TAX INCENTIVES FOR COMPUTER DONORS IS A BAD IDEA

HAL BERGHEL

A rigorous lobbying campaign orchestrated by microcomputer manufacturers together with the staunch support of former Governor Edmund Brown, Jr., [2] culminated this past year in changes in California's tax laws. Those changes provide economic incentives to computer manufacturers for the donation of computers to public schools. Now considerable pressure is being placed on Congress to provide similar encouragement at the national level. It is not obvious that such encouragement will be in the long-term public interest.

There are at present no fewer than eight pieces of pending legislation before both houses of Congress concerning Federal support of computer literacy programs, with new legislation of this sort being introduced nearly monthly. Pending legislation now includes: H.R. 91, "Computer Equipment Contribution Act of 1983;" H.R. 701, "Computer Contribution Act of 1983;" S. 108, untitled; H.R. 2417, "Computer Contribution and Teacher Training Act of 1983;" S. 1194, "Technology Education Assistance and Development Act of 1983;" S. 1195, "High Technology Research and Educational Development Act of 1983;" H.R. 3098, "Technology Education Assistance and Development Act of 1983;" and H.R. 3750, "Computer Literacy Act of 1983."

What the Pending Bills Call For

Of these bills, H.R. 3750 belongs to a separate class for it alone calls for direct appropriations "... 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 ..." [11, p. 1]. Although the other bills share this goal, they intend to achieve it by making significant alterations in the Internal Revenue Code (IRC). Specifically, they seek to modify that portion of the IRC that deals with corporate contributions to nonprofit organizations.

Section 170(e)(1) of the IRC [7], known as the "General Rule" for contributions, allows the contributor of property to certain nonprofit institutions to reduce his tax liability by the amount of his basis in the property.[1] The reasoning behind this section is that if a contributor is generous enough to make a charitable contribution, the community should at least share some of the contributor's loss. Apparently, its authors felt that it is in the public interest to so encourage such contributions in order to preserve the vitality of charitable institutions. Whether this provision was ever in the long-term public interest is not at issue here. Whether this provision should be modified to single out computer manufacturers for special treatment is.

[1] Basis is the total cost of an asset as defined for Federal Tax purposes [5, section 1471-11].

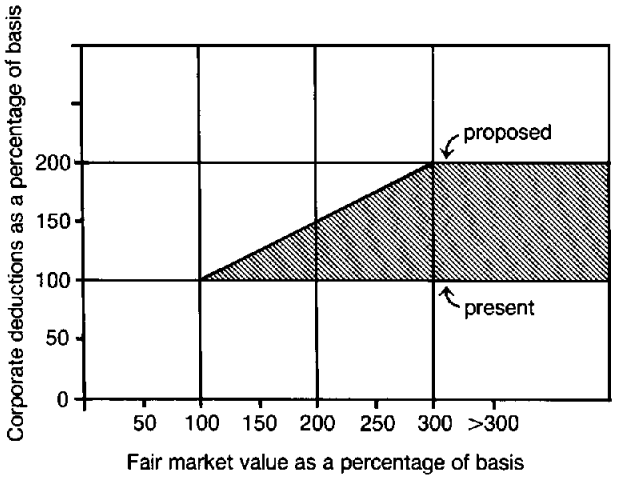


FIGURE 1. The Impact of HR 701 on Corporate Deductions for Contributed Property

Section 170(e)(1) of the IRC is quite specific in its treatment of contributed property. For such contributed short-term assets[2] as production and inventory items, the contributor may only reduce his tax liability by his basis in the property. In the words of the IRC,

> . . . The amount of any charitable contribution of property . . . shall be reduced by . . .
> (A) The amount of gain which would not have been long-term capital gain if the property contributed had been sold by the taxpayer at its fair market value . . . . [7, p. 25, 204]

The "amount of gain" referred to in (A) is the difference between the owner's basis in and the sale price of such property.

The effect of those bills above that seek to modify the tax code would be to subsume computer contributions under the "Special Rule" (170(e)(3)).[3] This "Special Rule" entitles the contributor to a reduction of tax liability determined by the following formula:

$$\text{Deduction} = \text{Basis} + ((\text{Fair Market Value} - \text{Basis})/2)$$

with a ceiling of twice their basis.[4] Figure 1 graphically represents the effect of this change.

An Incentive to Overproduce Computers

Some sense of the consequences of this change can be derived from Figure 2. Note that the after-tax cost of production for corporations making use of the proposed change in the IRC is as low as 8 percent. Further, since it takes only $100,000 of annual profits to place a corporation in the highest (46 percent) tax bracket, most if not all manufacturers would fall into this category.

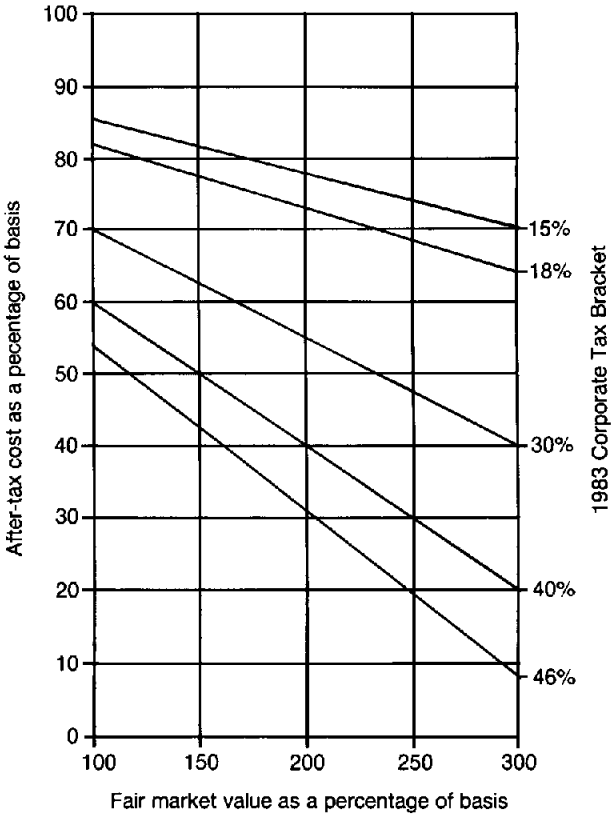


FIGURE 2. After-tax Costs of Contributed Property by Corporate Tax Bracket

Should the retail price of the computer equipment be three times their basis (not an altogether unlikely occurrence), these manufacturers would have their after-tax cost of manufacturing reduced by 92 percent. Although this will not in and of itself encourage companies to manufacture equipment solely for the purpose of donations, it will dramatically reduce the risks of overproduction. A manufacturer may well overproduce knowing that should the market fail to absorb the excess, the taxpayer may absorb 92 percent of the cost of their mistake. For obvious reasons it may work to the public detriment to offer this encouragement.

In addition to the minimization of risks of overproduction, the code change also has other unpleasant consequences. First, it is designed to most reward those companies in the highest corporate tax brackets and those whose products have the greater profit margins. Note that this is not a problem so long as the contributions are subsumed under the "General Rule."

Secondly, it seems unlikely that school districts will turn away such gratuities even though no immediate need is present. If only 25 percent of the contributed computers are unneeded, the cost to the taxpayer is 68 percent greater than if the needed 75 percent were purchased from the manufacturer at his cost. Sales at cost would still gain the manufacturer the sought-after free advertising, the potential of which may be enormous. As one marketing manager for Apple stated: "You learn

[2] Usually those held for less than one year.
[3] More properly, H.R. 91, H.R. 701, S. 108, and H.R. 2417 seek to subsume these contributions under IRC 170(e)(3). The others, with the exception of H.R. 3750, propose incorporation of this tax-deduction feature into another section of code (Ch. 1, SCh.B, Part VI, sect.174A). The overall effect, as far as tax deductions for contributed short-term assets of this type, is exactly the same.
[4] H.R. 2417 is unique in that it establishes a ceiling at 125 percent of basis.

on a particular computer, you become comfortable on a particular computer, all things being equal, you're likely to buy that computer."[8]

If the computer industry's perception of the potential of "hands-on" advertising is positive, such acquisitions would be easy to come by. However, the real advantage would be that the school districts would be responsible for both the justification of the acquisition and the overall tax impact.[5]

It must be understood that each and every contribution carries with it a direct cost to the taxpayer. Perhaps the most objectionable feature of pending legislation is that it encourages school systems to behave in ways that when generalized are fiscally irresponsible. The appropriations legislation, H.R. 3750, minimizes this problem, though at a cost of $3 billion over 10 years.

The Issues the Bills Fail to Address

The tax consequence of the proposed legislation is not the only objectionable feature. Table I summarizes these bills in terms of their major provisions.[6] One immediate concern is the lack of consideration given to software. H.R. 91, H.R. 701, and S. 108 allow only hardware to qualify as a contribution. Inasmuch as packaged software is a *sine qua non* in a computer-aided-instruction (CAI) environment, it seems both arbitrary and unreasonable to accord hardware a privileged status. H.R. 2417 only allows contributed software to qualify for a deduction if it is provided by the hardware manufacturer.

It would seem that, if Congress wanted to provide the student with the best of facilities, its members would do all they could to encourage the acquisition of the widest range of current software. Slighting the schools on software is certainly not consistent with the overall ambitions of the proposals at hand. Further, only S. 1194, S. 1195, and H.R. 3098 allow contributed services to qualify for tax credit. A school system that lacks a sufficient budget to support its acquisitions may find them to be an onerous gratuity.

The issue of the sources and types of hardware that will qualify as a contribution seems to have been treated in an equally cavalier fashion. Only H.R. 2417, S. 1194, S. 1195, and H.R. 3098 require that a monitor be included in the hardware package. It is difficult to comprehend how the student will use these computers without a monitor. Perhaps the authors of these bills feel that similar legislation in the past has inundated schools with unneeded televisions that can be scavenged for this purpose. Further, only H.R. 2417 requires that the contribution contain some form of secondary storage. Once again it is hard to imagine nontrivial uses of computers with this deficiency.

[5] Particularly worrisome in this regard is the fact that neither H.R. 701 nor S. 108 require the approval of the school district's governing board for the contribution. Presumably, schools and teachers may act unilaterally.

[6] Some bills contain additional provisions that are beyond our immediate concern. S. 108, for example, provides for tax credits to corporations that provide teachers to vocational schools. H.R. 3750 allows for funding of Teacher Training Institutes, and so forth. However, the nucleus of that portion of each bill relevant to our discussion is reflected in Figure 3.

Although few bills require that monitors and peripherals be included in the contribution, all bills make allowances for them. However, not all allowances are intuitive. H.R. 91, H.R. 701, and H.R. 2417 require that, if peripherals be contributed at all, they must be contributed by the same manufacturer that contributed the CPU. It is not obvious how any particular public benefit accrues by excluding manufacturers of plug-compatible peripherals.

Further all nonallocation bills except S. 108 specifically allow for the contribution of "any installation equipment." The public should be aware that a liberal reading of this provision would include such equipment as air purifiers, temperature/humidity control systems, static control products, and computer furniture. Such a liberal interpretation could extend this questionable tax incentive to a variety of industries.

Legislation Too Hastily Conceived

To be sure, the aforementioned are not the only areas of concern. Only four of the bills require that the contributed property be under some sort of warranty. Again, only four make mention of a concern that the equipment be determined in advance to be suitable for use in an educational environment. Further, each of the bills requires that the donee guarantee compliance with the terms of the bill only to the contributor. This last provision is perhaps the strangest feature of all.

As the above discussion illustrates, much of the legislation at hand seems poorly conceived and hastily prepared. What is most disappointing about them all is that they appear to approach a worthwhile goal with strategies that guarantee abuse.

As mentioned earlier, there already exist adequate incentives, both in section 170(e)(1) of the IRC and in

TABLE I. Major Features of Pending Computer Contributions Legislation

	H.R. 91	H.R. 701	S. 108	H.R. 2417	S. 1194	S. 1195	H.R. 3098
Date of Introduction	1-3-83	1-6-83	1-26-83	5-3-83	5-3-83	5-3-83	5-23-83
IRC	170(e)(1)	170(e)(1)	170(e)(1)	170(e)(1)	170(e)(4)	170(e)(4)	170(e)(4)
Duration	1 yr	1984	open	1 yr	5 yrs	5 yrs	5 yrs
Focus							
Public Schools	X	X		X	X	X	X
Low/Mid Inc. Public Schools	X[1]						
Vocational			X			X	
Higher Ed.					X	X	X
Museums					X		X
Prisons					X		X
Allowed Contributions							
Hardware	X	X	X	X	X	X	X
Software				X	X	X	X
Noncomputer Instruments					X	X	X
Services					X	X	X
Max. Corporate Contribution	open	open	open	open	20% of annual sales		
Max. Corporate Deduction	open	open	open	open	10% of annual taxable income		
Restrictions on Contributor							
-must be manufacturer	Y	Y	N	Y	Y	Y	Y
-max. age of equipment[3]	6 mos	6 mos	open	6 mos	6 mos	6 mos	6 mos
-unused	Y	Y	open	Y	Y	Y	Y
-100% contribution	Y	Y	Y	Y	Y	Y	Y
-plan[2]	N/R	N/R	N/R	Y	Y	Y	Y
Max. Deduction/Unit (% of basis)							
Hardware	200%	200%	200%	125%	200%	200%	200%
Software	N/A	N/A	N/A	N/A	FMV	FMV	FMV
Hardware Requirements							
Languages Supported	3	3	open	3	3	3	3
Min. Primary Storage	32K	32K	open	16K[4]	16K[4]	16K[4]	16K[4]
Monitor Required	No	No	No	Yes	Yes	Yes	Yes
Peripherals Required	none	none	none	DISK only	none	none	none
Must be Suitable for Educ. Use	N/R	N/R	N/R	Y	Y	N/R	Y
Must be Covered by Warranty	N/R	N/R	N/R	Y	Y	Y	Y
Restrictions on Use							
-primarily for student education	Y	Y	Y	Y	Y	Y	Y
-compliance guarantee	Y	Y	Y	Y	Y	Y	Y
-governing body consent	Y	N	N	Y	Y	Y	Y

LEGEND: N/A = not allowed N/R = not required FMV = fair market value

[1] At least 75% of total contribution must be to low/middle income schools.
[2] Four bills require that contribution be made pursuant to written plan guaranteeing equitable distributions of property.
[3] Since date of manufacture.
[4] Must be expandable to 48K.

the advertising potential to the contributors, to encourage manufacturers to provide the school systems with additional computational resources. That the greater use of computers and CAI in public schools and universities is desirable is not open to serious doubt. In an appropriate context where use is supervised by skilled personnel, computers have great pedagogical value. However, in the absence of such a context they will be of marginal utility and may even detract from the learning experience.

The indiscriminate acquisition of computing resources that these pieces of legislation encourage will accomplish no more than more conservative approaches that require that the donee justify both the need for the resources and the ability to use them effectively prior to the actual acquisition.

In sum, the lack of public control over the contributions together with the enormous potential costs force me to seriously question the wisdom of enacting this type of legislation.

REFERENCES

1. Bentsen and Chaffee, *High Technology Research and Educational Development Act of 1983*, 98th Cong., 1st sess., May 3, 1983, S. 1195.
2. Brown, E.G., Jr. Computers and the schools. *T.H.E. J.* 10, 1 (Sept. 1982).
3. Danforth, *Technology Education Assistance and Development Act of 1983*, 98th Cong., 1st sess., May 3, 1983, S. 1194.
4. Donnelly, *Computer Equipment Contribution Act of 1983*, 98th Cong., 1st sess., Jan. 3, 1983, H.R. 91.
5. *Federal Tax Regulations*. Prentice-Hall, Englewood Cliffs, N.J., 1983.
6. Grassley, untitled, 98th Cong., 1st sess., Jan. 26, 1983, S. 108.
7. *Internal Revenue Service Code of 1954* (as amended by public laws enacted subsequent to Public Law 591, Aug. 16, 1954). Prentice-Hall, Englewood Cliffs, N.J., 1983.
8. Larson, E. The sun sparkles, palm fronds sway, disk drives whir. *Wall Street J.* (July 20, 1983).
9. Stark, *Technology Education Assistance and Development Act of 1983*, 98th Cong., 1st sess., May 23, 1983, H.R. 3098.
10. Stark, et al., *Computer Contribution Act of 1983*, 98th Cong., 1st sess., Jan. 6, 1983, H.R. 701.
11. Wirth, et al., *Computer Literacy Act of 1983*, 98th Cong., 1st sess., Aug. 3, 1983, H.R. 3750.
12. Wright, *Computer Contribution and Teacher Training Act of 1983*, 98th Cong., 1st sess., Apr. 5, 1983, H.R. 2417.

Author's Present Address: Hal Berghel, Dept. of Computer Science, University of Nebraska, Lincoln, NE 68588

Congressman Stark and Professor Berghel were given the opportunity to respond to each other's viewpoints

Berghel's response to Stark:

Apparently, Congressman Stark and I are one concerning the specifics of the proposed legislation. Our disagreement concerns only the desirability of enacting the proposed legislation, and the anticipated overall tax consequences. In his words, this sort of legislation is "... one of the best marriages of a variety of interests..."

My belief, to extend his metaphor, is that this is going to be an extremely expensive wedding, and that the cost of the nuptials should be borne by the betrothed and not by the federal tax payer.

According to Stark, the estimated cost to the taxpayer of H.R. 701 would be $60 million. Let's assume for the moment that the donated equipment would in every case be complete (i.e., no additional software, peripherals, furniture, etc., would be needed to gain full advantage of the donated computers).

At an average "donation cost" to the taxpayer of $1,000 (92 percent of the manufacturer's cost of production), the number of computers to reach the schools would be 60,000. In the U.S., there are 40 million students currently enrolled in primary and secondary schools. The projected $60 million thus buys only one computer for every 663 students. I can't imagine that a school district would be content with this ratio. I conjecture that the public expense of H.R. 701, or any of its siblings, will be very much greater than the estimate.

Consider that the proponents of H.R. 3750 claim that computer resources sufficient to promote computer literacy would cost $3 billion over the next 10 years. Stark's figures seem suspect to me.

Even if the estimates were low by a factor of 10, the price would be justified if a genuine deficiency in our educational system were overcome. Stark seems to believe that one of our primary educational objectives should be to expose our children to computers.

My feeling is that our goal should be to prepare our children for computers. For a student well-grounded in formal logic, discrete mathematics and the physical sciences, computer literacy will be a breeze. In the absence of such training, no degree of "exposure" to computers will overcome their deficiencies.

In my view, if there is a genuine deficiency in our educational system, it is that it has lost sight of the objectives of a diversified, well-rounded education—not that it has failed to keep pace with technological change.

Of course, my previous remarks are concerned primarily with the issue of computer literacy (i.e.,

where the computer is the object of study). In addition, the computer may be an instrument for study—an instructional tool of enormous pedagogical benefit when used in an appropriate context by skilled personnel.

But the key to success is selective placement in subject areas where the skill levels of the instructional staff justify acquisition. For example, the use of LOGO to teach mathematical concepts could be of significant instructional value. However, little benefit accrues to the use of LOGO as an end in itself. In the few examples that I have seen of the use of LOGO in the public schools, the emphasis has been more on this latter use than on the former. I have doubts whether Papert's objectives are being realized. All too often the students are more concerned with the use of the Turtle to draw on the CRT than with geometrical concepts. And the influx of computers into the public schools will do little to change the situation.

Although the previous reflections bear little on the topic, they illustrate why I think that the unrestricted acquisition of computers by a school system is a bad idea. I cannot imagine how a school system could resist the offer of "free" computers, irrespective of whether their need is real or imagined. For this reason, I disagree that the schools will gain computer equipment "... that the taxpayer would be buying sooner or later." If required to justify their computer acquisitions, school systems would be found to have much more modest and purposeful computational requirements.

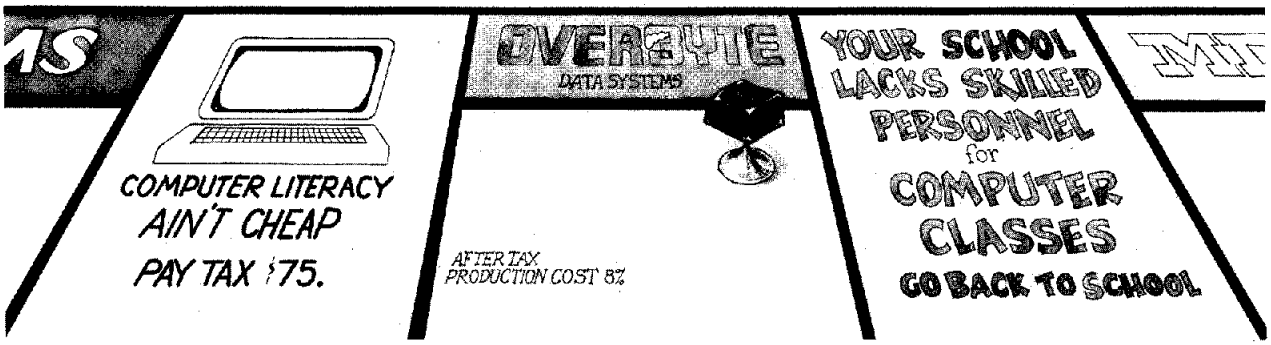
I remarked in my article that such legislation as H.R. 701 "... will not in and of itself encourage companies to manufacture equipment solely for the purpose of donations, (but) it will dramatically reduce the risks of over-production."

The legislation under consideration reduces these risks so long as there are school systems that will accept these donations. If a manufacturer thinks there is a 90 percent probability there will be a demand for x units and a 60 percent probability there will be a demand for $x + y$ units, he or she may well overproduce knowing that, as far as the overproduction is concerned, the worst case is an 8 percent loss on y units. One would certainly be more willing to gamble in this case than if the worst case were a 100 percent loss.

As I have argued, the cost of the proposed legislation seems to far outweigh any public benefits that might accrue. This is not to deny that there are educational advantages to the use of computers in the schools. In some circumstances, mathematical, logical, and scientific concepts may be better taught in a carefully prepared experimental environment. Involvement in practical projects often times generates enthusiasm that would not otherwise be present. Further, computer experiences may even make abstract concepts more comprehensible.

But these observations do not support the claim that a significant increase in the number of computers in the schools will translate into a significant increase in student performance. We need to get away from this more-is-better syndrome and focus our attention on the quality of the educational experience rather than the quantity of teaching aids available. We have ample evidence that teaching aids are not the primary determinants of a successful educational environment.

Stark has done little to assuage my fears that the proposed legislation does little more than provide a method of indirectly subsidizing computer manufacturers. In addition, and for reasons given earlier, this legislation is as a whole poorly thought through.



Stark's response to Berghel:

The ideal result of the enactment of H.R. 701 would be that it would put computers in every school in the country. However, that is not expected to happen. The law is not compulsory; firms are not obligated to donate computers. Also, with a sunset provision of one year, there literally is not enough time for companies to produce enough excess computers to put one in every school, even if they wanted to. Based on these assumptions, the revenue impact would be limited.

Berghel's analysis fails to really come to grips with the underlying premise of H.R. 701, which is that the bill puts computers into schools. Berghel does not seem to have made up his mind as to whether he wants computers in schools or not. He argues both that computers are useful learning tools and that they are really unnecessary in schools.

Children can be taught without computers. Students have learned without them for centuries. Chil-

dren also learned well before blackboards became an integral part of the teaching process. Yet, the advantages of computers in teaching children are not only recognized by Berghel, but by children, educators, parents, school boards, etc. That computers can contribute greatly to learning in schools has become virtually axiomatic. Yet, these machines are not meant to replace teachers, only to supplement them.

The kind of learning I am talking about should not be confused with creating tens of millions of computer programmers. Programming could be taught, but not everyone needs to know how to program, just like everyone does not need to be an auto mechanic to take full advantage of a car.

Computers can present concepts in innovative ways. They can be tailored to the fast or slow learner. We are only beginning to realize the learning potential that computers can provide. And this potential increases daily with the introduction of new innovations in equipment and software.

Berghel expresses concern that children will doodle with computers and not utilize the learning potential of the machine. I suggest that that is no different than a child doodling with pen and paper. Just because a student uses a learning device to play with hardly means that person should be denied access to it.

The underlying current of Berghel's arguments seems to be that something inherently evil is being done to the federal tax code to the detriment of generations of American taxpayers. I do not believe that is true. The tax code is being used as a tool to provide learning opportunities for our children. If computers are not going to become an integral part of the future, then there is no need for this legislation. However, it is my belief that computers do represent the future and that the sooner we can begin to put computers in schools the better.

Yes, this legislation will cost the taxpayer money. Yes, it will cause a distortion in the tax code for one year by adding a "loophole." But the ultimate impact of H.R. 701 is worth it. It is a bridge to the future for our children.

CR Categories and Subject Descriptors: K.3.1 [**Computers and Education**]: Computer Uses in Education; K.3.2 [**Computers and Education**]: Computer and Information Science Education; K.4.1 [**Computers and Society**]: Public Policy Issues
General Terms: Economics

Received 9/83; revised 1/84; accepted 1/84