Modems, Megabytes, and Multiple Intelligences

Smart ways to use the computer

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Mike is in third grade, and cannot sit still for even a few minutes. He hates reading, writing, and spelling, and consequently does poorly in all three. To help Mike master spelling and writing, the teacher had him copy each spelling word a number of times. When Mike (and his mother) asked if he could practice his words on the computer, the teacher said, "No, he has to write them out longhand." Mike would give almost anything to work on the computer, but his teacher has not yet seen the value of incorporating it into her teaching.

A partial answer to Mike's learning problem—and his teacher's teaching problems—is literally at his fingertips. Unfortunately, his teacher knows nothing about computer technology or the Multiple Intelligences Theory. Mike will probably not finish school unless someone helps him learn to use technology and his own intelligences.

Teachers feel, and rightly so, that students must master certain basic skills and knowledge. They also know that students learn in different ways, and thus seek to provide creative experiences to help them learn more effectively. A persistent prob-lem in education is how to accommodate the learning needs of each child.

A solution to both of these problems lies in integrating Multiple Intelligences Theory and computer technology. Students can thereby master basic skills while teachers adapt instruction to the learning needs of all of their pupils.

Curriculum approaches to MI theory incorporate activities from a wide range of areas to help students learn material and develop skills through the use of as many intelligences as possible. Integrating computers (and technology in general) into the curriculum offers excellent opportunities to teach through the seven intelligences. Listed below are some ideas for various computer activities and software programs that utilize a variety of intelligences. (A profile of the Multiple Intelligences Theory described by Howard Gardner can be found on page 10.)

Linguistic—Word Smart

Every age group can benefit linguistically from the use of a computer. Early-grade students can have their oral stories

keyed in by a teacher or can speak directly into the computer and get a written record of their linguistic efforts. Using the keyboard, students can develop writing skills long before they have the fine motor skills to use pencil and paper. Students produce more and better written work when they use word processors. When programs like Microsoft Word, Word Pro, and WordPerfect are combined with a spell checker, thesaurus and grammar check, and creative teaching, students have a very powerful way to exhibit and enhance their linguistic intelligence. A myriad of creative writing programs such as *Storybook Weaver Delux, Imagination Express Series*, and *Bank Street Writer* are available. Programs to enhance language and reading skills also help develop linguistic intelligence. Such programs include: *A+LS Language Series, American Heritage Talking Dictionary, Stickybear's Reading Room, American Poetry*, and programs that teach foreign language conversation skills. The computer opens the door to communicating, reading, and writing for both linguistically gifted students and those with learning disabilities.

Exchange of electronic mail between individuals and classrooms has helped students recognize the need for good linguistic skills and has opened avenues for communication. For example, students can write letters to President Clinton by addressing: president@whitehouse.gov. or visit the White House page on the World Wide Web (WWW). In the past year, the number of K-12 education resources accessible through telecommunication systems has grown tremendously. Students can communicate with their peers around the world via such programs as the *National Geographic Kids*

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Network. They can create their own WWW pages and share information,

projects, and research with the local community and the Internet community in general. (For suggestions, see the Summer 1996 issue of the JOURNAL.)

Logical/Mathematical—Logic Smart
In the early days of computer use, only logical/mathematically smart people worked with computers. Programming and spreadsheets were what computers were all about. At the present time, there are a number of ways to enhance and display students' logical/mathematical intelligence. Spreadsheets (e.g., *Microsoft Works, Lotus 1-2-3 Release 5*), which are the basis for business software, can also be used for problem solving. Simulation programs that combine linguistic, spatial/visual, and logical/mathematical skills (e.g., *Sim City, Oregon Trail*, and *Colonization'*) offer endless opportunities to stimulate logical and rational thinking at both elementary and secondary levels. Concept mapping is a valuable learning strategy whose usefulness may be limited by traditional

paper-and-pencil methods that get in the way of ideas students want to represent. Using a program such as *Inspiration*[2] allows students to graphically represent their understanding of an area of knowledge and to modify concepts and logical links at will. LOGO, a much-acclaimed artificial-intelligence program, is frequently used in the primary grades. It combines spatial/visual, linguistic, and logical/mathematical intelligences to do programming.

"Drill and practice" is still a useful way to build mathematical skills. But now, it is combined with color, animation, and sound. The old programmed instruction, which used only linguistic intelligence to teach basic math facts, now incorporates kinesthetic, musical, and linguistic intelligences (e.g., *Math Ace, Mastering Math, Clock*).

Musical—Music Smart

Music can be creatively taught via the computer, and using music with computer progams enhances the teaching of other subjects and material.

While much software uses music as accompaniment, the most exciting software allows the user to compose on the computer screen, with immediate playback of the composition and subsequent printing out of the score! Being able to immediately hear one's own composition is an incentive to anyone who deals with music. Composing is not restricted to writing notes on a staff and hearing the results. Students can hum a tune into a synthesizer, then have the computer reproduce the tune with any instrument they choose and a full rhythm accompaniment. This gives a whole new dimension to music composition! Even very young children (3 years old) can compose music by drawing colored shapes on a musical staff, then having the computer change their work into musical notation by using *Menulay's Musicland* from Computer Systems Research Institute.

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Kinesthetic—Body Smart

Of particular importance in technology education is the bodily/kinesthetic intelligence, which is so often overlooked or disregarded in Western culture. Gardner suggests that bodily/kinesthetic intelligence provides the third member of a trio of object-related intelligences: bodily/kinesthetic, spatial/visual, and logical/mathematical. A number of programs utilize eye-hand coordination to teach science or English. Highly interactive compact disk (CD) programs not only provide movement on the screen but also can be controlled by the student. Examples of such programs include:

• *Body Park CD*, which combines the linguistic, musical, logical/mathematical, and kinesthetic intelligences to teach about anatomy.

• *Opening Night CD*, which allows the user to select actors, costumes, stage props, and lighting choices and create, direct, and perform lifelike, onscreen plays.

• *Microsoft 3D Movie Maker CD*, which allows the student to write a plot, choose sets, shoot film, and cast movies.

Many CD simulations and games build fine-motor coordination and enhance logical thinking skills.

A number of programs combine hands-on experiments with computer projects (Venier Associates and LCSI/ Logo Computer Systems). Other programs offer interfaces between Lego blocks, gears, motors and wheels, and the computer. Science interfacing involves chemistry and physics; titration and acceleration experiments are two examples.

No longer does anatomy require an animal and dissection equipment; it can be effectively accomplished on the computer (e.g., *Operation Frog*).

Vicarious kinesthetic activities

can be accomplished via electronic mail. For example, students have communicated by electronic mail with the captains of a ship that sailed from San Francisco to New York City and charted the location of the vessel. One such program, easily accessible on the World Wide Web, is http://www.terraquest.com/galapagos/ which allows students to communicate with a group of writers, photographers, and scientists as they explore the Galapagos Islands.

Spatial/Visual—Picture Smart

Many software programs use spatial/visual intelligence. For example, artistic-effects software programs create the illusion of paint, charcoal, and pencil. Graphic-arts programs also allow the user to work in this intelligence. Some individuals have become skilled at creating computer graphics although they seemingly have little artistic ability with paper and pencil. For example, popular and powerful programs such as *Hyperstudio* allow students to create multimedia projects that combine many intelligences. *Painter 4.0* CD provides painting and drawing tools that look and feel real and has special features for animation, multiple layering, lighting, and texturing. *CorelDRAW3* CD allows for illustrating, charting, and photo-editing, includes clip-art images and symbols, and offers a variety of lettering fonts. Recent word processing programs incorporate both graphics and text manipulation. Desktop publishing provides powerful ways to utilize the spatial/visual intelligences on the elementary level (*Creative Writer*) and the post-elementary level (*PageMaker* and *Quark Xpress*).

Intrapersonal—Self-Smart

Nearly every aspect of the computer allows users to

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explore attitudes and ideas about themselves and to successfully complete games and projects, which helps them develop confidence in their abilities. For example, a program such as *Capture the Wind* encourages students to consider the issue of energy use and conservation and

offers excellent opportunities to apply Christian values in problem solving. As they construct and test their solutions to problems and projects, students typically experience a wide range of feelings, including a sense of pride and accomplishment from creating something. Additionally, online services such as Prodigy, America Online, and the Internet provide many opportunities for students to explore the ever-expanding world about them.

Interpersonal—People Smart

The computer nerd is traditionally considered a techno-wizard with no social skills, and computer use is often seen as a solitary activity. However, computer activities can easily be planned for cooperative learning groups. This challenges students to deal with their own feelings and those of other students working in the group. Coupling the computer with a video camera provides students with opportunity to reflect and

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present their ideas.

Computers also offer numerous opportunities for interaction with others through e-mail, bulletin boards, and "surfing the Net" to discover ideas and to react to them. One such program is the *National Geographic Kids Network*. This program puts young people across the U.S. in touch with their peers and with scientists, who share their data and analysis. SKOOLnet, operated from La Sierra University in Riverside, California, puts classrooms in contact to share results of scientific experiments, attitudes, and written work. K-12 Online, a service of the Pacific Union Conference, helps teachers identify projects in which their students can participate. Teachers can access these projects via Marilyn Eggers (her e-mail address: meggers@ scruznel.com).

Other telecommunications opportunities include projects for students to research, problem-solve, make decisions about, and share as they restore and reconstruct a woodland, wetland, or grassland area near their school and perhaps inspire others to do the same (prairemln @aol.com). Other World Wide Web sites allow students and teachers to exchange ideas about science, math, literature, ideals, and beliefs (http://www.ed. uiuc.edu/Guidelines/Riel-93.html). U.S.

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students can experience cooperative learning with schools across the country as they work together to solve problems and build good citizenship (http:// 199.44.64.3:80/itoreg/it049/itm0496. htm).

The opportunities for both isolated small schools and large schools in the Adventist system is endless, for the world is now at one's fingertips. There need be no more "two-by-four teachers"—those who use only things between the two covers of a textbook and

the four walls of a classroom. However, it is up to the educator to integrate software into the instructional curriculum process and not allow it to become an end in itself. Educators should carefully screen all programs and the intelligences they use to ensure that the technology promotes the goals of education.

Students who can examine and experience diverse approaches to learning not only have better developed skills but also develop a more positive self-concept. Once students are given permission to learn by using a number of intelligences, the computer can really enhance the process!

In summary, combining computer use and the multiple intelligences will make learning more exciting and prepare students for creative and productive lives. ✐

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REFERENCES
1. With the exception of *Colonization* and *Inspiration*, all software referred to in this article is available through Educational Resources (Catalog), 1150 Executive Dr., P. O. Box 1900, Elgin, IL 60121-1900. Telephone: (800) 624-2926; fax: (847) 888-8499/8689; Internet:http://www. edresources.com.
2. Available from Inspiration Software, Inc., 7412 Beaverton-Hillsdale Ave., Suite 102, Portland, OR 97225. Telephone: (800) 877-4292 or (503) 297-3004; fax: (503) 297-4676; Internet: http://www.inspiration.com. *Colonization* is available from Spectrum HoloByte, Inc., 2490 Mariner Square Loop, Alameda, CA 94501. Phone: (800) 695-4263; fax: (510) 522-9357.

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