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ABSTRACT

These two reports contain supporting material intended to accompany the Computer Literacy Acts of 1983 and 1984 (H. R. 3750). This bill was designed to promote the use of computer technologies in elementary and secondary schools by authorizing: (1) grants to local school districts, particularly in poor areas, to purchase computer hardware; (2) teacher training institutes to improve the technological skills of individuals who are engaged in or preparing to engage in teaching; and (3) a grants program for the evaluation and dissemination to schools of information educational computer hardware and software. The report of the Committee on Education and Labor (Part 1) includes the text of the 1984 bill; a summary; its legislative history; need for the legislation; provisions of the bill; cost estimates; and minority views on the Computer Literacy Act of 1984. The report from the Committee on Science and Technology (Part 2) includes the text of the 1983 bill; purpose of the bill; background and need for the legislation; a sectional analysis of the bill as amended; committee views; a legislative history; a budget analysis and projection; and additional minority views on the bill. (JB)

98TH CONGRESS
2d Session

HOUSE OF REPRESENTATIVES

REPT. 98-752
Part 1

COMPUTER LITERACY ACT OF 1984

MAY 15, 1984 —Ordered to be printed

Mr. PERKINS, from the Committee on Education and Labor, submitted the following

REPORT

together with

MINORITY VIEWS

[To accompany H.R. 3750 which on August 3, 1983, was referred jointly to the Committees on Education and Labor and Science and Technology]

[Including cost estimate of the Congressional Budget Office]

The Committee on Education and Labor, to whom was referred the bill (H.R. 3750) to provide assistance to local educational agencies and institutions of higher education to promote computer literacy among elementary and secondary school students and their teachers, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment is as follows:

Strike out all after the enacting clause and insert in lieu thereof the following:

That this Act may be cited as the "Computer Literacy Act of 1984".

TITLE I—ACQUISITION OF COMPUTER HARDWARE

PURPOSES

SEC. 101. It is the purpose of this title to authorize assistance to local educational agencies for the acquisition of computer hardware for use in school classrooms in order to promote student competence in the operation and use of new technologies, and thereby to improve students' academic performance in both technical and other fields.

DEFINITIONS

SEC. 102. For purposes of this title—

(1) the term "Secretary" means the Secretary of Education;

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(2) the term "local educational agency" has the meaning provided in section 198(a)(10) of the Elementary and Secondary Education Act of 1965;

(3) the term "State educational agency" has the meaning provided in section 198(a)(17) of such Act;

(4) the term "average daily attendance" has the meaning provided in section 198(a)(1) of such Act;

(5) the term "computer hardware" means—

(A) a data processor which—

(i) can be programed in at least three standard computer languages;

(ii) has a random access memory capacity of at least sixteen thousand bytes; and

(iii) is or can be connected with a screen for visual display;

(B) in connection with such a data processor (i) a display screen, and (ii) one or more disk or tape drives; and

(C) any equipment necessary for the installation of equipment described in subparagraphs (A) and (B); and

(6) the term "State" means each of the fifty States, the District of Columbia, Puerto Rico, Guam, American Samoa, the Virgin Islands, the Trust Territory of the Pacific Islands, and the Northern Mariana Islands.

ALLOCATION OF FUNDS

SEC. 103. (a)(1) From 5 per centum of the amount appropriated pursuant to section 107 for any fiscal year the Secretary shall allocate to each State educational agency an amount for monitoring and enforcement which bears the same ratio to such 5 per centum as the amount allocated to the local educational agencies in that State under paragraph (2) for such fiscal year bears to the sum of the amount allocated to local educational agencies in all the States under such paragraph for such fiscal year.

(2) From the remainder of the amount appropriated pursuant to section 107 for any fiscal year the Secretary shall allocate to each eligible local educational agency an amount which bears the same ratio to such remainder as the number of children aged five to seventeen, inclusive, in the school district of such local educational agency bears to the sum of such children in the school districts of all local educational agencies.

(b) Notwithstanding subsection (a)(2), the allocation of any local educational agency shall be reduced to the extent that assistance under this title has been or would be in excess of the amount necessary for such agency to acquire one unit of computer hardware for each thirty children in average daily attendance in the schools of such agency.

LOCAL APPLICATION FOR FUNDS

SEC. 104. (a)(1) A local educational agency shall be eligible for an allocation under section 103 if it has on file with the State educational agency a current application, approved by the State educational agency, describing the computer hardware procurement program to be conducted with assistance provided under this title. Such application shall contain—

(A) assurances that the local educational agency will allocate funds among the school within its district so that—

(i) funds are provided first to those schools with the least computer hardware per student;

(ii) funds are not provided to any school after such school has the equivalent of one unit of computer hardware for each thirty children in average daily attendance at such school;

(B) an identification of the computer hardware which are already available in the schools of such agency, a specification of the computer hardware to be acquired with funds provided under this title during the next funding period, and assurances that the acquisition cost of such hardware will be reasonable and in accordance with such guidelines as may be prescribed by the Secretary by regulation; and

(C) describe the programs and procedures which the local educational agency has developed to ensure the participation of parents in the establishment of its computer hardware acquisition program and in the development and implementation of a curriculum for the use of such hardware.

(2) Such an application may be amended at any time to describe changes in or additions to the activities originally set forth in the application.

(b) An application or amendment thereto shall be approved by the State educational agency unless such agency determines that the application does not provide for the use of such funds in a manner which meets the requirements of this title is inconsistent with such requirements as the Secretary may prescribe by regulation. No such determination shall be made except after notice and opportunity for a hearing is given to the applicant.

STATE RESPONSIBILITIES

SEC. 105. (a) Each State which desires to have its local educational agencies qualify for assistance under this title shall have on file with the Secretary an application submitted by its State educational agency. Each such application shall contain (1) satisfactory assurances that the State educational agency will comply with the requirements of this section; and (2) such information as the Secretary considers necessary to determine whether such assurances will be carried out.

(b) A State educational agency shall not finally disapprove, in whole or in part, the application of any local educational agency under section 104 without first affording such agency reasonable notice and opportunity for a hearing.

(c) Each State educational agency shall—

(1) adopt standards, consistent with minimum standards prescribed by the Secretary, for monitoring, with the funds provided under section 103(a)(1), the effectiveness of computer hardware procurement programs assisted under this title;

(2) adopt written procedures for receiving complaints regarding such programs;

(3) establish procedures for notifying the Secretary of any failure by a local educational agency to comply with this title, regulations prescribed thereunder, or any provision in its application; and

(4) make provision for audits of expenditures of funds received under this title to determine, at a minimum, the fiscal integrity of grant and subgrant financial transactions and reports, and compliance with applicable statutes, regulations, and terms and conditions of the grant or subgrant.

(d) Each State educational agency shall submit, at such times and in such detail as the Secretary may require, such reports as may be necessary to enable the Secretary to carry out this title, and shall keep such records and afford such access thereto, as the Secretary may require.

PARTICIPATION OF CHILDREN FROM PRIVATE SCHOOLS

SEC. 106. (a) To the extent consistent with the number of children in the school district of the local educational agency who are enrolled in private elementary and secondary schools, such agency shall, after consultation with appropriate private school representatives, provide for the benefit of such children in such schools secular, neutral, and nonideological materials and equipment. Expenditures pursuant to this subsection for children in private schools shall be equal (taking into account the number of children to be served and the needs of such children) to expenditures for children enrolled in the public schools of such agency. The control of funds provided under this Act and title to such materials and equipment shall be in a public agency, and a public agency shall administer such funds, materials, and equipment.

(b) If by reason of any provision of law a local educational agency is prohibited from providing for the participation of children from private schools as required by subsection (a), or if the Secretary determines that a local educational agency has substantially failed or is unwilling to provide for such participation on an equitable basis, the Secretary shall waive such requirements and shall arrange for the provision of services to such children, which shall be subject to the requirements of this section. Such waivers shall be subject to consultation, withholding, notice, and judicial review in accordance with section 586(e)(2), (f), (g), and (h) of the Education Consolidation and Improvement Act of 1981.

AUTHORIZATION OF APPROPRIATIONS

SEC 107. There are authorized to be appropriated to carry out this title such sums as may be necessary for each of the fiscal years 1985 through 1987.

TITLE II—TEACHER TRAINING INSTITUTES

NATIONAL SCIENCE FOUNDATION PROGRAM

SEC. 201. (a) From the amount appropriated pursuant to section 203 for any fiscal year, the National Science Foundation shall arrange, through grants and contracts

with nonprofit professional scientific or engineering organizations, science museums, regional science education centers, State educational agencies, and institutions of higher education (including community colleges), for the development and operation by such entities of short-term or regular session institutes for advanced study to improve the qualifications of individuals who are engaged in or preparing to engage in the teaching, or supervising or training of teachers, of the operation and use of new technologies.

(b) In making grants and contracts under subsection (a), the National Science Foundation shall give special consideration to institutes training teachers, or supervisors or trainers of teachers, serving or preparing to serve in elementary and secondary schools enrolling substantial numbers of culturally, economically, socially, and educationally handicapped youth or in programs for children of limited English language proficiency.

STIPENDS

SEC. 202. Each individual who attends an institute operated under the provisions of this title shall be eligible (after application therefor) to receive a stipend at the rate of $275 per week for the period of attendance at such institute.

AUTHORIZATION OF APPROPRIATIONS

SEC. 203. There are authorized to be appropriated to carry out this title such sums as may be necessary for each of the fiscal years 1985 through 1987.

TITLE III—INFORMATION DISSEMINATION AND EVALUATION

NATIONAL INSTITUTE OF EDUCATION

SEC. 301. (a) For the purpose of providing advice and technical assistance to State and local educational agencies on the expenditure of funds under title I of this Act and on the acquisition of suitable computer software, the National Institute of Education and the National Science Foundation, in accordance with an interagency agreement between such Institute and such Foundation, shall—

(1) evaluate available computer hardware and software, in terms of its usefulness in the classroom;

(2) disseminate the results of such evaluation; and

(3) develop model computer educational software, and make such model software (and its design premises) available to computer software producers and distributors, teachers, and school administrators.

(b) The Institute and the Foundation shall carry out the functions described in paragraphs (1), (2), and (3) of subsection (a) under grants or contracts made with funds appropriated under subsection (c).

(c) There are authorized to be appropriated to carry out this section such sums as may be necessary for each of the fiscal years 1985 through 1987.

EVALUATION AND DISSEMINATION CENTERS

SEC. 302. (a) The National Science Foundation shall, through grants to or contracts with nonprofit professional scientific or engineering organizations, science museums, regional science education centers, public television, State educational agencies, and institutions of higher education (including community colleges), conduct, assist, and foster research and experimentation on, and dissemination of, models of instruction in the operation and use of computers. In selecting such entities for such grants or contracts, the Foundation shall give priority to those proposals—

(1) prepared with the active and broad community involvement of such groups as parents, teachers, school boards and administrators, and local business;

(2) which propose the establishment of model training programs for adults;

(3) which would, to the extent practicable, take advantage of state-of-the-art development in computer and software design;

(4) which would—

(A) identify and develop model computer educational software and model curriculum materials providing instruction in the use of computers; and

(B) make such software and materials available to computer software producers and distributors, teachers, school administrators, to the extent that such activities supplement the activities funded under section 301(a);

(5) which would develop teacher training materials (including, but not limited to, computer programs, films, slides, pamphlets, audio and video cassettes, and demonstration computer programs) which—

(A) instruct educators about personal computers, computer programing, and the development of educational software, facilitate greater understanding of computers, and assist educators in making determinations regarding the allocation of financial and personnel resources for education involving computers; and

(B) provide special assistance to educators to assure that they are prepared to serve all segments of the population, including minorities, handicapped, limited English proficient, economicaliy disadvantaged individuals, and women;

(6) would conduct programs demonstrating the various educational uses of computers including, but not limited to—

(A) model programs using as many as one computer for every four students in a classroom;

(B) the establishment of a laboratory using computers to simulate live experiments;

(C) the establishment of a computer library that permits students to borrow personal computers for use outside the classroom; and

(D) a laboratory to exhibit examples of personal computer systems and educational software materials to enable educators to examine the operation of such systems and materials;

(7) which would monitor developments in computer technology, including (but not limited to) microcomputers, video disc systems, and intercommunication among users of personal computers, and disseminate to educators information regarding such developments and their possible application in education;

(8) which would establish a mechanism to inform the computer industry of the computer needs of the Nation's educational system and to receive from the computer industry information regarding recent developments in the field;

(9) which would undertake any studies requested by Congress or Federal agencies relating to the educational uses of computer technology, and assist in identifying areas in which Federal funding might accelerate the educational impact of emerging computer technologies;

(10) which would assist interested local libraries, to the extent practicable, in establishing programs to provide personal computers and video disc systems to the public; or

(11) which utilize, to the extent practicable, existing Federal computer communications and education networks (such as National Institute of Education regional laboratories).

(b) Funds available under a grant or contract pursuant to this section may be used for the acquisition of computer hardware and software.

(c) The Director of the National Science Foundation shall report to the Congress annually on the results of research and experimentation performed with funds made available under this section. The Director, in conjunction with the National Institute of Education, shall take such steps as may be necessary to disseminate information concerning such results to local educational agencies.

(d) There are authorized to be appropriated to carry out this section such sums as may be necessary for each of the fiscal years 1985 through 1987. The authority to enter into contracts under this section shall be subject to the availability of appropriations therefor.

SUMMARY

H.R. 3750 offers a comprehensive approach to the issue of computer literacy for our nation's elementary and secondary school students and teachers. The bill responds to the need for computer hardware in schools throughout the country, particularly in poor areas, by authorizing grants to local school districts to purchase computers. These grants would be distributed evenly throughout the school districts of the country so that every student will have access to this equipment, with priority going to the schools with the greatest need. Funds would not be provided to any school that has reached a ratio of one computer per thirty students, and parents would have to participate in the establishment of the computer hardware acquisition program.

The legislation also addresses the problem of education personnel unfamiliar with educational technology by authorizing teacher training institutes to instruct teachers in the use of computers. The National Science Foundation would administer these programs, to be offered by nonprofit professional organizations, science museums and centers, State educational agencies, and institutions of higher education.

A third title of the bill encourages the National Institute of Education and the National Science Foundation to evaluate existing computer hardware and software and disseminate information about these evaluations. In addition, the National Science Foundation would fund other evaluation and dissemination centers around the country, to conduct research on and disseminate information about models of instruction in the operation and use of computers. This latter provision incorporates many of the provisions of another bill considered by the Committee, H.R. 1134, a bill creating National Centers for Personal Computers in Education sponsored by Congressman Downey.

The bill authorizes such sums as may be necessary for each of the titles of the bill for each of the fiscal years 1985, 1986, and 1987.

LEGISLATIVE HISTORY

H.R. 3750 was introduced by Congressman Wirth and several other cosponsors on August 3, 1983. The bill was jointly referred to the Committee on Education and Labor and the Committee on Science and Technology. The Subcommittee on Elementary, Secondary, and Vocational Education conducted a hearing on this bill and related bills, H.R. 1134 and H.R. 4628, on May 1, 1984. The Subcommittee met in a markup session on May 3, 1984, and ordered the bill reported, amended, to the full Committee. After discharging from further consideration the Subcommittees on Postsecondary Education and Select Education, the full Committee on Education and Labor met and ordered the bill reported with amendment on May 8, by a vote of 21–2.

The Subcommittee had earlier conducted a hearing on H.R. 1132, Congressman Downey's bill to create national centers for personal computers in education, on April 21, 1983. The major provisions of this bill were incorporated into Title III of the Wirth bill in the full Committee markup.

In addition, the Subcommittee held an oversight hearing on educational technology on September 14, 1982, the findings of which aided the Committee in its consideration of H.R. 3750. The Committee also benefitted from the testimony received by the Subcommittee on Investigations and Oversight under the Science and Technology Committee during hearings held on September 28 and 29, 1983.

NEED FOR THE LEGISLATION

The Education and Labor Committee is in agreement with the conclusion reached by the National Science Board Commission on Precollege Education in Mathematics, Science and Technology that:

> Modern information technologies offer a tremendous potential for improving education and could revolutionize the education process.—Educating Americans for the 21st Century, 1983, p. 51.

This is particularly the case with the new microcomputers. Not only can microcomputers improve the way we educate our students, but exposure to the technology and acquisition of the skill to use it carry a promise of future career opportunities for many students.

The legislation being reported by the Committee, H.R. 3750, the Computer Literacy Act of 1984, introduced by Representative Timothy Wirth, will greatly facilitate the entry or quality computer hardware and software into our Nation's classrooms, at the same time ensuring that this technology will find a place in the elementary and secondary education curriculum, and not be under-utilized.

The need for this legislation is four-fold. First, although it appears that microcomputers are entering schools at a breakneck speed, far fewer units are available today than are needed to provide each student with the educational benefits possible with this technology. Indeed, serious inequities in terms of access to the technology have developed. Second, local school officials have a major need for assistance in planning how to secure, evaluate and use computer hardware and software. Third, the successful use of the microcomputer in schools will depend upon a key factor—the classroom teacher. Teacher training in the application of the new technology is a crucial need. Finally, it is clear that the microcomputer hardware holds a hollow promise of educational improvement if we do not have the high quality educational software to run the machinery.

H.R. 3750 will greatly assist the Nation's schools in meeting each of these needs. Another bill, H.R. 4628, the National Educational Software Act of 1984, being reported separately by the Committee, addresses a critical aspect of the educational software problem—the need for venture capital.

1. Distribution and access

According to the Department of Education's National Center for Education Statistics, in the fall of 1980, there were 31,000 microcomputers available for instructional uses in public elementary and secondary schools. By the spring of 1982, the National Center found that this number had tripled to 96,000 microcomputers. More recent data for the fall of 1983 compiled by Market Data Retrieval, Inc., a Connecticut-based research firm, show nearly 325,000 microcomputers now in use in public elementary and secondary schools.

Although these numbers depict significant growth in the number of microcomputers in schools, it is important that we place them in their proper context, as did our colleague Congressman Timothy Wirth in his testimony before the Subcommittee on Elementary, Secondary and Vocational Education. The 325,000 microcomputers now identified as being in schools are serving nearly 40 million students. That translates to a ratio of over 120 students per microcomputer unit. Clearly, to ensure that all students have access to the

new technology for an appropriate amount of time, a much lower ratio must be achieved across the country.

It might be noted that at this juncture that, although most of the data available on microcomputers addresses the situation in public schools, the Committee makes the benefits of this reported legislation available to students in both public and private elementary and secondary schools.

One of the most troubling aspects of the entrance of microcomputers into our scholls is that its occurrence is often a function of the income of the families whose children attend those schools. The poorer a school's student body, the less likely that school is to have any of the new technology. If it does have computers, it is likely to have fewer. A recent survey by Johns Hopkins University's Center for Social Organization of Schools found that, while 57% of high-income elementary schools have microcomputers, only 31% of the poorer elementary schools have the equipment. Among secondary schools, 86% of the wealthier schools have computers, compared with only 63% of the poorer schools. The fall 1983 survey conducted by Market Data Retrieval, cited earlier, indicated that the ratio of wealthy students per computer was roughly 97 students. In contrast, the ratio of poor students per computer was approximately 183. Even more striking evidence of the disparity in the availability of microcomputers is provided by a recent study of computers in the urban school districts comprising the Council of the Great City Schools. Although, as stated earlier, there are slightly more than 120 students per microcomputer in the United States, the ratios in urban school districts, such as those in the Council of Great City Schools, may be dramatically worse. It is in these schools where many of our minority and disadvantaged school children are enrolled. Reportedly, in 17 of the Council's districts, the ratio of elementary school students per microcomputer was 300 or more to 1: in 9 of these districts, the ratio at the secondary level was 175 or more to 1.

H.R. 3750 would respond to the microcomputer hardware needs of our schools by providing Federal funding directly to school districts for computer hardware purchases. The critical decisions about the kinds and amounts of hardware would remain at the local level where it belongs. The legislation addresses the inequities of computer access by precluding any financial assistance to a school district beyond that necessary to bring the ratio of students to computers in all of its schools down to 30 students per computer unit.

2. Planning

Planning for the uses of educational technology in our schools and the selection of computer hardware and software are crucial aspects of the technology revolution in education. The legislation being reported by the Committee will assist schools in this endeavor. As former U.S. Commissioner of Education Ernest L. Boyer observed in High School, the recent study from the Carnegie Foundation for the Advancement of Teaching:

> Here is the essential point. The deliberate absence of a computer policy [in schools] is itself a policy with major

> risks. We conclude that no school should buy computers, or any other expensive piece of hardware, until key questions have been asked—and answered. Why is this purchase being made? Is the software as good as the equipment? What educational objectives will be served? Which students will use the new equipment, when and why? Are teachers able to fit the technology and the software into the curriculum?

In testimony before the Subcommittee on Elementary, Secondary and Vocational Education, Judy Anderson, a computer specialist at the East Consolidated Elementary School in St. Paul, Minnesota, listed as the first priority for schools the clarification of the education uses of the computer. Ms. Anderson stated that dissemination of information is an integral part of this planning effort.

Our colleague, Representative Thomas Downey testified on April 21, 1983, before the Subcommittee on Elementary, Secondary and Vocational Education on behalf of his bill, H.R. 1134, to establish National Centers for Personal Computers in Education. Representative Downey stressed the key role to be played by information dissemination in the successful integration of the microcomputer into our schools. He observed:

> Unsound decisions in implementing technology and selecting curriculum packages could be extremely costly to schools. Money has already been wasted, and potential benefits could be lost. Further, exaggerated expectations or a bad initial experience could lead to disillusionment with educational technology and to significant delays in its appropriate implementation.

H.R. 3750 draws school districts into a planning process through its requirement that districts in their applications for funds specify what hardware they already have and what hardware will be purchased, and describe how the districts will secure parental participation in its hardware acquisition program and in the development of a curriculum for the new technology. Other activities related to the planning and information needs of schools that this legislation supports include the evaluation of computer hardware and software, the dissemination of such evaluations, the development of model curricular materials for the educational use of computers, and the demonstration of the educational uses of computers.

3. Teacher training

There can be no underestimating the fundamental role to be played by teacher training in securing the benefits of the technology revolution for our schools. In testimony before the Subcommittee on Elementary, Secondary and Vocational Education, Representative Wirth stressed the importance of teacher training:

> As we learned in the 1960's, there is potential for great waste by merely placing new equipment in schools without adequately training teachers how to use the equipment.

Data from the Johns Hopkins survey on school uses of microcomputers found that in half of the microcomputer-owning secondary schools, only one or two teachers "regularly" use the hardware

with students. Indeed, only one out of every seven students in schools with microcomputers uses the technology during any particular week of the school year. These data should be considered in light of the finding from a survey of teachers by the National Education Association that 58 percent of the respondents were "not well informed" about how to operate a computer. Fewer than 15 percent reported that they were "fairly well informed" or "very well informed" on how to operate hardware. Without enhancing teachers' abilities to use the new technology, Congressman Wirth's fears may be realized.

This legislation constitutes a major step in guaranteeing that the microcomputer will be integrated into the educational curriculum. The bill authorizes funding of teacher training institutes to improve teachers' ability to use the new technology. In addition, the bill supports research and development projects that would develop teacher training materials.

4. Software

Finally, the Committee believes that, without high quality educational software, microcomputers will probably stand idle in countless classrooms. The dimensions of the education software problem have been made clear by the record of the two days of hearings on computers and education held by Representative Albert Gore's Subcommittee on Investigations and Oversight of the Committee on Science and Technology.

Secretary of Education Terrel H. Bell testified during those hearings that, although there was an impressive amount of educational software currently available, most was currently inadequate to the task of educating our young people. The Secretary reported that serious gaps occur in many key areas of the curriculum—elementary school science, secondary school mathematics such as algebra, and in the foreign languages. Much of the software now available, according to the Secretary, is "low-level drill-and-practice programs."

H.R. 3750 responds to many of the software needs of elementary and secondary education. Funds would be provided for computer software evaluation and the development and dissemination of model educational software. The committee is reporting separately H.R. 4628, the National Educational Software Act of 1984, a bill that will address the critical venture capital needs of the software development market.

PROVISIONS OF THE BILL

The Committee is reporting H.R. 3750, the Computer Literacy Act of 1984, which, as reported, contains substantial portions of H.R. 1134, a bill to establish National Centers for Personal Computers in Education. Those provisions were added to H.R. 3750 during deliberations by the Committee.

As the preceding section on the need for this legislation delineates, there are four critical areas of need we seek to address in order to bring the benefits of the microcomputer to bear on education—adequate distribution and equal access to the technology, planning and informational needs of local school districts, teacher

training, and quality software development. The legislation reported by the Committee addresses each of those areas.

Title I of H.R. 3750 authorizes appropriations to be allocated directly to local educational agencies for the purchase of computer hardware to increase students' competence in the applications of the new technology and, thus, to improve their academic performance.

Of critical importance, the legislation defines "computer hardware" to mean a data processor that can be programmed in at least three standard computer languages, has a random access memory of at least 16,000 bytes (16 K), and is or can be connected to a display screeen. In addition to the data processor, "computer hardware" must include a display screen, one or more disk or tape drives, and any equipment necessary for installation of the processor, screen and drives. This definition is meant to provide flexibility to local education agencies in deciding what computer hardware to purchase, keeping in mind that one of the intentions of the legislation is to assure equal access by all students to this technology. Furthermore, as specified in the bill, the cost of such computer hardware equipment must be reasonable.

Title I authorizes such sums as may be necessary for fiscal years 1985 through 1987. Five percent of the amounts appropriated in each year is to be allocated to each State educational agency for monitoring and enforcement of the provisions of the title. The remainder of each year's appropriation is to be allocated among eligible local educational agencies according to each agency's share of the sum of children aged five to seventeen in all such agencies. Any agency's allocation is to be reduced to the extent that such sum exceeds the amount necessary for that agency to have one microcomputer unit per 30 children in average daily attendance.

A local educational agency is eligible only if it has an application on file with its State educational agency describing the hardware procurement program to be conducted and assuring that the agency will provide funds first to those schools with the fewest computer units per student and that no school will receive funds after it achieves a ratio of one unit per 30 students. In addition, the application must identify the computer hardware already available in the agency's schools, specify what hardware will be secured with funds made available under this legislation, assure that the costs of that hardware will be reasonable and adhere to such guidelines that may be prescribed by the Secretary of Education, and describe the means the agency has developed for securing parental participation in the creation of its hardware acquisition program and its curriculum for the use of such computer hardware.

For its local educational agencies to be eligible for funding, a State educational agency must file with the Secretary of Education an application assuring that the State agency will adopt standards for monitoring the effectiveness of the hardware acquisition programs funded by the legislation, has written procedures for receiving complaints, has established procedures for notifying the Secretary of Education if any local agency fails to comply with this title, and provides for audits of expenditures under this title.

Title I specifies that local educational agencies are to provide, for the benefit of students in private schools, secular, neutral, and non-

ideological materials and equipment from the funds allocated under this title. Expenditures for the benefit of private school children are to be equal (taking into account the number and needs of such children) to those benefitting public school children. A by-pass to be used by the Secretary of Education is provided when, by law, a local educational agency is prevented from serving private school students, or has substantially failed to, or is unwilling to, provide for the equitable participation of such children.

Title II of H.R. 3750 authorized funding for teacher training institutes to be arranged by the National Science Foundation. Among the entities eligible for grants or contracts from the National Science Foundation to conduct these institutes are nonprofit professional scientific or engineering organizations, science museums, regional science education centers, State educational agencies, and institutions of higher education. Such institutes, which may be short-term or regular session programs, are to provide advanced study to improve the qualifications of persons presently teaching, preparing to teach, or supervising or training teachers, in the use of new technologies. Special consideration is to be given by the National Science Foundation to institutes for individuals serving or preparing to serve in elementary and secondary schools enrolling substantial numbers of disadvantaged children or in programs for children with limited English proficiency. Attendees at such institutes are eligible for a stipend of $275 per week of attendance. Such sums as may be necessary are authorized to be appropriated for fiscal years 1985 through 1987.

Title III of the bill provides for dissemination of information on, and evaluations of, computer hardware and software. Such information and evaluations are to be provided to State and local educational agencies. Pursuant to an interagency agreement, the National Institute of Education and the National Science Foundation, through grants and contracts, are to evaluate computer hardware and software, disseminate such evaluations, develop model education software and make such model software available to software producers and distributors, teachers and school administrators.

In addition, the title provides that the National Science Foundation, through grants and contracts with nonprofit professional scientific or engineering organization, science museums, regional science education centers, public television, State educational agencies and institutions of higher education, is to support research and experimentation on models of computer instruction, as well as the dissemination of such models. The National Science Foundation is to give priority to proposals which have been prepared with active and broad community involvement; which propose to establish model training programs for adults; which take advantage of state-of-the-art development of computer and software design; which identify, develop and disseminate model educational software and model curricular materials in computer use; which develop teacher training materials and provide special assistance to assure that educators are prepared to serve all students, including minorities, the handicapped, limited English proficient students, economically disadvantaged students, and women; which conduct programs demonstrating the educational uses of computers; which monitor developments in computer technology and disseminate information

about such developments; which establish a mechanism to provide the computer industry with information on the educational system's computer needs and receive information from that industry regarding recent developments; which perform studies required by Congress or Federal agencies on eductional uses of computer technology; which assist local libraries in establishing programs to provide personal computers and video disc systems to the public; or which use existing Federal computer communications and education networks, such as the National Institute of Education's regional laboratories.

It is the Committee's intention that funds allocated under section 302(a)(5)(b) be used to develop teacher training materials promoting the goal of equal access for all children to computer instruction and use. These materials should address any special difficulties or differences in computer learning and usage patterns encountered by the various segments of the student population described in the subsection. Such materials should also assist educators in the selection of software and other materials demonstrated to be effective in teaching all segments of the student population. The Director of the National Science Foundation is to report annually to the Congress on the results of the research and experimentation supported with these funds.

Title III authorizes such sums as may be necessary for fiscal years 1985 through 1987.

OVERSIGHT

No findings or recommendations concerning oversight of the programs authorized by this bill have been received by the Committee from the Committee on Government Operations. The Committee has noted earlier that it drew on its own Subcommittee oversight hearing and on the hearings held by the Science and Technology Subcommittee on Investigations and Oversight.

COST ESTIMATES

The Congressional Budget Office has provided the following estimates of the cost which will be involved in implementing this legislation. The Committee concurs in these estimates and adopts them in compliance with clause 7 of rule XIII. No cost estimates have been received from any other Federal department or agency. The Congressional Budget Office letter follows:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, D.C., May 14, 1984.

Hon. CARL D. PERKINS,
Chairman, Committee on Education and Labor,
House of Representative, Washington, D.C.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for H.R. 3750, the Computer Literacy Act of 1984, as ordered reported by the House Committee on Education and Labor, May 8, 1984.

If your wish further details on this estimate, we will be pleased to provide them.

Sincerely,

ERIC HANUSHEK
(For Rudolph G. Penner).

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE—MAY 14, 1984

1. Bill number: H.R. 3750.
2. Bill title: Computer Literacy Act of 1984.
3. Bill status: As ordered reported by the House Committee on Education and Labor on May 8, 1984.
4. Bill purpose: The purpose of this bill is to establish a program to assist schools in acquiring computer hardware and a program to train teachers in the operations and use of new technologies. This bill is subject to subsequent appropriations action.
5. Estimated cost to the Federal Government:

[By fiscal year, in millions of dollars]

	1985	1986	1987	1988	1989
Computer acquisition.					
Estimated authorization levels	675	675	675		
Estimated outlays	338	675	675	337	
Teacher training·					
Estimated authorization levels	40	40	40		
Estimated outlays	20	40	40	20	
Information dissemination and evaluation.					
Estimated authorization level	2	2	3		
Estimated outlays	2	2	3		
Total					
Estimated authorization levels	717	717	718		
Estimated outlays	360	717	718	357	

The costs of this bill would fall within budget function 500.

Basis of estimate

H.R. 3750 authorizes the acquisition of one computer per every 30 students in attendance in public schools. The estimated authorization levels for equipment acquisition assumes that 1.3 million computers for the estimated 39 million elementary and secondary education students are purchased over a three-year period. The average cost per computer is $1,500. The estimate includes an additional 5 percent for state monitoring and enforcement as provided for in the bill.

The estimated authorization levels for teacher training assume 10 percent of the 2.2 million teachers over the three-year period attend a two week institute at the stated amount of $275 per week.

The estimated authorization levels for information dissemination and evaluation reflect current requests for similar evaluation activities in the Department of Education.

Estimated outlays assume full appropriation of authorized levels. The funds are projected to spend over a two year period.

6. Estimated cost to State and local governments: The bill does not require any state or local matching funds.

7. Estimate comparison: None.
8. Previous CBO estimate: None.
9. Estimate prepared by Deborah Kalcevic and Daniel Koretz.
10. Estimate approved by C.G. Nuckols for James L. Blum, Assistant Director for Budget Analysis.

INFLATIONARY IMPACT

The Committee estimates that there will not be a significant inflationary impact resulting from this legislation, particularly since the open-ended authorization allows the Congress to adjust appropriations to meet current needs and take into account economic conditions.

SECTION-BY-SECTION ANALYSIS OF H.R. 3750, COMPUTER LITERACY ACT OF 1984

Title I—Acquisition of Computer Hardware

Section 1.—States the short title, "Computer Literacy Act of 1984.

Section 101.—Expresses the purpose of this title, to assist local educational agencies in acquiring computer hardware to use in the classroom.

Section 102.—Contains the definitions of terms used in the bill.

Section 103.—Spells out the formula for allocating funds to local educational agencies on the basis of the number of children aged 5 through 17. Reserves 5% of the appropriation for State monitoring and enforcement.

Section 104.—Requires local educational agencies desiring funds to submit to the State an application assuring how funds will be allocated to schools within the school district, describing how parents will be involved, and specifying the hardware to be purchased.

Section 105.—Delineates State responsibilities, including submission of an application to the Secretary of Education; establishing procedures for auditing, complaint resolution, and monitoring program effectiveness; reporting; and recordkeeping.

Section 106.—Requires local school districts to make the programs under this Act available to children in private schools.

Section 107.—Authorizes such sums as may be necessary for each of the fiscal years 1985 through 1987 for this title.

Title II—Teacher Training Institutes

Section 201.—Authorizes the National Science Foundation to make grants and contracts with nonprofit science and engineering organizations, museums, centers, State educational agencies, and institutions of higher education to develop and operate short-term institutes to train teachers in new technologies.

Section 202.—Allow individuals engaged in training to receive stipends.

Section 203.—Authorizes such sums as may be necessary for each of the fiscal years 1985 through 1987 for Title II.

Title III—Information Dissemination and Evaluation

Section 301.—Directs the National Science Foundation and the National Institute of Education to establish and interagency program for evaluating computer hardware and software for the classroom, disseminating information about these evaluations, and developing model educational software. Authorizes such sums as may be necessary for each of the fiscal years 1985 through 1987 for this purpose.

Section 302.—Authorizes the National Science Foundation to make grants and contracts with State educational agencies, higher education institutions, and nonprofit scientific organizations to conduct resarch on and dissemination of instructional models on the use of computers. Specifies the type of proposals which will receive priroity for these centers. Authorizes such sums as may be necessary for fiscal years 1985 through 1987 for this purpose.

CHANGES IN EXISTING LAW MADE BY THE BILL AS REPORTED

The bill creates a new program and makes no changes in existing law.

MINORITY VIEWS ON H.R. 3750, THE COMPUTER LITERACY ACT OF 1984

Although this legislation was improived in Committee and despite the general appeal of legislation of this nature, we question the wisdon of H.R. 3750. At the verey least, there are several concerns which should be addressed by the Congress.

The major thrust of this bill is the purchase of computer hardware for use by students in schools and for the training of teachers in this area. While the goals are laudable, we fear that this bill merely duplicates existing law in the case of hardware and duplicates legislation which has passed the House and is pending in the Senate in the case of teacher training.

Funds from Chapter 2 of the Education Consolidation and Improvement Act, the education block grant, have been used largely for the purchase of computer equipment according to a recent study by the American Association of School Administrators. However, few districts appear to have used block grants to train teachers to use the equipment. Recognizing this shortcoming, Congress authorized funds for both in-service training and intensive summer institute programs for such training when it passed the bill H.R. 1310 (the Emergency Mathematics and Science Education Act). It is apparent that the current bill duplicates both the hardware and training provisions of legislation which has previously been reported out of this Committee. Consequently, H.R. 3750, the Computer Literacy Act of 1984, while laudable on its face, is an unnecessary piece of legislation. This is especially true in light of the severe budgetary problems which this Congress faces. We urge the supporters of this legislation to keep this in mind when we attempt to perfect this bill on the Floor of the House of Representatives with amendments that would ensure that any funding under this bill would be used to supplement existing programs rather than duplicate them. Of course, all of this would assume that Congress, in its wisdom, believe we can affored to authorize a piece of legislation that is of questionable necessity in light of existing programs.

JOHN N. ERLENBORN.
BILL GOODLING.
TOM COLEMAN.
STEVE GUNDERSON.
STEVE BARTLETT.
RON PACKARD.
HOWARD C. NIELSON.
ROD CHANDLER.
TOM TAUKE.
JOHN MCCAIN.

98TH CONGRESS
2d Session
HOUSE OF REPRESENTATIVES
REPT. 98-752
Part 2

COMPUTER LITERACY ACT OF 1983

AUGUST 15, 1984.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. FUQUA, from the Committee on Science and Technology, submitted the following

REPORT

together with

ADDITIONAL VIEWS

[To accompany H.R. 3750 which on August 3, 1983, was referred jointly to the Committee on Education and Labor and the Committee on Science and Technology]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 3750) to provide assistance to local educational agencies and institutions of higher education to promote computer literacy among elementary and secondary school students and their teachers, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment strikes out all after the enacting clause of the bill and inserts a new text which appears in boldface roman type in the reported bill.

That this Act may be cited as the "Computer Literacy Act of 1983".

TITLE I—ACQUISITION OF COMPUTER HARDWARE

PURPOSES

SEC. 101. It is the purpose of this title to authorize assistance to local educational agencies for the acquisition of computer hardware for use in school classrooms in order to promote student competence in the operation and use of new technologies, and thereby to improve students' academic performance in both technical and other fields.

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DEFINITIONS

SEC. 102. For purposes of this title—

(1) the term "Secretary" means the Secretary of Education;

(2) the term "local educational agency" has the meaning provided in section 198(a)(10) of the Elementary and Secondary Education Act of 1965;

(3) the term "State educational agency" has the meaning provided in section 198(a)(17) of such Act;

(4) the term "average daily attendance" has the meaning provided in section 198(a)(1) of such Act;

(5)(A) the term "computer hardware" means—

(i) a data processor which (I) has a random access memory capacity of at least 64,000 bytes, and (II) is or can be connected with one or more devices for interaction with users and for visual display;

(ii) in connection with such a data processor (I) one or more such devices, and (II) one or more mass storage devices; and

(iii) any equipment necessary (I) for the installation of equipment described in clauses (i) and (ii), or (II) for interconnection with communication networks; and

(B) the number of "units" of computer hardware is determined by the number of individuals who can concurrently use the data processor through separate interactive devices; and

(6) the term "State" means each of the fifty States, the District of Columbia, Puerto Rico, Guam, American Samoa, the Virgin Islands, the Trust Territory of the Pacific Islands, and the Northern Mariana Islands.

ALLOCATION OF FUNDS

SEC. 103. (a)(1) From 5 per centum of the amount appropriated pursuant to section 107 for any fiscal year the Secretary shall allocate to each State educational agency an amount for monitoring and enforcement which bears the same ratio to such 5 per centum as the amount allocated to the local educational agencies in that State under paragraph (2) for such fiscal year bears to the sum of the amount allocated to local educational agencies in all the States under such paragraph for such fiscal year.

(2) From the remainder of the amount appropriated pursuant to section 107 for any fiscal year the Secretary shall allocate to each eligible local educational agency an amount which bears the same ratio to such remainder as the number of children aged five to seventeen, inclusive in the school district of such local educational agency bears to the sum of such children in the school districts of all local educational agencies.

(b) Notwithstanding subsection (a)(2), the allocation of any local educational agency shall be reduced to the extent that assistance under this title has been or would be in excess of the amount necessary for such agency to acquire one unit of computer hardware for each thirty children in average daily attendance in the schools of such agency.

LOCAL APPLICATION FOR FUNDS

SEC. 104. (a)(1) A local educational agency shall be eligible for an allocation under section 103 if it has on file with the State educational agency a current application, approved by the State educational agency, describing the computer hardware procurement program to be conducted with assistance provided under this title. Such application shall contain—

(A) assurances that the local educational agency will allocate funds among the schools within its district so that—

(i) funds are provided first to the schools with the least computer hardware units per student;

(ii) funds are not provided to any school after such school has the equivalent of one unit of computer hardware for each thirty children in average daily attendance at such school;

(B) an identification of the computer hardware which are already available in the schools of such agency, a specification of the computer hardware to be acquired with funds provided under this title during the next funding period, and assurances that the acquisition cost of such hardware will be reasonable and in accordance with such guidelines as may be prescribed by the Secretary by regulation; and

(C) describe the programs and procedures which the local educational agency has developed to ensure the participation of parents in the establishment of its

computer hardware acquisition program and in the development and implementation of a curriculum for the use of such hardware.

(2) Such an application may be amended at any time to describe changes in or additions to the activities originally set forth in the application.

(b) An application or amendment thereto shall be approved by the State educational agency unless such agency determines that the application does not provide for the use of such funds in a manner which meets the requirements of this title or is inconsistent with such requirements as the Secretary may prescribe by regulation. No such determination shall be made except after notice and opportunity for a hearing is given to the applicant.

STATE RESPONSIBILITIES

SEC. 105. (a) Each State which desires to have its local educational agencies qualify for assistance under this title shall have on file with the Secretary an application submitted by its State educational agency. Each such application shall contain (1) satisfactory assurances that the State educational agency will comply with the requirements of this section; and (2) such information as the Secretary considers necessary to determine whether such assurances will be carried out.

(b) A State educational agency shall not finally disapprove, in whole or in part, the application of any local educational agency under section 104 without first affording such agency reasonable notice and opportunity for a hearing.

(c) Each State educational agency shall—

(1) adopt standards, consistent with minimum standards prescribed by the Secretary, for monitoring, with the funds provided under section 103(a)(1), the effectiveness of computer hardware procurement programs assisted under this title;

(2) adopt written procedures for receiving complaints regarding such programs;

(3) establish procedures for notifying the Secretary of any failure by a local educational agency to comply with this title, regulations prescribed thereunder, or any provision in its application; and

(4) make provision for audits of expenditures of funds received under this title to determine, at a minimum, the fiscal integrity of grant and subgrant financial transactions and reports, and compliance with applicable statutes, regulations, and terms and conditions of the grant or subgrant.

(d) Each State educational agency shall submit, at such times and in such detail as the Secretary may require, such reports as may be necessary to enable the Secretary to carry out this title, and shall keep such records and afford such access thereto, as the Secretary may require.

PARTICIPATION OF CHILDREN FROM PRIVATE SCHOOLS

SEC. 106. (a) To the extent consistent with the number of children in the school district of the local educational agency who are enrolled in private elementary and secondary schools, such agency shall, after consultation with appropriate private school representatives, provide for the benefit of such children in such schools secular, neutral, and nonideological materials and equipment. Expenditures pursuant to this subsection for children in private schools shall be equal (taking into account the number of children to be served and the needs of such children) to expenditures for children enrolled in the public schools of such agency. The control of funds provided under this Act and title to such materials and equipment shall be in a public agency, and a public agency shall administer such funds, materials and equipment.

(b) If by reason of any provision of law a local educational agency is prohibited from providing for the participation of children from private schools as required by subsection (a), or if the Secretary determines that a local educational agency has substantially failed or is unwilling to provide for such participation on an equitable basis, the Secretary shall waive such requirements and shall arrange for the provision of services to such children, which shall be subject to the requirements of this section. Such waivers shall be subject to consultation, withholding, notice, and judicial review in accordance with section 586(e)(2), (f), (g), and (h) of the Education Consolidation and Improvement Act of 1981.

AUTHORIZATION OF APPROPRIATIONS

SEC. 107. There are authorized to be appropriated to carry out this title such sums as may be necessary for each of the fiscal years 1985 through 1987.

TITLE II—TEACHER TRAINING INSTITUTES

NATIONAL SCIENCE FOUNDATION PROGRAM

SEC. 201. (a) From the amount appropriated pursuant to section 203 for any fiscal year, the National Science Foundation shall, with the cooperation of those Federal agencies engaged in similar activities, such as the Department of Defense, Department of Education, and any other appropriate agency, arrange, through grants to or contracts with professional educational, scientific, or engineering organizations, science museums, regional science education centers, State and local educational agencies, and institutions of higher education (including community colleges), for the development and operation by such entities of short-term or regular session institutes for advanced study to improve the qualifications of individuals who are engaged in or preparing to engage in the teaching, or supervising or training of teachers, of the operation and use of new and evolving technologies.

(b) In making grants and contracts under subsection (a), the National Science Foundation shall give special consideration to institutes training teachers, or supervisors or trainers of teachers, serving or preparing to serve in elementary and secondary schools enrolling substantial numbers of culturally, economically, socially, and educationally handicapped youth or in programs for children of limited English language proficiency. Applications for such training programs shall indicate that a portion of the funds for the training program will be used to instruct enrollees in methods to ensure equal access to and the use of the computer by students from underserved groups, including female students.

STIPENDS

SEC. 202. Each individual who attends an institute operated under the provisions of this title shall be eligible (after application therefor) to receive a stipend at the rate of $275 per week for the period of attendance at such institute.

AUTHORIZATION OF APPROPRIATIONS

SEC. 203. There are authorized to be appropriated to carry out this title $20,000,000 for each of the fiscal years 1985 through 1994.

TITLE III—EVALUATIONS, DISSEMINATION, AND INSTRUCTIONAL MODELS

INTERAGENCY PROGRAM

SEC. 301. (a) For the purpose of providing advice and technical assistance to State and local educational agencies on the expenditure of funds under title I of this Act and on the acquisition of suitable computer software, the National Institute of Education and the National Science Foundation, in accordance with an interagency agreement between such Institute and such Foundation, shall provide for—

(1) the evaluation of available computer hardware and software in terms of its usefulness in the classroom;

(2) the dissemination of the results of such evaluation.

Where appropriate, the evaluation shall include an evaluation of the usefulness of hardware and software to serve the special needs of the groups described in section 201(b) and of the extent to which the software promotes use by students of both sexes.

(b) The Institute and the Foundation shall carry out the functions described in paragraphs (1) and (2) of subsection (a) under grants to or contracts with non-Federal agencies and private nonprofit institutions or organizations made with funds appropriated under subsection (c).

(c) There are authorized to be appropriated to carry out this section $1,000,000 to the National Science Foundation and $1,000,000 to the National Institute of Education for each of the fiscal years 1985 through 1994.

COMPUTER INSTRUCTION MODELS

SEC. 302. (a) The National Science Foundation shall, through grants to or contracts with professional educational, scientific, or engineering organizations, science museums, regional science education centers, public television, State and local educational agencies, and institutions of higher education (including community colleges), conduct, assist, and foster research and experimentation on, and dissemination of, models of instruction in the operation and use of computers, educational computer software, and curriculum materials. In selecting such entities for such grants or contracts, the Foundation shall give priority to those proposals—

(1) prepared with the active and broad community involvement of such groups as parents, teachers, school boards and administrators, and local business:

(2) which propose the establishment of model training programs for adults;

(3) which would, to the extent practicable, take advantage of state-of-the-art development in computer and software design;

(4) which would—

(A) identify and develop model computer educational software and model curriculum materials providing instruction in the use of computers; and

(B) make such software and materials available to computer software producers and distributors, teachers, and school administrators;

(5) which would—

(A) identify and develop model computer educational software and model curriculum materials designed to increase access, participation, and achievement of historically underserved students, including minorities, women, handicapped, limited English proficient, and economically disadvantaged individuals in the use of computers; and

(B) make such software and materials available to computer software producers and distributors, teachers, and school administrators;

(6) which would develop teacher training materials (including, but not limited to, computer programs, films, tides, pamphlets, audio and video cassettes, and demonstration computer programs) which—

(A) instruct educators about personal computers, computer programming, and the development of educational software, facilitate greater understanding of computers, and assist educators in making determinations regarding the allocation of financial and personal resources for education involving computers; and

(B) provide special assistance to educators to assure that they are prepared to serve all segments of the population, including minorities, women, handicapped, limited English proficient, and economically disadvantaged individuals;

(7) would conduct programs demonstrating the various educational uses of computers including, but not limited to—

(A) model programs using as many as one computer for every four students in a classroom;

(B) the establishment of a laboratory using computers to simulate live experiments;

(C) the establishment of a computer library that permits students to borrow personal computers for use outside the classroom; and

(D) a laboratory to exhibit examples of personal computer systems and educational software materials to enable educators to examine the operation of such systems and materials;

(8) which would monitor developments in computer technology, including (but not limited to) microcomputers, video disc systems, and intercommunication among users of personal computers, and disseminate to educators information regarding such developments and their possible application in education;

(9) which would establish a mechanism to inform the computer industry of the computer needs of the Nation's educational system and to receive from the computer industry information regarding recent developments in the field;

(10) which would undertake any studies requested by Congress or Federal agencies relating to the educational uses of computer technology, and assist in identifying areas in which Federal funding might accelerate the educational impact of emerging computer technologies;

(11) which would assist interested local libraries, to the extent practicable, in establishing programs to provide personal computers and video disc systems to the public; or

(12) which utilize, to the extent practicable, existing computer communications and education networks and laboratories.

(b) Funds available under a grant or contract pursuant to this section may be used for the acquisition of computer hardware and software.

(c) The Director of the National Science Foundation shall report to the Congress annually on the results of research and experimentation performed with funds made available under this section. The Director, in conjunction with the National Institute of Education, shall take such steps as may be necessary to disseminate information concerning such results to local educational agencies.

(d) There are authorized to be appropriated to carry out this section $12,000,000 for each of the fiscal years 1985 through 1994. The authority to enter into contracts under this section shall be subject to the availability of appropriations therefor.

CONTENTS

I. PURPOSE OF THE BILL

The purpose of the bill is to promote the use of computer technologies in the schools to facilitate student and teacher use of computers and to study and enhance the educational uses of computer technologies. The bill addresses these priorities by: (1) authorizing grants to local school districts, particularly in poor areas, to purchase computers; (2) authorizing teacher training institutes to acquaint teachers to educational computer use; and (3) authorizing a grants program for the evaluation and dissemination of information on educational computer hardware and software, as well as basic research into computer models of instruction.

II. BACKGROUND AND NEED FOR THE LEGISLATION

The Committee on Science and Technology has been aware for many years that the new computer technologies would profoundly influence every sector of the American economy, including our educational system. The potential of the technologies to reshape education can be likened to the resulting educational impact of the printing press, which was developed over five centuries ago. However, the success and appropriate use of computer technology in education will depend upon the availability of computers in the classroom, the numbers of motivated and knowledgeable teachers, and careful and continuing research.

As greater numbers of schools incorporate computers into their curriculum, evidence suggests that a widening gap between schools in more affluent areas and those in poorer areas is developing. A survey conducted in January 1983 by Johns Hopkins Center for Social Organization of Schools, found that 70 percent of the schools in affluent areas had at least one microcomputer, while only 40 percent of the schools in poorer areas were so equipped. Also, a significant difference in the quality of computers, as well as software, teacher training, and computer use was found at the poorer schools. Although this disparity may simply reflect inequities which already exist between rich and poor schools, technology should not be allowed to exacerbate this problem; particularly as the United States enters the "information age". Title I of this bill is drafted to help alleviate this problem by providing funds for the purchase of hardware. Funds would flow first to those schools with the greatest need.

For computers to reach their full potential within the educational system, teachers must understand and accept the technology's potentials and limitations. Teachers, presently in our school systems, need to be instructed and, in some cases, retrained in the use of the technology in their classrooms. College curriculum should expose future teachers to the educational uses and limitations of these technologies. Title II of this bill authorizes teacher training institutes to instruct teachers in the use of computers. Through this program, administered by the National Science Foundation (NSF), institutes would be offered by State and local educational agencies, institutions of higher education, as well as private concerns such as educational, scientific and engineering organizations and science museums.

At the present time, educational computer use is in its infancy. To continue to develop and realize the possible uses of computers in education, continuing research must be performed. Title III of this bill authorizes a research program, administered by the NSF to develop educational software and computer instructional models. Also, a grants program, coordinated through the NSF and the National Institute of Education (NIE), for the evaluation and dissemination of information on current educational computer hardware and software is authorized. It is expected that these evaluations will facilitate the decisions educators and school administrators must make about computers in the classroom.

III. SECTIONAL ANALYSIS OF THE BILL, AS AMENDED

Title I—Acquisition of computer hardware

Title I authorizes the Department of Education to make grants to local school districts for the purchase of computer hardware. Funds are allocated to those schools with the fewest number of computer hardware units per student. When the ratio of one unit of computer hardware to every thirty students is reached, a local educational agency may not apply for more funds under this program.

All of the changes that the Committee on Education and Labor made to Title I have been incorporated into the bill reported by the Committee on Science and Technology. These changes specify that from funds allocated under this title, local educational agencies are to provide secular, neutral, and nonideological materials and equipment for students in private schools. The Committee on Education and Labor also changed the authorization from $300,000,000 for each of the fiscal years 1984 through 1993, to such sums as may be necessary for each of the fiscal years 1985 through 1987.

Further, the Committee on Science and Technology did consider changes to Section 102 of Title I which includes the computer hardware definition. Because of the technical nature of the definition, the Committee considered this section open for debate and amendment. The Committee amended the definition of computer hardware to expand the types of machines available for purchase under Title I—the hardware acquisition portion of H.R. 3750.

Title II—Teacher training institutes

Title II authorizes funding for teacher training institutes to be arranged by the NSF through grants and contracts to other organizations.

The Committee amended this title to allow profit-making organizations to receive grants for teacher training institutes. Language was included which allows NSF to coordinate this program with other Federal agencies involved in similar efforts, such as the Department of Defense and the Department of Education. Also, a stipulation, requiring that the teachers attending the institutes be instructed on methods to ensure equal access and use of computers by students from underserved groups, including female students, was placed on the institute applications. The authorization period for this title was changed from fiscal year 1984 through fiscal year 1993, to fiscal year 1985 through fiscal year 1994.

The bill reported by the Committee on Science and Technology does not reflect the changes made by the Committee on Education and Labor. In particular, the Committee on Education and Labor changed the authorization period to fiscal year 1995 through fiscal year 1987 and the authorization amount to such sums as may be necessary. The Committee on Science and Technology changed the authorization period as stated above, and retained the $20,000,000 authorization amount for each fiscal year.

Title III—Evaluation, dissemination, and instructional models

Section 301 provides funds for contracts and grants to be given for dissemination of information on and evaluation of existing educational computer software. The funds are administered through an interagency agreement between the NSF and the NIE.

Title III of this bill reflects some of the changes made by the Committee on Education and Labor. These changes incorporated the research responsibilities, placed in National Centers for Personal Computers in Education by H.R. 1134, into the NSF program in Section 302 of H.R. 3750. Research activities, such as the development of model computer software, curricula, teacher training materials, and demonstration projects, were integrated into the NSF program, as well as the monitoring of developments in computer technology applicable to education and the promoting of greater communication between educators, the computer industry, and the Federal Government.

However, the Committee on Science and Technology removed, from Section 302 of H.R. 3750, the priorities given to grants which utilize the National Institute of Education regional laboratories, or Federal computer communication and education networks. The Committee on Science and Technology also did not adopt the change the Committee on Education and Labor made to the authorization period. This change amended the authorization period from fiscal year 1984 through fiscal year 1993, to fiscal year 1985 through fiscal year 1987. The authorization period in the bill reported by the Committee on Science and Technology is fiscal year 1985 through fiscal year 1994.

Originally, the bill specified that NSF and NIE should conduct the evaluations of software and disseminate the results of those

evaluations. This was considered inappropriate to and inconsistent with the Federal Government's role in education. The bill now provides a $2 million program, over the next 10 years, coordinated by NSF and NIE to grant funds to non-profit organizations and institutions and non-Federal agencies to conduct the evaluations of the computer hardware and software and disseminate the results. Language requiring the evaluations to consider the usefulness of the hardware and software in serving the special needs of underserved groups, was also included.

Section 302 provides funds through the NSF for research and development of model educational computer software. The Committee amended this section to allow profit-making organizations to receive grants from the NSF program. Language was also added to give priority to proposals which would develop model instructional software aimed specifically at meeting the needs of historically underrepresented groups. $12 million per fiscal year for 10 years starting in fiscal year 1985 has been provided for the NSF educational software research program.

IV. COMMITTEE VIEWS

Title I: Acquisition of computer hardware

Description

Title I authorizes the Department of Education to make grants to local school districts for the purchase of computer hardware. Funds are allocated to those schools with the fewest number of computer hardware units per student. When the ratio of one computer hardware unit to every thirty students is reached, a local educational agency may not apply for more funds under this program. Private schools are allowed to participate in this program. A computer hardware unit can be either a personal computer or access to a larger time-sharing computer system.

Views

The Committee took action on those matters properly under its jurisdiction, and worked with the Committee on Education and Labor to assure that these changes did not impair the changes it had made to other sections of Title I. Title I describes a Department of Education program, which clearly falls under the jurisdiction of the Committee on Education and Labor. The Committee on Science and Technology's reported bill includes the changes the Committee on Education and Labor made to Title I. The only action the Committee on Science and Technology took in this title concerns the technical definition of computer hardware.

The Committee intends that the schools participating in the Department of Education program have a range of options for the development of their educational computer uses. Thus, the computer hardware definition has been expanded to include multi-user data processors as well as single-user data processors. In so doing, the Committee expects "devices for interaction with users" and "interactive devices" to define devices which accept and originate data, including but not limited to, remote terminals connected with a multi-user data processor, keyboards and/or monitors which are in-

separable from a single-user data processor, or other arrangements for interacting with the single or multi-user data processor.

The Committee believes that the current state of computer hardware available for school use is considerably different from even a year ago. Single and multi-user computer prices have decreased drastically. One reason for the price reduction is that computer memory has become less expensive. Lower memory prices have allowed schools to purchase more powerful machines for the same price as they were paying only a year ago for considerably less powerful computers. The Committee believes, from communications with software and hardware developers and vendors, and teachers and school administrators, that the current state of computer hardware for schools requires a single user data processor with an internal memory capacity of at least 64,000 bytes of memory. (In the case of multi-user machines, the memory capacity stipulated in the bill is not applicable. The Committee intends that multi-user data processors be evaluated for performance based upon the intended educational uses of the participating school.) At this point, most software is written for machines with at least 64,000 bytes of memory. Further, the Committee expects the schools to use high-quality, interactive software for the classroom, which requires powerful machines with at least the memory capacity stipulated in the bill. This assures that schools will be receiving current computer hardware through this program.

The Committee added further language allowing computer network communication equipment to be purchased under this program. As school districts upgrade to more sophisticated computer instructional capabilities, communication between schools will allow for greater efficiency, more effective use, and sharing of those instructional capabilities.

The Committee also intends that all monies authorized under this Title should supplement present efforts, rather than supplant existing programs.

Title II: Teacher training institutes

Description

Title II authorizes funding for teacher training institutes to be arranged by the NSF through grants and contracts to various state, local, and private sector organizations.

Views

The Subcommittee on Science, Research and Technology heard testimony from witnesses at the June 5, 1984 hearing suggesting that allowing only non-profit organizations to receive program funds for the teacher training institutes, may undercut existing private sector efforts at teacher training. Many witnesses pointed to Apple Computer Corporation and Tandy Corporation as two companies already supplying computer training to school teachers. However, witnesses also commented that the private sector is unable to meet all of the teacher training needs, and that this program will begin to alleviate the problem of educating our present and future teachers in computer use.

The Committee also intends that all monies authorized under this Title should supplement present efforts, rather than supplant existing programs.

Title III: Evaluation, dissemination, and instructional models

Description

Section 301 provides funds for contracts and grants to be given to non-Federal agencies and non-profit organizations to conduct evaluations of existing educational computer software and disseminate the results of those evaluations to State and local educational agencies. The program is to be administered through an interagency agreement between NSF and NIE.

Section 302 provides funds through the NSF for a research and development grants program for research on model educational computer software. Grants are provided for researchers from organizations in the private, public, and business sectors, as well as priorities being set for funding specific types of proposals.

View

The Committee intends that the evaluation of educational software should entail the description of software characteristics which could assist teachers in making decisions about the usefulness of materials for the classroom. These characteristics include, but are not limited to: the grade levels for which the software is appropriate; the availability of additional supporting materials, such as workbooks, teacher handbooks, course descriptions, and visual aids; a description of the subject matter and specific concepts addressed through the software; the method of computer instruction, i.e., drill-and-practice or individualized instruction; the ability of the software to address special needs of underserved populations; and the computer hardware needed to run the software, including hardware/software compatibility and the amount of memory capacity needed for the software. The Committee does not intend the evaluation to constitute decisions about the educational goals addressed by the specific software, but instead to provide information which is useful for teachers and administrators when making decisions about hardware and software purchases for the classroom.

The Committee believes that a long-term and sustained research program is essential to the effective present and future use of computers in the classroom. The Committee does not believe that each student must learn computer programming or that traditional educational activities should be displaced by the computer. Instead, it is expected that the computer will be used to enhance and extend the education of our elementary and secondary school children. As witnesses testified at the Subcommittee hearing, the current understanding of the possible uses of computers in the classroom is limited. However, the potential for computers to effect the educational process is enormous. Federally funded projects, such as the development of the widely used language LOGO, demonstrate the opportunity for Federally supported basic research to successfully motivate private sector development of useful educational software.

Language has been included to give priority to those NSF program proposals which develop instructional models specifically

aimed at increasing the participation of historically underserved students, including minorities, women, handicapped, limited English proficient, and economically disadvantaged individuals. Growing evidence in patterns of computer use suggest that certain individuals and groups will be left behind unless some effort is made to address their special needs.

The Committee also intends that all monies authorized under this Title should supplement present efforts, rather than supplant existing programs.

V. LEGISLATIVE HISTORY

H.R. 3750 was introduced by Congressman Wirth and several other cosponsors on August 3, 1983. The bill was jointly referred to the Committee on Education and Labor and the Committee on Science and Technology. The Subcommittee on Elementary, Secondary, and Vocational Education conducted a hearing on this bill and related bills, H.R. 1134 and H.R. 4628, on May 1, 1984. The Subcommittee met in a markup session on May 3, 1984, and ordered the bill reported, as amended, to the full Committee. After discharging from further consideration the Subcommittees on Postsecondary Education and Select Education, the full Committee on Education and Labor met and ordered the bill reported, as amended, on May 8, by a vote of 21–2.

The Subcommittee on Science, Research and Technology of the Committee on Science and Technology, conducted a hearing on H.R. 3750 and H.R. 4628, on June 5, 1984. The Subcommittee met in a markup session on June 19, 1984, and ordered the bill reported, as amended, to the full Committee. The full Committee on Science and Technology met and ordered the bill reported, as amended, on August 8, 1984, by a voice vote, a quorum being present.

VI. INFLATION IMPACT OF THE BILL

In accordance with Rule XI, Clause 2(l)(3) of the Rules of the House of Representatives, this legislation is assessed to have no adverse inflationary effect on prices and costs in the operation of the national economy.

VII. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

Pursuant to Rule XI, Clause 2(l)(3) of the Rules of the House of Representatives, and under the authority of Rule X, Clause 2(b)(1) and Clause 3(f), the Committee's oversight findings and conclusions are reflected in the recommendations found in the present bill and report.

VIII. SUMMARY OF COMMITTEE ON GOVERNMENT OPERATIONS FINDINGS AND RECOMMENDATIONS

Pursuant to Rule X, Clause 2(b)(2), and Rule XI, Clause 2(l)(3) of the rules of the House of Representatives, no findings or recommendations have been submitted by the Committee on Government Operations for inclusion in this report.

IX. BUDGET ANALYSIS AND PROJECTION

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, August 9, 1984.

Hon. DON FUQUA,
Chairman, Committee on Science and Technology,
House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for H.R. 3750, the Computer Literacy Act of 1984, as ordered reported by the House Committee on Science and Technology on August 8, 1984.

If you wish further details on this estimate, we will be pleased to provide them.

Sincerely,

RUDOLPH G. PENNER.

X. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 3750.
2. Bill title: Computer Literacy Act of 1984.
3. Bill status: As ordered reported by the House Committee on Science and Technology on August 8, 1984.
4. Bill purpose: The purpose of this bill is to establish a program to assist schools in acquiring computer hardware and to provide information and training in the operations and use of new technologies. This bill is subject to subsequent appropriations action.
5. Estimated cost to the Federal Government:

[By fiscal year, in millions of dollars]

	1985	1986	1987	1988	1989
Computer acquisition:					
Estimated authorization levels	675	675	675		
Estimated outlays	338	675	675	337	
Teacher training:					
Authorization levels	20	20	20	20	20
Estimated outlays	10	20	20	20	20
Information dissemination and evaluation					
Authorization level	2	2	2	2	2
Estimated outlays	2	2	2	2	2
Computer instruction grants:					
Authorization level	12	12	12	12	12
Estimated outlays	6	10	12	12	12
Total.					
Authorization levels	709	709	709	34	34
Estimated outlays	356	707	709	371	34

The costs of this bill would fall within budget function 250 and 500.

Basis of estimate

H.R. 3750 authorizes over the next three years the acquisition of one computer per every 30 students in attendance in public schools. The estimated authorization levels for equipment acquisition assumes that 1.3 million computers for the estimated 39 million ele-

mentary and secondary education students are purchased over a three-year period. The average cost per computer is $1,500. The estimate includes an additional 5 percent for State monitoring and enforcement as provided for in the bill.

The authorization levels for teacher training, evaluation and information dissemination, and the computer instruction grants are those specifically stated in the bill through 1994.

Estimated outlays assume full appropriation of authorized levels. The funds for computer acquisition and teacher training are assumed to be spent over two years. Outlays for the computer instruction grants reflect spending patterns of the NSF program.

6. Estimated cost to State and local governments: This bill does not require any State or local government matching funds.

7. Estimate comparison: None.

8. Previous CBO estimate: On May 14, 1984, CBO prepared an estimate on H.R. 3750 as ordered reported from the House Education and Labor Committee. That bill authorized the teacher training and information dissemination and evaluation at such sums through 1987 and did not include the computer instruction grants.

9. Estimate prepared by: Deborah Kalcevic; Daniel Koretz.

10. Estimate approved by: C. G. Nuckols (For James L. Blum, Assistant Director for Budget Analysis).

XI. COMMITTEE RECOMMENDATIONS

A quorum being present, on August 8, 1984, the Committee ordered favorably reported the bill, H.R. 3750, by voice vote and recommends its approval.

ADDITIONAL VIEWS OF JUDD GREGG ON H.R. 3750, THE COMPUTER LITERACY ACT OF 1984

Notwithstanding concern for the financial cost of the bill, I have expressed my support for the concepts and programs authorized in Title II and Title III of H.R. 3750, those areas of the legislation within the jurisdiction of this committee.

Title II and III of H.R. 3750 address two very important aspects in the educational process, that is assistance to teachers so that new and/or developing instructional methods can be assimilated into the school curriculum and secondly, a mechanism for the Federal Government to act, within its jurisdiction, to promote quality educational materials and research to advance the state of the art. H.R. 3750 does so in the field of computers.

Title II, recognizing the potential of the National Science Foundation to instill excellence in education, would authorize funding for teacher training institutes. It is the intention of the Committee that such efforts would compliment, not conflict, with those activities in the private sector, which are well oversubscribed. NSF, by nature of its relationships with undergraduate and graduate institutions, as well as its progress with industrial partnerships, can provide quality guidance to the teaching profession in sponsoring such training institutes. The Science and Engineering Education Directorate, offers a promising future for the encouragement of high quality computer oriented instruction of scientific, mathematical and technical concepts. I would strongly encourage NSF to recognize the potential of new technologies, which build upon the computer, and which have a potential for use in education.

Title III of the bill speaks to the role the Federal Government can take in research and development, as well as making available to the public that information.

There are some concerns which should be raised regarding this legislation and that of similar bills passed by the Congress regarding education. First, there is a fiscal reality which is unfortunately overlooked in Title I of this bill. Whereas no specific level of funding is recommended, one only needs to look at the legislative history of the bill to know that it is exorbitant. I intend to oppose this title on the Floor of the House at the appropriate time. Secondly, as raised in the Minority views of the Committee on Education and Labor, there is some conventional wisdom in noting that previous laws exist in the case of hardware and block grants. Thirdly, while the fate of H.R. 1310 was not known when the Education and Labor Committee worked on this legislation, it is now clear what version has gone forward.

Whereas H.R. 3750 would have more closely complimented the House version of H.R. 1310, the compatability with the Senate version is less clear. Therefore serious oversight by this Committee will be necessary to clarify the message Congress is sending to the

Foundation. For this reason the Minority urges the Committee to address the inconsistency in the authorization process in fiscal year 1986.

JUDD GREGG.