Beyond the Chip: A Model for Fostering Equity

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Arguing that current and soon-to-be-available technologies offer unique and unprecedented possibilities for improving instruction and increasing learning, this article identifies probable obstacles to the exploitation of those opportunities for all types of students, including female, handicapped, inner-city and rural, minority, disadvantaged, and average learners. A two-tiered model is presented for the school library media specialist to apply in addressing the critical issue of equity of access to technology.

> O Wonder! How many goodly creatures are there here!
> How Beauteous mankind is! O brave new world
> That has such people in `t!
>
> —William Shakespeare, *The Tempest*
> V.i. 181-184

Miranda's excitement over Shakespeare's magic island has been echoed many times over the centuries. Today, those echoes might easily refer to the "many goodly creatures" described elsewhere in this special issue: CD-ROMs, artificial intelligence, hypertext, and more. Indeed, there is no question that the tools currently or soon to be in educators' hands offer unique and unprecedented possibilities for improving instruction and increasing learning. The challenge lies in exploiting those opportunities for all segments of "beauteous mankind": female as well as male, handicapped as well as nonhandicapped, inner-city and rural as well as suburban, minority as well as majority, disadvantaged as well as privileged, average learners as well as both ends of the ability spectrum. The purpose of this paper is to address that challenge-first, by identifying probable obstacles to achieving educational equity through and with emerging technology and, second, by offering a two-tiered model for the school library media specialist to apply in addressing this critical issue.

Computers and Equity

History does not suggest that equitable access to and use of the newest technologies will happen automatically or even easily. A number of studies and reviews of equity in computer-based education have described a full spectrum of problems associated with this first and simplest educational incarnation of the chip.(1) At the most basic, or "counting" level, it has become a truism that wealthy school districts own more computers than impoverished ones and that they augment their numbers so rapidly that the gap between rich and poor schools is widening rather

than shrinking. At a more subtle level, Daniel Watt's often-quoted finding suggests a less visible but arguable more pernicious problem in the ways the equipment is used: "When computers are introduced into suburban schools, it is often in the context of computer programming and computer awareness courses. In less affluent, rural or inner-city schools, computer use is more likely to be in the context of computer-assisted instruction of the drill and practice variety. Affluent students are thus learning to tell the computer what to do while less affluent students are learning to do what the computer tells them."(2)

An ERIC search completed for this paper revealed over 130 documents dealing with various aspects of the computer equity issue. This collection includes research reports, position papers, conference presentations, and suggestions for resolving inequities. It documents inequitable patterns not only in regard to financial status but in regard to race, gender, geography, handicapping condition, and level of academic ability as well. Throughout this literature, authors have chronicled widespread inequity in access to computers, described patterns of inequitable distribution and use of computers within and across schools, and delineated disturbing implications of such patterns for individuals and society. The picture is bleak. As Lipkin noted, "Computer literacy . . . represents the basis for creating a further schism between the 'haves' and the 'have nots' . . . Thus the economically and educationally disadvantaged are prime candidates to join the ranks of this new category of disadvantaged-the computer nonliterate."(3)

Equity and the New Technologies

Although assessments of the impact on equity of the newer technologies are not yet available, it is clearly time to consider that issue. History suggests that that technological inequity in education appears early and endures indefinitely. And even a basic understanding of the new technologies suggests that they are so different, so powerful, so little understood-and initially, at least, so expensive-that opportunities for inequity are likely to increase. It is startling to realize that the serious issues of equity occasioned by the simple microcomputer will become even more critical and subtle as more powerful and sophisticated tools appear in the schools. Without careful and active attention, our "brave new world" could become more like Huxley's than Shakespeare's. Evidence of such attention is beginning to appear. In addition to documenting and explaining current problems, the literature is starting to suggest that the newer technologies can offer an escape route from present inequities rather than a road to future ones. At the federal level, at least three major documents of interest to school library media specialists incorporate such a viewpoint into their wide-ranging and informative treatments of technology and education. *Transforming American Education: Reducing the Risk to the Nation* presents to the Department of Education the report and recommendations of the National Task Force on Educational Technology convened in 1984 by the-Secretary Terrel H. Bell.(4) *Rethinking the Library in the Information Age* provides similar information gathered under the auspices of the Office of Library Programs of the Department of Education.(5) *Power On! New Tools for Teaching and Learning* presents the results of the Office of Technology Assessment study commissioned by the House of Representatives Committee on Education and Labor and its Subcommittee of Select Education.(6) All three documents reveal an awareness of the problems of the past and present but suffuse these with a recognition of the promise of the future. Perhaps the following excerpt from *Transforming American Education* best exemplifies this approach:

Information technology represents a powerful array of tools that when creatively applied and appropriately integrated will meet three fundamental goals:

1. Improving the quality of learning.
2. *Increasing equity of opportunity, access, and quality* [emphasis added].
3. Enduring greater cost effectiveness.(7)

Professional organizations that represent school library media specialists are taking a similar track. The Association fir Educational Communications and Technology (AECT), for example, was involved with the Department of Education Task Force throughout its work and continues to serve as the primary disseminator of its findings.(8) The American Association of School Librarians (AASL) played a prominent role in the development of the American Library Association (ALA) Presidential Committee's Statement on Information Literacy, which addresses the importance of technology in an "information age school."(9) And AECT and AASL together, acknowledging the enormous and continuing effect of emerging technologies on school library media programs, issued a joint challenge in Information Power: Guidelines for School Library Media Programs: "To ensure equity and freedom of access to information and ideas, unimpeded by social, cultural, economic, geographic, or technological constraints."(10)

Publications on computing and education offer background information on equity issues as well as concrete suggestions for addressing them on a day-to-day basis. Articles have been sprinkled throughout this literature for several years in such journals as *Educational Technology,*(11) *Electronic Learning,*(12) and *Journal of Educational Computing Research.*(13) Perhaps the most consistently helpful and easily accessible of these resources is *The Computing Teacher,* which has published a number of "equity" articles,(14) offers an occasional column entitled "Action for Equity,"(15) and has devoted two issues(16) to technology and the kinds of students for whom equity has traditionally been a problem. In a similar vein, *School Library Media Quarterly* recently published a special issue in which excerpts from *Rethinking the Library in the Information Age* are infused with questions suggesting the importance and subtlety of this topic.(17)

The assumption underlying much of the emerging literature is the same one that had fueled the hype for many previous technological advances in education: the latest gimmick will solve all our pedagogical, motivational, financial, and societal problems. But history has demonstrated that such an assumption is never borne out. On the contrary, as noted above in the discussion of computers and equity, the introduction of new technology can exacerbate existing problems. If this recent history repeats itself, the advent of the emerging technologies will signal an unbridgeable widening of the gulf between those who are in society's mainstream and those who, for whatever reason, are in its eddies. Without deep commitment, strong leadership, careful planning, and consistent attention to equitable implementation, the promise of the "goodly creatures" will be subverted.

Equity and the School Library Media Specialist

A variety of factors have conspired to place the school library media center and its professional staff in the ideal position to meet the challenge posed by the implementation of new technologies

in educational settings. Traditional headquarters for media as diverse as the study print and the videocassette, the library media center offers the natural home for the newer technologies as well. More knowledgeable about the instructional uses of media than any of their colleagues on the instructional team, library media professionals embody the experience and expertise necessary to exercise the commitment, leadership, planning, and implementation mentioned above. Library media professionals touch all segments of the instructional enterprise rather than focus on any particular component of it; therefore, they have a broad perspective on the needs and abilities of various groups of students across the school. And charged by Information Power to ensure unimpeded access to information and ideas, library media specialists have the support of their major professional organizations to tackle the equity issue.

No single group or individual, of course, can resolve all existing inequities or prevent every new one. But inequity is often the result of oversight, of the absence of an advocate for those who are overlooked. And no one else within the school community is so uniquely suited to play the "equity advocate" role as the school library media specialist. While many people and organizations within and beyond the school have made important contributions to equity, no one else occupies such a potentially effective position for exerting both immediate and long-term influence. Tradition, training, perspective, and national mandate all suggest that the school library media specialist can-and should-play a key role in using both existing and emerging technologies to overcome problems and to enhance equity for all students.

A Model for Fostering Equity

Accepting the role of equity advocate does not necessarily imply undertaking a grand initiative. For the most part, it means infusing everyday activities with an awareness of the issue and looking for opportunities to address it carefully and systematically. The literature on computer equity suggests that a successful approach must comprise two tiers, general and specific. Each tier itself includes a series of closely related steps for enhancing equity within the school library media center and across the wider constituency the library media specialist serves.

General Steps for Equity

At a general level, addressing equity has four major dimensions. The first—gathering and interpreting information—not only draws on the traditional skills of the library media specialist but provides the basis upon which the latter three rest. The other dimensions, which involve using the information in ways that can affect policy and planning at a variety of levels, are critical to establishing a context in which efforts for equity can achieve success.

Become knowledgeable about both the potential value and the potential problems in regard to equity that are inherent in each of the emerging electronic tools. This paper and the references cited in its tables and endnotes offer a baseline for becoming informed about the issue. Reading the documents, contacting staff members of the projects cited, and gathering additional information are obvious first steps. Table 1, "Selected Sources of Information on Technology and Target Groups," lists the names, audiences, and services and publications of a range of agencies and organizations that provide information about the uses of technology for particular groups for whom equity has been a problem. The popular press also provides leads to current

developments that have implications for equity: *Time* Magazine's "Video" column, for example, has covered such stories as the federal government's Star Schools Project (a demonstration project in distance education) and the introduction of commercial, for-profit television programming into the classroom. When one has become attuned to the issue of equity, questions about uses of and access to technological breakthroughs become self-evident.

Table 1. Selected Sources of Information on Technology and Target Groups

Source	Target Audience	Services and Publications
Apple Computer Office of Special Education and Rehabilitation, Apple Computer Office of Special Education and Rehabilitation, 19925 Stevens Creek Blvd., MS 43S, Cupertino, CA 95014, (408) 974-7910	Handicapped students and adults	National Special Education Alliance, Electronic information exchange, *Apple Computer Resources in Special Education and Rehabilitation* (comprehensive resource guide)
Center for Special Education Technology, Council for Exceptional Children, 1920 Association Dr., Reston, VA 22091, (800) 873-8255	Handicapped students and adults	Resource inventories, Electronic bulletin board, Regular publications
Computer EQUALS, Lawrence Hall of Science, University of California, Berkeley, CA 94720, (415) 642-1823	Female students, minority/ disadvantaged students	Curriculum materials, Reports, Newsletter, Technical assistance, Off and Running (teaching manual)
IBM National Support Center for Persons with Disabilities, P.O. Box 2150, Atlanta, GA 30055, (800) 426-2133	Handicapped students and adults	Resource guides, Electronic information exchange, Reports on new products
ISTE, University of Oregon, 1787 Agate St., Eugene, OR 97403, (503) 686-4414	Minority/disadvantaged students, female students, handicapped students	*The Computing Teacher* (journal), *Yes I Can! ECCO's Equity in Technology Project* (book; Summer 1990)
PEER, NOW Legal Defense and Education Fund, 99 Hudson St. (12th floor), New York, NY 10013, (212) 925-6635	Female students and adults	Reports, Technical assistance, Newsletter, *Debugging the Program* (kit)
Sex Equity in Education, Women's Action Alliance, 141	Female students and adults	Staff development, Various materials, *The Neuter*

Fifth Ave., New York, NY 10011, (212) 532-8330		*Computer* (resource guide and teaching manual)
Sex Equity in Education, Women's Action Alliance, 141 Fifth Ave., New York, NY 10011, (212) 532-8330	Female students and adults	Staff development, Various materials, *The Neuter Computer* (resource guide and teaching manual)

Raise awareness of equity concerns among administrators, teachers, school board members, and others in decision-making positions. Planners and decision makers at all levels—local, district, state, and national—must be reminded to "think equity" and to take steps to achieve it. Raising awareness can be accomplished both informally, through day-to-day contact and discussion, and formally, through making presentations at meetings, scheduling speakers for in-services and other programs, and designing information sessions about the problems and possibilities for equity in the implementation of new and expensive technology. The school library media specialist can fill a critical role by providing information to decision makers that can bring important issues to light and lead to suggestions of alternatives that minimize inequity.

Consider long-range and policy implications for equity as well as immediate needs. Focusing on immediate needs can introduce practices that result in unintended inequity. The present pattern of male-dominated computer use, for example, results more from inadequate vision than from conscious efforts to exclude other groups. Nevertheless, that pattern is not only likely to transfer to the new arena of networked computers but also to continue indefinitely into the future unless its long-term implications are recognized and considered. As an advocate for equity, the school library media specialist must draw upon knowledge of past practices to suggest farsighted approaches for the future. Policies and plans must promote equity for tomorrow's students as well as today's.

Provide informed and committed leadership for equity as the acquisition and implementation of new technologies are planned. Volunteering to serve on appropriate committees within the educational system as well as within professional organizations will provide opportunities to exercise leadership and influence policy. Unless people who are knowledgeable about and committed to using technology to promote equity serve in such capacities, opportunities will be lost. Advocacy implies active involvement, and the library media specialist can provide a vital service by working diligently to acquire information, to provide it to appropriate individuals and groups, and to propose and support general policies and specific plans that promote equity at every level.

Specific Steps for Equity

The library media specialist can take a number of measures to enhance equity within the library media center as well as beyond it. The following seven specific steps, like the four general ones

outlined above, are based on the literature on computer equity but are clearly applicable to promoting equitable access to and use of the more advanced technologies as well.

1. Determine the adequacy of the numbers and types of hardware and software available at the school. According to *Power On!* the current national average of installed computers is one machine for every thirty public school students, while the desired ratio "often cited by school district personnel and educational technologists" is one for every three.(18) These overall statistics obviously mask differences in needs and numbers across a variety of factors, particularly school level. Nevertheless, the figures suggest that, in practice, assessing the adequacy of existing resources will almost always identify such a large hardware need that the acquisition of additional equipment will be justified.

Determining the exact configuration of equipment needed will, of course, depend upon local needs, goals, and curricula. Assessing the adequacy of the software for the equipment will also depend upon an examination of local conditions—curricular goals and objectives, teachers' and administrators' priorities, student population, and gaps in the existing collection. In any event, while simply asking for "more of everything" will not solve equity problems, having more will certainly improve the chances of spreading the resources among more kinds of students. And including on purchase orders such items as software thought to appeal to girls (e.g., programs that incorporate nonviolent fantasies) and adaptive input and output devices designed for the handicapped (e.g., guarded keyboards for the physically impaired and large-print monitors for the visually impaired) will open the spectrum of the resources to a much wider audience.

2. Determine additional funding needs, explore additional sources of funding, and make funding for additional hardware and software part of long-term plans. Electronic technology is far more expensive than chalk and slate, and the new technologies will require a substantial initial investment and a long-term commitment to maintenance and upgrading. Clearly, district and building budgets as currently constituted cannot absorb the full costs. In addition, such traditional sources of "extra" funds as the PTA are also unlikely to be adequate. Planners and policymakers must exercise vision and creativity in recognizing the need for ongoing expenses for the new technologies—and for achieving equity through them—and in devising ways to meet this goal.

Many of the most glaring examples of inequity exist across district lines rather than within districts or schools; long-term, widespread solutions to these problems must await national political attention. Nevertheless, individual districts and schools can take steps to address their own immediate needs. Both the public and the private sectors offer sources of additional funding, and the school library media specialist should investigate these. The federal government and almost all state governments provide some funding for technology and education. Foundations and corporations are also emerging as important sources for grants of funds and equipment for school initiatives in technology: computer companies like Apple, IBM, GTE, Commodore, and others have all supported various programs. Standard Oil of Ohio (now BP America) funded the first three years of the equity projects of the Educational Computer Consortium of Ohio noted below. In addition, local businesses as well as national corporations are becoming increasingly aware of the need to assist in the funding of educational improvement in order to serve our nation's changing student population and to maintain our country's position within the world

economy. The Committee for Economic Development, for example, provides general information about business involvement in education.(19) The National Business Roundtable booklet entitled *Business Means Business in Education* lists almost 200 examples of school/business partnerships across the country, a number of which are designed to address equity.(20)

3. Ensure equitable scheduling for all segments of the student body. Is all the school's computer time being used by the gifted and talented classes? By the Chapter 1 students? National data suggest that the former scheduling pattern is more likely, but both patterns result in restricted access and disparate applications. Until the additional funding requested in Step 2 results in the additional hardware and software mentioned in Step 1, the library media specialist should take care that patterns of inequity in regard to both old and new technologies are avoided. Despite the constraints imposed by curricular, logistical, and other considerations, equity requires that all students have reasonable access to computers and to whatever other electronic tools appear in the schools.

Equipment location is a key element in scheduling this access. The school library media specialist should take the lead in arguing for the placement of equipment in a central location, accessible by all students, rather than only in labs and classrooms restricted to particular student groups. Locating old and newer technologies where students can use them on their own time—at lunch, during study hall, and before and after school—is a particularly important strategy. It will enable the school library media specialist to schedule periods of open access to the equipment so that students who might otherwise have limited or no opportunities to use it can explore its possibilities.

4. Identify and remove both overt and subtle biases from curricula, course outlines, and uses of technology by different groups. Both kinds of bias are problematic, but the subtle aspects of inequity are more difficult to pinpoint and to address. In her interviews with the experts, Zakariya uncovered a number of the more elusive aspects of computer inequity.(21) For economically disadvantaged students, the problems

center on the absence of programming instruction and enrichment activities and the use of the computer exclusively for drill and practice and for business and vocational courses. For girls in nonacademic tracks, the problems often involve curricular offerings leading to lower-paying computer operator jobs rather than to the computer-related jobs in drafting and accounting pursued by boys in such tracks. For handicapped students, the lack of special software and a similar lack of information about adapting "regular" software to meet special needs leaves many of those needs unmet. For all students, unnecessarily difficult prerequisites for computer courses can restrict these offerings to academically gifted students with a special talent for mathematics. Many of these subtle inequities seem to be the unforeseen consequences of laudable attempts to address students' individual needs and aspirations. Nevertheless, using computers in these ways perpetuates stereotypical patterns and consigns many students to be servants rather than masters of the technology. Such subtle and complex issues will certainly provide the most challenging obstacle to the equitable use of the emerging technologies as well as of the microcomputer.

The library media specialist is ideally placed to work at forestalling the subtle problems that are sure to emerge. Responsible for providing services across the curriculum, the library media specialist is likely to be more aware of the scope of the curriculum than anyone else in the school. In addition, through maintaining collections of syllabi and guidelines as well as systematically collecting curriculum information,(22) library media specialists have a unique vantage point for identifying any possible biases across the curriculum and within individual courses. Capitalizing on this perspective, actively planning for equity, questioning assumptions about the "appropriate" uses and users of each new tool, and keeping the issue alive in the local environment are especially critical strategies for fighting subtle and unintended inequity.

5. Actively promote appropriate use by target groups. Every school employee, of course, can contribute to efforts to foster equity. In particular, however, female, minority, and handicapped personnel should be encouraged to offer technology courses and advise technology clubs so that target students will recognize that technology holds something for them, too. Recruiting these students into such activities is a similarly straightforward promotional strategy. Scheduling classes specifically for target students is also an option: learning to use a word processor can benefit resource-room English classes as well as advanced ones; remote instruction can benefit the vocational student who wants to learn about auto mechanics as well as the physics whiz who wants to learn about superconductivity. Using peer tutoring to help target students learn CD-ROM database searching can have multiple benefits: not only can it expand opportunities for the tutees, it can make the tutors partners in enhancing equity in the present and sensitize them to the issue for the future.

Building positive attitudes toward using technology is a critical element in promoting appropriate use; once again, the school library media specialist has a key role to play in this complex and subtle area. Only when students perceive using the equipment as personally attractive—nonthreatening, useful, and empowering—will they exert the effort necessary to take charge of the technology. If equipment is housed in the library media center, staff can promote uses of it that are likely to build such perceptions. When students can use the technology for their own purposes (e.g., to create personal products and to explore intriguing applications) and in an informal atmosphere (e.g., in collaboration with one another), they can be guided to discover the importance of technology as an attractive tool that expands their own abilities and affords them a measure of personal control.

6. Develop strategies for using various technologies effectively with target groups. Reaching target students, like counting pieces of equipment, is a simple step compared to the steps that follow. Fortunately, a number of efforts for promoting equity with microcomputers can serve as models for promoting equity with the newer technologies. Table 2, "Exemplary Efforts to Promote Equity in Computer Access and Use," summarizes several such efforts for enhancing equity both within and beyond the school library media center. The strategies range from such simple approaches as scheduling special classes during and after school to such elaborate ones as planning and outfitting a mobile unit to deliver the technology and related instruction to targeted students' homes.

Table 2. Exemplary Efforts to Promote Equity in Computer Access and Use

Project and Contact Person	Target Audience	Strategies
Computers and You, David Autor, Glide Memorial Methodist Church, 330 Ellis St., San Francisco, CA 94102, (415) 922-7593	Minority/disadvantaged families	Walk-in computer center, After-school classes, Preschool program
Detroit Public Schools, Geraldine Carroll, Lawton Building, 9345 Lawton St., Detroit, MI 48206, (313) 494-0915	Minority/disadvantaged families	Parent workshops, Hardware/software lending, Telecommunications
Equity in Technology Projects, Alice Fredman, c/o ECCO, 1123 S. O. M. Center Rd., Cleveland, OH 44124, (216) 461-0800	45 projects: minority/disadvantaged, female, learning disabled, and physically disabled students	Telecommunications, Science projects, After-school courses, Parent/child teams, Parent/child workshops, Hardware/software lending, Peer tutoring, In-school courses
Fairfax County Public Schools, Marvin Koontz, Office of Instructional Technology, 4414 Holborn Ave., Annandale, VA 22003, (703) 978-0075	Minority/disadvantaged students	Computer labs, Grants, Long-range plan
Houston Independent School District, Patsy Rogers, Dept. of Technology, 5300 San Felipe, Houston, TX 77056, (713) 960-8888	15 projects: minority/disadvantaged students	After-school courses, Hardware/software lending, Hardware discounts, Techmobile, Parent/child training, Computer camps, Technology fairs
Playing to Win, Antonia Stone, 1449 Lexington Ave., New York, NY 10128, (212) 410-1694	Minority/disadvantaged families	Walk-in computer center, Technical assistance, Publications
Project MiCRO, Carol Edwards, Southern Coalition for Educational	Minority/disadvantaged students, female students	Teacher training, In-school courses, Parent involvement

Equity, 1293 Peachtree
Street, NE, Suite 226,
Atlanta, GA 30309, (404)
874-5199

The details of the projects can be learned either by reading the appropriate references for this article or by contacting the individuals listed in the table. In addition, some common elements extracted from the projects suggest general ideas that can be adapted to other settings. Many of these ideas are noted in the steps above as well: securing additional equipment, increasing the amounts and kinds of access necessary for target groups through innovative scheduling, and locating materials designed to promote equity with target groups. Other major strategies involve moving beyond the library media center itself to involve parents and other members of the community in efforts for equity: providing training for parents as well as students, finding ways to get hardware and software into the homes of those who would not otherwise have access to these resources, offering summer camps and special technology fairs for target groups. One of the most ambitious projects—Playing to Win—is a privately funded Computer Center visited by approximately 700 economically disadvantaged people each week either to use one of the Center's computers or to borrow one to take home (see Table 2).

7. Explore ways the new technologies can be used to promote equity. Like the microcomputer before it, emerging technology is being touted as the great equalizer. As reported by Bruder, equity is in fact the primary impetus behind distance education: the satellite dish will increase access and opportunities for students who live in remote areas; who endure illnesses and physical disabilities that keep them out of classrooms; who need remediation that requires individual rather than group attention; and who attend schools that cannot afford the latest technology, the most advanced courses, and the most skilled teachers.(23)

Clearly, the tools appearing on the horizon can vastly expand the horizons of all these groups. Demonstration projects in various parts of the country are already exploring some of the possibilities.(24) It is equally clear, however, that widespread equity will never occur unless specific plans are made in each school to include those who are too often overlooked. Will teleconferencing permit electronic field trips to museums and labs? Fine—as long as handicapped students get to go, too. Will interactive television enable students to take courses not offered locally? Fine—as long as minority students get to take them, too. Will networking allow students across the country to collaborate on science and communication projects? Fine—as long as females collaborate, too. Will expanded online services empower students to gain and use more information than they dreamed existed? Fine—as long as these undreamed of possibilities are made available and attractive to all the students in the school. Will someone make sure that they are? That is the key question.

Conclusion

Left to chance, the opportunities presented by the new technologies will elude the same groups who have been underserved by the computer revolution. Inclusion of these groups will not happen automatically, and exclusion will have dramatic consequences for both individuals and society. Assumptions about the equity benefits "beyond the chip" are at present just that—assumptions. To bring them to life in the day-to-day business of the school, someone—the school library media specialist—must exercise awareness, commitment, leadership, planning, and careful implementation of a model involving both general and specific steps. Without such a catalyst, equitable participation by all students will be as illusory as the wonders on Shakespeare's island.

On that island, Prospero responds to his daughter's naive enthusiasm with the cynicism of one who knows that promise often goes unfulfilled: her "brave new world" is "new to *thee*," he chides, knowing from experience that "such people" can be monsters rather than models. The challenge for the school library media specialist, then, is to prevent either Prospero's pessimism or history's precedent from prevailing with the new technologies. The challenge is to preserve Miranda's faith in her "many goodly creatures"—to discover ways to use these powerful and exciting new tools to maximize educational benefits for all students.

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