SPECIAL NEEDS

In this issue, we welcome a new contributor to our newsletter. This Special Needs column, written by Eileen Pracek of FDLRS / TECH, Melbourne, will offer suggestions to help you provide alternatives through technology which meet the special needs of a wide range of students. This first article discusses one approach to selecting technology programs which can make a difference in how well students learn new information. MB

Thomas Armstrong strongly believes that students may be at risk or labeled "underachievers, hyperactive, or learning disabled" because they have not learned "how to learn" according to their own distinct aptitudes. In his book, *In Their Own Way*, he describes the need for teachers to address all critical skills and content through seven different learning styles: linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal, and intrapersonal. These styles correspond to the seven different intelligence areas identified by Howard Gardner.

Armstrong describes the intelligence areas through classroom behaviors which help teachers recognize students who prefer each of these learning styles. For example: Students with a high degree of *linguistic* ability are sensitive to language and learn by listening, reading, and/or verbalizing. They may enjoy word games and have good memories for names and places.

Students with a high degree of *logical-mathematical* ability reason things out logically and look for abstract patterns and relationships. They may enjoy problem-solving and projects which involve doing research.

Students with a high degree of *spatial* ability think in images and pictures and prefer a highly visual format for learning new information. They may enjoy mazes and puzzles and like to draw, paint, or create things.

Students with a high degree of *musical* intelligence think in tones and learn through the pitch, timbre, and rhythm of sounds. They may be very sensitive to sounds in the classroom, need music to study, or remember melodies of songs. They may enjoy playing a musical instrument or creating their own songs.

Students with a high degree of *bodily-kinesthetic* intelligence process knowledge through bodily sensations and learn by touching, manipulating, and moving. They need a hands-on approach to new information. They like physical activity and may enjoy crafts, fixing machines, dancing, or role-playing.

Students with a high degree of *interpersonal* intelligence understand and care about people and learn by relating and cooperating with others. They may enjoy group games, team sports, clubs, and committee work.

Students with a high degree of *intrapersonal* intelligence display a sense of independence and learn new information alone at their own pace. They may need their own quiet space, "march to the beat of a different drummer" and prefer individual sports and games.

It is important to understand that students will have a combination of characteristics of all seven of these intelligence areas, although some will be much stronger than others. By identifying software programs, videodiscs, and CD-ROMs which address all areas, teachers can involve students in learning critical content in their areas of learning strengths.

Technology programs approach content through different formats. Some use a *linguistic* approach such as word processors, prompted writing programs, programs which require students to read and answer questions, and programs which have speech output.

Others employ a *logical-mathematical* approach such as data-bases and spreadsheets, or problem-solving programs and strategy games. Some programs may use a logical approach to teach content such as reading (the rat sat on the mat) or music.

Draw and paint programs, programs which allow student to to see information as maps, charts, or diagrams, use a highly visual or *spatial* approach. Programs which teach content with visual clues such as the rebus method for reading, or use color coding, may benefit students with a high degree of spatial ability. The compelling visual content of many videodiscs and CD-ROMs may increase the learning curve for such students.

Other programs use a *musical* approach to present content such as reading, or allow students to create their songs, or add music to multimedia presentations. Music can be a powerful, engaging feature of the audio content of CD-ROMs and videodiscs.

Some programs use a *bodily-kinesthetic* approach by requiring alternate input such as a joystick or touchwindow, or the use of probes and accompanying manipulatives. Others may use an arcade-game format or involve the movement of objects around the screen.

Programs with an *intrapersonal* approach include tutorials, instructional games in which the opponent is the computer, and programs which encourage self-awareness or build self-improvement skills.

By carefully considering the learning styles of students, and by examining the approach of software programs, videodiscs, and CD-ROMs, teachers can select programs which offer a variety of approaches to the skills and concepts which are critical for success in the classroom.

You may request a more detailed list of learning characteristics and specific programs for special needs by calling Eileen Pracek at FDLRS/TECH (407) 631-1911 X544, or SC 323-1011 or by writing to:

FDLRS/TECH
2700 Judge Fran Jamieson Way
Viera, FL 32940-6699

References

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Using Technology Effectively

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In the last issue of *The PrintOut*, this column described one way to use technology effectively to meet the special needs of a wide range of students. It suggested that teachers:

- Consider the seven different learning styles of students described by Thomas Armstrong and Howard Gardner... *linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal* and *intrapersonal*,
- Examine the different ways that software programs, videodiscs, and CD-ROMs approach skills and concepts critical for success in the classroom,
- Select programs which offer a variety of approaches to this critical content.

This issue will look more in depth at ways for using technology effectively with some students who are at risk in the classroom because they perceive and process information differently.

According to Thomas Armstrong, students who experience success in school tend to demonstrate a higher degree of linguistic and/or logical-mathematical ability than those students who are not successful. Textbooks, workbooks, and other support materials have traditionally approached content in a linguistic, and/or logical-mathematical way. When students are not "making it" in school because they perceive and process information differently, they need alternative ways to learn.

It is critical that teachers provide students at risk with opportunities to learn new skills and concepts through the use of technology programs which engage their learning strengths.

For example, students who are high in bodily-kinesthetic intelligence may have a lot of difficulty learning new information in the traditional classroom. They are the ones who need to *move* to learn. They may be informally labeled hyperactive, ADD, or ADHD.

Armstrong describes such students who:

- process knowledge through bodily sensations,
- communicate through gestures,
- move, twitch, tap, or fidget while sitting in a chair,
- like physical activity,
- enjoy hands-on activities,
- may prefer sporting events, dancing, acting, building models, fixing things.

Teachers may recognize high bodily-kinesthetic behavior characters in students at risk who:

- rock in their chairs,
- exhibit a lot of out of seat behavior,
- continually touch objects and/or other students,
- play the "class clown,"
- use their finger to follow along while they read, or
- sharpen their pencils to stubs.

To capitalize on the strengths of these students, teachers can select programs which use a bodily-kinesthetic approach

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to skills and concepts. Here are some examples of technology which may benefit bodily kinesthetic learners.

The computer itself is a highly kinesthetic tool which should be an integral part of the bodily-kinesthetic learner's curriculum. Alternate input devices such as a joystick, *Touch Window*, *Muppet Learning Keys*, and graphics tablet may be an appropriate choice for many students.

Instructional games, especially those in an arcade format, may assist students in attaining fluency in needed academic skills. MECC's *Word Munchers*, Davidson's *Math Blaster*, and Data Command's *Beamer* use this format.

Programs which have accompanying probes and manipulatives are very effective ways to approach science and math content. Broderbund's *Science Toolkit* allows students to learn concepts by interacting with the physical world in ways not possible without the use of the computer. When used with rods, tiles, blocks, chips, tangrams or geoboards, *Hands-On Math* from Ventura Educational Systems helps students master necessary concepts for success.

Programs which allow students to move objects around on the screen are an effective way to provide opportunities for learning. Programs which encourage students to manipulate story elements like the *Explor-a-Story Series* from William K. Bradford may assist with reading comprehension. Sunburst's *The Geometric Supposer Series* may open new worlds of content to students at risk.

Multimedia programs which require students to interact with laserdisc players, scanners, CD-ROM players, VCRs and camcorders are among the most powerful ways to engage students across curriculum areas in learning new information. *Windows on Science* from Optical Data offers a science curriculum on laserdisc. *Media Magic* from Pelican/Queue, *HyperStudio* from Roger Wagner, IBM *LinkWay* from Eduquest/IBM and *HyperCard* from Claris offer students tools for interacting with multimedia in any subject area.

By providing technology alternatives which encourage students to move to learn, teachers can increase opportunities for all learners to master content and meet the critical special needs of bodily-kinesthetic students who are at risk. These students will succeed in academic tasks if educators honor their differences and use technology effectively to teach them in ways they can learn.◆

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The "Linguistic Learner"

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After a short absence, this column continues to share ways for using technology effectively with students who are at risk in the classroom because they perceive and process information differently. Previous issues explored the seven different learning styles described by Thomas Armstrong and identified by Howard Gardner….linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal and intrapersonal…and discussed in depth some effective uses of technology for students who were high in bodily-kinesthetic (need to move to learn), spatial (need visual or mental pictures to learn) and musical intelligences (need rhythm and harmony to learn new information.)

This issue will look at the impact technology can have on students who are high in linguistic intelligence, who may think in words, and need to say, hear or see words to learn new information.

Linguistic intelligence may well be the most universal of all the intelligences. Almost everyone in most cultures learns to speak. In our country we are impressed with large vocabularies, fluent speakers, published writers, and well-read individuals. IQ tests reflect a high dependence on verbal elements and have long served as the arbiter of intelligence in our cultures according to Armstrong in *7 Kinds of Smart*.

Schools have traditionally honored linguistic intelligence. Speaking, reading, writing and listening are academic skills related to linguistic ability. It is little wonder that students who excel in this intelligence succeed more frequently in school than students who do not rate high in this area.

Thomas Armstrong describes such students who may

- think in words
- love to spin tall tales and tell jokes and stories
- like to write
- enjoy reading in their spare time
- appreciate puns, rhymes and tongue twisters
- like doing crossword puzzles
- have a good memory for verse, lyrics or trivia
- enjoy spending leisure time in bookstores and libraries

Teachers may recognize behavior characteristics which indicate high linguistic ability in students at risk who may:

- speak their thoughts well but can't express them in writing
- decode words well but haven't a clue about what they mean
- Read and/or talk about every exhaustive detail related to one topic like cars, airplanes, horses, cycles, baseball
- write prolific notes to peers
- act as the class lawyer and argue anyone's case well
- enjoy listening to stories or books on tape.

To use technology effectively with these students, teachers can select software, CD-ROM, and laserdisc programs which may appeal to their linguistic strengths.

The one most effective tool for helping students who are having problems with reading or writing is the talking word

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processor. *Write OutLoud* (Mac) from Don Johnston and *IntelliTalk* (Apple, Mac, MS-DOS) from IntelliTools are examples of programs which will allow students of all ages to enter their own words, hear the computer speak them and print them out to be read. *Dr. Peet's Talk/Writer* from Hartley (Apple, MS-DOS, Mac) and *KidWorks 2* from Davidson (MS-DOS, Mac, Windows) are examples of talking word processors for younger students.

Interactive books are an effective way to engage students who have linguistic ability but are reluctant readers. The Discis Library (Mac, MS-DOS, Windows) appeals to those who love to listen to stories. The narrations are rich in expression and convey the mood of the story through language. Students can have the computer repeat words, phrases, or sentences, or speak the definition of selected words. The Living Books Series from Broderbund (Mac, Windows) with such titles as *Just Grandma and Me*, *The Tortoise and the Hare*, and *Arthur's Teacher Trouble* appeal to an even greater audience of learners. With colorful graphics and animations, and original music, they enhance the reading experience for spatial, musical and linguistic learners.

There are readiness programs which help teach the basics of reading. A classic favorite is the *Muppet Word Book* from Sunburst (Apple, MS-DOS) which uses large print and graphics to teach letter discrimination, rhyming words, initial consonants, and word endings. It operates with the keyboard, *Muppet Learning Keys*, and *TouchWindow*. In the irresistible *Bailey's BookHouse* from Edmark (Mac, MS-DOS) young non-readers can learn letters and sounds, acquire vocabulary, compose a story, have the computer read the story outloud, and print it out. *Reader Rabbit's Interactive Reading* from The Learning Company (Mac, Windows) is a new integrated approach to beginning reading instruction which combines skill-building activities and storybooks to help students develop phonics skills in the context of reading. The graphics, music, and stories appeal to a wide variety of learning styles as students enjoy the delightful journey through Imaginative Letter Lands.

Joseph's Readers from JFL Enterprises (Mac, Windows) offer talking software for the not-yet reader. Through a series of integrated programs which could supplement any reading program, students may choose to have a book read to them with human inflection, practice reading skills, vocabulary, alphabetizing, spelling, word and phrase recognition. JFL Enterprises also offers *The Failure Free Reading Program* for low or non-achieving students of any age who can not seem to make sense out of phonics instruction. It concentrates on teaching the 220 most often used words in the English language through print and talking software.

Reading Realities from Teacher Support Software (Apple, Mac, MS-DOS) is a high interest-low readability program which entices secondary students to examine and problem solve real issues of life as they practice reading, writing and listening activities in a meaningful context.

The Sentence Master from Laureate (Apple IIe, Mac, Windows) is a well-researched program which can be successful with students who are at risk of reading failure because of difficulties in phonics, oral language, English as a Second Language, and/or impulsive learning styles. It is designed to overtrain students in 150 commonly used non-content words which are major determiners of meaning.

For students who are reluctant to write, desktop publishing programs may offer them an exciting way to share their thoughts and experiences. *The Children's Writing and Publishing Center* (Apple, MS-DOS) and the *Student Writing Center* (Mac and Windows) from the Learning Company provide an easy to use format for printing out professional looking newsletters, journals and reports. *Storybook Weaver* and *My Own Stories* from MECC (Apple, Mac, MS-DOS) engage students in the writing process by helping them combine words, pictures, sounds, and songs to bring their stories to life. *Once Upon a Time from Compu-Teach* (Apple, Mac, MS-DOS) allows students to publish their own illustrated books related to four different themes. *BigBook Maker* from Toucan (Apple, MS-DOS, Mac) encourages students to create large books related to familiar characters which fit well into whole language and cooperative learning environments.

For older students who need help with punctuation and grammar, *Perfect Copy* from Logicus (Mac, MS-DOS, Windows) provides practice in these skills in a linguistic environment, as they edit text for a newspaper. *Write This Way/ LD* from Hartley (Apple, Mac) is a word processing program which includes a dictionary and grammar checker, both based on extensive research into common errors made by learning disabled students.

For students who are high in linguistic ability, but need practice in vocabulary and spelling, *Worksheet Magic* from Teacher Support Software (Mac, MS-DOS) allows teachers to print out a variety of creative worksheets formats including crossword puzzles, word search, cloze and secret code.

For more information, contact your local FDLRS center or TechTeam member.

Special Needs

The "Logical-Mathematical Learner"

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Previous issues have explored the seven different learning styles described by Thomas Armstrong and identified by Howard Gardner…linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal and intrapersonal…and discussed in depth some effective uses of technology for students who were high in linguistic (need to see, hear, or say words to learn), bodily-kinesthetic (need to move to learn), spatial (need visual or mental pictures to learn) and musical intelligences (need rhythm and harmony to learn new information.)

This issue will look at the impact technology can have on students who are high in logical-mathematical intelligence, who reason things out and look for abstract patterns and relationships. Students who are high in logical-mathematical intelligence may enjoy and do well in school subjects related to mathematics and science.

Thomas Armstrong describes such students who may:

- think conceptually (without images)
- like to experiment and test things out
- work mental arithmetic problems effortlessly
- enjoy brain teasers, logical puzzles, and strategy games
- have a good sense of cause-effect for their age
- love the computer
- enjoy science fairs, electronics exhibits, math contests

Teachers may recognize some of the following behavior characteristics which indicate high logical-mathematical ability in students at risk who may:

- ask a lot of questions about how things work
- have well-organized and categorized collections of coins, cards, or insects
- choose to play and win at Monopoly, Clue, Battleship, checkers, or chess
- handle money-related matters well (may be the class entrepreneur)
- prefer to do assignments on the computer
- like to "mess around" with science kits, chemistry sets
- perseverate on a problem until they get it solved

To use technology effectively with these students, teachers can select software, CD-ROM, and laserdisc programs which appeal to their abstract thinking strengths. Here are some examples of technology which may benefit the logical-mathematical learner.

Databases and spreadsheets are engaging formats for the learner who seeks abstract patterns and relationships. *Microsoft Works* (Mac, MS-DOS, Win), *ClarisWorks* (Mac, Win) and *AppleWorks* (Apple IIe, IIgs) are examples of inte-

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The "Logical-Mathematical Learner"

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grated programs which can be used as effective tools across the curriculum. *The Cruncher* from Davidson (Mac, Win) teaches students how to use spreadsheets and graphs in everyday life. It also talks.

The database format may also be an effective way to engage logical-mathematical learners in other content areas. For example, *PC Globe* and *PC USA* (MS-DOS), *Mac Globe* and *Mac USA* (Mac) from Broderbund, and *World Geograph* and *USA Geograph* (Apple IIgs) from MECC allow students to use databases and charts to compare demographic, social, environmental and economic data. With *Timeliner* from Tom Snyder (Apple, MS-DOS, Mac), students can create time lines to examine patterns in history, chart major events, or organize their schedules.

For young children, *Millie's Math House*, *Sammy's Science House*, and *Thinkin' Things* from Edmark (Mac, MS-DOS) develop number concepts, science concepts, and problem-solving skills in creative and exciting programs. For Apple users there are *Counting Critters* from MECC and *Stickybear Numbers* from Optimum Resources.

For students who need drill and practice to acquire fluency with basic math skills, there are many options which appeal to a variety of interests. The *Math Football* series from Gamco (Apple, Mac, MS-DOS) offers drill on whole numbers, fractions, decimals, percent or rounding for the sports-minded student. *Number Munchers* and *Fraction Munchers* from MECC (Apple, Mac, MS-DOS) appeal to students who enjoy a similar arcade format. The *Math Blaster* series from Davidson (Apple, Mac, MS-DOS, Win) engages students in building number skills and concepts through a space arcade game format. *Math Blaster Mystery* also tackles positive and negative numbers, interest, word problems, and games in logic and problem-solving.

For students who are having difficulty with math word problems, recent research indicates that strategies which encourage students to use manipulatives (bodily-kinesthetic), draw a picture (spatial), or produce statements in written language may be helpful.

The new *Word Problem Processors* developed by Dr. Stanley Pogrow of the HOTS-Math Project from Thinking with Computers (Mac, MS-DOS) is one example. Students write story problems to communicate with a space creature who understands English and "talks" mathematics.

The *Mechanics of Word Problems* series from Decision Development Corporation (Apple, Mac, MS-DOS) uses a six-step method which teaches students to identify clue words to help solve word problems.

Bake and Taste from Mindplay (Apple, Mac, MS-DOS) helps students learn following directions, fraction concepts and measurement in a problem-solving context as they work with real recipes that they can make and eat.

Students can use technology tools to explore science concepts and practice sci-

entific methods and procedures. In the classic *Operation Frog* from Scholastic (Apple, Mac, MS-DOS), students can dissect a frog and put it back together again. They can do on-screen experiments in *Super Solvers Gizmos & Gadgets!* from the Learning Company (Mac, MS-DOS, Win). They can explore the environment by day or night in *A Field Trip to the Rain Forest* and check out predator/prey relationships in *A Field Trip to the Sea* by Wings/Sunburst (Apple, Mac). They can use probes to do experiments in the *Personal Science Laboratory* from IBM/Eduquest and the *Science ToolKit* series from Broderbund (Apple, MS-DOS).

There are an increasing number of laserdiscs which offer problem-solving experiences for math and science which are anchored in realistic settings. The *Adventures of Jasper Woodbury* series from Optical Data and *Math Sleuths* from Videodiscovery are two examples. In *The Great Solar System Rescue* and *The Great Ocean Rescue* from Tom Snyder, students work in teams as experts to use science content to solve a problem.

New CD-ROM technologies include spirited music, colorful animated graphics, increased options and interactivity to help students build skills and problem-solving abilities in math and science. *The Math Workshop* from Broderbund (Mac, Win), *Operation Neptune* from the Learning Company (Mac, Win) *The Secret Island of Dr. Quandary* from MECC (Mac, Win) and *The Lost Mind of Dr. Brain* from Sierra (Mac, Win) are a sampling of such programs.♦

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The "Spatial" Learner

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In this column we will continue to explore ways for using technology effectively with students who are at risk in the classroom because they perceive and process information differently. In previous issues we considered the seven different learning styles described by Thomas Armstrong and Howard Gardner...*linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal and intrapersonal*...and looked in depth at effective uses of technology for those students who were high in bodily-kinesthetic intelligence and who needed to *move* to learn.

This issue will look at students who need mental or physical pictures to understand new information, the ones who are high in spatial intelligence. Thomas Armstrong describes such students who may:

- think in images and pictures,
- like to draw, paint, and design things,
- enjoy solving mazes and jigsaw puzzles,
- like to build 3D models,
- prefer videos, slides, maps, charts, diagrams,
- enjoy going to art museums, planetariums, architectural landmarks.

Teachers may recognize behavior characteristics which indicate high spatial ability in students at risk who:

- doodle or draw when someone is speaking,
- win easily at checkers, chess, battleship, or other board games,
- love to play cards,
- daydream a lot,
- react strongly to colors (both likes and dislikes),
- close their eyes when asked to recall information,
- are easily distracted by visual stimuli.

To capitalize on the strengths of these students, teachers can select programs which use a visual format to approach skills and content. Here are some examples of technology which may benefit spatial learners.

Students who have trouble making sense out of numbers may easily see connections when the same information is presented graphically. Programs such as *Math Connections: Algebra I* and the *Geometric Supposer Series* by Sunburst/ Wings for Learning provide visual models for math concepts.

Programs like MECC's *World Geograph/ USA Geograph*, Broderbund's *PC Globe*, and Tom Snyder's *Timeliner* translate numerical information into maps, charts, and graphs.

Wooly Bounce by MECC and *Interactive Physics* by Knowledge Revolution allow students to "see" principles of physics.

Students who have difficulty writing may be highly motivated by programs which

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use colorful graphics as story starters. The Toucan Creative Writing Series—-*Pow! Zap! Ker-Plunk!, Monsters and Make-Believe*, and Big Book Maker Series, MECC's *Storybook Weaver, and* Compu-Teach's *Once Upon a Time...*Series use this format.

Drawing and graphic programs such as Broderbund's *Kid Pix* and *Print Shop* can be used across the curriculum for students to illustrate their understanding of content. Davidson's *Kid Cad* lets students create structures and their environments with electronic building blocks that may be viewed from many perspectives.

Interactive videodisc and CD-ROM present the most visually exciting format for spatial learners. Programs such as *HyperStudio* from Roger Wagner, *LinkWay* from Eduquest/ IBM and *HyperCard* from Claris offer students powerful tools to create their own multimedia productions across the curriculum.◆

Dates

October	Computer Learning Month
October 27-30	FAME (Florida Assoc. for Media in Education) Tampa, Florida
November 24	Poster Contest Deadline Florida Says! Deadline
February 1-4	FETC (Florida Educational Technology Conference) Tampa, Florida
February 14-20	AECT (Association for Educational Communications & Technology) Nashville, Tennessee
June 13-15	NECC (National Educational Computing Conference) Boston, Massachusetts

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The "Musical Learner"

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This column continues to consider ways for using technology effectively with students who are at risk in the classroom because they perceive and process information differently. Previous issues explored the seven different learning styles described by Thomas Armstrong and identified by Howard Gardner ....linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal and intrapersonal... and discussed in depth some effective uses of technology for students who were high in bodily-kinesthetic (need to move to learn) and spatial (need visual or mental pictures to learn) intelligences. This issue will look at the impact technology can have on students who are high in musical intelligence, who may think in tones and need rhythm and harmony to learn new information.

Musical intelligence may well be the most powerful of all the intelligences. In *Introduction to the Musical Brain*, Campbell summarizes the research as he comments on the impact of music on the brain. Millions of neurons can be activated with a single (musical) experience. By activating more neurons, more connections can be created for a learning experience than would ordinarily occur. By increasing the connections, the potential of a learning experience can be maximized.

For example: Think about a song which has a special meaning in your life. When you hear that song, does it evoke a special experience, a particular time and place, or person(s), or ambiance, feeling(s), or even smells? Chances are that your memories are vivid, even if much time has passed since the experience occurred.

By harnessing such power in the curriculum and combining it with technology, teachers can optimize learning for all students, and address the learning style of students who are high in musical intelligence.

Thomas Armstrong describes such students who may:

- think in tones
- learn through rhythm and melody
- play a musical instrument
- remember melodies of songs
- need music to study
- notice nonverbal sounds in and out of the classroom
- learn things more easily if sung, tapped out, or whistled
- enjoy concerts and musicals

Teachers may recognize behavior characteristics which indicate high musical ability in students at risk who:

- react strongly to music (both likes and dislikes)
- hum or whistle while they work
- tap out rhythms with pencils or other objects when they study
- are easily distracted by back ground sounds
- have extensive collections of tapes, CDs, and/or sound systems

To use technology effectively with these students, teachers can select software, CD, and laserdisc programs which integrate music as part of the learning experience across the curriculum. For example: *Map Rap*, from *GTV: A Geographic Perspective on American History*, teaches the westward expansion in a dynamic, upbeat, modern musical way. The Discus Books use music to set

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The "Musical Learner"

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the mood for a story or poem and to transition from one story to another. The new *English Language Development* (ESOL) program developed by Josten's, Dade County, and the Florida Department of Education uses rhymes and songs to introduce students to the sounds and rhythms of the English language. Edmark has developed a series of programs for younger students which capitalize on the power of music. *Bailey's Book House* and *Millie's Math House* use music to captivate and engage the young learner in prereading and early math experiences. *Thinkin' Things* uses music as the basis for both problem solving and creative thinking activities.

It is important for students to have interactive experiences with music. *Jam Session* from Broderbund allows students of all ages, no matter what their experience, to make professional sounding music as they play along with songs and have fun with musical scales, patterns, and styles of expression. *KidsNotes* from Great Wave Software's *KidsTime* allows students to manipulate the tempo and dynamics of familiar nursery songs with an on-screen keyboard or create their own music. *Adventures in Musicland* from Dr. T's Music Software helps students learn about musical notes, symbols, instruments, composers, pitch discrimination, and melodic memory through a series of musical games.

With the addition of a MIDI (Musical Instrument Digital Interface) an electronic keyboard can be connected to the computer. Music played on the electronic keyboard is directly entered into the computer. Musical compositions on the computer are played back through the electronic keyboard. *Music Studio* from Mediagenic and *Songworks* from Activision are two of many programs which can be used with the MIDI to create such interaction. *Music Studio* lets students of all abilities create music with the mouse, MIDI-keyboard, or with a paintbox feature, in which different colors represent different instruments and brush sizes represent note variations. In *Songworks* students play a tune on the computer keys or keyboard, and the program suggests chords, transposes, plays, and prints your song with melody, chord symbols, and lyrics.

Programs which allow students to add music to their own presentations may provide the most powerful uses of music in the classroom. *HyperStudio* from Roger Wagner, *LinkWay* from Eduquest/IBM, and *HyperCard* from Claris offer students exciting tools to integrate music into their own reports and productions across the curriculum.

For more information on music software and students with special needs, contact Becky Atwood, at FDLRS/TECH, 2700 Saint Johns St, Melbourne, FL. 32940-6699. Becky has created a music mat which allows students of all ages and abilities to create professional sounding music without a computer, and has developed a workshop on Using Computer Technology to Make Music. ♦