Meeting the Needs of Students with Visual Impairments

Special Needs Technology Assessment Resource Support Team (START)

Annapolis Valley Regional School Board

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CLOSE-UP

MEETING THE NEEDS OF STUDENTS WITH VISUAL IMPAIRMENTS

Daniel, is a ten year old boy in grade four who attends an elementary school in the city. Daniel enjoys going to school and listening to music. He has recently started piano lessons and it appears he has a special musical talent.

Daniel has not always attended this school. Because he is blind, Daniel's early schooling took place in a residential school in another province, a school for the visually impaired. He suffers the effects of retinopating of prematurity, failure of the retinal vascular system to develop.

Two years ago, Daniel's planning team decided that he should return to his home town and attend his neighbourhood school. A great deal of planning was done in order to make the transition. Daniel had to learn cane travel, orientation and mobility. Daniel has had to be carefully oriented to his home and his school. He travels to school on a special bus and is escorted from the bus to the school by a student assistant. Once inside, Daniel uses his cane and his orientation and mobility skills to get to his classroom door, remove his outdoor clothing and hang his coat on his hook, then find his way to his seat in the classroom. Daniel is now learning to move around his neighbourhood using his cane.

Daniel also has to learn skills to use the technology which will enable him to participate in his grade four class. He is learning braille and the class textbooks have been produced in braille for Daniel to use. His teachers can turn lessons into braille with the help of a brailler. Daniel is now learning to use a Braille-to-Print computer which will provide a printout of his writing to his teachers and others.

Daniel has many friends who care about him and who often take part in special planning to help him learn social skills.

MEETING THE NEEDS OF STUDENTS WITH VISUAL IMPAIRMENTS

Students with visual impairments may experience slight, significant or total vision loss. For functional education purposes the two main categories of visual impairment are Low Vision and Blind.

Blind
Most students who are blind have light perception, but a small number have absolutely no vision.

Low Vision
Students having low vision can learn from their residual (remaining) vision and other senses. They are essentially print users but require optimal lighting and the use of optical aids and devices.

It is important for a teacher to understand the nature and degree of the student's vision loss. The severity of vision loss, age of onset, intellectual ability and surrounding environmental conditions all affect how a student uses his/her residual vision. For example, reading is mostly a function of central vision and mobility of peripheral vision. A student with a central loss due to macular degeneration may not be able to read visually, but may have no difficulty with his/her mobility, whereas a student with tunnel vision may experience great difficulty with reading but little difficulty with mobility. Factors such as light glare, fatigue and insufficient lighting may cause vision to fluctuate. It is also not uncommon for students with vision loss to have additional impairments (eg. vision and hearing loss, vision loss and cerebral palsy).

Vision loss affects the following areas of development:

- acquisition of basic concepts
- life skills
- communication skills
- orientation and mobility skills
- academic development

Students with visual impairments should have access to itinerant teachers for the visually impaired who understand the educational implications of vision loss. This service can be delivered as direct teaching as well as consultation with regular class or special education teachers. Various learning resources and technologies available today can help students achieve success in learning, relationships and independence. A number of the most common technologies are presented below.

TECHNOLOGY-RELATED STRATEGIES

Low-Tech

- Use **photocopiers or word processing programs with large print options** to enlarge educational materials.

- Use **bold-lined paper** (darkened lines, enlarged spaces) for students who are unable to successfully use regular paper.

- Use **large print or braille textbooks and novels**. (Request help from the itinerant teacher for the visually impaired in your area.)

- Create optimum reading angles and lighting by bringing books closer to student through use of **tilted desk tops and book stands**.

- Use **reading windows/templates** and **line markers** (rulers) to help student keep his/her place on the page when reading.

- Use **low vision optical devices** such as magnifiers, telescopes. Magnifiers assist students with near-distance vision tasks like reading and writing but telescopes assist with far-distance vision tasks such as reading the chalkboard. Both telescopes and magnifiers can be hand-held or mounted on eye-glasses. *Note: These devices are prescribed by a physician, low vision nurse or itinerant teacher for visually impaired students.

- Use **tape recorders** to help students take notes, do assignments, answer long essay questions and complete examinations.

- Use **braillers** (machines for writing Braille) for activities involving reading and writing.

- Use **various low tech aids** such as writing guides, tactile maps, raised line drawing kits, 4-track tape recorders to help student in the classroom.

- Use **mathematical aids** such as raised clock faces, geometric area and volume aids, Braille rulers and talking calculators.

- Use **textbooks** and **novels** on **tape/disk**. Sources for obtaining textbooks/novels on tape include:

Local Public Library

Learning Disabilities Association of Newfoundland and Labrador (LDANL). (See Agencies and Associations in Appendix E of handbook for address and phone number.)

Learning Distribution Resource Center. See Appendix E.

Local CNIB (Canadian National Institute for the Blind) district office.

Recordings for the Blind and Dyslexic @ 1 800-221-4792. For approximately one hundred dollars a school/district can register with the association to receive catalogues for both pre-kindergarten to 13 and adult level or pay approximately fifty dollars for the pre-kindergarten to 13 catalogue only. Once registered the school or district can borrow at no cost except shipping and handling.

High Tech: Computer-Related Strategies

Note: The technologies marked "*APSEA Candidate Criteria" may be obtained from APSEA (Atlantic Provinces Special Education Authority) resource centre for the visually impaired. Consult with your itinerant teacher for the visually impaired or Student Support Services Coordinator.

- **Magnification systems** enlarge text displayed on computer monitor screens and printed texts, making these accessible to students with low vision. Screen magnification can be provided through additional hardware or software magnification programs.

- **Braille printers** translate text into braille, thus providing access to computer screens and other types of information.

- **Optical Character Recognition Systems** scan the printed word or transmit the text into computers for storage and retrieval. Screen reading programs can then read the text aloud.

- **Portable Notetakers** such as the Braille 'N' Speak (voice output) and Braille Lite (voice and braille) from Blazie Engineering are lightweight electronic note taking devices with built in speech synthesizers. A student uses a **braille notetaker** to take

notes in class and uses its voice synthesizer to review notes. Device features usually include word processor, appointment calendar, calculator, terminal program and clock. Notes can be transferred to computers with braille printers. ***APSEA Candidate Criteria***

- **Speech Synthesizers** and **Screen Reading Software** allow blind users to access printed text on the computer screen by hearing the information on the computer screen. Screen reading software enables the student to navigate the screen to hear what others see.

- **Laptop Computers with Large Print** provide students with word processing, dictionary, thesaurus and large print software. They are suited for note taking in the classroom, homework, studying and note review. ***APSEA Candiate Criteria***

- **Braille to Print Device** is a small computer system used to convert braille, entered from a standard Perkins Brailler into text. This system provides a print copy of work for the teacher and a braille copy for the student. ***APSEA Candiate Criteria***

- **EUREKA A - 4 Braille Computer** is a non-IBM compatible computer designed to be used by the visually impaired. It offers braille input and speech output and has software built into memory. Features include a word processor, note taker and scientific calculator. ***APSEA Candiate Criteria***

- **Laptop Computer with Speech (and headphones)** an IBM compatible laptop computer which includes features such as word processing, meaning dictionary, thesaurus, menu facilities for handling the disk operating system and speech output software. ***APSEA Candidate Criteria***

- **The Personal Braille Embosser** is a small braille printer which uses standard sized form feed braille paper to produce a braille copy of work composed on the Laptop Computer with speech, Braille Mate or Braille 'N' Speak. Note: The Braille embosser can only provide Braille output using braille translation software. ***APSEA Candidate Criteria***

High Tech: Other

- Use an **Electronic Dictionary with Speech** with students who do not have a laptop computer with speech. This hand held, battery-operated dictionary and thesaurus has a standard QWERTY keyboard and information is outputted through the speech

synthesizer or large print. ***APSEA Candidate Criteria***

- Use a **Scientific Calculator with Speech** with students in high school who are required to perform trigonometry or scientific calculations. When the help learn mode key is pressed all other keys speak when pressed without activating their function. This helps a totally blind person to learn the calculator. ***APSEA Candidate Criteria***

- Use a **Closed Circuit Television (CCTV)**. This desktop visual aid electronically enlarges print materials on a large TV screen. Its magnification and contrast capabilities as well as adjustable illumination allow students to view various print sizes, handwriting, photos, diagrams, charts and maps. Most CCTVs also allow the polarity of the display from **positive** (black print on white background) to **negative** (white text on black background) ****APSEA Candidate Criteria***

- Use a **Portable Closed Circuit Television (CCTV)** when necessary. It offers the same features as the desktop to CCTV, but is suitable for students who need access to a CCTV in several classes throughout the school day. ***APSEA Candidate Criteria***

- Use **Home Key Indicators** such as dimples, dots and felt appliques and **key replacements** (large/unique keys) as input adaptations for often-used keys. They help improve accuracy and efficiency during data entry.

- Use **Enlarged Fonts** on computer screen for students needing moderate character enlargements. Most graphics-based programs allow one to select the font size to be used on-screen. Choose a computer with a large-size monitor whenever possible.

- Use **Screen Enlargement Utilities or Programs** to magnify images on the computer screen 4-16 times for students with low vision.

GENERAL STRATEGIES

- Requests for taped, brailled or large print books should be submitted several weeks/ months before student is required to use material in class. Consult itinerant for the visually impaired and/or Student Support Coordinator for further details.

- Preferential seating should be given to student so he or she can better hear/see what is happening in class.

- Adaptations for test taking should be arranged according to the student's needs, (e.g. extended time, taped exams, readers, scribes etc).

- Orientation to school building, classroom, grounds, etc. should be provided to student.

- For students with low vision consider the following for written materials:
  use typed and not handwritten materials, use black lettering on non-gloss cream or white paper
  do not crowd information on page
  use only one side of paper
  use white/yellow chalk on chalkboards