is not a new issue for Congress. Several recently enacted laws, as well as House and Senate bills in conference, expand literacy services through a variety of institutions. Improving the literacy skills of all citizens is one of the six national goals agreed to at the Education Summit. OTA's work on educational technology, worker training, adolescent health, rural telecommunications, and economic development will provide useful background information. (Forty-one footnotes and a list of 12 major federal program supporting literacy efforts are included in this document). (NLA)

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Technologies for Literacy

PROJECT DESCRIPTION: Technology is changing every aspect of our society, including the levels of literacy skills needed to participate in the workplace and to contribute as a member of the family and community. Some 30 million adults have serious problems with some aspect of literacy -- from reading and numeracy skills for the most basic tasks, to more advanced skills for entry into job training, or knowledge and skills to complete a high school degree. Moreover, citizens' needs vary widely. They include learning English as a second language or overcoming learning disabilities. In families where literacy problems cross generations, both adults and children are affected.

Concerned with the mounting evidence of underutilized human resources, Congress has expanded efforts to support literacy instruction, utilizing the infrastructure of adult basic education programs in schools, community colleges, community-based organizations, volunteer services, and libraries. Using these services differently could create new opportunities. Evidence of effective and innovative use of computer-based technologies in classrooms and industry shows that these technologies can be powerful tools for learning in literacy programs. The capabilities of computer technology -- graphic, audio, video, and information handling -- make it possible to offer new paths for learning. At the same time, the growing infrastructure of telecommunications networks provides alternative ways to bring instruction to learners who are at home, in the community, or in the workplace. With advancing technology, global competition, and increased demands for literacy, Congress will be under pressure to ensure that resources are being well used to raise the literacy level of the Nation.

Building on its prior work in education and training, OTA will undertake a comprehensive assessment of literacy and the technologies to improve it. OTA will examine how technology can offer new resources and create new opportunities to reach learners and improve productivity of learning. OTA will identify ways to increase learning access in existing programs and in new ways, overcoming economic, social, institutional, and technological barriers.

CONGRESSIONAL INTEREST: Several recently enacted laws, as well as House and Senate bills in conference, expand literacy services through a variety of institutions. Improving the literacy skills of all Americans is one of the six national goals agreed to at the Education Summit.

REQUESTER: House Committee on Education and Labor (Hawkins, Ford, Goodling, Sawyer); Senate Committee on Labor and Human Resources (Kennedy, Hatch)

CONGRESSIONAL AND OTHER WORK: CRS has prepared issues briefs on adult literacy and related issues. OTA's work on educational technology, worker training, adolescent health, and rural telecommunications and economic development will provide useful background information.

SCHEDULE: This assessment will begin in October 1990; delivery to TAB by June 1992.

OTA CONTACT: Linda Roberts, Science, Education, and Transportation Program, 228-6936.

CE 057 039

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COMMITTEE ON EDUCATION AND LABOR

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SUBCOMMITTEE ON ELEMENTARY, SECONDARY,
AND VOCATIONAL EDUCATION

July 10, 1990

John H. Gibbons
Director
Office of Technology Assessment
600 Pennsylvania Avenue, S.E.
Washington, D.C. 20510-8025

Dear Mr. Gibbons:

America is faced with a crisis in literacy. The Congress, and in particular the Committee on Education and Labor, has joined with the President and the Nation's governors in a goal for the year 2000 that calls for every adult American to be literate, and to possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

Currently, concern about American literacy is extremely high, as the evidence continues to mount of wasted lives and underutilized resources. An estimated 30 million adults have serious problems with some aspect of literacy. Literacy problems are closely associated with poverty, and often more than one generation suffers. More than 75 percent of the population in our prisons, jails and juvenile facilities is functionally illiterate. Clearly, the time has come to make a real commitment to reversing the trend lines. Congress has begun to address these problems through a series of bills, including the Adult Literacy and Employability Act of 1990.

The contribution that can be made to solving this problem through the use of technology is frequently overlooked. The Committee wants to ensure that all resources are brought to bear, and believes that the ability of technology to reach new audiences, cross institutional and geographic boundaries, and multiply existing opportunities might prove crucial in reaching our year 2000 goal. Accordingly, the Committee asks that the Office of Technology Assessment undertake a study examining the opportunities and barriers to the use of technology to improve literacy in America.

This study should build upon the basic assessments of technology in education prepared for the Committee, Power On! and Linking for Learning. These reports provide important insights into the use of technology for learning in the school environment, and have been most helpful to the Committee in its deliberations.

There are several aspects the Committee wishes OTA to explore. These include:

* How can technology be enlisted to reach a wide variety of learners, including families, adults, and children outside the conventional schoolroom? How can community institutions, groups and organizations contribute to such an effort?

* How can technology build upon existing services to serve a larger population? What types of programs or software need to be developed to serve special groups? How can the marketplace help in this effort?

* Considering the existing distribution of technology, how can programs be devised that will not favor only those already rich in technology? How can the Congress ensure that new efforts will not simply exacerbate the disparities in learning that already exist in the society?

* How can Congress ensure that America's illiterates have an increased awareness of and have equal access to the technology addressed in this study?

* How can the resources of the formal education system be made more available to all citizens without reducing their utility to schools? What social, legal, and technical problems exist that prevent expanded use of school equipment and space?

* How can telecommunications technology that now provides information over geographic boundaries be used to offer literacy services? Does distance matter? Can technology that now provides other types of data and services also offer resources for learning?

* What is the appropriate role for workforce literacy programs, and which Department within the Executive Branch should administer such programs?

* What role can the Federal Government play that moves America toward its literacy goals while

respecting State and local perogatives in education? What models and historical experience in meeting national needs can guide our thinking?

* How can the revolution that has occurred in information technology be harnessed to create a revolution in literacy for Americans?

This Committee seeks the type of analysis and foresight that the Office of Technology Assessment embodies in answering these questions. Surely no task at hand is more critical than making Americans ready and able to work, learn and vote effectively. We look forward to the outcome of this study.

Sincerely,

Augustus F. Hawkins
Chairman

William F. Goodling
Ranking Republican

William D. Ford
Member of Congress

Thomas C. Sawyer
Member of Congress

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United States Senate
COMMITTEE ON LABOR AND
HUMAN RESOURCES
WASHINGTON, DC 20510-6300

September 14, 1990

Dr. John H. Gibbons, Director
Office of Technology Assessment
United States Congress
Washington, D. C. 20510

Dear Jack:

This is to request that OTA undertake a comprehensive assessment of the ways in which technology can be utilized to promote increased literacy. We have been very favorably impressed with OTA's recent reports on technology and education -- Power On and Linking for Learning -- and believe it is important to build on that base of experience and extend OTA's expertise into related high priority areas.

As the nation continues its evolution into an information-based, technological society, few challenges rate as high a national priority as that of extending and upgrading public literacy. One hundred years ago, literacy was defined as the ability to sign one's name; fifty years ago it meant having the equivalent of a fourth grade education. But to be literate -- or functional -- in the technological civilization of the twenty-first century, will require a much higher level of communication, calculation, and computer skills. And at present, it has been estimated that about thirty million Americans have serious problems with some facets of literacy.

To enable all Americans to be literate by the Year 2000 -- or even soon thereafter -- we must make optimum use of all the technological aids at our disposal. In its earlier reports, OTA has demonstrated the impressive potential of technologies for learning. With that background in mind, we believe it would now be highly useful to assess the ways in which technologies could specifically aid in expanding and upgrading literacy among all Americans, both within school systems and through other family-oriented, community programs.

Accordingly, we request that OTA undertake a comprehensive assessment of technologies for literacy, including consideration of the changing definition of literacy, present patterns of literacy, future requirements for literacy, specific technological systems that can aid in imparting particular aspects of literacy, along with their respective costs and benefits, and the problems and opportunities involved in implementing the various policy options that have been

identified. Throughout the assessment, we urge that OTA place special emphasis on ensuring access for all Americans to the technological aids under consideration. We look forward to discussing this with you and the other TAB Members at the next Board meeting.

With best personal wishes.

Sincerely,

Edward M. Kennedy

Orrin G. Hatch

TECHNOLOGIES FOR LITERACY

BACKGROUND: LITERACY AS A NATIONAL GOAL

The goal of a fully literate citizenry is as old as the Nation itself, seen by our founding fathers as essential for the survival and growth of a democracy. The American system of public education was created to help meet this goal. In the 20th century, there was a great expansion of the population's literacy skills, reflected in years of school completed and increased circulation of print matter.[1] And by the literacy standards of 100 or even 50 years ago, almost all (95 percent) of America's young adults are literate today.[2] But the demands for literacy are much higher now, and our many citizens with marginal reading, quantitative, and related skills face substantial hardships. Even though tremendous progress has been made, it is not enough.

Today's literacy problem has serious social and economic implications. In a survey of disadvantaged 19 to 23 year olds, 68 percent of those arrested, 85 percent of unwed mothers, 79 percent of welfare dependents, 85 percent of school dropouts, and 72 percent of the unemployed had low basic skills.[3] Many experts believe that literacy is increasingly an intergenerational problem, passed down through families.[4] There is also mounting evidence that ". . . literacy problems are closely associated with poverty and pose a major threat to the economic well-being of the United

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1. Carl F. Kaestle, "The History of Literacy and the History of Readers," Review of Research in Education, vol. 12, Edmund W. Gordon (ed.) (Washington, DC: American Educational Research Association, 1985).

2. The ability to sign one's name was the standard of literacy 100 years ago; some 50 years ago, having the equivalent of a fourth grade education became the standard. See Irwin S. Kirsch and Ann Jungeblut, Literacy: Profiles of America's Young Adults (Princeton, NJ: National Assessment of Educational Progress, Educational Testing Service, 1986).

3. Gordon Berlin and Andrew Sum, Toward More Perfect Union: Basic Skills, Poor Families, and our Economic Future (New York, NY: Ford Foundation, 1988) as cited in Anthony Carnevale et al., Workplace Basics: The Skills Employers Want (Alexandria, VA: American Society for Training and Development, n.d.), p. 6.

4. Thomas G. Sticht and Barbara A. McDonald, Making the Nation Smarter: The Intergenerational Transfer of Cognitive Ability (San Diego, CA: Applied Behavioral and Cognitive Sciences, Inc., January 1989).

States."[5] And the personal costs, in wasted lives and missed opportunities, are equally compelling.

Changes in technology and society have raised the requirements for literacy in the workplace, in the home, and in the community. The changes we see today are likely to become even more pronounced in the future.

> Over the next two or three decades, economic, social, and political life will be profoundly shaped by new technologies of production and communication. To utilize these new technologies fully and in ways that enhance rather than threaten political democracy, we will require a population that is literate in the deepest sense of the word, a population able to modify and adapt to the technology as needed, a population able to understand and thereby maintain appropriate control over a complex economic structure. Our population must be able to learn "on the job" as conditions change, to respond productively to new opportunities and challenges, and to deal with complexities that require thinking and reasoning powers far beyond the routinized skills of traditional "basic education."[6]

Making America smarter has become the rallying cry of policymakers at all levels. At the 1990 Education Summit, the President and the Governors articulated a national goal for literacy, building on the requirements for a new set of basics:

> By the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.[7]

The President and the Governors have recognized that meeting this goal will require coordinated efforts from all segments of society and at all levels of governance.

Congress has already taken a number of steps. Legislation has expanded Federal assistance for traditional adult education programs and newer community-based programs.[8] Congress has emphasized literacy in existing programs for job training, welfare reform, assistance for the homeless,

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5. H.R. 5115, Equity and Excellence in Education Act of 1990, Title V -- Family Literacy and Lifelong Learning, Sec. 502.

6. Lauren B. Resnick, testimony before the Joint Economic Committee, Subcommittee on Education and Health, Oct. 5, 1987.

7. National Governors' Association, National Education Goals (Washington, DC: Feb. 25, 1990).

8. The Adult Education Act (AEA) serves 3.5 million people annually. The AEA was amended and extended through fiscal year 1993 by Public Law 100-297, the Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary School Improvement Amendments of 1988.

assistance for refugees and amnesty populations, library services, education for the disadvantaged, dropout prevention, and pre-school Head Start programs.[9] Most recently, the House and Senate passed legislation to expand programs aimed at family literacy and lifelong learning.[10]

These recent initiatives in Congress and other actions at the State and local level signal a commitment to dealing with the problem and reversing the trends for the future. Yet there is concern that these efforts will not be enough. Recognizing the need to look at the complicated and interrelated issues surrounding literacy, the House Committee on Education and Labor and the Senate Committee on Labor and Human Resources have asked OTA to undertake a comprehensive assessment of literacy in America.

Specifically, the assessment will examine how technology can offer new resources and create new opportunities to reach learners and improve productivity of learning. OTA will identify ways to increase learning access in existing programs and in new ways, overcoming economic, social, institutional, and technological barriers.

In assessing new roles for technology, the study will analyze the changing requirements for skills and knowledge. In this effort OTA will incorporate existing data and information about what people know, how they learn, and what they need to know in the workplace, the home, and the community.

The assessment will look at the current base of adult education and family literacy services in schools, community colleges, community-based organizations, volunteer networks, libraries, and business. OTA will examine how these programs work, who is being reached, and what opportunities can be created by new institutional arrangements and emerging technology.

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9. See the Omnibus Trade and Competitiveness Act of 1988, Public Law 100-418; the Family Support Act of 1988, Public Law 100-484; the Stewart B. McKinney Homeless Assistance Amendments Act of 1988, Public Law 100-628; the Immigration Reform and Control Act of 1986, Sec. 204, Public Law 99-603; the Library Services and Construction Act, Public Law 98-480; the Head Start Act, Public Law 99-425; and the Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary Improvement Amendments of 1988, Public Law 100-297.

10. See Title V -- Family Literacy and Lifelong Learning, cited as "Literacy for All Americans Act of 1990, H.R. 5115 -- Equity and Excellence in Education Act of 1990. In the bill, the term literacy means ". . . the attainment of a level of proficiency in basic skills that is sufficent to allow each individual to meet individual goals for proficiency to meet social and economic demands for proficiency." The term basic skills means "reading in the English language; writing in the English language; speaking in the English language; mathematics; and problem solving."

ASSESSMENT ISSUES AND TASKS

Roles for Technology

I knew computers were the future, but I had no idea they could be my future.
Playing to Win student and 37 year-old mother of two

Computer and telecommunications technologies are becoming important resources for education and training -- tools for learning, vehicles to access information, and means to reach out to new learners. Improvements in technology have vastly increased capabilities and reliability, and lowered cost. Today's computer software offers much more than text: graphics, audio, and motion combine with text in powerful ways; multimedia connects all this with video and multiple networks of data and information.[11] Advances in telecommunications have broadened applications for learning at a distance. Whereas early efforts with instructional radio and television broadcasts were "one-way," today's efforts not only reach out to learners, but bring them into the learning group, with two-way, interactive capabilities.[12]

There are other reasons for growing interest in technology. Computer-based instruction can be self-paced, highly individualized, and fit the learner's time schedule. More importantly, there is evidence that this form of instruction is highly efficient -- that adult learners cover material faster than using traditional methods of instruction.[13] With computers, teachers have greater flexibility -- they can work with more students or spend more time with individuals. In a number of military and industry applications, instruction using computers, interactive video, and telecommunications are highly cost-effective.

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11. U.S. Congress, Office of Technology Assessment, *Power On! New Tools for Teaching and Learning*, OTA-SET 379 (Washington, DC: U.S. Government Printing Office, September 1988).
12. U.S. Congress, Office of Technology Assessment, *Linking for Learning: A New Course for Education*, OTA-SET 430 (Washington DC: U.S. Government Printing Office, November 1989).
13. Dexter Fletcher and Jesse Orlansky, "Cost Effectiveness of CBI in Defense Training," paper presented to the American Educational Research Association, 1986. See also Arnold H. Packer, Retooling the American Workforce: The Role of Technology in Improving Adult Literacy During the 1990s (Southport, CT: Southport Institute for Policy Analysis, December 1988).

Interactive telecommunications applications offer a significant new dimension to services for families, young adults, and adults in the community. The rapidly expanding satellite, cable, telephone, and fiber networks for public and higher education, business and industry constitute a basic resource.

Yet, applications of technology in our schools, the military, and the workplace far outpace applications in literacy efforts. There are some notable exceptions.

- In a storefront in Harlem, the Playing to Win project offers access to computers, informal computer education classes, and the computer as a learning tool for adult beginning reading. The program began 7 years ago with a handful of donated computers; today more than 500 neighborhood residents use the facility each week.[14] Working with other community-based organizations, prisons, hospitals, and libraries to use computers in their literacy efforts, Playing to Win developed new approaches for working with adult beginning readers. The Playing to Win materials challenge the assumption that adults have to read on a third or fourth grade level to be able to use computers and productivity tools such as word processing, database management tools, or graphics tools.[15]

- Another approach, also using computer instruction, is used at the Ripken Learning Center in Baltimore. Each day, welfare mothers spend at least an hour in the computer lab, with a goal of raising their reading skills. Each person works at her own pace, on her own level in a commercially developed, "integrated learning system" that monitors the progress of each student and signals any problems. Along with help in reading, students are also seeking instruction in keyboarding and word processing skills.[16] At another Baltimore location, a center operating with Head Start funding is experimenting with computer applications to help young children learn; computers that are used with children can, with appropriate software, provide instruction for their parents.[17]

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14. Antonia Stone, executive director, Playing to Win, personal communication, August 1990.
15. The development of these applications were funded by a 3-year grant from the NYNEX Foundation. See Antonia Stone, Keystrokes to Literacy: Using the Computer as a Tool for Adult Beginning Readers (Chicago, IL: National Textbook, 1990).
16. OTA site visit, Aug. 9, 1990.

- For decades, many citizens in Kentucky had no access to adult education in their remote rural communities; that is no longer the case thanks to The Kentucky Network (KET). KET broadcasts to the home three separate series, "Learn to Read," "Another Page," and "GED ON TV," as well as a schedule of fully accredited undergraduate and graduate telecourses. KET also offers 5 half-hour television programs, "Teach an Adult to Read," on introductory training for volunteer tutors interested in working with adults. Since 1985, 9,542 students have enrolled in the GED ON TV series, paying a $15 fee to receive workbooks, newsletters, and access to trained tutors via a toll-free telephone line.[18]

- One-quarter of Maine's adults are functionally illiterate; one-third have not earned a GED or high school diploma, and the State ranks last in adults participating in higher education.[19] To address these pressing needs, the Community College of Maine/Telecommunications Network was developed. In building the network, Maine also created the equivalent of a community college system across the State. In its first year of operation, Maine citizens were able to access courses from 36 different locations all across the State. As Governor John McKernan noted, "Rather than accept the idea that higher education is inaccessible because of the huge geography of our state, we have found a way to make that geography irrelevant."[20]

- Telecommunications technology is also used to bring education to students at a residential correctional facility in Danville, Pennsylvania.[21] A unique aspect of this effort is the

17. Ken Miller, IBM Corp., personal communication, Aug. 10, 1990.
18. Sandy Welch, deputy executive director, The Kentucy Network, personal communication, May 29, 1990.
19. See Office of Technology Assessment, op. cit., footnote 12, p. 116.
20. The Community College of Maine, Annual Report: Year One 1989-1990 (Augusta, ME: University of Maine, June 1990), p. 4.
21. Bruce O. Barker, "Distance Learning Case Studies," OTA contractor report, section on the Pennsylvania Teleteaching Project, 1989.

cooperation between the local school district and the facility. Students at Danville take a calculus course with peers -- their teacher and the students are linked via computer and telephone, using an audiographics system. In other correctional facilities, located 3,000 miles away, inmates learn English, basic math, and how to read with computers with programs supported by the Los Angeles County Sheriff's Department.[22]

What can be learned from these and other examples of institutions using technology well? Under what conditions is the use of technology most effective? Most appropriate? In learning English? In learning to read or do math? Going beyond basic skills? What type of social and institutional arrangements lead to success in learning?

Access to and use of technology resources is very limited. One reason is that the initial investments in hardware and software -- or the costs of building a distance learning network -- can be quite high, particularly for programs that operate on a shoestring budget. How can programs tap into available technology (use of schools' computers after hours, for example), or share costs among several programs and agencies? What role can the Federal Government, States, localities, and the private sector play in expanding resources? In bringing resources to the community and home?

Another reason for limited use of technology is uncertainty over applications. Teaching a person to read appears to be much more effective via computer-assisted instruction (CAI) than over a distance learning network using one-way video and two-way audio. On the other hand, CAI may work well in teaching English as a second language to some students. In programs using technology, which applications work well? Which don't? What other factors affect outcomes? How can understanding of the learning process and learning needs shape future efforts?

Effective use of computer and telecommunications technology also requires appropriate software and programming. Is the marketplace producing the kind of resources that programs and individuals need? If the system for providing education, training, and retraining is highly fragmented (even more fragmented that the school marketplace), is there a role for government reducing the

22. John Fleischman, Administrator of Media Services, Hacienda La Puente Unified School District, Sept. 4, 1990.

barriers to development?

A third reason for the slow adoption of technology relates to how programs are funded and operated. To address the immediate needs of legalized aliens, Congress has appropriated funding for educational services. Yet in administering these programs, both Federal and State agencies have discouraged investment in technology -- arguing that the program is of limited duration (3 years). But a lack of teachers -- even a shortage of classrooms -- might be alleviated if communities and providers were encouraged to use computer and telecommunications technology applications in providing some of the instructional services. What other barriers exist?

Understanding Literacy

Where can technology make the most difference? To answer that question, we need to have a better understanding of the problem. The lack of consensus on definitions of illiteracy and literacy, as well as the varying methods for assessment, accounts for the wide variation in estimates of how many people need help. Three studies are illustrative:

- In 1975, the Adult Performance Level study sampled 7,500 people on a 300-item questionnaire. Using the 1970 census data, researchers estimated that some 23 million adults were functionally incompetent and 39 million marginally competent.[23]

- In 1979, the U.S. Census Bureau measured the illiteracy rate in a survey of ancestry and language. All persons 14 years and over who had less than a sixth grade education were counted as illiterate if they reported they were (a) unable to read and write English at all, or (b) unable to read and write a language other than English which they also spoke at home. Based on a sample of fewer than 2,500 households, the Census Bureau estimated that 0.6 percent of the population (about 1.0 million people) were unable to read and write.[24]

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23. Adult Performance Level Project, Final Report: The Adult Performance Level Study (Washington, DC: U.S. Office of Education, 1977).

24. Paul M. Irwin, Adult Literacy Issues, Programs, and Options (Washington DC: Congressional Research Service, April 1990), p. 2.

- In 1982, the Department of Education again used data from the Census Bureau's 1982 English Language Proficiency Survey, a national sample of 3,400 adults who responded to 26 written questions measuring their comprehension of English. Those answering 20 or more questions correctly were identified as literate; fewer than 20 were identified as illiterate. Based on this data, the Department of Education estimated that some 17 to 21 million persons, 20 years old and over were illiterate.[25]

The most recent study, the National Assessment of Educational Progress (NAEP) survey of the literacy skills of young adults, breaks new ground. The sample was representative of some 21 million young adults, ages 21 to 25, residing in households. The definition of literacy adopted for the assessment was ". . . using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential."[26] This 1985 assessment examined a range of literacy tasks from the most rudimentary to the more difficult and challenging. For the first time, information about three distinct and important aspects of literacy was obtained in a set of "real world" tasks:

1. Prose literacy: the knowledge and skills needed to understand and use information from texts that include editorials, news stories, poems, and the like;

2. Document literacy: the knowledge and skills required to locate and use information contained in job applications or payroll forms, bus schedules, maps, tables, indexes, and so forth; and,

3. Quantitative literacy: the knowledge and skills needed to apply arithmetic operations, either alone or sequentially, that are embedded in printed materials, such as in balancing a checkbook, figuring out a tip, completing an order form, or determining the amount of interest from a loan advertisement.[27]

In contrast with previous surveys, this study made clear that illiteracy (not being able to read, write, or do the most basic arithmetic) is not a major problem for young adults. The majority of 21 to 25 year olds can use printed information to accomplish many tasks that are either routine or

25. Ibid., p. 3.

uncomplicated. But beyond these basic tasks, a high proportion of young adults have difficulty performing tasks of even moderate complexity.[28] Serious differences in performance by race and ethn'city also exist (see figure "Literacy of Young Adults.")

The 1985 National assessment of adult literacy was a survey of 21 to 25 year olds in households. As a result the survey missed entirely those in correctional institutions and those in the military. A new 4-year, expanded assessment, to be completed in 1994, will provide greater precision of data. A Department of Labor assessment of workplace literacy currently under way will add more information. Other research conducted at the State and local level should also be useful.[29]

OTA will identify other ways to assess what people know, what skills and motivations they bring to different contexts, and how they learn in a variety of settings. Research from the fields of reading, writing, English as a second language, mathematics, special education, and higher order thinking skills may clarify the problems and opportunities faced by learners.

Much can be learned from research on the demand side of the issue. OTA will look at studies that identify the needs from a variety of perspectives -- what skills parents need to help their children, and what knowledge and skills are valued in the family and in cultural groups. OTA's assessment of workplace training summarizes the new demands from industry, and will be the essence of any sections on workplace needs.[30]

The Infrastructure of Services

Federal dollars underlie the growing network of literacy efforts for adults and families. Adult Basic Education (ABE) basic grants support programs that reach approximately 3.5 million adults

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26. Kirsch and Jungeblut, op. cit., footnote 2, p. 3.
27. Ibid., p. 4.
28. Ibid., p. 6.
29. In New York City, the Literacy Assistance Center maintains an extensive database on clients and services in the city. The Center sponsors research on adult literacy education in areas of student characteristics, needs, interests, program materials, methods, and outcomes, teacher competencies and training, and other issues. Angela Covert, director, Literacy Assistance Center, personal communication, July 31, 1990.
30. U.S. Congress, Office of Technology Assessment, *Worker Training: Competing in the New International Economy*, OTA-ITE-457 (Washington, DC: U.S. Government Printing Office, September 1990).

through a variety of services coordinated by each State. Public school systems, community colleges, community-based organizations, libraries, volunteer groups, business, labor organizations, and correctional institutions comprise the ABE infrastructure. Most recently, the ABE program has added new programs that target families (parents and their children) and those with limited English proficiency; other programs outside ABE have also been developed and are expanding (see table 1, "Department of Education: Programs That Support Adult Literacy").[31]

The expansion of services to address the literacy problem goes well beyond the Department of Education. One of the largest Federal efforts -- JOBS (Job Opportunities and Basic Skills Training) -- is aimed at providing literacy and basic skills training for AFDC recipients most at risk for long-term welfare dependency. These are primarily never-married mothers who did not complete high school and who had their first child at a young age. JOBS includes vocational training and work experiences to help secure employment. Child care and other supportive services are also covered.[32] Other efforts include services for "eligible legalized aliens" through State Legalization Impact Assistance Grants (SLIAG) and new initiatives in the Head Start Program aimed at intergenerational literacy.[33] Programs in the Department of Labor, particularly those under the Job Training Partnership Act, have components that deal with literacy, basic skills, and English for non-English speakers.[34]

Recent legislative action and executive branch initiatives account for the proliferation of programs -- as many as 80 different programs administered by 11 separate Federal agencies. What is

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31. See Joan Seamon, Director, Division of Adult Education and Literacy, U.S. Department of Education, "Major Federal Programs Supporting Adult Literacy Efforts in the U.S. Department of Education," working document, February 1990.

32. The JOBS program was created by the Family Support Act, Public Law 100-485.

33. See U.S. Department of Health and Human Services, Family Support Administration, "Major Federal Activities and Programs Supporting Adult Literacy Efforts in the U.S. Department of Health and Human Services," working document, April 1990.

34. A portion of funds for Training Services for Disadvantaged Youth and Adults; Summer Youth Employment; Employment and Training Assistance for Dislocated Workers; Research, Evaluation, Pilot and Demonstration; Job Corps; Special Programs for Migrant and Seasonal Farmworkers; Indian and Native American Programs; and the Senior Community Service Employment Program support adult literacy efforts. For example, an estimated 8 percent of those enrolled in Training Services for Disadvantaged Youth and Adults received basic skills training; some 12 percent ($11 million) of the total for research, evaluation, pilot, and demonstration for 1989 and 1990 was spent on projects in the areas of basic skills and literacy. See U.S. Department of Labor, Employment and Training Administration, "Major Federal Programs Supporting Adult Literacy Efforts in the U.S. Department of Labor," working document, March 1990.

the full picture and how well do Federal programs meet national needs?[35] What needs should have highest priority? How can programs be better coordinated?

Along with expanding Federal programs has come increased investment at the State and local level. Here decisions about allocation of resources (Federal and other), coordination of services, and implementation of programs play out. Recognizing the importance of leadership at the State level, the Governors have laid out comprehensive and far-reaching strategies to achieve national goals for literacy. The Governors' Task Force on Education argues that the current system to educate, train, and retrain adults and out-of-school youth is ". . . highly fragmented and reaches only 5 percent of the eligible population."[36]

Important lessons can be learned from States that have spearheaded dramatic efforts to improve the quality of programs and services. (Examples include Maryland, Connecticut, and Mississippi.) How well have these efforts succeeded? What happens at the end of the line to the citizens who need help? Who has access to services; who does not? What factors contribute to participation, early dropout, or nonparticipation? What elements make a difference in programs that are voluntary and those that are required? What is known about the costs and the results (outcomes and impacts) of diverse efforts? Is it possible to create a comprehensive system envisioned by the Nation's Governors ". . . that can respond to the needs of adults and employers, provide training, and support lifelong learning?"[37] What are the most appropriate roles for Federal, State, and local government? What are the roles for public, business, volunteer, and other community organizations? What new arrangements are needed and where can technology play a role?

35. A comprehensive survey of Federal programs will be completed by December 1990, by the Cosmos Corp., under contract with the Department of Education. This survey and information being provided to the interagency task force on adult literacy will map a more complete picture of Federal involvement.

36. National Governors' Association, Educating America: State Strategies for Achieving the National Eduation Goals, Report of the Task Force on Education (Washington, DC: 1990).

37. Ibid., p. 12.

CONGRESSIONAL INTEREST

Literacy is not a new issue for Congress. Provisions to raise the literacy of the Nation's children, citizens, and workers can be found in the major education, employment and training, welfare reform, immigration, and early childhood bills. Congressional oversight is likely to focus on progress being made. Pressures to find better ways to address the problems of families, limited English speaking populations, young adults, and workers will grow. New legislation is likely to focus on raising incentives for learners (this approach was taken in welfare reform and is now being considered for those behind bars in our correctional institutions). Congress is also likely to look at ways to increase incentives for providers -- including the States themselves -- as well as public education, community, and business organizations.

Federal expenditures for literacy and related areas are increasing; pressure will build to make sure those resources are used most effectively. Congress will want to know where improvements in current programs can be made, how all community and institutional resources can be multiplied, and where Federal efforts can have the most impact.

CONGRESSIONAL AND OTHER RELATED WORK

Numerous national reports examine literacy and related issues from various perspectives. These reports provide a historical perspective[38] as well as new data on contributing economic and social factors, including children and families in poverty,[39] school dropouts, and youth unemployment.[40] These reports and many others from States, localities, the military, the library

38. David Harman, Illiteracy: A National Dilemma (New York, NY: Cambridge Book Co., 1987). See also Carmen St. John Hunter and David Harman, Adult Illiteracy in the United States: A Report to the Ford Foundation (New York, NY: McGraw Hill, 1979).

39. Business-Higher Education Forum, Three Realities: Minority Life in the United States (Washington, DC: Business-Higher Education Forum, 1990). See also MDC, Inc., America's Shame, America's Hope: Twelve Million Youth at Risk (New York, NY: n.d.); and Rockefeller Foundation, Literacy and the Marketplace: Improving the Literacy of Low-Income Single Mothers (New York, NY: June 1989).

40. William T. Grant Foundation Commission on Work, Family and Citizenship, The Forgotten Half: Pathways to Success for America's Youth and Young Families (Washington, DC: November 1988), final report. See also Andrew Hahn et al., Dropouts in America: Enough is Known for Action

community, and others are invaluable resources. OTA will also be able to take advantage of major studies and analyses under way in the Federal agencies, including the Department of Education (Adult Literacy Initiative) and the Department of Labor (Secretary's Commission on Achieving Necessary Skills -- SCANS), and work across agencies (e.g., the Special Subcommittee on Adult Literacy under the Domestic Policy Council Task Force).

Work completed by CRS, GAO, and CBO will also be utilized. CRS expects to prepare an analysis of Federal programs (funding and services) to follow its recent CRS Issue Brief on literacy.[41] CRS staff have already begun to work informally with OTA to provide useful data. Other relevant work at GAO covers school dropouts, youth employment/basic skills, and programs for at-risk populations.

The literacy assessment will draw extensively on OTA's recent work in educational technology (*Power On! New Tools for Teaching and Learning* and *Linking for Learning: A New Course for Education*), worker training (*Worker Training: Competing in the New International Economy*), and ongoing studies of adolescent health and rural telecommunications. OTA's extensive information about changing demographics, educational requirements, employment practices, and health and community services will add to information available from the research literature.

PROJECT METHODOLOGY AND SCHEDULE

The assessment will begin in October 1990 and the first Advisory Panel Meeting will take place early in 1991. The panel will consist of a distinguished group of practitioners, researchers, government policymakers, industry representatives, and other stakeholders. Members will be selected to represent or have expertise in the following or similar areas:

- **Education and related services** -- teachers and administrators of adult basic education, English as a second language, workplace skills, the military, and community college programs;

(Washington, DC: Institute for Educational Leadership, March 1987).

41 Paul M. Irwin, Adult Literacy Issues, Programs, and Options, CRS issue brief (Washington, DC: The Library of Congress, Congressional Research Service, April 1990)

- **Community-based organizations** -- librarians, literacy volunteers, social workers, developers of family services, directors of non-profit groups, etc.;

- **State/local government** -- a Governor, Mayor, State Commissioner of Education, Director of Correctional Services, Director of Health and Social Services;

- **Business and industry** -- executives involved in training or human resources development, corporate sponsor of literacy activities, representatives of the computer, software, telecommunications industries;

- **University/research community** -- experts in cognitive science, literacy, language, and reading; social and cultural issues;

- **Special population interests** -- groups and organizations serving immigrant and refugee populations, prisoners, the homeless, etc.; and

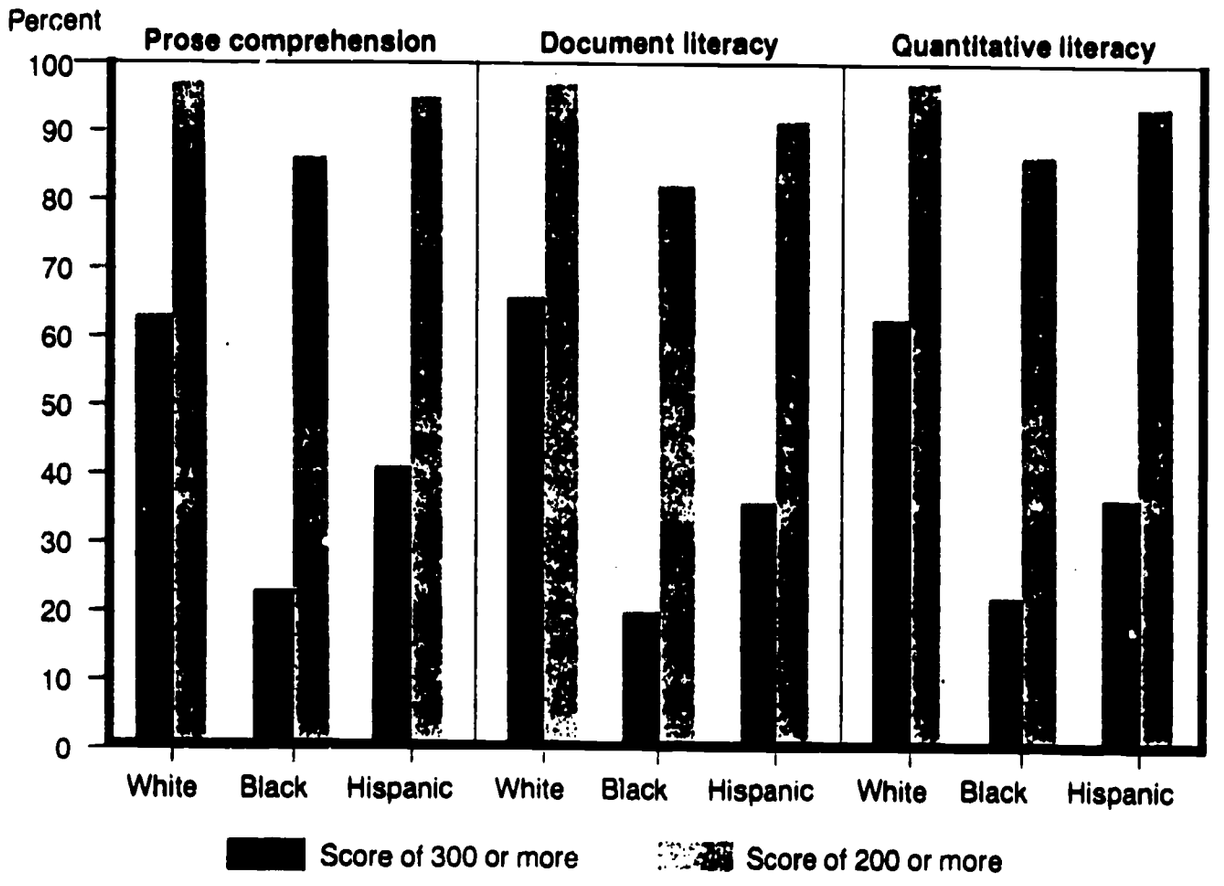
- **Adult learners** -- individuals representing diverse learning needs and approaches to overcoming their literacy problems.

OTA will convene a number of workshops during the study. The workshops will bring together practitioners from the field, cognitive scientists and researchers, technology developers, State agency personnel, and community and business leaders. Workshops will focus on issues such as English as a second language (needs, nature of language learning, technology applications) and family literacy (intergenerational issues, crossing institutional boundaries). One workshop will examine the changing requirements for literacy and higher order thinking.

Case studies and contractor reports will provide background information for the assessment issues described above. The study is projected to take 21 months, for delivery to TAB in June 1992.

Indicator 29. Literacy of Young Adults

Literacy skills of young adults, by race/ethnicity: 1985



SOURCE: U.S. Department of Education, Office of Educational Research and Improvement, contractor report, *Literacy: Profiles of America's Young Adults*, by Irwin S. Kirsch and Ann Jungeblut, Educational Testing Service.

While most young adults adequately perform tasks requiring basic literacy skills (a score of 200 or more), nearly one-half are unable to do well on tasks of even moderate complexity (a score of 300 or more), such as balancing a checkbook or using a map.

NOTE: This figure comes from U.S. Department of Education, Office of Educational Research and Improvement, Youth Indicators 1988: Trends in the Well-Being of American Youth (Washington, DC: U.S. Government Printing Office, August 1988), p. 67.

List of Major Federal Programs Supporting Adult Literacy Efforts
DEPARTMENT OF EDUCATION

Adult Education Basic Grants to states
- Adult basic education
- English as a second language
- Adult special education
- Literacy
- Set aside for Correctional Institutions (10 percent)

Adult Education for the Homeless
- Literacy training and basic skills remediation for homeless adults

Workplace Literacy Partnerships
- Exemplary partnerships to provide training for workers in basic literacy or English language skills

English Literacy Grants
- Programs for individuals of limited english proficiency, includes support services for child care and transportation

National Demonstration Programs
- Special demonstration projects, research and evaluation in adult ed and literacy

Even Start
- Early childhood education and adult education in unified family centered education programs

Migrant Education (under Even Start)
- Special setaside for family-centered programs involving children and their parents

Educational Services for Indian Adults
- Grants for basic literacy, completion of secondary education, and skills necessary to benefit from vocational training

Family English Literacy Program
- Interganerational literacy activities for limited English proficent families

Student Literacy Corps
- Undergraduates service as volunteer literacy tutors in public adult literacy programs

Library Literacy Program
- State library coordination and training for local programs
- Funding for local programs for training, materials, promotion

Other activities:
- National Adult Literacy Survey
- ERIC clearinghouse on Adult, Career and Vocational Education
- Center on Adult Literacy and Educational Quality of the Workforce
- National clearinghouse on literacy and limited English proficiency

FUNDING LEVELS:

FY-89 Appropriation	$195.3 million
FY-90 Appropriation	$237.3 million
FY-91 Request	$314.4 million

Source: Based on "Major Federal Programs Supporting Adult Literacy EFforts in the U.S. Department of Education," Working Document, prepared by the Division of Adult Education and Literacy, February 1990.

DOCUMENT RESUME

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IDENTIFIERS	*United States; *Workplace Literacy

ABSTRACT

The Office of Technology Assessment (OTA) is undertaking a comprehensive assessment of literacy in the United States. The assessment will examine how technology offers new resources and creates opportunities to reach learners and improve productivity of learning. OTA will identify ways to increase learning access in existing programs and overcome economic, social, institutional, and technological barriers. In assessing new roles for technology, the study will analyze the changing requirements for skills and knowledge. In this effort, OTA will incorporate existing data and information about what people know, how they learn, and what they need to know in the workplace, the home, and the community. The assessment will look at the current base of adult education and family literacy services in schools, community colleges, community-based organizations, volunteer networks, libraries, and businesses. OTA will examine how these programs work, who is being reached, and what opportunities can be created by new institutional arrangements and emerging technology. Literacy is not a new issue for Congress. Several recently enacted laws, as well as House and Senate bills in conference, expand literacy services through a variety of institutions. Improving the literacy skills of all citizens is one of the six national goals agreed to at the Education Summit. OTA's work on educational technology, worker training, adolescent health, rural telecommunications, and economic development will provide useful background information. (Forty-one footnotes and a list of 12 major federal program supporting literacy efforts are included in this document). (NLA)

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Technologies for Literacy

PROJECT DESCRIPTION: Technology is changing every aspect of our society, including the levels of literacy skills needed to participate in the workplace and to contribute as a member of the family and community. Some 30 million adults have serious problems with some aspect of literacy -- from reading and numeracy skills for the most basic tasks, to more advanced skills for entry into job training, or knowledge and skills to complete a high school degree. Moreover, citizens' needs vary widely. They include learning English as a second language or overcoming learning disabilities. In families where literacy problems cross generations, both adults and children are affected.

Concerned with the mounting evidence of underutilized human resources, Congress has expanded efforts to support literacy instruction, utilizing the infrastructure of adult basic education programs in schools, community colleges, community-based organizations, volunteer services, and libraries. Using these services differently could create new opportunities. Evidence of effective and innovative use of computer-based technologies in classrooms and industry shows that these technologies can be powerful tools for learning in literacy programs. The capabilities of computer technology -- graphic, audio, video, and information handling -- make it possible to offer new paths for learning. At the same time, the growing infrastructure of telecommunications networks provides alternative ways to bring instruction to learners who are at home, in the community, or in the workplace. With advancing technology, global competition, and increased demands for literacy, Congress will be under pressure to ensure that resources are being well used to raise the literacy level of the Nation.

Building on its prior work in education and training, OTA will undertake a comprehensive assessment of literacy and the technologies to improve it. OTA will examine how technology can offer new resources and create new opportunities to reach learners and improve productivity of learning. OTA will identify ways to increase learning access in existing programs and in new ways, overcoming economic, social, institutional, and technological barriers.

CONGRESSIONAL INTEREST: Several recently enacted laws, as well as House and Senate bills in conference, expand literacy services through a variety of institutions. Improving the literacy skills of all Americans is one of the six national goals agreed to at the Education Summit.

REQUESTER: House Committee on Education and Labor (Hawkins, Ford, Goodling, Sawyer); Senate Committee on Labor and Human Resources (Kennedy, Hatch)

CONGRESSIONAL AND OTHER WORK: CRS has prepared issues briefs on adult literacy and related issues. OTA's work on educational technology, worker training, adolescent health, and rural telecommunications and economic development will provide useful background information.

SCHEDULE: This assessment will begin in October 1990; delivery to TAB by June 1992.

OTA CONTACT: Linda Roberts, Science, Education, and Transportation Program, 228-6936.

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U.S. DEPARTMENT OF EDUCATION
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COMMITTEE ON EDUCATION AND LABOR

U.S. HOUSE OF REPRESENTATIVES
B-346C RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515

SUBCOMMITTEE ON ELEMENTARY, SECONDARY,
AND VOCATIONAL EDUCATION

July 10, 1990

John H. Gibbons
Director
Office of Technology Assessment
600 Pennsylvania Avenue, S.E.
Washington, D.C. 20510-8025

Dear Mr. Gibbons:

America is faced with a crisis in literacy. The Congress, and in particular the Committee on Education and Labor, has joined with the President and the Nation's governors in a goal for the year 2000 that calls for every adult American to be literate, and to possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

Currently, concern about American literacy is extremely high, as the evidence continues to mount of wasted lives and underutilized resources. An estimated 30 million adults have serious problems with some aspect of literacy. Literacy problems are closely associated with poverty, and often more than one generation suffers. More than 75 percent of the population in our prisons, jails and juvenile facilities is functionally illiterate. Clearly, the time has come to make a real commitment to reversing the trend lines. Congress has begun to address these problems through a series of bills, including the Adult Literacy and Employability Act of 1990.

The contribution that can be made to solving this problem through the use of technology is frequently overlooked. The Committee wants to ensure that all resources are brought to bear, and believes that the ability of technology to reach new audiences, cross institutional and geographic boundaries, and multiply existing opportunities might prove crucial in reaching our year 2000 goal. Accordingly, the Committee asks that the Office of Technology Assessment undertake a study examining the opportunities and barriers to the use of technology to improve literacy in America.

This study should build upon the basic assessments of technology in education prepared for the Committee, Power On! and Linking for Learning. These reports provide important insights into the use of technology for learning in the school environment, and have been most helpful to the Committee in its deliberations.

There are several aspects the Committee wishes OTA to explore. These include:

* How can technology be enlisted to reach a wide variety of learners, including families, adults, and children outside the conventional schoolroom? How can community institutions, groups and organizations contribute to such an effort?

* How can technology build upon existing services to serve a larger population? What types of programs or software need to be developed to serve special groups? How can the marketplace help in this effort?

* Considering the existing distribution of technology, how can programs be devised that will not favor only those already rich in technology? How can the Congress ensure that new efforts will not simply exacerbate the disparities in learning that already exist in the society?

* How can Congress ensure that America's illiterates have an increased awareness of and have equal access to the technology addressed in this study?

* How can the resources of the formal education system be made more available to all citizens without reducing their utility to schools? What social, legal, and technical problems exist that prevent expanded use of school equipment and space?

* How can telecommunications technology that now provides information over geographic boundaries be used to offer literacy services? Does distance matter? Can technology that now provides other types of data and services also offer resources for learning?

* What is the appropriate role for workforce literacy programs, and which Department within the Executive Branch should administer such programs?

* What role can the Federal Government play that moves America toward its literacy goals while

respecting State and local perogatives in education? What models and historical experience in meeting national needs can guide our thinking?

* How can the revolution that has occurred in information technology be harnessed to create a revolution in literacy for Americans?

This Committee seeks the type of analysis and foresight that the Office of Technology Assessment embodies in answering these questions. Surely no task at hand is more critical than making Americans ready and able to work, learn and vote effectively. We look forward to the outcome of this study.

Sincerely,

Augustus F. Hawkins
Chairman

William F. Goodling
Ranking Republican

William D. Ford
Member of Congress

Thomas C. Sawyer
Member of Congress

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United States Senate
COMMITTEE ON LABOR AND
HUMAN RESOURCES
WASHINGTON, DC 20510-6300

September 14, 1990

Dr. John H. Gibbons, Director
Office of Technology Assessment
United States Congress
Washington, D. C. 20510

Dear Jack:

This is to request that OTA undertake a comprehensive assessment of the ways in which technology can be utilized to promote increased literacy. We have been very favorably impressed with OTA's recent reports on technology and education -- Power On and Linking for Learning -- and believe it is important to build on that base of experience and extend OTA's expertise into related high priority areas.

As the nation continues its evolution into an information-based, technological society, few challenges rate as high a national priority as that of extending and upgrading public literacy. One hundred years ago, literacy was defined as the ability to sign one's name; fifty years ago it meant having the equivalent of a fourth grade education. But to be literate -- or functional -- in the technological civilization of the twenty-first century, will require a much higher level of communication, calculation, and computer skills. And at present, it has been estimated that about thirty million Americans have serious problems with some facets of literacy.

To enable all Americans to be literate by the Year 2000 -- or even soon thereafter -- we must make optimum use of all the technological aids at our disposal. In its earlier reports, OTA has demonstrated the impressive potential of technologies for learning. With that background in mind, we believe it would now be highly useful to assess the ways in which technologies could specifically aid in expanding and upgrading literacy among all Americans, both within school systems and through other family-oriented, community programs.

Accordingly, we request that OTA undertake a comprehensive assessment of technologies for literacy, including consideration of the changing definition of literacy, present patterns of literacy, future requirements for literacy, specific technological systems that can aid in imparting particular aspects of literacy, along with their respective costs and benefits, and the problems and opportunities involved in implementing the various policy options that have been

identified. Throughout the assessment, we urge that OTA place special emphasis on ensuring access for all Americans to the technological aids under consideration. We look forward to discussing this with you and the other TAB Members at the next Board meeting.

With best personal wishes.

Sincerely,

Edward M. Kennedy

Orrin G. Hatch

TECHNOLOGIES FOR LITERACY

BACKGROUND: LITERACY AS A NATIONAL GOAL

The goal of a fully literate citizenry is as old as the Nation itself, seen by our founding fathers as essential for the survival and growth of a democracy. The American system of public education was created to help meet this goal. In the 20th century, there was a great expansion of the population's literacy skills, reflected in years of school completed and increased circulation of print matter.[1] And by the literacy standards of 100 or even 50 years ago, almost all (95 percent) of America's young adults are literate today.[2] But the demands for literacy are much higher now, and our many citizens with marginal reading, quantitative, and related skills face substantial hardships. Even though tremendous progress has been made, it is not enough.

Today's literacy problem has serious social and economic implications. In a survey of disadvantaged 19 to 23 year olds, 68 percent of those arrested, 85 percent of unwed mothers, 79 percent of welfare dependents, 85 percent of school dropouts, and 72 percent of the unemployed had low basic skills.[3] Many experts believe that literacy is increasingly an intergenerational problem, passed down through families.[4] There is also mounting evidence that ". . . literacy problems are closely associated with poverty and pose a major threat to the economic well-being of the United

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1. Carl F. Kaestle, "The History of Literacy and the History of Readers," Review of Research in Education, vol. 12, Edmund W. Gordon (ed.) (Washington, DC: American Educational Research Association, 1985).

2. The ability to sign one's name was the standard of literacy 100 years ago; some 50 years ago, having the equivalent of a fourth grade education became the standard. See Irwin S. Kirsch and Ann Jungeblut, Literacy: Profiles of America's Young Adults (Princeton, NJ: National Assessment of Educational Progress, Educational Testing Service, 1986).

3. Gordon Berlin and Andrew Sum, Toward More Perfect Union: Basic Skills, Poor Families, and our Economic Future (New York, NY: Ford Foundation, 1988) as cited in Anthony Carnevale et al., Workplace Basics: The Skills Employers Want (Alexandria, VA: American Society for Training and Development, n.d.), p. 6.

4. Thomas G. Sticht and Barbara A. McDonald, Making the Nation Smarter: The Intergenerational Transfer of Cognitive Ability (San Diego, CA: Applied Behavioral and Cognitive Sciences, Inc., January 1989).

States."[5] And the personal costs, in wasted lives and missed opportunities, are equally compelling.

Changes in technology and society have raised the requirements for literacy in the workplace, in the home, and in the community. The changes we see today are likely to become even more pronounced in the future.

> Over the next two or three decades, economic, social, and political life will be profoundly shaped by new technologies of production and communication. To utilize these new technologies fully and in ways that enhance rather than threaten political democracy, we will require a population that is literate in the deepest sense of the word, a population able to modify and adapt to the technology as needed, a population able to understand and thereby maintain appropriate control over a complex economic structure. Our population must be able to learn "on the job" as conditions change, to respond productively to new opportunities and challenges, and to deal with complexities that require thinking and reasoning powers far beyond the routinized skills of traditional "basic education."[6]

Making America smarter has become the rallying cry of policymakers at all levels. At the 1990 Education Summit, the President and the Governors articulated a national goal for literacy, building on the requirements for a new set of basics:

> By the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.[7]

The President and the Governors have recognized that meeting this goal will require coordinated efforts from all segments of society and at all levels of governance.

Congress has already taken a number of steps. Legislation has expanded Federal assistance for traditional adult education programs and newer community-based programs.[8] Congress has emphasized literacy in existing programs for job training, welfare reform, assistance for the homeless,

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5. H.R. 5115, Equity and Excellence in Education Act of 1990, Title V -- Family Literacy and Lifelong Learning, Sec. 502.

6. Lauren B. Resnick, testimony before the Joint Economic Committee, Subcommittee on Education and Health, Oct. 5, 1987.

7. National Governors' Association, National Education Goals (Washington, DC: Feb. 25, 1990).

8. The Adult Education Act (AEA) serves 3.5 million people annually. The AEA was amended and extended through fiscal year 1993 by Public Law 100-297, the Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary School Improvement Amendments of 1988.

assistance for refugees and amnesty populations, library services, education for the disadvantaged, dropout prevention, and pre-school Head Start programs.[9] Most recently, the House and Senate passed legislation to expand programs aimed at family literacy and lifelong learning.[10]

These recent initiatives in Congress and other actions at the State and local level signal a commitment to dealing with the problem and reversing the trends for the future. Yet there is concern that these efforts will not be enough. Recognizing the need to look at the complicated and interrelated issues surrounding literacy, the House Committee on Education and Labor and the Senate Committee on Labor and Human Resources have asked OTA to undertake a comprehensive assessment of literacy in America.

Specifically, the assessment will examine how technology can offer new resources and create new opportunities to reach learners and improve productivity of learning. OTA will identify ways to increase learning access in existing programs and in new ways, overcoming economic, social, institutional, and technological barriers.

In assessing new roles for technology, the study will analyze the changing requirements for skills and knowledge. In this effort OTA will incorporate existing data and information about what people know, how they learn, and what they need to know in the workplace, the home, and the community.

The assessment will look at the current base of adult education and family literacy services in schools, community colleges, community-based organizations, volunteer networks, libraries, and business. OTA will examine how these programs work, who is being reached, and what opportunities can be created by new institutional arrangements and emerging technology.

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9. See the Omnibus Trade and Competitiveness Act of 1988, Public Law 100-418; the Family Support Act of 1988, Public Law 100-484; the Stewart B. McKinney Homeless Assistance Amendments Act of 1988, Public Law 100-628; the Immigration Reform and Control Act of 1986, Sec. 204, Public Law 99-603; the Library Services and Construction Act, Public Law 98-480; the Head Start Act, Public Law 99-425; and the Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary Improvement Amendments of 1988, Public Law 100-297.

10. See Title V -- Family Literacy and Lifelong Learning, cited as "Literacy for All Americans Act of 1990, H.R. 5115 -- Equity and Excellence in Education Act of 1990. In the bill, the term literacy means ". . . the attainment of a level of proficiency in basic skills that is sufficent to allow each individual to meet individual goals for proficiency to meet social and economic demands for proficiency." The term basic skills means "reading in the English language; writing in the English language; speaking in the English language; mathematics; and problem solving."

ASSESSMENT ISSUES AND TASKS

Roles for Technology

I knew computers were the future, but I had no idea they could be my future.
Playing to Win student and 37 year-old mother of two

Computer and telecommunications technologies are becoming important resources for education and training -- tools for learning, vehicles to access information, and means to reach out to new learners. Improvements in technology have vastly increased capabilities and reliability, and lowered cost. Today's computer software offers much more than text: graphics, audio, and motion combine with text in powerful ways; multimedia connects all this with video and multiple networks of data and information.[11] Advances in telecommunications have broadened applications for learning at a distance. Whereas early efforts with instructional radio and television broadcasts were "one-way," today's efforts not only reach out to learners, but bring them into the learning group, with two-way, interactive capabilities.[12]

There are other reasons for growing interest in technology. Computer-based instruction can be self-paced, highly individualized, and fit the learner's time schedule. More importantly, there is evidence that this form of instruction is highly efficient -- that adult learners cover material faster than using traditional methods of instruction.[13] With computers, teachers have greater flexibility -- they can work with more students or spend more time with individuals. In a number of military and industry applications, instruction using computers, interactive video, and telecommunications are highly cost-effective.

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11. U.S. Congress, Office of Technology Assessment, *Power On! New Tools for Teaching and Learning*, OTA-SET 379 (Washington, DC: U.S. Government Printing Office, September 1988).
12. U.S. Congress, Office of Technology Assessment, *Linking for Learning: A New Course for Education*, OTA-SET 430 (Washington DC: U.S. Government Printing Office, November 1989).
13. Dexter Fletcher and Jesse Orlansky, "Cost Effectiveness of CBI in Defense Training," paper presented to the American Educational Research Association, 1986. See also Arnold H. Packer, Retooling the American Workforce: The Role of Technology in Improving Adult Literacy During the 1990s (Southport, CT: Southport Institute for Policy Analysis, December 1988).

Interactive telecommunications applications offer a significant new dimension to services for families, young adults, and adults in the community. The rapidly expanding satellite, cable, telephone, and fiber networks for public and higher education, business and industry constitute a basic resource.

Yet, applications of technology in our schools, the military, and the workplace far outpace applications in literacy efforts. There are some notable exceptions.

- In a storefront in Harlem, the Playing to Win project offers access to computers, informal computer education classes, and the computer as a learning tool for adult beginning reading. The program began 7 years ago with a handful of donated computers; today more than 500 neighborhood residents use the facility each week.[14] Working with other community-based organizations, prisons, hospitals, and libraries to use computers in their literacy efforts, Playing to Win developed new approaches for working with adult beginning readers. The Playing to Win materials challenge the assumption that adults have to read on a third or fourth grade level to be able to use computers and productivity tools such as word processing, database management tools, or graphics tools.[15]

- Another approach, also using computer instruction, is used at the Ripken Learning Center in Baltimore. Each day, welfare mothers spend at least an hour in the computer lab, with a goal of raising their reading skills. Each person works at her own pace, on her own level in a commercially developed, "integrated learning system" that monitors the progress of each student and signals any problems. Along with help in reading, students are also seeking instruction in keyboarding and word processing skills.[16] At another Baltimore location, a center operating with Head Start funding is experimenting with computer applications to help young children learn; computers that are used with children can, with appropriate software, provide instruction for their parents.[17]

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14. Antonia Stone, executive director, Playing to Win, personal communication, August 1990.
15. The development of these applications were funded by a 3-year grant from the NYNEX Foundation. See Antonia Stone, Keystrokes to Literacy: Using the Computer as a Tool for Adult Beginning Readers (Chicago, IL: National Textbook, 1990).
16. OTA site visit, Aug. 9, 1990.

- For decades, many citizens in Kentucky had no access to adult education in their remote rural communities; that is no longer the case thanks to The Kentucky Network (KET). KET broadcasts to the home three separate series, "Learn to Read," "Another Page," and "GED ON TV," as well as a schedule of fully accredited undergraduate and graduate telecourses. KET also offers 5 half-hour television programs, "Teach an Adult to Read," on introductory training for volunteer tutors interested in working with adults. Since 1985, 9,542 students have enrolled in the GED ON TV series, paying a $15 fee to receive workbooks, newsletters, and access to trained tutors via a toll-free telephone line.[18]

- One-quarter of Maine's adults are functionally illiterate; one-third have not earned a GED or high school diploma, and the State ranks last in adults participating in higher education.[19] To address these pressing needs, the Community College of Maine/Telecommunications Network was developed. In building the network, Maine also created the equivalent of a community college system across the State. In its first year of operation, Maine citizens were able to access courses from 36 different locations all across the State. As Governor John McKernan noted, "Rather than accept the idea that higher education is inaccessible because of the huge geography of our state, we have found a way to make that geography irrelevant."[20]

- Telecommunications technology is also used to bring education to students at a residential correctional facility in Danville, Pennsylvania.[21] A unique aspect of this effort is the

17. Ken Miller, IBM Corp., personal communication, Aug. 10, 1990.
18. Sandy Welch, deputy executive director, The Kentucy Network, personal communication, May 29, 1990.
19. See Office of Technology Assessment, op. cit., footnote 12, p. 116.
20. The Community College of Maine, Annual Report: Year One 1989-1990 (Augusta, ME: University of Maine, June 1990), p. 4.
21. Bruce O. Barker, "Distance Learning Case Studies," OTA contractor report, section on the Pennsylvania Teleteaching Project, 1989.

cooperation between the local school district and the facility. Students at Danville take a calculus course with peers -- their teacher and the students are linked via computer and telephone, using an audiographics system. In other correctional facilities, located 3,000 miles away, inmates learn English, basic math, and how to read with computers with programs supported by the Los Angeles County Sheriff's Department.[22]

What can be learned from these and other examples of institutions using technology well? Under what conditions is the use of technology most effective? Most appropriate? In learning English? In learning to read or do math? Going beyond basic skills? What type of social and institutional arrangements lead to success in learning?

Access to and use of technology resources is very limited. One reason is that the initial investments in hardware and software -- or the costs of building a distance learning network -- can be quite high, particularly for programs that operate on a shoestring budget. How can programs tap into available technology (use of schools' computers after hours, for example), or share costs among several programs and agencies? What role can the Federal Government, States, localities, and the private sector play in expanding resources? In bringing resources to the community and home?

Another reason for limited use of technology is uncertainty over applications. Teaching a person to read appears to be much more effective via computer-assisted instruction (CAI) than over a distance learning network using one-way video and two-way audio. On the other hand, CAI may work well in teaching English as a second language to some students. In programs using technology, which applications work well? Which don't? What other factors affect outcomes? How can understanding of the learning process and learning needs shape future efforts?

Effective use of computer and telecommunications technology also requires appropriate software and programming. Is the marketplace producing the kind of resources that programs and individuals need? If the system for providing education, training, and retraining is highly fragmented (even more fragmented that the school marketplace), is there a role for government reducing the

22. John Fleischman, Administrator of Media Services, Hacienda La Puente Unified School District, Sept. 4, 1990.

barriers to development?

A third reason for the slow adoption of technology relates to how programs are funded and operated. To address the immediate needs of legalized aliens, Congress has appropriated funding for educational services. Yet in administering these programs, both Federal and State agencies have discouraged investment in technology -- arguing that the program is of limited duration (3 years). But a lack of teachers -- even a shortage of classrooms -- might be alleviated if communities and providers were encouraged to use computer and telecommunications technology applications in providing some of the instructional services. What other barriers exist?

Understanding Literacy

Where can technology make the most difference? To answer that question, we need to have a better understanding of the problem. The lack of consensus on definitions of illiteracy and literacy, as well as the varying methods for assessment, accounts for the wide variation in estimates of how many people need help. Three studies are illustrative:

- In 1975, the Adult Performance Level study sampled 7,500 people on a 300-item questionnaire. Using the 1970 census data, researchers estimated that some 23 million adults were functionally incompetent and 39 million marginally competent.[23]

- In 1979, the U.S. Census Bureau measured the illiteracy rate in a survey of ancestry and language. All persons 14 years and over who had less than a sixth grade education were counted as illiterate if they reported they were (a) unable to read and write English at all, or (b) unable to read and write a language other than English which they also spoke at home. Based on a sample of fewer than 2,500 households, the Census Bureau estimated that 0.6 percent of the population (about 1.0 million people) were unable to read and write.[24]

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23. Adult Performance Level Project, Final Report: The Adult Performance Level Study (Washington, DC: U.S. Office of Education, 1977).

24. Paul M. Irwin, Adult Literacy Issues, Programs, and Options (Washington DC: Congressional Research Service, April 1990), p. 2.

- In 1982, the Department of Education again used data from the Census Bureau's 1982 English Language Proficiency Survey, a national sample of 3,400 adults who responded to 26 written questions measuring their comprehension of English. Those answering 20 or more questions correctly were identified as literate; fewer than 20 were identified as illiterate. Based on this data, the Department of Education estimated that some 17 to 21 million persons, 20 years old and over were illiterate.[25]

The most recent study, the National Assessment of Educational Progress (NAEP) survey of the literacy skills of young adults, breaks new ground. The sample was representative of some 21 million young adults, ages 21 to 25, residing in households. The definition of literacy adopted for the assessment was ". . . using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential."[26] This 1985 assessment examined a range of literacy tasks from the most rudimentary to the more difficult and challenging. For the first time, information about three distinct and important aspects of literacy was obtained in a set of "real world" tasks:

1. Prose literacy: the knowledge and skills needed to understand and use information from texts that include editorials, news stories, poems, and the like;

2. Document literacy: the knowledge and skills required to locate and use information contained in job applications or payroll forms, bus schedules, maps, tables, indexes, and so forth; and,

3. Quantitative literacy: the knowledge and skills needed to apply arithmetic operations, either alone or sequentially, that are embedded in printed materials, such as in balancing a checkbook, figuring out a tip, completing an order form, or determining the amount of interest from a loan advertisement.[27]

In contrast with previous surveys, this study made clear that illiteracy (not being able to read, write, or do the most basic arithmetic) is not a major problem for young adults. The majority of 21 to 25 year olds can use printed information to accomplish many tasks that are either routine or

25. Ibid., p. 3.

uncomplicated. But beyond these basic tasks, a high proportion of young adults have difficulty performing tasks of even moderate complexity.[28] Serious differences in performance by race and ethn'city also exist (see figure "Literacy of Young Adults.")

The 1985 National assessment of adult literacy was a survey of 21 to 25 year olds in households. As a result the survey missed entirely those in correctional institutions and those in the military. A new 4-year, expanded assessment, to be completed in 1994, will provide greater precision of data. A Department of Labor assessment of workplace literacy currently under way will add more information. Other research conducted at the State and local level should also be useful.[29]

OTA will identify other ways to assess what people know, what skills and motivations they bring to different contexts, and how they learn in a variety of settings. Research from the fields of reading, writing, English as a second language, mathematics, special education, and higher order thinking skills may clarify the problems and opportunities faced by learners.

Much can be learned from research on the demand side of the issue. OTA will look at studies that identify the needs from a variety of perspectives -- what skills parents need to help their children, and what knowledge and skills are valued in the family and in cultural groups. OTA's assessment of workplace training summarizes the new demands from industry, and will be the essence of any sections on workplace needs.[30]

The Infrastructure of Services

Federal dollars underlie the growing network of literacy efforts for adults and families. Adult Basic Education (ABE) basic grants support programs that reach approximately 3.5 million adults

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26. Kirsch and Jungeblut, op. cit., footnote 2, p. 3.
27. Ibid., p. 4.
28. Ibid., p. 6.
29. In New York City, the Literacy Assistance Center maintains an extensive database on clients and services in the city. The Center sponsors research on adult literacy education in areas of student characteristics, needs, interests, program materials, methods, and outcomes, teacher competencies and training, and other issues. Angela Covert, director, Literacy Assistance Center, personal communication, July 31, 1990.
30. U.S. Congress, Office of Technology Assessment, *Worker Training: Competing in the New International Economy*, OTA-ITE-457 (Washington, DC: U.S. Government Printing Office, September 1990).

through a variety of services coordinated by each State. Public school systems, community colleges, community-based organizations, libraries, volunteer groups, business, labor organizations, and correctional institutions comprise the ABE infrastructure. Most recently, the ABE program has added new programs that target families (parents and their children) and those with limited English proficiency; other programs outside ABE have also been developed and are expanding (see table 1, "Department of Education: Programs That Support Adult Literacy").[31]

The expansion of services to address the literacy problem goes well beyond the Department of Education. One of the largest Federal efforts -- JOBS (Job Opportunities and Basic Skills Training) -- is aimed at providing literacy and basic skills training for AFDC recipients most at risk for long-term welfare dependency. These are primarily never-married mothers who did not complete high school and who had their first child at a young age. JOBS includes vocational training and work experiences to help secure employment. Child care and other supportive services are also covered.[32] Other efforts include services for "eligible legalized aliens" through State Legalization Impact Assistance Grants (SLIAG) and new initiatives in the Head Start Program aimed at intergenerational literacy.[33] Programs in the Department of Labor, particularly those under the Job Training Partnership Act, have components that deal with literacy, basic skills, and English for non-English speakers.[34]

Recent legislative action and executive branch initiatives account for the proliferation of programs -- as many as 80 different programs administered by 11 separate Federal agencies. What is

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31. See Joan Seamon, Director, Division of Adult Education and Literacy, U.S. Department of Education, "Major Federal Programs Supporting Adult Literacy Efforts in the U.S. Department of Education," working document, February 1990.

32. The JOBS program was created by the Family Support Act, Public Law 100-485.

33. See U.S. Department of Health and Human Services, Family Support Administration, "Major Federal Activities and Programs Supporting Adult Literacy Efforts in the U.S. Department of Health and Human Services," working document, April 1990.

34. A portion of funds for Training Services for Disadvantaged Youth and Adults; Summer Youth Employment; Employment and Training Assistance for Dislocated Workers; Research, Evaluation, Pilot and Demonstration; Job Corps; Special Programs for Migrant and Seasonal Farmworkers; Indian and Native American Programs; and the Senior Community Service Employment Program support adult literacy efforts. For example, an estimated 8 percent of those enrolled in Training Services for Disadvantaged Youth and Adults received basic skills training; some 12 percent ($11 million) of the total for research, evaluation, pilot, and demonstration for 1989 and 1990 was spent on projects in the areas of basic skills and literacy. See U.S. Department of Labor, Employment and Training Administration, "Major Federal Programs Supporting Adult Literacy Efforts in the U.S. Department of Labor," working document, March 1990.

the full picture and how well do Federal programs meet national needs?[35] What needs should have highest priority? How can programs be better coordinated?

Along with expanding Federal programs has come increased investment at the State and local level. Here decisions about allocation of resources (Federal and other), coordination of services, and implementation of programs play out. Recognizing the importance of leadership at the State level, the Governors have laid out comprehensive and far-reaching strategies to achieve national goals for literacy. The Governors' Task Force on Education argues that the current system to educate, train, and retrain adults and out-of-school youth is ". . . highly fragmented and reaches only 5 percent of the eligible population."[36]

Important lessons can be learned from States that have spearheaded dramatic efforts to improve the quality of programs and services. (Examples include Maryland, Connecticut, and Mississippi.) How well have these efforts succeeded? What happens at the end of the line to the citizens who need help? Who has access to services; who does not? What factors contribute to participation, early dropout, or nonparticipation? What elements make a difference in programs that are voluntary and those that are required? What is known about the costs and the results (outcomes and impacts) of diverse efforts? Is it possible to create a comprehensive system envisioned by the Nation's Governors ". . . that can respond to the needs of adults and employers, provide training, and support lifelong learning?"[37] What are the most appropriate roles for Federal, State, and local government? What are the roles for public, business, volunteer, and other community organizations? What new arrangements are needed and where can technology play a role?

35. A comprehensive survey of Federal programs will be completed by December 1990, by the Cosmos Corp., under contract with the Department of Education. This survey and information being provided to the interagency task force on adult literacy will map a more complete picture of Federal involvement.

36. National Governors' Association, Educating America: State Strategies for Achieving the National Eduation Goals, Report of the Task Force on Education (Washington, DC: 1990).

37. Ibid., p. 12.

CONGRESSIONAL INTEREST

Literacy is not a new issue for Congress. Provisions to raise the literacy of the Nation's children, citizens, and workers can be found in the major education, employment and training, welfare reform, immigration, and early childhood bills. Congressional oversight is likely to focus on progress being made. Pressures to find better ways to address the problems of families, limited English speaking populations, young adults, and workers will grow. New legislation is likely to focus on raising incentives for learners (this approach was taken in welfare reform and is now being considered for those behind bars in our correctional institutions). Congress is also likely to look at ways to increase incentives for providers -- including the States themselves -- as well as public education, community, and business organizations.

Federal expenditures for literacy and related areas are increasing; pressure will build to make sure those resources are used most effectively. Congress will want to know where improvements in current programs can be made, how all community and institutional resources can be multiplied, and where Federal efforts can have the most impact.

CONGRESSIONAL AND OTHER RELATED WORK

Numerous national reports examine literacy and related issues from various perspectives. These reports provide a historical perspective[38] as well as new data on contributing economic and social factors, including children and families in poverty,[39] school dropouts, and youth unemployment.[40] These reports and many others from States, localities, the military, the library

38. David Harman, Illiteracy: A National Dilemma (New York, NY: Cambridge Book Co., 1987). See also Carmen St. John Hunter and David Harman, Adult Illiteracy in the United States: A Report to the Ford Foundation (New York, NY: McGraw Hill, 1979).

39. Business-Higher Education Forum, Three Realities: Minority Life in the United States (Washington, DC: Business-Higher Education Forum, 1990). See also MDC, Inc., America's Shame, America's Hope: Twelve Million Youth at Risk (New York, NY: n.d.); and Rockefeller Foundation, Literacy and the Marketplace: Improving the Literacy of Low-Income Single Mothers (New York, NY: June 1989).

40. William T. Grant Foundation Commission on Work, Family and Citizenship, The Forgotten Half: Pathways to Success for America's Youth and Young Families (Washington, DC: November 1988), final report. See also Andrew Hahn et al., Dropouts in America: Enough is Known for Action

community, and others are invaluable resources. OTA will also be able to take advantage of major studies and analyses under way in the Federal agencies, including the Department of Education (Adult Literacy Initiative) and the Department of Labor (Secretary's Commission on Achieving Necessary Skills -- SCANS), and work across agencies (e.g., the Special Subcommittee on Adult Literacy under the Domestic Policy Council Task Force).

Work completed by CRS, GAO, and CBO will also be utilized. CRS expects to prepare an analysis of Federal programs (funding and services) to follow its recent CRS Issue Brief on literacy.[41] CRS staff have already begun to work informally with OTA to provide useful data. Other relevant work at GAO covers school dropouts, youth employment/basic skills, and programs for at-risk populations.

The literacy assessment will draw extensively on OTA's recent work in educational technology (*Power On! New Tools for Teaching and Learning* and *Linking for Learning: A New Course for Education*), worker training (*Worker Training: Competing in the New International Economy*), and ongoing studies of adolescent health and rural telecommunications. OTA's extensive information about changing demographics, educational requirements, employment practices, and health and community services will add to information available from the research literature.

PROJECT METHODOLOGY AND SCHEDULE

The assessment will begin in October 1990 and the first Advisory Panel Meeting will take place early in 1991. The panel will consist of a distinguished group of practitioners, researchers, government policymakers, industry representatives, and other stakeholders. Members will be selected to represent or have expertise in the following or similar areas:

- **Education and related services** -- teachers and administrators of adult basic education, English as a second language, workplace skills, the military, and community college programs;

(Washington, DC: Institute for Educational Leadership, March 1987).

41 Paul M. Irwin, Adult Literacy Issues, Programs, and Options, CRS issue brief (Washington, DC: The Library of Congress, Congressional Research Service, April 1990)

- **Community-based organizations** -- librarians, literacy volunteers, social workers, developers of family services, directors of non-profit groups, etc.;

- **State/local government** -- a Governor, Mayor, State Commissioner of Education, Director of Correctional Services, Director of Health and Social Services;

- **Business and industry** -- executives involved in training or human resources development, corporate sponsor of literacy activities, representatives of the computer, software, telecommunications industries;

- **University/research community** -- experts in cognitive science, literacy, language, and reading; social and cultural issues;

- **Special population interests** -- groups and organizations serving immigrant and refugee populations, prisoners, the homeless, etc.; and

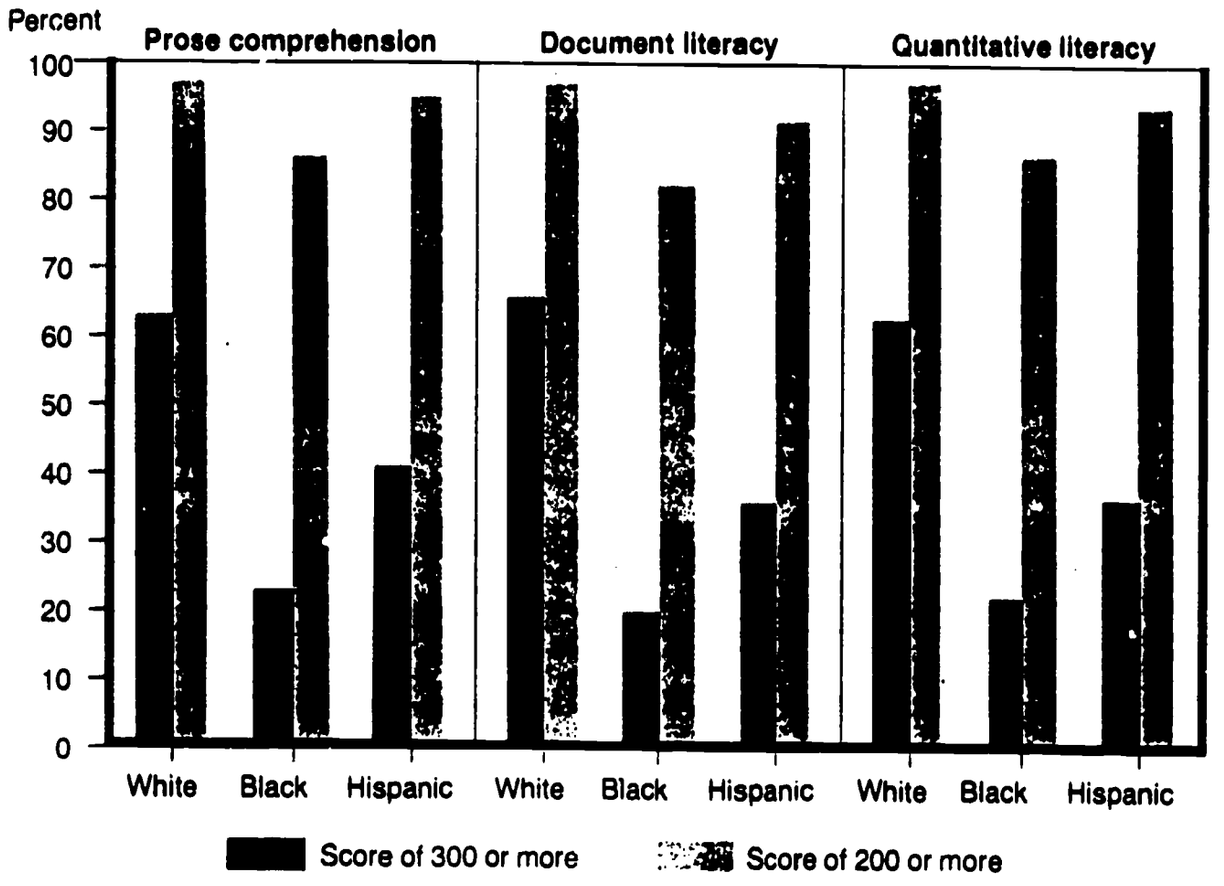
- **Adult learners** -- individuals representing diverse learning needs and approaches to overcoming their literacy problems.

OTA will convene a number of workshops during the study. The workshops will bring together practitioners from the field, cognitive scientists and researchers, technology developers, State agency personnel, and community and business leaders. Workshops will focus on issues such as English as a second language (needs, nature of language learning, technology applications) and family literacy (intergenerational issues, crossing institutional boundaries). One workshop will examine the changing requirements for literacy and higher order thinking.

Case studies and contractor reports will provide background information for the assessment issues described above. The study is projected to take 21 months, for delivery to TAB in June 1992.

Indicator 29. Literacy of Young Adults

Literacy skills of young adults, by race/ethnicity: 1985



SOURCE: U.S. Department of Education, Office of Educational Research and Improvement, contractor report, *Literacy: Profiles of America's Young Adults*, by Irwin S. Kirsch and Ann Jungeblut, Educational Testing Service.

While most young adults adequately perform tasks requiring basic literacy skills (a score of 200 or more), nearly one-half are unable to do well on tasks of even moderate complexity (a score of 300 or more), such as balancing a checkbook or using a map.

NOTE: This figure comes from U.S. Department of Education, Office of Educational Research and Improvement, Youth Indicators 1988: Trends in the Well-Being of American Youth (Washington, DC: U.S. Government Printing Office, August 1988), p. 67.

List of Major Federal Programs Supporting Adult Literacy Efforts
DEPARTMENT OF EDUCATION

Adult Education Basic Grants to states
- Adult basic education
- English as a second language
- Adult special education
- Literacy
- Set aside for Correctional Institutions (10 percent)

Adult Education for the Homeless
- Literacy training and basic skills remediation for homeless adults

Workplace Literacy Partnerships
- Exemplary partnerships to provide training for workers in basic literacy or English language skills

English Literacy Grants
- Programs for individuals of limited english proficiency, includes support services for child care and transportation

National Demonstration Programs
- Special demonstration projects, research and evaluation in adult ed and literacy

Even Start
- Early childhood education and adult education in unified family centered education programs

Migrant Education (under Even Start)
- Special setaside for family-centered programs involving children and their parents

Educational Services for Indian Adults
- Grants for basic literacy, completion of secondary education, and skills necessary to benefit from vocational training

Family English Literacy Program
- Interganerational literacy activities for limited English proficent families

Student Literacy Corps
- Undergraduates service as volunteer literacy tutors in public adult literacy programs

Library Literacy Program
- State library coordination and training for local programs
- Funding for local programs for training, materials, promotion

Other activities:
- National Adult Literacy Survey
- ERIC clearinghouse on Adult, Career and Vocational Education
- Center on Adult Literacy and Educational Quality of the Workforce
- National clearinghouse on literacy and limited English proficiency

FUNDING LEVELS:

FY-89 Appropriation	$195.3 million
FY-90 Appropriation	$237.3 million
FY-91 Request	$314.4 million

Source: Based on "Major Federal Programs Supporting Adult Literacy EFforts in the U.S. Department of Education," Working Document, prepared by the Division of Adult Education and Literacy, February 1990.