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Education: A Long Term Investment in United States International Competitiveness

INTRODUCTION

When American business leaders were asked what is the most significant challenge American business faces, many answered—"education."¹ In an era of high technology, a nation's international competitiveness requires a strong and effective system of education. One commentator explains that, "[a] nation's educational system is a critical element in its ability to function in today's high technology world and, consequently, to achieve and maintain a lead in aspects of the on-going Technology War."²

Part one of this paper will discuss the link between education and international competitiveness. Part two will examine how the Omnibus Trade and Competitiveness Act of 1988 ("Trade Bill")³ addresses education. In particular the structure of the Trade Bill and its probable impact will be considered. Finally, part three will present new areas of exploration in improving education.

I. EDUCATION AND INTERNATIONAL COMPETITIVENESS

Congress believes that technological education is a long-term investment in international competitiveness that cannot be neglected.⁴ In the Trade Bill Congress clearly states that "the relationship between a strong and vibrant educational system

1. The following are examples of their comments:

Robert E. Allen, Chairman and CEO, AT&T. High quality education for all our young people. We must stem the dropout rate and insure that students learn the skills they will need to be productive citizens.

.....

Richard M. Morrow, Chairman and CEO, Amoco. The serious decline in the quality of our schools. We must signal to the schools that verbal, mathematical and computer skills will be prerequisite in tomorrow's work place.

Views From the Top, BUS. MONTH, July/August 1988, at 66-67.

2. D. BRANDIN & M. HARRISON, *THE TECHNOLOGY WAR: A CASE FOR COMPETITIVENESS* 89 (1987) [hereinafter *TECHNOLOGY WAR*].

3. Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 100-418, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 1107 [hereinafter *Trade Bill*].

4. Illustrative of this are the comments of the House Committee on Education and Labor which state:

and a healthy national economy is inseparable in an era in which economic growth is dependent on technology and is imperiled by increased foreign competition."⁵

The United States' present productivity is impacted daily by the ineffectiveness of its educational system. The Committee on Education and Labor explains that:

[A]n estimated \$100 billion is lost each year in Gross National Product due to the existence of the 26 million, or more, adults who are illiterate or functionally illiterate. Similarly, we will continue to lose competitive ground unless vocational education responds to the structural changes in the economy; and without skilled scientists and mathematicians, we will lose our technological edge. Our inability to communicate in other languages costs us daily in our trade transactions abroad and at home.⁶

High technology positions remain vacant and businesses remain

[I]nvesting in human capital is at least as important to improving our long-range competitiveness as investing in equipment or negotiating trade agreements. By making our workforce more productive and management more innovative, education and training programs have the capability to both redress current trade imbalances and prevent us from losing ground in the future.

HOUSE COMM. ON EDUCATION AND LABOR, REPORT ON TRADE AND INTERNATIONAL ECONOMIC POLICY REFORM ACT OF 1987, H.R. REP. NO. 40, 100th Cong., 1st Sess., pt. 5, at 71 (1987) [hereinafter COMMITTEE REPORT].

5. Trade Bill, *supra* note 3, § 6002(1). Congress continues by stating that:

(2) our Nation's once undisputed pre-eminence in international commerce is facing unprecedented challenges from competitor nations who have given priority to the relationship between education and economic growth in areas such as high technology industries;

(3) our standing in the international marketplace is being further eroded by the presence in the workforce of millions of Americans who are functionally or technologically illiterate or who lack the mathematics, science, foreign language, or vocational skills needed to adapt to the structural changes occurring in the global economy;

(4) our competitive position is also being eroded by declines in the number of students taking advanced courses in mathematics, science, and foreign languages and by the lack of modern technical and laboratory equipment in our educational institutions;

(5) restoring our competitiveness and enhancing our productivity will require that all workers possess basic educational skills and that many others possess highly specific skills in mathematics, science, foreign languages, and vocational areas; and

(6) our Nation must recognize the substantial impact that an investment in human capital will have on increasing productivity.

Id.; see also NATIONAL COMM'N ON EXCELLENCE IN EDUC., A NATION AT RISK: THE IMPERATIVE FOR EDUCATIONAL REFORM, TECHNICAL REPORT 7 (April 26, 1983) [hereinafter A NATION AT RISK] ("Learning is the indispensable investment required for success in the 'information age' we are entering.").

6. COMMITTEE REPORT, *supra* note 4, at 71.

understaffed because the work force is untrained and uneducated.⁷ Business leaders complain of having to spend millions of dollars on remedial education and training programs in basic skills because of an illiterate work force.⁸

Given the link between education and international competitiveness, the present status of the United States' educational system is alarming. Historically, the United States has been a leader in education and consequently in technological advancement; however, our pre-eminence in both education and technological advancement has deteriorated⁹ creating an education deficit in our universities, secondary and elementary schools. This educational deficit is demonstrated by the inability to attract and retain qualified teachers and the failure to provide basic skills to students.

A. *Qualified Teachers*

On average, one-tenth of the nation's faculty positions are vacant because university salaries remain uncompetitive with salaries of private industry.¹⁰ The secondary and elementary

7. The National Assessment of Educational Progress found that 43% of persons between the ages of 21 and 25 are unable to sufficiently master multi-step directions, communicate ideas and directions to others, or calculate at a level necessary for high technology occupations. COMMITTEE REPORT, *supra* note 4, at 76. The problems of finding skilled labor is already facing the business community. For example,

Chemical Bank in New York must interview 40 applicants to find one who can be successfully trained as a teller. And IBM Corp. discovered after installing millions of dollars worth of fancy computers in its Burlington (Vt.) factories that it had to teach high school algebra to thousands of workers before they could run them.

Nussbaum, *NEEDED: Human Capital*, Bus. Wk., Sep. 19, 1988, at 100.

The economic failures of educational programs grow even more stark when compared with the successes of America's competitors. Merry White, author of *THE JAPANESE EDUCATION CHALLENGE* (1987), explains that "[m]uch of the success of Japan stems from the fact that its blue-collar workers can interpret advanced mathematics, read complex engineering blueprints, and perform sophisticated tasks on the factory floor far better than blue-collar workers in the U.S." Nussbaum, *supra* note 7, at 101.

8. *A NATION AT RISK*, *supra* note 5, at 9-10. Another commentator explains that:

Companies will find that basic skill deficiencies--reading, writing, speaking, listening, math--of employees will add to their costs, not only through greater remediation expenses, but also through lower productivity, higher supervisory time, and poorer product quality. . . . I predict, and already see, increasing pressure from employers to improve the quality of public schooling.

Miller, *Insurance: The Noncrisis Crisis*, IND. SCH. BOARDS A.J. 14, 18 (Nov. 1988).

9. For example, in 1967 the United States had more than twice the number of scientists and engineers working in research and development as the Japanese; but by the 1980's, the United States had only 15% more. See *TECHNOLOGY WAR*, *supra* note 2, at 91.

10. See HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY, TASK FORCE ON SCIENCE

schools have similar problems attracting and retaining qualified teachers.¹¹ The majority of today's new teachers ranked in the bottom twenty-five percent of their classes as high school and college students, and one half of all new mathematics and science teachers are not qualified to teach in these fields.¹² However, the absence of skilled teachers is only one of the many problems facing United States education today.¹³

B. Providing Basic Skills to Students

A serious indication that America's educational system is failing is its present literacy rate.¹⁴ Approximately thirteen per-

POLICY, REPORT OF THE WHITE HOUSE SCIENCE COUNCIL PANEL ON THE HEALTH OF U.S. COLLEGES AND UNIVERSITIES, H.R. REP. NO. 107, 99th Cong., 2d Sess. 2 (1986). Some universities report 50% vacancies in computer science and electrical engineering fields. *Id.*; see also Willenbrock, *The Status of Engineering Education in the United States*, in THE STATE OF GRADUATE EDUCATION 85-96 (B. Smith ed. 1985) ("The most crucial problem facing United States engineering schools is their decreasing ability to attract and retain faculty members who are in the top rank of their technical specialties.").

11. The National Science Foundation has stated: "[T]oo few of this country's elementary school teachers have even a minimal science background; too few of the science and mathematics teachers at the high school level have been well-trained in their subjects." Finbeiner, *Precollege Education and The Personnel Issues*, in NATIONAL SCIENCE FOUNDATION—ANNUAL REPORT 1986 at 46.

The difficulty in attracting qualified students into the teaching profession is illustrated by the fact that "[i]n California, for example, only 97 of 400,000 1982 college students were preparing to teach high school math. In New Hampshire the figure is even more dismal: only one college graduate planned a math teaching career." U.S. DEPARTMENT OF EDUCATION, NATIONAL INSTITUTE OF EDUCATION, PROBLEMS IN MATH AND SCIENCE EDUCATION: RESEARCH IN BRIEF 1 (1984) [hereinafter RESEARCH IN BRIEF].

Sadly, the situation is only going to grow worse. "The combined impact of retirements and the arrival of the baby boom's children in the schools will require replacement of half of the teacher work force—about 1.3 million teachers—in the 1990s." Hoffman, *Many American Schools Still at Risk*, 20 NAT'L J. 1082 (1988).

12. NATIONAL SCIENCE TEACHERS ASSOCIATION YEARBOOK, REDESIGNING SCIENCE AND TECHNOLOGY EDUCATION 12 (1984).

13. A NATION AT RISK cites numerous illustrations of existing problems in education that began to become apparent in the 1970s and are now critical as the United States enters the 1990s. See A NATION AT RISK, *supra* note 5, at 8-9. For example, in the early 1970s, American students never finished first or second on 19 international student achievement tests. When compared with industrialized nations, American students finished last seven times. Average achievement of high school students on standardized tests is lower than it was in 1957. The College Board's Scholastic Aptitude Tests (SAT) scores showed an almost unbroken decline from 1963 to 1980. There is also a steady decline in science achievement scores of United States' 17-year-olds as measured by national assessments in science for 1969, 1973, and 1977.

14. "Tday [sic] 23 million adults are considered functionally illiterate, and these numbers are expected to worsen due to an increase of minority youth who have had greater functional illiteracy rates." Miller, *supra* note 8, at 14; see also D. KEARNS & D. DOYLE, WINNING THE BRAIN RACE 1 (1988). These statistics are in stark contrast with

cent of all seventeen-year-olds in the United States are functionally illiterate and among minorities, youth illiteracy reaches forty percent.¹⁵ From twenty to forty percent of seventeen-year-olds do not possess the "high order" intellectual skills necessary for technological competence.¹⁶ Though in recent years there has been some improvement in base statistics, the fundamental problems still remain.¹⁷

II. TRADE BILL

The Trade Bill is an excellent example of how Congress is attempting to solve educational problems through increased spending. Congress' new activism in education, as political economist Michael Porter explains, is because Congress "no longer sees education primarily as a social agenda, but as an economic agenda."¹⁸ The Trade Bill can be examined as to both its structure and probable future impact.

A. Structure

Title VI of the Trade Bill is cited as "Education and Training for a Competitive America Act of 1988."¹⁹ Title VI authorizes the following expenditures:

- 1) \$65 million in matching funds for adult education programs sponsored by industry and education which are

other industrialized nations. "In 1988, Japan's functional literacy rate is better than 95%. In America it's down to about 80%." Nussbaum, *supra* note 7, at 100.

15. See A NATION AT RISK, *supra* note 5, at 8.

16. *Id.* "High order" skills include drawing inferences from written materials, solving mathematical problems requiring several steps and writing a persuasive essay. *Id.*

The needs of the gifted students are also being overlooked. Over half of gifted students do not match their tested level of ability with comparable achievements in school. *Id.* Only 35% of the gifted population is being served. See Lyon, *The Federal Perspective on G & T*, in JOURNAL FOR THE EDUCATION OF THE GIFTED 4 (1980). The failure to meet the needs of the gifted is disturbing in light of the congressional declaration that "the Nation's greatest resource for solving critical national problems in areas of national concern is its gifted and talented children, unless the special abilities of gifted and talented children are developed during their elementary and secondary school years, their special potentials for assisting the Nation may be lost." Gifted and Talented Children's Act of 1978, Pub. L. No. 95-561, §901, 92 Stat. 2292, 2292 (1978).

17. "Education Secretary William J. Bennett lamented in February that except for a few encouraging signs such as better performance on tests by minority students 'the news is not what it should be: Test scores are in a dead stall.'" Hoffman, *supra* note 11, at 1083.

18. Marquand, *Congress Funds Increased Federal Role in Education*, The Christian Science Monitor, Jan. 22, 1988, at 19, col. 1.

19. Trade Bill, *supra* note 3, § 6001.

- designed to meet work place requirements and funds for a student "literacy corps" which gives university credit for voluntary tutoring in basic skills;²⁰
- 2) \$175 million for state education agencies to assist in foreign language instruction programs in elementary and secondary schools;²¹
 - 3) \$56.5 million for technology-oriented training programs which would include strengthening mathematics, science, and language programs, regional technology training centers, and training in telecommunications;²²
 - 4) \$80 million for vocational training and assistance for high technology-workers who were adversely affected by foreign competition;²³
 - 5) \$250 million to improve the teaching of basic skills in secondary schools and to discourage school dropout;²⁴
 - 6) \$114 million for higher education programs to facilitate joint business and international studies, to improve mathematics, engineering and science programs, and to upgrade university research facilities and libraries;²⁵
 - 7) \$980 million for worker retraining and adjustment in connection with the Job Training Partnership Act with special funds for workers displaced by imports.²⁶

The above listed expenditures of the Trade Bill are directed at some of the major educational problems which impact the United States' international competitiveness and address: literacy, foreign language instruction, mathematics and science instruction, drop-out prevention, and retraining for displaced workers. Much of the funding goes towards existing programs or is set up as incentive for the creation of new programs by local entities.

However, the Trade Bill does little more than provide money and fails to give a sense of direction as to how education in the United States must improve in order for the United

20. INTERNATIONAL DIV. OF THE U.S. CHAMBER OF COMMERCE, THE OMNIBUS TRADE AND COMPETITIVENESS ACT OF 1988: A STRAIGHTFORWARD GUIDE TO ITS IMPACT ON U.S. AND FOREIGN BUSINESS 56 (1988) [hereinafter CHAMBER].

21. *Id.*

22. *Id.*

23. *Id.*

24. *Id.*

25. *Id.*

26. *Id.*

States to compete in the international business arena. The two specific areas of school dropout and literacy that are addressed in the Trade Bill illustrate how Congress deals with educational issues.

1. *School Dropout Demonstration Assistance Act*²⁷

The purpose of the School Dropout Demonstration Assistance Act is to reduce elementary and secondary school dropouts by grants to local school programs. The grants are to assist in identifying students who are potential dropouts or are in high risk groups. The money is also designed to benefit programs which assist in the reentry of students who have dropped out. Portions of the grants will also go towards evaluating and reporting changes in dropout rates in areas where the grants have been applied.

The amount of the grant money given to the schools is based on the overall enrollment in the schools. The Act allows, at the discretion of the Secretary of Education, money to be given to institutions outside of the existing school system. Grants can also be directed to programs that are partnerships between educational institutions and the business world.²⁸ In addition, where the money is not fully needed or allotted to the school the Act provides for returning the money back to the Secretary.

Applications for the grants are for one year only. The information required in the grant applications includes showing the number of students who have dropped-out of the area schools in the last five years and showing how many students are in the school system. The application must also set forth the plan(s) for the use of the grant funds and demonstrate that it will meet the purposes of this Act. The plans may include methods for using media or reaching special target groups such as school age parents. The plans should also include means to evaluate the success of the programs and means to coordinate the program with other existing programs. The Act gives priority to programs that have proven successful in the past.

27. Trade Bill, *supra* note 3, §§ 6061-67. Because the text is a brief summary of the contents of §§ 6061-67, specific cites have been omitted.

28. This is a common thread in the portions of the Trade Bill dealing with education. *See, e.g.*, Trade Bill, *supra* note 3, §§ 6041-49. The encouragement of a partnership between the business world and education is a recognition that the problem of education cannot be solved by the government alone. *See infra* notes 46-48 and accompanying text.

Activities approved by the Act for use of grant funds may be either district or school-wide. The programs may be directed to either prevention or reentry. The funds can be directed to special programs such as summer schools or work study. The Act permits contracting out services directed towards dropout problems by the school. The Act specifically refers to programs that are directed to under-served students and student motivation. The Act emphasizes partnership activities between industry and educational institutions. Activities include summer employment, occupational training and counseling, and job placement programs.

2. *Student Literacy Corps*²⁹

The Student Literacy Corps is designed to create higher education programs which promote voluntary tutoring to improve literacy in the United States. The grants are for a maximum of two years. The money will go towards both the costs of the program and stipends to students participating in the programs. The Act also provides for technical assistance in developing the programs and coordinating them with other programs.

To apply for the program the institution must show that it has at least one course designed for voluntary tutoring. The course must require at least six hours per week of voluntary uncompensated service on the part of the volunteers. In addition to the six hours, the course should require class attendance and a teacher should be provided to prepare the tutors for their activities. The institution must show that the program serves disadvantaged persons. Also, the institution should show that it has participated in similar programs in the past. However, the requirement of past participation can be waived by the Secretary. The technical assistance and coordination of programs provided by the federal government is an essential element of this Act and allows for efficient use of the grant money provided.

B. *Impact*

The eventual impact of the Trade Bill funding grants on education is unknown at the present time. The United States Chamber of Commerce suggests that the likely effect of the Bill on United States companies and on United States policy is "[a] more educated and skilled work force from which to draw pro-

29. Trade Bill, *supra* note 3, § 6201. Because the text is a brief summary of what is contained in § 6201, specific cites have been omitted.

ductive talent in the long term [and an] [i]mproved environment for commercial innovation, ultimately leading to increased U.S. productivity and competitiveness."³⁰ Increased funding and involvement of the federal government enriches educational programs because it increases the resources available to the programs.³¹

The question is whether the programs to which Congress is appropriating funds in the Trade Bill will accomplish their purpose in strengthening the United States' educational system. Some educational problems do not fall within the scope of the programs receiving money under the Trade Bill. Two areas that are relatively unaddressed in the Trade Bill that are essential to improving United States' education are 1) increasing the respect given to the teaching profession and 2) improving the curriculum requirements of the students.

1. *Teaching Profession*

As previously discussed, a critical problem of education is a shortage of quality teachers on the elementary, secondary and university level.³² One commentator has stated:

A major problem is the quality of teachers in the United States. Not only has the public too little respect for teachers, many of our teachers are not good enough. What is cause and what is effect? It is hard to say, but it is clear that teacher prestige is high in countries that have good educational systems.³³

"Teacher prestige" is a difficult ideal to capture and an even more difficult attitude to cultivate.³⁴

30. CHAMBER, *supra* note 20, at 56. The Chamber of Commerce stated that the impact on foreign companies and countries is "[g]reater competition from U.S. companies employing a highly skilled U.S. labor force." *Id.* Note the caveat that such an impact will occur only if Congress actually appropriates the funds which "is not certain at this time." *Id.*

31. "US Secretary of Education William J. Bennett, however, cautions against a 'cash-register mentality' and contends that Americans spend 'more on education than ever before and more than any other country in the world.'" *Human Capital: Education and the Wealth of Nations*, *The Christian Science Monitor*, July 24, 1987, at 14, col. 1 [hereinafter *Wealth*].

32. See *supra* notes 10-12 and accompanying text.

33. TECHNOLOGY WAR, *supra* note 2, at 91.

34. "Teaching today is blue collar work. . . . That's not to say that there aren't large numbers of teachers who are professionals—many are. Indeed, the wonder is that there are so many professionals when most schools are organized to discourage, even disparage them." D. KEARNS & D. DOYLE, *supra* note 14, at 51.

The Trade Bill follows the National Science Foundation's suggestion to secure teacher prestige through existing methods such as the Presidential Awards for Excellence in Science and Mathematics Teaching.³⁵ Although beneficial, this is only a superficial solution. Professionals in the area advocate "restructuring the teaching profession and the duties of teachers (for example have them help develop a curriculum and train other teachers, etc.), and establishing better working conditions and salaries."³⁶

Possibly the highest hurdle to restructuring the teaching profession is changing the quality and expectations of present teachers. Problems dealing with poor quality teachers are compounded by the fact that many students today are undisciplined and incapable of adapting to a rigorous school environment thus requiring enormous amounts of teacher-time being spent on student discipline.³⁷ The business community can help improve the teaching profession by supplying additional funding³⁸ or entering into partnerships with the schools.³⁹

2. Curriculum

The recruitment and retention of competent teachers must be combined with development of more meaningful curriculum. The National Institute of Education (NIE) explains that:

The curriculum must provide students with enough basic science and math so that they are capable of using technology in intelligent and appropriate ways. Take the job market, for instance. Ford Motor Co. presently has more than 2,000 robots in their plants. The corporation expects that by the end of this

35. Finbeiner, *supra* note 11, at 46.

36. RESEARCH IN BRIEF, *supra* note 11, at 3.

37. Inner-city schools have been compared to prisons "complete with wardens (principals) and guards (teachers) striving to control a mob of prisoners (students), some so preoccupied with the three Cs—crack, crime and casual sex—that they have no time for the three Rs." White, *Education: Getting What you Pay For*, TIME, Sept. 12, 1988, at 31.

38. For example, when Houston, Texas was faced with a high number of teaching vacancies, Houston schools sought community involvement. From the funds derived from community and government sources, stipends were offered to teachers willing to teach in curriculum areas or schools where there were shortages. See RESEARCH IN BRIEF, *supra* note 11, at 2.

39. For example, team-teaching with business and educational personnel combines the economic resources of private industry and education and creates an ongoing communication between education and the business community. Moreover, teachers are placed on par with experts in private industry and become colleagues of these experts in the eye of the community—thereby enhancing teacher prestige.

decade (15 short years) it will have close to 7,000 robots. Future generations must be able to handle technology such as this.⁴⁰

One reason for the Japanese consistently scoring higher on standardized mathematics and science tests than any other nation is the high degree of standardization in their curriculum.⁴¹ Students in other industrialized countries spend three times the number of hours spent by students in the United States on mathematics and science.⁴²

During the 1960's and early 1970's education in the United States moved towards giving choices and independence to students resulting in more courses being offered and liberalization of graduation requirements.⁴³ Now educational experts are concerned that "[s]econdary school curricula has been homogenized, diluted, and diffused to the point that they no longer have a central purpose. In effect, we have a cafeteria-style curriculum in which the appetizers and desserts can easily be mistaken for main courses."⁴⁴ Though the Trade Bill provides funding that

40. RESEARCH IN BRIEF, *supra* note 11, at 2. This is part of a three part plan proposed by the NIE to improve science and mathematics education.

41. B. DUKE, *THE JAPANESE SCHOOL* 82 (1986) ("Every child [in Japan] is carefully and painstakingly led through the same precise step-by-step procedure in learning to divide with a two-digit divisor, for example, or to multiply by a fraction.").

42. RESEARCH IN BRIEF, *supra* note 11, at 1. A commentator, while comparing Japanese schools to American schools, explains:

Japanese students do so well on international comparisons because they go to school for a longer day than Americans and a longer year. They have—and do—more homework. They work harder. . . . As a consequence, a majority of American youngsters attend school 180 days a year while the Japanese student goes 240. The typical American student has an hour or less of homework; the Japanese student two and one-half hours or more.

D. KEARNS & D. DOYLE, *supra* note 14, at 68. In the high schools of France, Germany, and the Soviet Union—four years of biology, chemistry, and physics are required. *TECHNOLOGY WAR*, *supra* note 2, at 91.

43. "Though progressive education has been doing its work for more than 60 years, it took the upheavals of the Sixties and early Seventies to exaggerate all its tendencies and hasten the evacuation of learning from the schools." Magnet, *How To Smarten Up the Schools*, *FORTUNE*, Feb. 1, 1988, at 86, 89.

44. *A NATION AT RISK*, *supra* note 5, at 61. As a result only 31 percent of high school graduates complete intermediate algebra and only 6 percent of all students complete calculus. *Id.* at 61-62. Another study found that one third of United States high schools do not offer physics, almost one fifth offer no chemistry, one tenth offer no biology, and nearly three-fourths offer no earth or space science. Finbeiner, *supra* note 11, at 46.

These days cooking and driving courses count as much toward a high school diploma as English, history, or science courses. While it's fine to teach kids to cook and drive, 13 states let high-schoolers earn at least half their graduation credits from electives like these or like Bachelor Living, where presumably

will be used towards improving curricula it does not move the country towards a standardization of curriculum that would ensure a higher quality of technological education.⁴⁵

III. NEW AREAS OF EXPLORATION IN IMPROVING TECHNOLOGICAL EDUCATION

The Trade Bill increases funds to education which may indirectly lead to improved teacher prestige or curriculum. Yet, Congress should explore more direct avenues to improve technological education. Possible areas of exploration include creating greater tax incentives for business/education partnerships and developing national minimum standards for education.

A. *Encouraging Business/Education Partnerships*

A common theme that runs through educational literature is a need to increase the partnership between the business community and education.⁴⁶ For example the Task Force on Education for Economic Growth calls for "broader and more effective partnerships for improving education. Working together businesses and the schools can work to offer professional training to teachers, to experiment with team teaching, and to establish cooperative learning situations."⁴⁷

they can learn condom etiquette and that communities have singles bars. Magnet, *supra* note 43, at 89. Moreover, many state universities must accept every resident high school graduate who applies. A NATION AT RISK, *supra* note 5, at 63 (as of 1983, "[o]ne fifth of all 4-year public colleges in the United States must accept high school graduates within the State regardless of program followed or grades. . .").

45. See *infra* notes 49-51 and accompanying text.

46. For example, a recent educational publication stated: "Business, public training institutions, school systems, private training institutions, and labor must work in partnership to insure minimal duplication in the provisions of training and education. Each has important roles to play." Miller, *supra* note 8, at 23; see also REPORT OF THE BUSINESS ROUNDTABLE ON INTERNATIONAL COMPETITIVENESS, AMERICAN EXCELLENCE IN A WORLD ECONOMY 27 (June 15, 1987) [hereinafter BUSINESS ROUNDTABLE].

47. NATIONAL SCIENCE TEACHERS ASSOCIATION YEARBOOK, REDESIGNING SCIENCE AND TECHNOLOGY EDUCATION 12 (1984); see also *supra* note 28. An example of a successful business/education partnership occurred in Rochester, New York where "schools and business have joined efforts to increase minority student enrollment in science and math courses. Students enrolled in the program make monthly visits to industrial sites and have after-school activities in which faculty and industry experts participate." RESEARCH IN BRIEF, *supra* note 11, at 2.

Similar partnerships have been attempted in Germany, France, and Great Britain. See H. Noah & M. Eckstin *International Study of Business/Industry Involvement with Education* (London University 1986). The business community seems ready for the challenge. In a survey by the Conference Board of 83 companies that listed education as

The Trade Bill at numerous times specifically provides funding for partnership programs.⁴⁸ However, Congress should also consider enhancing tax incentives to entering into these educational partnership. Also, Congress should also consider increasing the federal government's technical assistance to business/education partnerships. The federal government is often best equipped to identify existing programs and coordinate the efforts of multiple interested parties. Without coordination, duplication of resources would result in a drain on educational programs.

B. National Standardization

Congress could also consider a more active role in determining the minimum standards of quality in education.⁴⁹ Historically education has been in the domain of the states and local governments; however, the national economy has developed such that there is a minimum level of competence necessary in the United States' work force. In order to ensure this threshold level of competency, Congress should develop minimum standards of education that will be offered at any school in the United States.

their top societal concern, 65 were making financial contributions to education; 62 "were involved in business partnerships; more than half said they were involved in programs to improve teaching; and about a third were helping to revise school curricula." Hoffman, *supra* note 11, at 1083.

48. See *supra* note 28.

49. The call for national standards has come from many different directions; for example: Education Secretary Bennett, *Wealth, supra* note 31; and the Business Roundtable, BUSINESS ROUNDTABLE, *supra* note 46, at 27. A recent poll states that 84% of Americans believe that the federal government should require states to meet minimum federal standards. D. KEARNS & D. DOYLE, *supra* note 14, at 103 (citing the 19th Annual Gallup Poll of the Public's Attitudes Toward Public Schools). Congress requires a greater degree of accountability from the schools in order to receive the funding. Marquand, *Congress Funds Increased Federal Role In Education*, *The Christian Science Monitor*, Jan. 22, 1988, at 19, col. 1 ("Congress is shifting its thinking—and funding priorities—on education. . . . This includes more strategic spending, and more accountability.").

An example of possible minimum standards that could be imposed by Congress would be the recommendations in A NATION AT RISK. See A NATION AT RISK, *supra* note 5. Presently,

[m]ost high schools still do not require students to meet widely accepted standards for math and science. On the average, a student takes only 2.3 credits in math and 2 in science to graduate, instead of the 3 credits in each subject recommended by the National Commission on Excellence in Education.

White, *supra* note 37, at 31. National standards could also be applied to the teaching profession by way of national teacher certification exams similar to the National Board of Professional Teaching Standards formed by the Carnegie Forum on Education and the Economy. Magnet, *supra* note 43, at 92-94.

Therefore, "[a]lthough the issue is tremendously controversial, given America's states' rights traditions, logic would indicate that the federal government ensure the uniform quality of education."⁵⁰ Conditioning the receipt of federal funds on the recipient school complying with national minimum standards is a necessary step to improving America's educational system. "Allowing state or local governments to control schools entirely 'would reduce the United States to a collection of democratic city-states, totally neglecting our collective interest in education.' Accordingly, Congress should set minimum educational standards."⁵¹

CONCLUSION

United States' education is in a state of deterioration but can no longer be neglected if America is going to compete internationally. The partial solution, found in the Trade Bill, infuses needed funds into programs to improve basic literacy, mathematics and science teaching, foreign language and other programs. However, new funds will not automatically solve problems such as low teacher prestige and poor curriculum. Poor education creates a damaging cycle because poorly taught students too often become poorly trained teachers. The future strength of the United States' economy and its international competitiveness relies in good measure on our ability to break this cycle.

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50. *Wealth*, *supra* note 31, at 14, col. 4. The Heritage Foundation is a proponent of the opposite view. They call for dramatic reduction in federal control and suggest stronger measure be taken by State agencies (i.e., state sponsored competency tests, revision of teacher salary schedules, tax credits and vouchers). See COMPETITIVENESS PLANK 7, EDUCATION: THE FOUNDATION FOR COMPETITIVENESS, MAKING AMERICAN MORE COMPETITIVE: A PLATFORM FOR GLOBAL ECONOMIC SUCCESS 69 (Heritage Foundation 1987).

51. Book Review, *Republican Citizenship in a Democratic Society*, 66 TEX. L. REV. 1229, 1236 (1988).