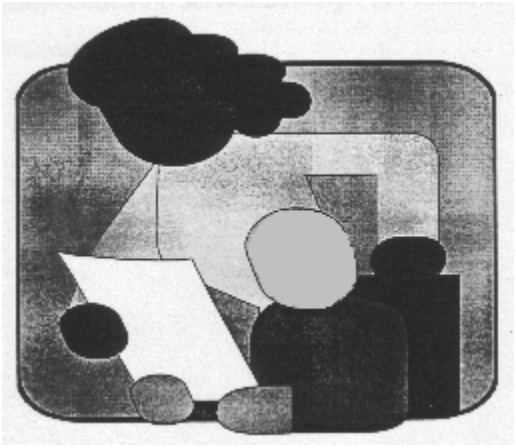
New Nouveau
Brunswick
EDUCATION

Resource For Assisting Struggling Learners



Student Services *September 2000*

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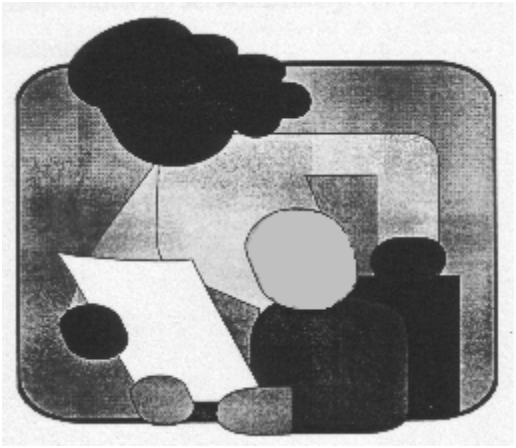

Student Services *September 2000*

Table of Contents

Rationale

In recent years there has been renewed emphasis on the importance of gaining literacy and numeracy skills. Provincial assessment results, as well as assessment results at local levels, indicate a need to refocus our attention on how to best teach students who are not achieving at acceptable levels. Educators are faced with the formidable task of implementing practices that will result in more satisfactory learning outcomes for all students regardless of their individual characteristics, personalities, abilities, circumstances or backgrounds.

The goal is to have the majority of the students in our schools performing at an acceptable level or higher. The classroom teacher, with the assistance of others, needs to be knowledgeable regarding various instructional strategies and programs so that appropriate educational programming can occur to assist struggling students. This document has been produced to support teachers in choosing appropriate methods, strategies and programs to help struggling students attain acceptable achievement levels. The instructional methods described in this document are ones that current research indicates are highly effective.

The terms "intervention strategies," "intervention programs" and/or "intervention services" are used throughout this document in lieu of "remediation strategies", "remediation programs" and/or "remediation services." The contributors to this document believe that the terms "remediation" and "remedial strategies/programs/services" conjure up an image of low teacher expectations for students, endless drill and repetition, and an emphasis on student deficits rather than strengths and assets. "Remediation" suggested that problems lie within the struggling students rather than with the methods of instruction. The contributors regard the term "intervention" as preferable because it is broader in scope and allows for different approaches or strategies to be implemented in order for the struggling learners to successfully learn the intended content, skills or attitudes. The word "intervention" also suggests to the contributors that the onus is on the educators to collaborate to find and implement innovative strategies/programs that work best for each individual student.

Beliefs and Guiding Principles

- Good classroom instruction is of paramount importance.
- Educators are expected to remain current in effective teaching practices and learning theory such as multi-level and/or differentiated instruction, learning styles theory and practice, and multiple intelligences theory and practice.
- Educators are expected to evaluate the curriculum, delivery methods, and other classroom issues as the possible causes for poor student performance before concluding it is the result of students' deficits or inabilities.
- Many students can develop an understanding of significant concepts via the active use of concrete materials, first-hand data, visual representations and other like materials. These students would not otherwise be successful with approaches that are relatively abstract and may require abstract symbol manipulation.
- School, district, and Department of Education supervisors and administrators must ensure that students receive instruction from competent and caring professional teachers.
- School, district, and Department of Education supervisors and administrators must provide, monitor and assess the necessary support and training to teachers to ensure students receive quality instruction and services.
- Classroom teachers are expected to provide additional assistance to students who experience difficulties.
- Collaborative consultation and problem-solving approaches are seen as the most effective processes for resolving instructional, delivery problems and/or students' learning difficulties.
- Intervention strategies or programs are appropriate for students who are experiencing ongoing, moderate or severe difficulties in meeting the standards in learning specific academic concepts, skills, or a body of knowledge.
- Classroom teachers are the educators who have primary responsibility for all students, including struggling learners.

Assessment

Assessment is an ongoing process involving the collection of data for the purpose of evaluating a student's acquisition of knowledge, skills and attitudes. The classroom teacher is in the best position to provide information on a current basis. Observation, work samples, student portfolios, journals, standardized tests, whether group or individual, are all valid examples of assessment and therefore are all appropriate in assisting the teacher to determine the best approach to programming for learners who are experiencing learning difficulties.

As a result of a continuing assessment process, the teacher may recognize that a child is still struggling despite his or her various intervention methods. When this occurs, the teacher should submit a referral to the school-based team for further assistance in determining the learning needs of the student.

The following referral process emphasizes the responsibility of the collaborative team at the school level in developing and implementing all possible strategies and resources to address the needs of the struggling student.

1. When it is recognized that a child is experiencing significant difficulty, the child's name should be forwarded to the school-based student services team for discussion. The school-based student services team is a collaborative group that should consist of a school administrator, guidance counsellor, resource teacher, classroom teacher and other district or private professionals (when required). Parents should be included in the planning process.
2. The school-based student services team will identify the child's strengths and needs, and will decide on the most appropriate course of action with regard to the student referred.
3. The team may suggest a problem-solving process (e.g. 30-minute problem-solving technique) where strategies will be identified to address the child's strengths and needs. These strategies will be prioritized and implemented.
4. If the child continues to have significant difficulties, further informal and/or formal assessment may be warranted. Additional strategies may be identified and implemented as a result of the assessment process. District personnel may be consulted at any point during this process.
5. Strategies and methods will continue to be reviewed and adjusted as needed.

When determining appropriate instruction for a student, the goal is to have the student in the least restrictive environment for learning to occur. In most cases, the emphasis will be placed on serving the child in his or her classroom with various groupings, strategies, methods and programs to address educational needs and improve skill level.

Roles And Responsibilities

District Administrators

- provide guidance, support and funding to schools for the provision of appropriate programs and/or services for struggling learners
- provide appropriate consultative services to schools to assist in the identification of students requiring intervention
- work collaboratively with school administrators to ensure intervention programs and/or services are available to students in need
- work collaboratively with schools in planning and providing for the in-service needs of the school staff so that appropriate interventions, programs and services are implemented
- assist the schools in monitoring the effectiveness of interventions, programs and services

School Administrators

- work collaboratively with school district personnel in the planning, provision and monitoring of interventions, programs and/or services in their schools
- make every effort to schedule time during the instructional day for staff collaboration among themselves, with district personnel and with parents for the planning, implementing and monitoring of interventions and/or programs for struggling learners
- work collaboratively with schools in planning and providing for the in-service needs of the school staff so that appropriate interventions, programs and services are implemented
- are to be informed of students requiring intervention
- are responsible for seeing that programs and/or services are provided to students requiring intervention
- are responsible for the monitoring of interventions, programs and/or services

Classroom Teachers

- demonstrate effective teaching, classroom organization and management skills in order to ensure that students' learning needs are appropriately addressed
- monitor the effectiveness of their instructional methods as well as the learning profiles (preferences, characteristics, strengths, interests, talents, styles, etc.) of the students they teach
- adjust or change their teaching methods as required to meet the learning needs of each of their students
- as part of their responsibilities as professional educators, engage in appropriate professional development and in-service activities, particularly in the areas of literacy and mathematics, in order to gain new knowledge, skills and attitudes that relate to teaching students who experience difficulties
- maintain an awareness of the performance level of all students in their classes so that the school-based student services team can discuss those students experiencing difficulties

Resource Teachers

- keep abreast of and develop skills required for the delivery of effective instructional practices for learners experiencing academic difficulties
- participate in classroom settings to assess student needs, and assist the classroom teacher in the development and delivery of appropriate programs or services

- share information regularly with fellow teachers regarding new developments, methods, resources and materials that have been tested and found to be effective for preventing, instructing, and/or intervening with learners who are experiencing academic difficulties
- when deemed necessary and appropriate by the school-based student services team, the resource teacher will conduct informal and/or formal assessments (Please refer to the section on Assessment)
- collaborate with classroom teachers, designated teachers, the school and district administration and parents (i.e. school-based student services teams) in planning, implementing, teaching and monitoring plans and/or services

Teacher Assistants and Volunteers

- assist with or provide practice and/or application components of the intervention program or service under the supervision of the classroom and the resource teacher maintain the confidentiality of student work

In addition, teacher assistants

- know and understand the Teacher Assistant Guidelines (Department of Education, 1994)
- know and understand school policies
- demonstrate appropriate interpersonal skills and are committed to assisting the student
- participate in appropriate in-service and professional development opportunities provided by the classroom teacher, school or district in order to keep abreast of developments in strategies, programs and services for struggling learners

Parents

- understand the school's expectations
- supervise the completion of practice home assignments
- communicate regularly with the school and their child's teachers regarding successes and difficulties that the child experiences with home assignments
- communicate problems or concerns about their child's progress, or any other information that might help the school to better understand the child and to develop and deliver appropriate instruction

Peer Tutors

- follow the procedures as stated in the specific peer-tutoring program or service utilized by the school
- complete the required training for the peer-tutoring or helping services or programs offered by the school
- demonstrate appropriate interpersonal skills and are committed to assisting the learner
- complete the instructional tasks assigned to them by the supervising teachers or administrators
- communicate ideas, concepts and skills so that learning occurs
- keep accurate records of the struggling learners' progress and report any concerns or problems to the supervising teachers

Effective Instructional Methods

The instructional methods listed below are intended to provide classroom teachers with a variety of strategies to help struggling students achieve the academic standards required in learning specific concepts, knowledge and skills. Teachers may find it necessary to employ a variety of instructional methods and/or programs in order that all students achieve the intended learning outcomes. For more detailed information, please refer to the suggested resources, reference and appendices sections of this document.

Research shows that the methods, strategies and programs identified throughout this document help all students perform better, not just those who struggle academically, thus providing additional incentive to educators to use these methods on a regular basis in all classrooms and schools.

Classroom Applications of Learning Styles Theory

The way a person processes information best becomes the basis for his/her learning style. Perceptual strengths and student preferences both affect a learner's ability to process information. It is therefore important not only to match a student's strengths (analytic, global, visual, auditory, tactile, kinesthetic), but also to create an environment that will reduce stress and will maximize learning. The identification of students' learning styles involves an examination of their preferences with respect to instructional styles, learning environment, thinking styles, and expression or output style. (Please refer to Appendix A for more detailed information.)

Multi-level Instruction

Multi-level instruction is based on the premise that one lesson will be taught to the whole class. It is an approach to planning that assumes the individualization, flexibility and inclusion of all students regardless of their personal levels of skills. It allows the teacher to plan for all students within one lesson, thereby decreasing the necessity for separate programs while allowing the teacher to weave individual goals into the classroom content and instructional strategies. To develop a unit or a lesson that is truly multi-level, the lesson must have a definite aim for all students. It must also include a variety of teacher techniques aimed at reaching students at all levels. In developing such techniques, the teacher must consider student learning styles, use questioning methods aimed at different levels of thinking, allow that some students will need adjusted expectations, give students a choice in what method they will use to demonstrate understanding of concepts, accept that these different methods are of equal value and evaluate students based on individual differences (Collicott 1991). (Please refer to Appendix B for more information on multi-level instruction.)

Differentiated Curriculum

The content, process and/or product of the prescribed curriculum are modified to accommodate variations in students' learning styles, preferences, characteristics, multiple intelligences, talents, strengths and needs. A critical step in the development of differentiation is the identification of the underlying concepts to be taught. (Please refer to Appendix C for specific information on how to differentiate a unit of study.)

Co-operative/Collaborative Learning

Co-operative learning is the practice of assigning a common task to a group of students who work together to accomplish a common goal. In co-operative learning situations there is a positive interdependence among students' goal attainments; students perceive that they can reach their learning goals if and only if the other students in the learning group also reach their goals. Such learning requires face-to-face interaction among students, individual accountability for mastering the assigned material, appropriate use of interpersonal and small group skills, and time and procedures for processing (analysing) the effectiveness of a group.

Co-operative learning teaches students to interact with, learn from, and value others of varying ability levels, interests, talents and personalities.

Application of Multiple Intelligences Theory

Dr. Howard Gardner developed the Theory of Multiple Intelligences and believes that human cognitive competence is better described in terms of a set of abilities, talents, or mental skills which he calls intelligences. All normal human beings possess each of these intelligences to some extent; however, individuals differ in the levels of development and the nature of their combination. The nine intelligences presently identified by Gardner are verbal/linguistic, naturalist, logical/mathematical, musical, existential, visual/spatial, bodily/kinesthetic, interpersonal and intrapersonal. Dr. Gardner continues to research the existence of additional intelligences, and further intelligences may be identified in the future.

Traditional teaching tends to recognize and reward those students who show strengths in verbal/linguistic and logical/mathematical intelligences. Students weak in those intelligences are often identified as slow learners or educationally at risk; however, when concepts are presented through the intelligences in which they are strong, they are as capable of learning as their traditionally successful peers. In addition, by applying this theory to teaching, previously unrecognized talents and abilities related to the other intelligences can be developed. (Refer to Appendix D for more information.)

Brain-based Instruction

Brain-compatible/brain-based instruction draws on recent findings in neuro-scientific and cognitive research which provide new insight into the ways the brain is best and biologically designed to learn. While brain research cannot tell educators specifically what to do in a classroom, it does have implications for how we educate children. (Several references which provide detailed information on implications for classroom instruction are listed in the Additional Resources section of this document.) The four findings that follow are causing educators to take a closer look at educational practice and to develop brain-compatible or brain-based instructional strategies and techniques (Wolfe 1998):

- The brain changes physiologically as a result of experience. The environment in which a brain operates determines to a large degree the functioning ability of that brain.
- Intelligence is not fixed at birth.
- Some abilities are acquired more easily during certain sensitive periods, or "windows of opportunity."
- Learning is strongly influenced by emotion.

Accelerated Learning Techniques

Once considered appropriate for use almost exclusively with students identified as gifted and talented, accelerated learning is now believed to be effective with students of any level of performance or ability. The approach is based on the assertion that no learning can take place without memory. Things are best encoded into memory by creating concrete images of sights, sounds and feelings, and by strong association of one image with another. A specific learning pattern is recommended for factual recall. Other accelerated learning techniques include chunking and the use of music and rhyme as aids to memory; peripheral learning and the use of memory "maps" to encourage association are also used to improve recall.

Active Learning

Students are given ample opportunities to -experiment actively and directly and to apply concepts and skills as they are taught through the experiences of daily life. The range of active learning experiences includes games, simulations, product making, role-playing, creative dramatics, pantomime, contests, use of manipulatives and tactile materials.

Quantum Teaching and Learning

Quantum Teaching is founded on such educationally sound theories as Accelerated Learning (Lozanov), Multiple Intelligences (Gardner), Neuro-Linguistic Programming (Grinder and Bandler), Experiential Learning (Hahn), Socratic Inquiry, Co-operative Learning (Johnson and Johnson) and Elements of Effective Instruction (Hunter). Quantum teaching weaves the best of the best into a multi-sensory, multi-intelligence, brain-based package, boosting teachers' ability to inspire and students' ability to achieve.

Thematic or Interdisciplinary Instruction

Two or three subject areas are combined in a single unit that focuses on a theme, issue, problem, topic or concept. This approach helps students connect what they learn from one subject to another and to discover relationships. Interdisciplinary projects promote thinking strategies that cross content areas and transfer into real-life application.

Strategies Intervention Model

This approach identifies specific strategies, techniques and rules that the students' can use in coping with the demands of the curriculum. Many of the techniques used in this approach use acronyms and mnemonic methods, as well as planning through visual organizers to assist students in the organization, retention and comprehension of subject material.

Ron Davis' Symbol Mastery

This technique, developed by Ron Davis, is utilized to improve students' reading and writing skills, primarily by resolving confusion about letters, words, numbers, punctuation marks and math symbols. The procedures use each of the senses for learning and provide concept integration. Students see, touch, discuss, and conceptualize the information they are learning. The application of a strong multi-sensory approach provides stimulation of important parts of the brain and facilitates long-term retention.

Reading Reflex

This is a phonographic method of teaching reading. This work by Geoffrey and Carmen McGuiness operates on the premise that phonological awareness is the basis for our ability to learn to read. This method translates phonemes into "sound pictures" in a developmentally appropriate manner.

Educational Computer Software

A wide variety of educational software is now available to assist teachers with primary instruction or remediation. ***It must be emphasized that educational software programs are tools for learns. They cannot replace teachers.*** The best use of software involves close interaction between the teacher and student in order to ensure optimal appropriate use of the programs.

There are several different types of educational software available:

- **Tutorial:** presents new information, introduces the necessary concepts, provides explanations and demonstrations, and assists students as they practise the new material.
- **Drill and Practice:** provides opportunities for guided practice in a skill or knowledge area.
- **Educational Games:** are designed to make learning fun; a major purpose is to motivate reluctant learners.
- **Discovery:** provides a learning environment in which students can learn by experimentation; there are no right or wrong answers.
- **Simulation:** creates situations in which students make decisions and can see the consequences of those decisions.
- **Problem solving:** provides practice in thinking skills.

Each of these types of software approaches instruction differently; however, it is possible for one piece of software to incorporate more than one approach (Lewis 1993). (Please refer to Appendix E for a list of highly rated software.)

Computer-assisted Learning Programs

Computer-assisted learning programs are, as the name suggests, computer software programs that allow for computer-directed assessment, learning, and evaluation of student progress. The programs usually offer a management component to keep track of each individual learner's program and results, as well as curriculum. Computer-assisted learning programs are attractive for intervention programs because they feature individualized assessment, instruction, practice and testing that allow learners to fill the "missing gaps" in their learning in various subjects or areas of study.

It must be emphasized that computer-assisted learning programs (as with all educational software) are tools for learning. They cannot re lace teachers. The best use of computer-assisted learning programs involves close interaction between the teacher and student in order to ensure optimal appropriate use of the programs. The following programs have been found to be effective. (See Appendix F for more detailed descriptions.)

- Wiggleworks (K-2) - Reading
- Accelerated Reader (K- 1 0) - Reading
- Academy of Reading (K-10) - Reading
- Plato (4-12+) - All subjects

Intervention Strategies/Programs

Intervention strategies or programs are provided to students who have not been successful in meeting the academic standards required in learning specific concepts, skills or knowledge. **Intervention strategies or programs should only be applied when other instructional methods have not been successful.**

Guidelines for Intervention Strategies/Programs:

- Intervention strategies or programs are appropriate for students who are experiencing ongoing, moderate or severe difficulties in meeting the standards in learning specific academic concepts, skills, or a body of knowledge.
- Intervention programs and/or services are to be provided in each school, whether elementary, middle or high school, and delivered as promptly and intensively as is feasible.
- The duration of intervention is to be determined according to the needs of individual students.
- Intervention programs and/or services are to be flexible enough to allow students to receive or terminate intervention as appropriate.
- Student progress and effectiveness of intervention strategies are to be monitored and adjusted as required.
- When tutoring is deemed to be the most appropriate intervention, classroom teachers will communicate student needs to enable appropriate matching to the competency of the tutor or volunteer providing interventions.
- Classroom teachers will supervise the involvement of the tutor or volunteer providing additional assistance.
- Classroom teachers will collaborate with resource teachers, the school and district administration, and parents in planning, implementing and monitoring intervention plans and/or services.
- Resource teachers are knowledgeable regarding specific strategies that are effective for learners who are experiencing difficulties. Thus resource teachers should be consulted in the development of intervention strategies.

(Information on delivery models for intervention strategies/programs is located in Appendix G.)

Tutoring

Tutoring is a type of intervention usually provided on a one-to-one ratio, or in small groups. The tutor usually models or follows the methodology and content of the original instruction. (See Appendix H for information on tutoring service delivery.)

Guidelines for tutoring:

- When deemed to be appropriate by the school-based student services team, the classroom teacher should approach students or their parents privately to encourage the student's attendance in tutoring and/or extra-help sessions.
- If parents are willing and able to provide private tutoring, the classroom teacher is to cooperate with the private tutor in providing appropriate information. However, the classroom teacher is not obligated to provide the private tutor with textbooks or materials. The student should provide the materials for use during tutoring sessions.
- It is in the best interest of the student for the school, district or private tutor to consult with the classroom teacher regarding the student's needs.

Conclusion

This document is intended to provide teachers with up-to-date information on instructional methods, strategies and programs that have been found to be particularly effective with struggling students. It is anticipated, however, that teachers will discover that the methods, strategies and programs identified throughout this document help all students perform better, not just those who struggle academically. The importance of employing a variety of methods in order to accommodate the diversity of learner needs and abilities found in today's inclusive classrooms cannot be overemphasized. By continuing to increase our knowledge and skills on how best to foster learning, student assessment results are likely to improve, thereby moving us closer to the attainment of the Mission of New Brunswick Public Education:

To have each student develop the attributes needed to be a lifelong learner, to achieve personal fulfilment and to contribute to a just and democratic society.

Additional Resources

Accelerated Learning

McPhee, Doug. Limitless Learning. Tucson, AZ: Zephyr Press, 1996.

Rose, Colin, and Malcolm Nicholl. Accelerated Learning for the 21st Century. New York: Delcorte Press, 1997.

Schuster, D.H. and C. E. Gritton. Suggestive Accelerative Learning Techniques. New York: Gordon and Breach Science Publishers, 1986.

Differentiated Curriculum

Differentiating Instruction Video. Alexandria, Virginia: ASCD, 1997.

Tomlinson, Carol Arm. The Differentiated Classroom: Responding to the Needs of All Learners. Alexandria, Virginia: 1999.

Tomlinson, Carol Ann. Professional Inquiry Kit: Differentiating Instruction for Mixed-Ability Classrooms. Alexandria, Virginia: ASCD.

Learning Styles

Carbo, M. What Every Principal Should Know About Teaching Reading. Syosset, NY. NRSI, 1996.

Dunn, R.S. and Rita Dunn. Teaching Students Through Their Individual Learning Styles. Englewood Cliffs, NJ: Prentice-Hall, 1986.

Dunn, R.S., Rita Dunn. Teaching Elementary Students Through Their Individual Reading Styles: Practical Approaches for Grades 3-6 and for Grades 7-12. Boston, Mass: Allyn and Bacon,1992.

Dunn, R.S., Rita Dunn and D. T. Trefinger. Bringing out the Giftedness in Your Child. New York: John Wiley and Sons, Inc., 1992.

Gregorc, Anthony. Gregorc Mind Styles. Columbia, CT. Gregorc Associates, 1997.

Guild, Pat and Kathi Hand. Professional Inquiry Kit: Learning Styles. Alexandria, Virginia: ASCD.

Multiple Intelligences

Armstrong, Thomas. 7 Kinds of Smart. New York: Plume/Penguin Books, 1995.

Multiple Intelligences in the Classroom. Alexandria, VA: ASCD, 1993.

Gardner, Howard. Multiple Intelligences: Theory in Practice. New York: Basic Books, 1993.

Lazear, David. Seven Kinds of Knowing: Teaching for the Multiple Intelligences. Palatine, IL: Skyline Publishing, 1991.

Teaching to Multiple Intelligences Video Set: *Parts 1 and 2*. Quality Ed. Media.

Brain Based Learning

Hart, Leslie. Human Brain, Human Learning. New York: Brain Age Publishers, 1983.

Herrmann, Ned. The Creative Brain. Lane Lure, NC: Brain Books, 1990.

Jensen, Eric. Super Teaching. San Diego, CA: The Brain Store, Inc., 1995.

Brain-Based Learning. Del-Mar, CA: Turning Point Publishing, 1996.
Brain Compatible Strategies. Del-Mar, CA: Turning Point Publishing, 1997.
Sousa, David A. How the Brain Learns. Reston, Virginia: NASSP, 1995.

Quantum Teaching and Learning

(The following can be ordered from Success Products. 1-800-285-3276.)

DePorter, Bobbi. Quantum Learning: Unleashing the Genius in You. New York: Success Products. Dell Publishing, 1992.
Flanberg, Scott. Math *Magic.*
Harmin, Merrill. Inspiring Active Learning: Strategies for Instruction. Edwardsville, IL: Inspiring Strategies Institute, 1995.
Success Products. 1-800-285-3276. Kaplan Succeed in School. Life Skills CD-Rom.

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Davis, Ronald. The Gift of Dyslexia. New York, NY. Perigree Book, Berkley Publishing Group,1994.

Deniz, Carla B., ed. Only the Best: The Annual Guide to the Highest-Rated Software and Multimedia. Alexandria, Virginia: ASCD, 1997.

DePorter, Bobbi, Mark Reardon, Sarah Singer-Nourie. Quantum Teaching: Orchestrating Student Success. Needham Heights, MA: Allyn,& Bacon, 1999.

Deshler, Donald, Edwin Elis and B. Keith Lenz. Teaching Adolescents with Learning Disabilities: Strategies and Methods, 2nd Edition. Denver, Colorado: Love Publishing Co., 1996.

Ellis, Edwin, B. Keith Lentz, and, David, Scanlon. Teaching Learning Strategies to Adolescents and Adults with LD. Austin, Texas: PROED, 1996.

Johnson, David, et at. Co-operation in the Classroom. Rev. ed. Edina, Minnesota: Interactive Book Company, 1996.

Lewis, Rena. Special Education Technology: Classroom Applications. Pacific Grove, California: Brooks/Cole, 1993.

McGuiness, Geoffrey and Carmen. Reading Reflex. Toronto, Ontario: The Free Press, 1998.

McLellan, Borden. Computer-assisted Learning Systems: A Comparative Study . New Brunswick School Districts 14, 15 & 16, 1998.

National Dropout Prevention Center. Pocket Guide to Multiple Intelligences. Clemson, South Carolina: Clemson University, 1996.

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Appendix A

Learner Characteristics, Preferences And Traits

Learner Characteristics

Visual Learners

- detect visual differences
- recall what they see
- learn by observing

Auditory Learners

- detect sound differences
- recall what they hear
- learn by listening and speaking

Tactile Learners

- detect differences in shapes and textures that they touch
- recall what they touch

Kinesthetic Learners

- detect differences in experiences
- recall body movements, experiences, feelings
- learn by performing and by most kinds of physical activity

Learner Preferences

Environmental

- light
- sound
- temperature
- design
- time of day

Social

- individual
- small group with teacher
- peer group
- partner

Learner Traits

Motivation

- self-motivated
- peer-motivated
- authority-motivated
- unmotivated

Thinking Styles

- analytic: works from parts to whole
- global: works from whole to parts

Responsibility
- responsible
- fairly responsible
- not responsible

Structure/Organization
- clear directions, few choices
- specific time limits
- few directions, many choices
- flexible deadlines

Persistence
- persistent, finishes tasks
- fairly persistent
- not persistent

(Carbo 1996)

Appendix B

Sample Multi-Level Unit Plan

The Novel or Short Story

Language arts lends itself to the format for multi-level instruction, as the following unit plan for teaching a novel or short story illustrates.

Concepts to be Taught:

Character	Plot
Climax	Setting
Atmosphere	Conflict
Theme	

Method of Presentation:

One suggestion for teaching these concepts was through the use of a movie (e.g. *The Outsiders* by S.S. Hinton). This would be effective for all students and particularly for two groups—visual learners, and children with low reading levels. The concepts would be presented by a variety of modes and then the novel could be the vehicle for project work based on understanding the concepts.

Method of Student Performance:

A variety of assignments were developed to show an understanding of each concept as it was covered. They ranged from the concrete to the abstract in ideas and from the knowledge level to the evaluation level of Bloom's Taxonomy.

Method of Evaluation:

Individual assignments were used as the major evaluation. Main concepts were tested in a written form where possible. Adaptations were made for students who had limited writing skills.

Methods of Presentation and Student Practice for Specific Concepts:

Setting:

1. Have the students describe the settings of their lives to each other.
2. Describe a setting and have the students draw a picture to illustrate it or find a picture that closely resembles it.
3. Have the students name the setting for a variety of situations depicted through video, pictures, written paragraphs.
4. Discuss or draw pictures of the setting of television shows.
5. Have the students read books or stories at their own reading level and describe the setting.
6. Have the students create a setting for a particular atmosphere.

Plot:

1. Discuss the plot of television shows.
2. Divide students into small groups and have each student write or discuss what they did that day (for practice and sequencing).
3. Have a student act out events and have the other students identify the part of the plot shown.
4. On tape, record sounds to fit certain segments of the plot.

5. Have students write a plot in point form. This is helpful for weak writers, as well as being practice in concise notetaking for others.
6. Instruct students to create a collage of events in the plot.
7. Have students explain which part of the plot is most convincing.

Characters:

1. Have students describe how characters are similar to someone they know.
2. Ask students to describe which character they liked and disliked the most.
3. Instruct students to compare a character's qualities to qualities the students admire.
4. Choose two or three teachers and have students compare and contrast their characters.
5. Ask students to judge what might have happened in the character's life to make him or her rum out that way.
6. Have students describe a character and relate the character to an animal.
7. Have students discuss a character's speech patterns.
8. Instruct students to develop a wardrobe for a character.
9. Have students sketch what a character might look like.

Atmosphere:

1. Ask students to indicate how atmosphere was developed in a television show.
2. Have students use music to create an atmosphere.
3. Have students use colour to create an atmosphere.
4. Have students decide what atmosphere is established by a specific tone of voice.
5. Make tapes of sounds illustrating certain atmospheres.

(Excerpted from Collicott, Jean. "Implementing Multi-Level Instruction: Strategies for Classroom Learners." Changing Canadian Schools: Perspectives on Disabilities and Inclusion. (North York, Ontario: The Roeher Institute, York University, 1991), Chapter 3.))

Appendix C
Differentiating A Unit

The following steps serve as a guide for differentiating curriculum. A science unit, *Face-lifting a Planet*, has been selected to illustrate the process.

Step 1
A teacher begins to differentiate the unit by first determining the learning experiences the students will be offered. The content should range from simple (kinds of features that change the face of the earth) to complex (continental drift). Some of this content will be required information for all students, whereas, other content may only be for those students who select a more sophisticated level of information.

Step 2
The teacher now decides the processes available to students for acquiring the information in the content domain. In this example, the process selected by the teacher was Bloom's Taxonomy of Thinking Skills that ranges from simple (knowledge) to complex (evaluation).

Step 3
The teacher works with the students to determine the types of products that students will create when learning about the content and the research skills students will need to develop the product.

Step 4
In this step, the teacher and students create the learning experiences. They begin by determining an activity (learning experience) that students may complete at the simplest content level (kinds) and simplest process level (knowledge). For example, students could list two ways that mountains, earthquakes and volcanoes change the face of the earth. The teacher and students then develop learning experiences for simple content (kinds) and the comprehension process. Learning experiences are developed along the continuum: simple content (kinds) to complex processes (analysis, synthesis, evaluation). Moving through the content continuum toward complex content, learning experiences are developed for the various cells. For example, the complex content *future* and the complex process *synthesis* could result in the learning experience *design a map of earthquake activity* in *NB 1000 years from now*.

Step V

The type of research skill a student uses and the type of product the student produces to complete a learning activity may be recorded in each cell. This is illustrated by the letters and numbers in the various learning experience cells of the sample that is provided here.

The content cells (Kinds, Formation, Influences, Future) progress from simple to complex, going left to right while the process cells (Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation) progress downward from simple to complex.

Content → / Process ↓	**Kinds** **Mountains** **Earthquakes** **Volcanoes**	**Formation** **Mountains** **Earthquakes** **Volcanoes**	**Influences** **Mountains** **Earthquakes** **Volcanoes**	**Future** **Mountains** **Earthquakes** **Volcanoes**
Knowledge	List two ways that mountains, earthquakes, and volcanoes change the face of the earth.	Read the text on folds and faults	Read the text and list four ways that mountains, earthquakes, and volcanoes influence us.	Find three examples where plate boundaries are closing and plates are in collision.
Comprehension	Summarize notes on how mountains, earthquakes, and volcanoes influence us. (a – 1, 10)	Explain how mountains can be built through the action of earthquakes and volcanoes. (c – 10, 11)		Prepare a report on the future of earthquake activity in N.B. (b)
Application		Demonstrate to the class how folds and faults build mountains. (p)	Read about the Mt. St. Helen Volcano. Write a newspaper article of the event. (e – 8, 10, 11)	On a map, group the data found on plates in collision. (j – 9)
Analysis	What would be the consequence of an earthquake in NB? (f – 11)	What would happen to San Francisco if the San Andreas fault slipped?	Determine why volcanoes occur only in certain places.	Predict what will happen in regions where plates are in collision.
Synthesis	Compare and contrast the effects of earthquakes in NB and BC. (f – 5)	Hypothesize if the San Andreas fault would influence earthquakes in BC.	Design a filmstrip on the influences of mountains, earthquakes, and volcanoes on environment/climate.	Design a map of earthquake activity in NB 1000 years from now. (j)
Evaluation	Decide which kind of facelifting is more detrimental to people. (h – 7,8,19, 11)	Infer how the Rocky Mountains were created.	Set up a panel discussion debating the issues of Continental Drift. (h – 3, 5, 7, 8, 11)	Justify your map to the class.
Research Skills	1. Notetaking 2. Skimming 3. Card catalogue 4. Index	5. Library (Internet, CD-Rom, ERIC, microfiche) 6. Interview 7. Stating a premise 8. Making inferences		9. Outlining 10. Summarizing 11. Drawing conclusions 12. Writing a report
Products	Written a. notes b. report c. test d. story e. editorial	Oral f. report g. debate h. panel discussion i. interview	Visual j. map k. table l. display m. chart	Kinesthetic n. model o. puzzle p. demonstration q. filmstrip

(Adapted from *Gifted and Talented Students: A Resource Guide for Teachers*, (Fredericton: Student Services Branch, New Brunswick Department of Education, 1997))

Appendix D

Helpful Information About Multiple Intelligences

Main Ideas from the Theory of Multiple Intelligences

1. Every person has each of the intelligences.
2. Most people can develop each of the intelligences to a level of competency.
3. Intelligences tend to work together in complex ways.
4. There are many ways to be smart within each intelligence.
5. Each intelligence meets eight criteria identified by Dr. Howard Gardner.

Verbal/Linguistic Intelligence

This intelligence focuses on the ability to use both oral and written language fluently. People strong in this intelligence are able to manipulate the structure, sounds and semantics of language with ease and comfort. People who are strong in verbal/linguistic intelligence think in words. They love reading, writing, telling stories, and playing word games.

Classroom Applications

In the learning environment, students strong in verbal/linguistic intelligence need activities that involve books, tapes, writing tools, paper, diaries, dialogue, discussion, debate and stories to make their learning come alive. Read about it, write about it, and talk about it are instructional strategies that the student strong in the verbal/linguistic intelligence finds interesting.

Logical/Mathematical

This intelligence is the ability to use abstract thought, precision, deductive/inductive reasoning, counting, organization and logical structure. The person strong in this intelligence is able to solve abstract problems and understands complex relationships found in mathematics and in the scientific process. People strong in this area think by reasoning. They like experimenting, figuring things out logically, questioning, calculating, predicting and estimating.

Classroom Applications

A learning environment with plenty of opportunities for students to use manipulatives and go on field trips will challenge the learner who is strong in this area. Phrases such as compare and/or contrast these, quantify this, conceptualize this, and figure this out pique the interest of the students strong in logical/mathematical intelligence.

Musical Intelligence

This intelligence is evidenced by sensitivity to pitch, rhythm, timbre, tone, colour, and the emotional power and complex organization of music and the sounds in one's environment. The person strong in this intelligence has the ability to perceive, discriminate, express and transform all aspects of music and environmental sounds. People strong in this area think in

rhythms and melodies. They make vital links and connections for learning through singing, whistling, tapping their feet and/or hands, listening, and humming.

Classroom Applications
A learning environment that engages students in sing-along time and concerts, offers opportunities for playing musical instruments, and plays music in the background is a musically enriched classroom environment. A teacher can relate well to the students strong in the musical intelligence by asking them to *sing it, rap it,* and *listen to it*.

Visual/Spatial Intelligence

The visual/spatial intelligence is the capacity to perceive the world in mental images—the ability to see form, colour, shape, and texture in the mind's eye. Through keen observation and visual thinking, one can recreate visual experiences. A person strong in this area thinks in pictures and images. Designing drawing, visualizing and doodling are important tools in the development of imagination and creativity.

Classroom Applications
In the visual/spatial learning environment, one will find art materials, maps, videos, cameras, movies, slides, illustrated books, mazes, and puzzles. Phrases such as *see* it, *draw it*, *can you visualize this, and draw a mindmap explaining this*, capture the attention of the visually/spatially intelligent person.

Naturalist Intelligence

This intelligence deals with one's affinity with nature, with being able to see connections and patterns in the natural world and identify and interact with its processes. People who are strong in this intelligence think in reference to nature. They enjoy activities such as nature walking, animal interaction, categorizing, stargazing, forecasting, simulations and discovery.

Classroom Applications
In the learning environment, students strong in the naturalist intelligence need to interact with nature. They thrive on outdoor and/or environmental activities that allow them to sort and categorize, observe natural occurrences and life forms, interact with or manipulate animal life or natural conditions. They respond well to instructional strategies that ask them to observe it, record about it, categorize according to features, and care for it.

Bodily/Kinesthetic Intelligence

This intelligence relies on the whole body to express ideas and feelings, and the hands to produce or transform things. Physical skills that are specific to this intelligence include coordination, balance, dexterity, strength, flexibility and speed. People who are strong in this intelligence think by using body sensations such as dancing, running, jumping, building, touching, and gesturing.

Classroom Applications
In the learning environment, students strong in bodily/kinesthetic intelligence need to participate in role-playing, drama, and movement. They thrive on hands-on learning activities, physical games, and opportunities to build or make things. They respond well to instructional strategies that ask them to *build it, act it out, and touch it*. A classroom filled with manipulatives, building tools and materials, and sports equipment will enhance the bodily/kinesthetic learner.

Interpersonal Intelligence

The interpersonal intelligence involves the ability to perceive and discriminate the feelings, moods, intentions and motivations of other people. People who are strong in this intelligence seem to be able to easily read other people's facial expressions, voice and gestures and then interpret those actions with appropriate responses. People who exhibit a strength in interpersonal intelligence do their best thinking by discussing ideas with others. They are the students who love co-operative learning groups because this activity allows them to bounce ideas off others. They love to read, organize, relate, mediate and party with others.

Classroom Applications

A learning environment that encourages students to interact through board games, cooperative learning groups, clubs, and community events will be the classroom that relates well to these students. Persons strong in interpersonal intelligence also enjoy teaching others and collaborating with others. Instructional strategies that ask students to *talk, share, co-operate* or *collaborate* are effective with these learners.

Intrapersonal Intelligence

The ability to know oneself and to act adoptively is the mark of the person who has strong intrapersonal intelligence. This intelligence allows one to accurately assess personal strengths and weaknesses; perceive inner moods, motivations, temperaments and desires; and practise self-discipline. Persons strong in intrapersonal intelligence are reflective in their thinking. They enjoy setting personal goals, meditating and daydreaming. Alone time for them is a must.

Classroom Applications

A learning environment that allows students to work on projects and/or assignments that permit self-pacing and choice works well for persons strong in this intelligence. They connect well to instructional strategies that relate to their own lives, such as *recall about a time in your life when, imagine how things might be if, think about the next ten years and describe.*
(NDPC 1996)

Existential Intelligence

This intelligence involves the ability to understand where humankind stands in the "big picture" of existence. Children who are strong in this intelligence ask questions such as "Why are we here?" and "What is our role in the world?" This intelligence is seen in the discipline of philosophy. More information on the ninth intelligence and other possible intelligences is discussed in Dr.Gardner's two forthcoming publications: M.I. Reframed and The Disciplined Mind: What all Students Should Understand.

Appendix E

Highly Rated Educational Software

The following is a sampling of software programs that are listed in the 1997 edition of Only the Best: The Annual Guide to the Highest - rated Educational Software and Multimedia:

Primary (K-Grade 5)

The Berenstain Bears	
Get in a Fight	*Living Books, 1995*
Dr. Seuss's ABC's	*Living Books, 1995*
JumpStart First Grade	*Knowledge Adventure 1995*
Little Monster at School	*Living Books, 1994*
My First Amazing World Explorer	*DK Multimedia*
Trudy's Time and Place House	*Edmark, 1992*
A to Zap!	*Sunburst Communications, 1993*
Arthur's Teacher Trouble	*Broderbund Software, 1992*
Bailey's Bookhouse	*Edmark, 1993*
Millie's Math House	*Edmark, 1992*

Language Arts

The Amazing Writing Machine	*Broderbund Software, 1994*
The Electronic Bookshelf	*The Electronic Bookshelf, 1984*
Grammar Games	*Davidson & Associates, 1994*
How the Leopard Got His Spots	*Microsoft Corp., 1995*
The Imagination Express Series	*Edmark, 1995*
MACBETH	*Voyager Company, 1994*
Read, Write, & Type!	*The Learning Company, 1995*
Romeo and Juliet	*Attica Cybernetics, 1994*
Storybook Weaver Deluxe	*MECC, 1994*
Ace Series	*Mindplay*
Read'N Roll	*Davidson & Associates, 1987*
Stickybear Reading	*Optimum Resource, 1984*
M-ss_ng L-nks	*Sunburst Communications, 1983*

Mathematics

Boxer Trigonometry	*Boxer, 1995*
Counting on Frank	*EA Home Software, 1994*
Exploring Mathematics with	
Manipulatives, Levels II and III	*IBM/EducQuest, 1992*
MathKeys	*MECC, 1994*
Tabletop Jr.	*Broderbund Software, 1994*
Hot Dog Stand: Survival	
Math Skills	*Sunburst Communications, 1991*
Math Rabbit	*The Learning Company, 1986*

Suggested Supplier: Educational Resources
Toll Free Number: 1-800-565-5198 or E-Mail: edresources@sympatico.ca

Appendix F

Popular Computer-Assisted Learning Programs

(McLellan 1998)

Wiggleworks

Supplier

Scholastic Canada Ltd.
123 Newkirk Road
Richmond Hill, ON
L4C 3G5
Telephone: 1-800-268-3848

Description

Wiggleworks is a multimedia interactive computer-based reading and writing program for students K-2. *Wiggleworks* is designed to assist emerging readers in developing confidence in reading, listening, spelling and writing skills. The program is presented in Stages A, B & C that generally correspond to Grades K, 1 & 2. Each stage has three levels of difficulty, which are progressively more challenging and address a wide variety of learning styles. *Wiggleworks* is a unique combination of stories and entertaining activities that make learning to read fun for young students.

Wiggleworks allows students to listen to a story or read it themselves, record their reading, check their comprehension, then create and illustrate their own story. A wide range of writing options and student supports are available, including "sentence starters," "story words," and a list of their own "saved words" to assist them in personalizing their work. Students may use the tape recorder to record their text ideas, then play them back and type them on-screen, editing as they go. By seeing their own work on the computer and printing it, they learn the relationship between spoken and printed words. The text-to-speech function allows students to read back what they have just written.

Materials provided with each stage include 7 copies each of 24 book titles, 6 CD-ROM's, 24 tracking plans and 24 audiocassettes, together with management items. Additional literature collections are also available to purchase. Program books covering a wide variety of topics are pictorial (soft or hard cover), and allow students to pace their own learning. *Wiggleworks* promotes the notion that holding, touching and having books is as important to students as the on-screen printed word.

Learning Management System

Management tools provided with each stage of software include a teaching plan which makes suggestions for implementation and observation notes for assessing student literacy skills; *Benchmark Books* assist teachers in determining the level to begin a student. Some additional tools that are provided are a skills and strategies chart, a learning outcomes checklist, a reading log and parent conference sheets.

Management options allow teachers to modify students' programs to suit their learning needs and to track and record student work. Teachers keep their own confidential notes on all students in the *Comments File* while class lists and special groupings are recorded in *Class Lists.*

Teachers may leave recorded messages for students which they read (or hear) when they log in to their workstations. Any instructions that teachers give or programs they select are saved in the *Teachers File* for future reference. Teachers can record up to sixteen pages of text and pictures for student use, which then become part of the learning program until the teacher removes them. Teachers can also scan in or draw pictures on-screen which students can then colour with the Paint-It feature.

Usage in NB Schools
Wiggleworks is currently used in nineteen (19) elementary schools as an integral part of their overall literacy program. It complements and supports Reading Recovery and Read Along programs in several schools. Eight (8) schools use the "Read to Me" feature for kindergarten students, in order that they can hear the books read on the computer and follow along in their books. Kindergarten students enjoy this very much and request more reading time.

Nine (9) schools having Stage B, or B & C use their programs daily in all grades 1 and 2 classes for literacy, remediation (up to gr. 5), and enrichment for accelerated students. It is especially helpful in two multi-age, multi-grade classes and has been found to be effective with students with special needs.

Conclusion
This beginning literacy program designed for K-2 is user-friendly and highly interactive, thus able to catch and sustain students' interest. The stories on the program can be read on-screen with highlighted text, music, sound effects and illustrations. There are a variety of activities for various learning levels.

This is the most popular early literacy computer-assisted learning system used in the province of New Brunswick. Teachers who use it recommend it highly.

The Academy Of Reading

Supplier
Auto Skill International
331 Cooper Street, Suite 301
Ottawa, ON K2P OG5
Telephone: 1-800-288-6754

Description
The *Academy of Reading* is designed to assist students in acquiring the skills necessary for a mastery of reading. The understanding that spoken words are made up of speech sounds, or phonemes, is central to this program. The methodology is to improve reading comprehension through phonemic awareness and decoding skills.

Having identified sub-skills of reading difficulties, AutoSkill has developed learning modules, which assist students to gain the necessary skills in grade-appropriate reading comprehension.

The *Academy* works on the premise that reading can be broken down into sub-skills. The modules have been developed to address each identified sub-type of reading disability: oral reading (type 0), auditory matching (type A) and visual matching (type S).

The *Diagnostic Assessment* module includes pre-tests and post-tests which measure speed and accuracy in phonemic awareness, sub-skills reading assessment and word recognition. Grade level assessment using cloze paragraphs is also available. Test results are analysed within the program to determine a student's current reading level, and then a course of study is recommended. Teachers may then automatically assign training within the program or prescribe their own learning exercises. A French version of the Academy of Reading program is also available.

The *Academy* has been designed to primarily serve students in elementary and middle schools who have been identified with reading difficulties. It is considered an excellent program for teaching phonemic awareness, during either initial teaching or remediation.

Learning Management System
In the *Data Analysis Room* of the *Academy*, teachers can monitor student results in all areas of testing and training. The reports and data analysis capabilities allow teachers to monitor students' progress, time on task, test results and score analysis, and to print out all reports. Pre-test and post-test assessments include measurements of accuracy, and speed of response for the reading sub-skills. The record-keeping system can actually identify student progress in sub-skills before there is a noticeable gain in reading fluency.

Students may be tested individually, or in small or large groups, with results accurately recorded for each student. Comparisons can be made not only for the lesson currently being worked on, but also with the results from yesterday, last week or last month. A message system allows teachers to send on-screen messages to students individually, by class or grade. By tracking overall class and grade progress, administrators are able to identify specific areas of need and thus concentrate on these particular skills.

The *Streamlined Approach* tests students in groups for grade level only, but students who have more severe difficulties can be given a Clinical Assessment, and appropriate remedial training can be prescribed. Regardless of the grade level or type of reading difficulty, each student's work is individually assigned and assessed by the *Academy of Reading*.

Usage in NB Schools
Many schools are using this program to assist with reading remediation, literacy enrichment, and services to students at risk and students with special needs. Several are using it to help prepare grade 8 students for the English Language Proficiency Assessment. Three high schools are using it with students in grades 9110 to help them prepare to rewrite the assessment. The program is widely used in School District 16.

Conclusion
Academy of Reading is one of the better programs for building phonemic awareness, decoding skills, and improving reading comprehension in students with reading delays, grades 3-8. While the program description claims that the program is also suitable for students K-2 and grades 9-10, experience has shown there are other programs which serve students better at these grade levels. The strengths of the program are its extensive diagnostic and clinical tests and student assessment components.

A major complaint of users of the Academy is that they encountered many technical difficulties with the program. It is so finely tuned that the slightest irregularity by sound cards, video cards, drivers or users causes major problems that most teachers are unable to resolve. These technical difficulties have frustrated some teachers and discouraged them from using the program.

Accelerated Reader

Supplier:
Renaissance Learning
P.O. Box 8036
Wisconsin Rapids, Wisconsin • 54495-8036 • USA
Toll-Free Phone: (800) 338-4204
http://www.renlearn.com

Description
The Accelerated Reader is a reading management system designed to motivate students to read more and better books, thus helping them become better readers. Students select library books within their current reading level, read the books, then complete comprehension tests. *Accelerated Reader* has a library of over 12,000 books and tests from which to choose. Expansion disks are available which contain additional books and tests so that new materials can be added to the program. A team of librarians and educators selects books based on the best and most current research on reading styles, interests and curriculum grade requirements.

The computer program assesses reading comprehension, tracks performance, and provides reports for teachers and students. The impetus behind the development of the *Accelerated Reader* program is the conviction that encouraging reading practice is the best way to promote literacy.

Based on the belief that practice in reading improves reading skill and comprehension, this program combines the motivational potential of quality literature with the use of the computer, and a points system for incentive and recognition. Students select books to read from a list of over 200 titles (in each grade group) based on reading levels and points value. Once a student has read a book, he/she completes a test on the book consisting of 5, 10, or 20 objective questions. The computer scores the test, awards the student points on the basis of test performance, tells which questions were missed (if any), gives the correct answers, and keeps a record of the results.

Each book's point value is based on its length and its readability level. The computer awards reading points to the student on the basis of the percent of correct answers achieved on the test. Thus, point values reward the student on the basis of quantity, quality and level of reading. Readers accumulate points that make them eligible for prizes, merchandise, parties, names on a wall chart, etc.

Learning Management System
The program records students' reading progress and makes it available to teachers in 21 different report formats. Teachers can also remove scores from the computer's memory, create new tests, change existing ones, print tests and reports and add to the original list of book choices. The teacher controls when and what students can print and the level of books on which they may be tested.

The program summarizes student test results and points earned individually, by class, or selected groups. Security features in the software greatly reduce the possibility of students cheating. Each student has his/her own password and the program alerts teachers to unauthorized access attempts. Points awarded to students are a fair measure of the quantity of words being read and their comprehension, and are therefore a good measure of student reading practice.

Usage in NB Schools
There are currently four programs installed in schools in School District 15, two in elementary and one each in a middle and high school. One elementary site has been installed for over a year and is achieving a high degree of success. Students clamour to use *Accelerated Reader* and will even slip out of class to get to the lab to read. This elementary program is serving students in grades 3 - 5 at varying levels of achievement, and is being used to develop reading comprehension, and for enhancement and enrichment. Teachers now have students use *Accelerated Reader* instead of sustained silent reading, with great success.

Conclusion
Accelerated Reader is designed to increase student motivation to read (K-12) by awarding points for successfully reading books and completing comprehension tests. The higher the reading level of the book and subsequent comprehension test score, the greater the award points which can be exchanged for prizes or privileges.

The schools using the program find it has had a tremendously positive effect on students' willingness to read. Yet, the research literature indicates this is a controversial program. Some argue that the choice of books is too limited, increased reading scores are only temporary, and prizes for reading sends the wrong message to students. The program is expensive. Potential buyers need to carefully consider whether the program is worth the expense, given that it basically only does four things: provides the school with books, records the number of books students read, scores tests results, and awards points.

Plato

Supplier

TRO Learning (Canada) Inc.
48 St. Clair Avenue West
Suite 901
Toronto, ON
M4V 2Z2
Doug Borthwick, Atlantic Regional Manager
Telephone: 1-506-877-1122 (Moncton)
Or 1-902-835-2363

Description
Plato is a leading provider of computer-assisted, interactive, self-paced learning systems. The courseware is designed to span a broad range of curriculum areas, with each course targeted to specific competencies and skill levels. It incorporates effective instructional strategies for skill development with real-life applications to help students establish a solid foundation of learning skills.

Plato courseware is objective-based and able to be configured to meet provincial curriculum objectives at middle and high school levels. By identifying the needs of the learners the program then applies instructional strategies best suited to their requirements. Students can then immediately focus on mastering those needed skills, thereby improving their achievement. As their learning progresses, the courseware reinforces those concepts already learned as they move forward and master new ones.

Plato is a skills-based program which pre-tests students' competencies in specific modules and assigns learning paths to address their needs. Problem-based activities encourage critical thinking, and life skill lessons apply to real-life situations. The courseware is designed to integrate all software from the Plato library, and third party suppliers, into the program. Other software may also be added to the management system, with a reduced level of record keeping. All programs can be used as published, or may be restructured to accommodate specific program or teaching strategies.

Plato is currently being used in hundreds of public schools, alternative schools, community learning centres and other institutions across Canada. The courseware is ideally suited for a variety of learning purposes such as course remediation, skill building, alternative programs. It is equally valuable for enrichment as well as reinforcement for senior courses like Physics, Chemistry, Advanced Math and Calculus. *Plato* can augment regular programs of instruction, and assist struggling learners, as well as students with special needs.

Plato has proven to be a strong program for remediation, through its ability to customize onscreen instruction and to focus specifically on student skill areas needing attention. *Plato* offers students control of their own learning through self-paced, self-directed daily monitoring of their progress.

Plato software diagnoses student skills quickly and prescribes individual learning paths that direct them to the lessons they need and exempt them from outcomes they have already mastered. Each student keeps an individual record of his or her progress by creating a Personal Learning Disk. This records scores from drills, applications, reviews and tests, and has printout capabilities.

Learning Management System

The management system provides a wide range of tracking and reporting options on learner work and achievement. A variety of assessment tools are available for skill diagnosis and suitable learning-paths placement. Special courses can also be provided with customized assessment, and a fast track evaluation is available to quickly target a course of study and monitor student progress. Other management functions provide class lists, course selections, time on task and performance evaluation.

Usage in New Brunswick Schools

Plato is currently the only learning system that has invested the time and money to identify the alignments of their software with the New Brunswick curriculum.

The *Plato* courseware aligned with the New Brunswick curriculum for English 112, 113, 123 and Math 112, 113 has been found to be sufficiently strong to allow students to complete these courses on *Plato* with good success.

Plato is currently being used (or is about to be installed) in fourteen schools throughout the province and fifteen alternative settings. Most schools with *Plato* are high schools.

Conclusion

Plato is designed to teach adolescents and adults (grades 4 - 12). The courseware is modular with over 5000 self-paced learning activities. The courseware is student-centred and designed for direct use by learners on screen. The assessment and management feature allows students, teachers, or the program to select appropriate learning paths and to continually monitor the learning progress.

The alignment of the program with the NB curriculum is a positive selling feature. *Plato* is able to serve a wide range of student needs and is the most widely used computer-assisted learning program in the province. While it is expensive, schools have found it to be of good value.

Appendix G

Delivery Models For Intervention Strategies/Programs

The following intervention delivery models are used at all levels: elementary, middle and high, progressing from less to more intensive intervention. Model 3 or 4 should be implemented ONLY when models 1 or 2 have been unsuccessful:

1. Customized schedules are developed for students to allow them a "Double Dose" of instruction. Thus, students having difficulty in a-particular subject receive instruction in the subject for two sessions or periods a day or some similar scheduling arrangement. Students may be scheduled either long-term or short-term for this assistance, i.e. for a full year or for a semester.
2. An intervention program is developed and delivered by the classroom teacher with practice/application components supervised by others, i.e., Teacher Assistant, volunteer, peers, parents. The practice components may be supervised either within or outside of the classroom.

Regarding models 3 and 4, an intervention program is developed by the resource teacher in collaboration with the classroom teacher, middle school or high school team and is delivered by

3. the resource teacher in the regular class: This resembles team teaching and requires cooperation between the classroom teacher or team and the resource teacher. Time for collaborative preparation is also necessary.
4. designated teacher: (Note: The designated teacher may be a classroom teacher, resource teacher, administrator, or other professional staff.) The following are suggested as two of several delivery models that have been found effective for providing intervention to students eligible for intervention programs and/or services.

The Blocking Model

The student participates in an intensive pullout program provided by the designated teacher. (Example: Instruction 1/2 to 1 hour per day, 5 days a week for 6-8 weeks.) The pullout block is followed by in-class application of the target skills with support provided by the designated teacher. The duration of in-class involvement may be short-term or long-term depending on individual student needs. Thus, the transference of intervention may be accomplished by having the designated teacher continue working with the student in the classroom. Once the transfer phase is complete, the student is allowed to work independently as a member of the class for 6 to 8 weeks. Following this, the designated teacher becomes re-involved to provide a refresher course. Good communication and collaboration among the designated teacher and/or resource teacher, classroom teacher and team insures continued support of the work.

Scheduled Resource Period

A resource period is scheduled into the timetable of students identified as requiring intervention in one or more subject areas. A scheduled resource period is often used in the high school, particularly during grades 11 and 12 where blocking may not be possible due to the structure of the credit system.

Appendix H

Tutoring Service Delivery

Tutoring follows closely or is the same methodology and content presented in the regular classroom program. Tutoring services may be provided by

- Classroom teacher during class time, at noon or after school hours
- peer tutors supervised by a teacher
- tutors employed by a school or district to provide services to students during or after school hours
- private tutors employed by parents to provide services outside of school hours

Funding is available to each school district to provide tutoring services.

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