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Introduction

This report presents a review of best practice in the field of learning disabilities (LD) based on current research from North America, the United Kingdom and Australia and, to a lesser extent, other countries such as New Zealand, the Netherlands, and South Africa. The following questions guide this review of current research on best practice in the field of learning disabilities:

- Who are students with learning disabilities and how is "success" defined?
- What are “best practices” in teaching students with learning disabilities?
- How do various models of service delivery align with best practices in teaching students with LD?
- What are some examples of current practice in service delivery? How do they align with best practices?

Section One presents information about students with LD and discusses what “success” means for these students. Section Two addresses the “best practices” in teaching students with LD. Overall considerations of effective instruction are presented first and include:

- Assessment and Identification
- Individualized Program Plans
- Collaboration
- Meaningful Parent Involvement
- Ongoing Assessment
- Accommodations and Assistive Technology
- Self-advocacy
- Transition Planning
Next, instructional practices are explored. Best practices that apply across the school years are presented, followed by practices more specific to the early years and then to grades 3 through 12. Finally, additional emerging issues relevant to students with LD are presented, including co-existing AD/HD, the knowledge base of teachers and administrators, multicultural and second language issues in intervention and inclusive practices such as Differentiated Instruction and Universal Design for Learning.

In Section 3, the elements of best practice in teaching students with LD are used as a basis for exploring models of service delivery to determine how well they align with best practice. Examples of current practices in service delivery are provided to illustrate a variety of approaches to meeting the needs of students with LD at different age levels. Segregated special placements to more inclusive models are presented.
Section 1 - Individuals with Learning Disabilities

Defining and Describing Learning Disabilities

The development of the LD field in Canada parallels that of the United States. Compared to other special needs, learning disabilities were not recognized in the American educational system until the 1960s and actual provision for children with LD did not formally occur until the mid 1970s with the passage of Federal Legislation (Public Law 94-142). In Canada, the Montreal Children’s Hospital Learning Centre was founded in 1960 by psychiatrist Mel Levinson. The purpose was to investigate the difficulties experienced by children who seemed to have average intelligence but who experienced significant difficulty with school functioning. Considerable leadership in the field has been provided by the “Association for Children with Learning Disabilities” (now the Learning Disabilities Association of Canada) founded in 1963 by a group of concerned parents.

Individuals with LD have average to above average intelligence but experience difficulties in processing information that affect learning. Learning disabilities have a neurological basis, are often hereditary and are life long. They represent the most common special education need in North America. For example, 57% of high school students with disabilities in public high schools in the United States have LD. A Statistics Canada survey of parents of children with disabilities conducted in 2001 found that four out of five children requiring special education services had LD (Uppal, Kohen and Kahn, 2006). In Alberta, students with LD are the largest group of students designated as having special education needs. It is estimated that 1 in 10 Canadians has a learning disability.

Canadian provinces have authority over education and there is no federal legislation related to LD resulting in variability in defining and diagnosing LD across the country. Most Canadian provinces accept the
following conceptual definition put forward by the Learning Disabilities Association of Canada in 2002:

“Learning Disabilities refer to a number of disorders which may affect the acquisition, organization, retention, understanding or use of verbal or nonverbal information. These disorders affect learning in individuals who otherwise demonstrate at least average abilities essential for thinking and/or reasoning. As such, learning disabilities are distinct from global intellectual deficiency. Learning disabilities result from impairments in one or more processes related to perceiving, thinking, remembering or learning. These include, but are not limited to: language processing; phonological processing; visual spatial processing; processing speed; memory and attention; and executive functions (e.g. planning and decision-making).

Learning disabilities range in severity and may interfere with the acquisition and use of one or more of the following:

- oral language (e.g. listening, speaking, understanding)
- reading (e.g. decoding, phonetic knowledge, word recognition, comprehension)
- written language (e.g. spelling and written expression)
- mathematics (e.g. computation, problem solving).

Learning disabilities may also involve difficulties with organizational skills, social perception, social interaction and perspective taking. Learning disabilities are lifelong. The way in which they are expressed may vary over an individual's lifetime, depending on the interaction between the demands of the environment and the individual's strengths and needs. Learning disabilities are suggested by unexpected academic under-achievement or achievement which is maintained only by unusually high levels of effort and support.
Learning disabilities are due to genetic and/or neurobiological factors or injury that alters brain functioning in a manner which affects one or more processes related to learning. These disorders are not due primarily to hearing and/or vision problems, socio-economic factors, cultural or linguistic differences, lack of motivation or ineffective teaching, although these factors may further complicate the challenges faced by individuals with learning disabilities. Learning disabilities may co-exist with various conditions including attentional, behavioural and emotional disorders, sensory impairments or other medical conditions. For success, individuals with learning disabilities require early identification and timely specialized assessments and interventions involving home, school, community and workplace settings. The interventions need to be appropriate for each individual's learning disability subtype and, at a minimum, include the provision of:

- specific skill instruction
- accommodations
- compensatory strategies
- self-advocacy skills.

As can be seen from the definition, students with LD experience diverse challenges, often hidden, that differ in terms of severity and the areas affected. There are many different patterns of strengths and needs among students with LD. Language processing is the most common area of difficulty. Considerable research has confirmed that the majority of children with LD experience phonological processing difficulties, with 80% of LD children having difficulty learning to read. Phonological awareness is a cognitive requisite for reading and is the most frequent impediment to learning early reading skills. Phonological awareness enables the learner to understand and manipulate smaller components in spoken language (e.g., adding, omitting, substituting sounds, or phonemes, within words;
understanding syllables within words; and putting words together into sentences), and provides the foundation for acquiring the alphabetic principle, word analysis, spelling and other high level skills.

Learning disabilities are not just confined to difficulties in reading, and can manifest in other areas such as visuospatial processing, executive functioning and reasoning, directionality, mathematics, and so on. All learning is directly affected by the student's memory and attention. Students with LD often have problems with their memory, a cognitive activity that is part of the executive system. Memory is the capacity to encode, process, hold, retrieve and manipulate information for as long as necessary to accomplish a task. Students with LD have difficulty holding and maintaining attention to task despite distraction or disturbance, forget instructions, struggle to keep track of complex tasks, and have particular difficulty with tasks requiring processing and storing information.

To add to the complexity, LD often co-exists with other disorders. The most common co-existing disorder is Attention-Deficit/Hyperactivity Disorder (AD/HD) with 30% to 50% of children with LD also having AD/HD. Adolescents with learning disabilities also often describe experiencing symptoms of anxiety and depression. A person with LD can also have “twice-exceptional status”, that is be formally diagnosed with more than one disorder (e.g., Gifted/LD).

The increasing diversity of the Canadian population is also adding to the complexity of practice in the field of LD. Multicultural and second language issues have an impact on the identification and diagnosis of LD, on interactions between parents and school personnel, and on strategies for intervention.
What does “success” mean for individuals with LD?

Individuals with LD have the potential to lead happy and productive lives and to make significant positive contributions to society and to the economy. However, when their difficulties are not recognized and appropriate interventions and supports are not provided throughout their school careers, there are negative long term consequences. In a recent report by the Learning Disabilities Association of Canada, Putting a Canadian Face on Learning Disabilities (2007), an analysis of Canadian census data found that when compared with the general population, individuals with LD were:

- twice as likely to drop out of school
- significantly underachieving in literacy
- less likely to experience stable employment
- more likely to report higher levels of stress, depression and anxiety
- more likely to report poorer mental/physical health

In addition, individuals with LD are at an increased risk for lingering dependence on caregivers and are more likely to be involved with the criminal justice system (Shrum, 2004).

Given these potential negative outcomes, it is critical that action be taken to increase the success of students with LD. In the long term, the goal is that adults with LD have positive interpersonal relationships, stable and meaningful employment, good mental and physical health, financial security and no involvement in criminal activity. Success includes completing high school and going on to the successful completion of some kind of post-secondary education. Six factors that contribute to the success of adults with LD are self-awareness, proactivity, perseverance, goal-setting, support systems and emotional coping strategies.
During the school years, success is measured in many different ways:

- **Basic skill development**: achievement of or movement towards age-appropriate reading, written language, and math skills.
- **Ability to access age-appropriate regular curriculum**: with minimal support from the teacher and with increasing independence as a learner.
- **Demonstrated and observable use of compensatory strategies**.
- **Demonstrated knowledge and use of helpful accommodations and assistive technology**.
- **Demonstrated ability to “self-advocate” and self-monitor for success**.
- **Involvement in and understanding of planning for transitions that goes beyond one year**.
- **Pursuit of career options based on goals, interests, and abilities**.
- **Appropriate and successful social interaction with peers and adults**.

In the future, a potential measure of success may be to demonstrate changes in brain functioning as a result of intensive remedial programs for individuals with LD. Functional MRIs (Magnetic Resonance Imaging) allow neuroscientists to study the brain at work and have shown different brain activation patterns during reading tasks for good readers compared with individuals with LD characterized by severe reading difficulties. There is some evidence that intensive remedial reading instruction may actually change brain processes (Carnegie Mellon University, 2008).

**Summary**

One in ten Canadians has a learning disability. Students with LD form a large part of the school population. They have a range of complex needs that interfere with learning. Language processing difficulties that affect the acquisition of literacy skills are most common, but students with LD have difficulties that go beyond reading and a range of educational supports are
needed. Individuals with LD have the potential to be successful in school and in life when their difficulties are recognized and appropriate interventions and supports are provided in school.
Section 2 - What are “Best Practices” in Teaching Students with Learning Disabilities?

In a review of research and best practice in meeting the needs of students with learning disabilities conducted by the Calgary Learning Centre in 2000-2001, nine key components were identified as essential considerations. These components formed the basis for a resource developed for Alberta Education (Unlocking Potential: Key Components of Programming for Students with Learning Disabilities, 2002). The key components were: collaboration, meaningful parent involvement, identification and assessment, ongoing assessment, individualized program planning, transition planning, self-advocacy, accommodations and instructional practices.

The current review confirmed the importance of the above components for effective programming. Advances in knowledge and emerging themes were found to relate to these key components and include: changing approaches to identifying learning disabilities, an emphasis on early intervention and evidence-based practice, recognition of adolescent literacy issues and advances in Assistive Technology. Overall considerations in meeting the needs of students with LD are presented first. The following components are considered:

- Assessment and Identification
- Individualized Program Plans
- Collaboration
- Meaningful Parent Involvement
- Ongoing Assessment
- Accommodations
- Assistive Technology as an Accommodation
- Self-Advocacy
- Transition Planning
Next, instructional practices are explored. Best practices that apply across the school years are presented, followed by practices more specific to the early years and then to grades 3 through 12. Finally, additional emerging issues relevant to students with LD are presented, including co-existing AD/HD, the knowledge base of teachers and administrators, multicultural and second language issues in intervention and inclusive practices such as Differentiated Instruction and Universal Design for Learning.

**Overall Considerations in Meeting the Needs of Students with LD**

The components presented below all contribute to effective programming for students with LD. They are not isolated, but influence and complement one another and support instructional practices.

**Assessment and Identification**

Since the term "learning disabilities" was first used in 1962 by Dr. Samuel Kirk, the field has struggled to define the concept of LD and to operationalize the definition. In diagnosing LD, psychologists have typically explored the following:

- **discrepancy** (uneven abilities, underachievement)
- **processing deficits** (intrinsic to the individual)
- **exclusionary factors** (cannot be primarily accounted for by other conditions environmental factors or cultural or linguistic diversity).

In practice, the emphasis on identifying LD students who are eligible for special education services has resulted in reliance on a discrepancy between intelligence test scores and achievement as the criteria for identifying LD. However, at the 2002 LD Summit in the United States, there was consensus that the ability-achievement discrepancy was "neither necessary nor sufficient" for LD identification. Criticisms of the discrepancy criteria include:
intelligence test scores do not predict the ability to benefit from remediation in reading
intelligence test scores are not synonymous with "cognitive abilities"
tendency to regard those with LD as one group of similar individuals in contrast to the heterogeneity of this group
bias towards culturally and linguistically diverse populations
problematic psychometric properties of tests
lack of consideration of the role of inadequate instruction and lack of effective remediation for some students
delay in service provision given that the discrepancy requires students to fail academically ("wait to fail" philosophy).

In the United States, federal policy, namely the Individuals with Disabilities Education Act (IDEA), was amended in 2004 to reflect a more current understanding of the concept of LD. The requirement of an intellectual-achievement discrepancy was removed and the Act allowed the use of "Response to Intervention" (RTI) data as part of the evaluation for special education to assist in the identification and determination of eligibility of students with LD. The core concepts of RTI include the systematic application of scientific, research-based interventions in general education; measurement of student responses to the interventions; and use of the response data to change the intensity or type of subsequent intervention. RTI will be described further in a later section.

A recent review of Canadian provincial and territorial policy information related to LD found that the majority of policies retained a discrepancy between intelligence test scores and achievement as a defining feature of LD even though most Canadian provinces accept the cognitive processing conceptual definition put forward by the Learning Disabilities Association of Canada in 2002 (Kozey and Siegel, 2008).
This is a time of change and transition in the assessment and identification of LD in North America. There is a desire to move away from reliance on the IQ-achievement discrepancy as criteria for identifying LD and alternative approaches are being explored. As we wait for research to validate new approaches to LD assessment and identification, recommended practices include:

- early identification - the earlier, the better eliminating the “wait to fail” philosophy
- systems in place to identify LD at all ages with the understanding that the difficulties of some students will not manifest until the demands of the environment increase
- a comprehensive problem-solving and collaborative team planning approach that includes looking at a student’s response to instruction/intervention
- use of standardized tests to assess basic psychological processes with careful consideration of the appropriateness of the measures for students from different cultures and language groups
- multiple sources of information: academic, cognitive, oral language proficiency, mental health; classroom observations and indirect data (teacher and parent reports)
- exploration of discrepancies across abilities
- examination of the link between processing deficits and academic difficulties
- consideration of environmental influences: social, cultural, familial and contextual.

**Individualized Program Plans**

When a student with LD is identified as having special education needs, most education systems in North America require an individualized plan for that student, typically referred to as an Individualized Program Plan (IPP) or
an Individualized Education Plan (IEP). The term IPP will be used in this report. Some provinces make IPPs available to students not identified as exceptional but who still require accommodations, program modifications or alternative programs (e.g., Ontario Ministry of Education, 2006). IPPs currently have an important role in supporting students with LD given that the IPP process is typically the mechanism guiding joint planning and monitoring of success. These joint team plans are intended to involve the parent or caregivers who can provide personal information and will be in the position of supporting the student in the future, and school-based personnel and/or other professionals involved with the student. Described as a working document, the IPP is based on diagnostic information and written to outline a plan of action including a summary of goals, objectives and accommodations to provide appropriate supports and educational instruction targeting the unique needs of a student. IPPs are used to record student progress, and to help create smooth transitions throughout the student's school career.

A number of areas have been identified as challenges in the development, implementation and maintenance of IPPs, including:

- level of collaboration and communication that occurs among the IPP team members
- level of investment of teachers in the IPP process - do they view the actions in the document as 'do-able' and meaningful?
- level of teachers' knowledge of LD and methods for ongoing assessment, intervention and accommodation; professional development dedicated to the IPP process
- understanding of necessary elements for smooth transitions, particularly to secondary education
methods for efficiently incorporating goals and objectives of IPP into all content areas in daily classroom experiences, regardless of placement or program delivery model

time available for developing, maintaining and reviewing the IPP.

The following is a synopsis of the literature on common elements of useful, meaningful and effective IPPs, and therefore more effective programming for the student with LD:

- **Student-focus is central with active student participation in the ongoing process.**
- **Students, teachers, involved school personnel and external professionals, and caregivers and/or parents must value the document as a necessary foundation and guide for supporting students with LD and have a shared understanding of the intent of the document.**
- **All teachers involved with the student should be versed in the contents of the IPP.**
- **Sufficient time must be allocated by administration for teachers and/or support personnel to develop, implement, maintain and regularly review the IPP.**
- **Timelines must be established to review and update the IPP to ensure it is a meaningful and fluid document responding to, and reflecting the strengths and needs of the student.**
- **Various assessment measures must be conducted to monitor the student's progress, including specialized assessment (e.g., psycho-educational assessment), classroom assessment, and assessment of progress related to IPP goals. Where possible, the student should be included in monitoring (e.g., self-reporting through interview or checklists).**
• Goals must be meaningful to students, particularly in secondary school. Students should be included in writing their goals with post-school interests and goals in mind.

• Terminology of IPP, such as ‘goals’, ‘objectives’, ‘accommodations’, ‘strategies’, and so forth must be understood by those writing the document and written in a reader-friendly way to ensure understanding amongst the team members.

• Support services must not only be identified in the document, but a team member must be dedicated to follow-through on making sure the service is made available for the student (e.g., occupational therapy).

• A transition plan for the student's new learning environment (e.g., new classroom, new grade) should be in place at the start of each year.

• Meaningful parent involvement is necessary both for informed consent and to help goals and objectives generalize to environments other than school.

Collaboration

No one person or one profession has all of the knowledge and skills to meet the complex needs of students with LD. The “learning team” of the student, parents, teacher, support personnel and specialists is most effective when administrative support fosters teamwork and collaborative problem-solving. “Schools that succeed in changing practice are those that start with the practice and modify the school structure to accommodate it” (Elmore as cited in Deshler et. al, 2006, p. 5). For effective programming for students with LD, the environment must be structured to allow for differentiated instruction (the act of fine-tuning instruction to address individual strengths and needs of every learner), time for preparation, planning time, team meetings, flexible programming options and professional development. For example, the opportunity for teachers to plan
and coordinate instruction to teach and reinforce strategies in every classroom creates a consistent delivery of information regardless of the content area, thereby promoting the generalized use of a strategy. Teamwork provides the opportunity for organizing small groups to facilitate delivering more intensive instruction often needed by students with LD. For instance, teachers can coordinate how much homework is assigned and schedule tests to prevent overlap and to provide ample time for studying.

Classroom teachers need the support of personnel with knowledge about LD. Through team teaching, coaching, planning and discussion, all personnel can gain skills to be more effective in teaching students with LD. Regular education teachers often find the development and implementation of IPPs to be challenging and they benefit from the support of school personnel with training in the field of LD.

Collaboration beyond the school level is also recognized as important. The school alone cannot meet all of the students' needs, particularly for students with LD who may also have social, emotional and mental health concerns. There is a growing emphasis on the need for schools and community agencies to work together to meet the diverse needs of students and their families. Such collaboration requires being open to other organizations and institutions in the community, cooperation among stakeholders from these various organizations and coordination of their actions.

**Meaningful Parent Involvement**

There is an important connection between constructive and meaningful parent involvement and student achievement. Studies from the 1980s to the 1990s highlight the ongoing and reoccurring theme of “higher academic achievement, improved school attendance, increased cooperative behaviour, and lower dropout rates” with increased parental involvement.
Historical approaches to special education viewed the teacher as expert and the parent as a passive participant. Parent roles in education are moving from passive recipient to knowledgeable consumer. Factors contributing to this shift include increased efforts by professionals to empower and include parents in the educational decision-making process and to reduce their ‘expert’ role as service provider, and because of the accessibility of information on the internet. While this shift has been deemed a positive and necessary move, it has also increased parental criticism of the education system.

Barriers to meaningful parent involvement in the support of students with LD are well researched. Some examples offered by both teachers and parents include frustration with confusing educational jargon, information overload at meetings, lack of teacher or parent follow-through after meetings, limited time available for communication between school and parent, and challenges with communication between home and school. Socio-cultural factors such as financial status, cultural and/or language differences between home and school, and lack of knowledge about how to navigate the educational system are common themes. In addition, families may experience stress related to the social and behavioural problems often experienced by children with LD (Dyson, 2003). Peer rejection and social difficulties are most significant for children who have both LD and AD/HD (Wiener, 2004) and are of concern to parents.

The following strategies are recommended to increase meaningful parent involvement:

- Supporting parents to increase their knowledge about LD, for example, suggesting print and non-print resources, connecting them with parent support associations such as the Learning Disabilities Association
• Being sensitive to the possibility that the parents of a student with LD may also have LD and thus have difficulty with oral and written language. Determining their communication preferences can be supportive (e.g., written notes, email, telephone).

• Empowering parents by recognizing their point-of-view and socio-cultural situation, including stress factors and cultural differences in how they regard learning, education and disabilities.

• Communicating with parents and seeking frequent input from parents to ensure their productive involvement through the use of an agenda, meetings, and inclusion in the process of developing the student’s IPP.

• Employing verbal communication techniques, such as balancing positive and constructive feedback regarding the student’s challenges and the use of “I” statements to avoid blaming.

• Providing clear expectations regarding how to support their child at home in a collaborative problem-solving way - what is realistic for the specific family?

• Developing a guide for parents of students with special needs and informing them of policies, procedures for accessing services, IPPs, transition plans, and ways to navigate the system, such as “The Learning Team” developed by Alberta Education.

**Ongoing Assessment**

Ongoing monitoring of student progress has many benefits for students with LD. Ongoing assessment within specific areas is necessary to ensure:

• timely and appropriate adjustments to programming are made

• appropriate accommodations can be chosen

• the learning strengths as well as the needs of the student can be considered when developing the IPP.
• a baseline of personal strengths and needs is established as early as possible in the student's school career so that repeated evaluation can occur to monitor progress
• a plan for transition can be created
• immediate and corrective feedback can occur
• pacing of instruction is appropriate.

Different levels of assessment are necessary when gathering information. These include: norm-referenced achievement testing (comparison of student's performance to same age peers); informal observational reports (e.g., documentation for screening purposes); criterion-referenced testing (comparing a child's performance to a list of skills, e.g., a math test that assesses long division skills); in-class assessment (analysis of daily class work including task and error analysis); and curriculum-based assessment (daily or biweekly assessment of in-class student work and performance, e.g., frequent timed tests in calculation and progress is charted).

Formative assessment is particularly beneficial. Direct and frequent measures of reading, writing and math can provide information to improve instruction and increase the achievement of students. The immediate and corrective feedback is particularly helpful to students (Ysseldyke, 2001).

Other assessments include compiling a portfolio to create a chronological representation of a student's growth; authentic assessment (student performs a tasks that in a real-world setting such as identifying flora and fauna on a field trip); dynamic assessment (consideration given to student's performance and their thought processes in executing a task, as well as their response to intervention, e.g. interact with a student as they execute a math problem and observe the student's understanding, ability to recognize and respond to error analysis, and response to intervention); and, strengths-based assessment (an assessment of the student's competencies...
to determine how to utilize their strengths to help them compensate for their LD).

Assessment in the classroom can include observation of the student, reviewing student work; investigating progress of particular skills (e.g., reading comprehension), monitoring the development and use of learning strategies and work habits; understanding and addressing attitude towards themselves as learners, of school, and of specific subject areas; daily functioning skills, identifying and monitoring social/emotional or behavioural skills; and diagnostic assessment.

There are a number of considerations in the ongoing assessment of students with LD:

- A variety of assessment tools should be used to capture data as one single test will not necessarily reveal change; the student's performance may vary from one situation to the next, depending on his challenges and response to the type of measurement; or, the choice of assessment may not fully capture the desired information.

- The intent of the assessment (what information is desired) must be carefully considered, as well as the test format. For instance, to gain information about a student's knowledge of a topic, the assessment should not pose a barrier, e.g. a student with weak fine motor and written language skills but stronger verbal skills could be assessed via an oral exam.

- The same measurements should be used when gathering information about progress in specific skill areas. For instance, an Informal Reading Inventory has several versions available.

- Students should be involved where possible in assessing personal growth to encourage self-monitoring, independence and self-advocacy. Areas might include: goal setting, good habits of learning
(e.g., using time wisely, organizational skills, building reading endurance), or actively using learning strategies.

- High expectations for each student and personalized, respectful, caring interactions between teachers and students are key features of ongoing monitoring which allow for a supportive learning environment that celebrates growth and achievement.

**Accommodations**

In addition to the key elements of best practice for instruction, a student's challenges resulting from their LD can be offset with accommodations that 'level the playing field'. "An accommodation is a change or alteration to the regular way a student is expected to learn, complete assignments or participate in the classroom" (Alberta Education, 2002, p. 47). Accommodations include: classroom or physical changes, such as alternative seating; instructional changes, such as providing notes for a student with difficulty in written language; and, changes in testing and evaluation, such as providing extended time. Examples of accommodations to address a range of difficulties are presented in Appendix 1. Accommodations do not give the student with LD an advantage over their peers. Accommodations ensure that students with LD are given the same opportunities as other students to access information, to demonstrate their knowledge and to succeed. Accommodations do not replace strategic and responsive teaching or the need to continue the development of basic skills. They should not be overused or reduce the teacher's expectations for a student. For example, providing access to a computer to a student with severe fine-motor challenges does not necessarily mean the teacher eliminates working on letter formation or fluency in handwriting.
The following best practices contribute to the positive and effective use of accommodations:

- The choice of accommodations should be unique to the strengths and needs of each student.
- Students may need to be taught how to use an accommodation, and should be given opportunity to practice before a major assignment (e.g., proper use of a calculator, learning to use speech-to-text software).
- Students should be involved in selecting accommodations. Often, teachers choose what they believe to be an appropriate accommodation but the student may refuse to use it because it makes them look different from their peers, or they find it difficult to use.
- Accommodations should be included on the student's IPP to make certain the student will have them available on diploma/provincial exams.
- Monitoring the effectiveness of the accommodation and ensuring that the student understands the benefits are important to developing self-advocacy.
- Collaboration should occur between teachers so the student may consistently use accommodations in all appropriate settings (e.g., a laptop in every classroom to take notes) and to facilitate teachers' recognition and understanding of the intent for the accommodation.
- Appropriate adjustments may be required to allow the student to use an accommodation (e.g., sit next to a plug-in for a laptop).
Assistive Technology as an Accommodation

“For people without disabilities, technology makes things easier. For people with disabilities, technology makes things possible (Cardinali and Gordon, 2002). Assistive technology (AT) enhances learning for students with LD, and can range from simple "low-tech" tools such as raised or highlighted lines on paper, to "mid-tech" tools such as a talking calculator, to more complex "high-tech" tools such as screen reading software.

As with any accommodation, AT must be specifically chosen to address a particular need and to allow for increased independence when executing a task. Not all AT is appropriate for all students with LD and some AT may cause frustration if a student's difficulties interfere with its use. Ongoing monitoring should occur regarding the effectiveness of the AT. As the student matures and expectations change, the choice of AT may also change.

Success in choosing AT involves including the student, parent/caregiver and the school team to ensure it will be appropriate, accepted, and consistently used. Specialists such as occupational therapists should be included where appropriate to assist with AT choice. Certain technology may already be available and accessible to all students in the classroom in a differentiated learning environment, and so consideration must be given to what is already available, and what supports may need to be put in place for the student with LD to use their accommodation. Will those adjustments be realistic or possible? For instance, for a student to benefit from screen reading software, they must have access to a computer and possibly a scanner whenever reading is involved, and will require direct instruction/training and supported practice to learn to use the software. The SETT framework developed by Joy Zabala is useful when considering AT for a student: Student needs and strengths, Environmental considerations, Tasks that will be supported, and Tools and strategies needed to address the task.
AT must be clearly linked to goals and objectives in the student's IPP. Outlining AT in the student's IPP also ensures access to whatever tools are needed in the classroom environment and for specific activities, such as provincial/diploma exams. As well, AT should be considered in transition-planning. For instance, as reading becomes more complex and extensive, consistent access to reading software may become more appropriate and necessary for a student with LD in high school who previously was able to cope with extended time as an accommodation.

**Self-advocacy**

Self-advocacy involves taking action on one's own behalf and is related to success in school and in the workplace for persons with LD. Strong self-advocacy skills have been shown to facilitate smoother transitions for the learner from year-to-year, and to post-secondary education. A student's ability to effectively and constructively advocate on their own behalf requires a clear understanding of their abilities and challenges, knowledge of effective interventions necessary for learning and skills to communicate this knowledge to others. Self-advocacy is a component skill of self-determination which is described as self-knowledge (identifying one's own likes, dislikes, wants, needs, strengths, and limitations), the need for autonomy and control in decision making; and opportunities to express one's needs and interests.

Research has clearly shown that students with LD often struggle with self-advocacy. They may have minimal understanding of themselves and limited ability to articulate their strengths and needs. They may lack self-confidence, be reluctant to seek help and take a passive approach to learning. In addition, teachers may not effectively support the development of self-advocacy skills because they hold traditional belief systems of adult and student roles regarding responsibility for learning do not recognize or
value self-advocacy or lack the awareness and skills to promote self-advocacy.

Supporting the development of self-advocacy skills beginning early on in school is essential for the long term success of students with LD. The seven most frequently discussed components of self-advocacy instruction are:

• making choices and decision-making
• setting goals
• problem-solving
• management and evaluation of self
• skills for self-advocacy
• participation in the planning and executing of IPP meetings
• awareness of self as a learner and person (Fiedler and Danneker, 2008).

A student’s involvement in the IPP process has been found to be important for developing self-advocacy skills. Students who are able to participate in their program plans and lead meetings are more likely to:

• develop effective communication of personal strengths and needs
• demonstrate a vested interest and understanding of goals
• request suitable accommodations (Mason, McGahee-Kovac, and Johnson, 2004; Torgeson, Miner and Shen, 2004).

The following general strategies promote the development of self-advocacy skills:

• involve students in making decisions about their education
• help students understand their learning strengths and needs
• model and teach appropriate self-advocacy skills
• help students set appropriate and realistic goals for their learning (Alberta Education, 2002).
**Transition Planning**

Including the student in the process of transition planning is critical to promoting self-advocacy. A transition is when something changes in the student's world, such as routines, relationships, settings, and roles. Educational transitions include moving from grade to grade, moving through divisions, changing schools or programs, moving between more specialized programs and the regular classroom, and moving from grade school to post-secondary or job related settings.

Effective transition planning begins early, is collaborative, and involves the student as much as possible. Student involvement varies depending on their age, maturity, skill sets and ability; older students may be more involved in exploring career interests, monitoring their own progress, or exploring post-secondary options. Raising the student's level of awareness of personal strengths and needs, and effective compensatory strategies helps position the student for successful and independent transitions. Students with LD benefit from supported opportunities to practice skills and strategies that will be important in a new learning situation; opportunities to become familiar with a new setting, the people and the expectations prior to the change; and opportunities to practice responding appropriately to novel situations and forecasting consequences. To facilitate transition planning, the key participants must have knowledge of what is required to make effective transitions. For instance, the learning team must understand the steps necessary for a student with LD in high school to prepare for transition to a post-secondary setting: What documents are necessary for the student to access accommodations and supports? How much time is needed to get ready? What does the student need to do to prepare?

Transition planning involves identifying the skills and strategies that a student will need for a future change early on and planning instruction to develop them. The student's readiness to make a transition is often part of
the decision-making in transition planning. Adequate information regarding the student's strengths and needs facilitates appropriate choices for transitions. Considerations in the literature often include the student’s level of independence as a learner such as basic skill development, their ability to use learning strategies, their effective use of accommodations and assistive technology and their ability to self-advocate. The demands of the new learning environment and access to supports are also considered.

Effective Instruction for Students with Learning Disabilities

The components described above are important to programming for students with LD. They influence and support classroom practice. There is no "one size fits all" approach to the instruction of students with LD. These students vary in the severity of their needs, in the pattern of their strengths and difficulties, and in the range and types of supports they need across the lifespan. They need support that begins in kindergarten and continues to the end of high school and leads to their transition to post-secondary studies and the job market. This section focuses on the elements of effective instruction for students with LD across the school years. Overall best practices are described followed by more specific considerations that address the changing needs across the school years from the early years to grades 3 through 12.

Effective instruction for students with learning disabilities is explicit and intensive and combines direct instruction with strategy instruction. Effective instruction is strategic and responsive to the specific information processing and learning needs of students.

Explicit instruction involves systematic, clear, overt, detailed explanations. Concepts, steps and procedures are demonstrated and the connections, rationale and reasoning are clearly described.
**Intensive instruction** refers to the amount of time in instruction and how engaged students are in learning experiences. Intensive instruction involves longer periods of instruction, opportunities for highly individualized learning experiences, such as individual and/or small group instruction and instructional techniques that increase student engagement such as progressive pacing, frequent question-answer interactions and frequent activities that require a physical response (e.g., pointing, writing, raising hands, repeating) and questioning techniques that evoke reflection and thought.

**Direct instruction** is teacher-directed explicit instruction. Objectives are clearly specified and taught in specific small steps. Feedback, guided and independent practice and practice for transfer to other situations are provided.

**Strategy instruction** involves teaching students "how to learn". Students are taught how to approach tasks and to use knowledge to solve problems. Learning strategies, often referred to as cognitive strategies, address planning, performing and evaluating performance. Self-monitoring is emphasized. Students gain greater independence as learners through the use of strategies. Some of the strategies may be viewed as “compensatory strategies”, that is, they enable the student to bypass an area of difficulty. The effective teaching of strategies to promote independent application requires explicit teaching through the following steps developed by Schumaker and Deshler (1992) of the University of Kansas Center for Research on Learning Disabilities:

- pretest
- describe
- model
- verbal practice
• controlled practice
• grade appropriate practice
• posttest, and
• generalization.

In this model, the students learn the rationale for each strategy, verbally rehearse and actively employ the strategy in controlled tasks, and eventually apply the strategy to grade-relevant material. This metacognitive approach to instruction is appropriate at all grade levels, with an increasing emphasis in later years on approaches to problem-solving, organization, listening and note-taking, study and test-taking skills to foster independence and self-advocacy. Examples of metacognitive strategies include the use of visual organizers, intentionally activating prior knowledge and linking it to new information, and memory strategies.

**Combined direct instruction and strategy instruction** is most effective for students with LD. A meta-analysis of intervention studies by Swanson, Hoskyn and Lee (1999) supported a combined model with the following elements:

• sequencing; e.g., breaking down the task, fading of prompts or cues, sequencing short activities, giving step-by-step prompts
• drill-repetition and practice-review; e.g., daily testing of skills, frequent short opportunities for review and practice distributed over time, sequenced review, daily feedback and or weekly review
• segmentation; breaking down a targeted skill into smaller units and then synthesizing the parts into a whole
• directed questioning and responses; e.g., the teacher asks process-related and/or content-related questions; students are directed to ask questions; teacher and students engage in dialogue
• controlling the difficulty of processing demands of a task; that is, tasks are sequenced from easy to difficult and only necessary hints and probes are provided

• technology; e.g., use of computers, structured text or flow charts to facilitate presentation, emphasis on pictorial representations, use of specific or structured material, use of media to facilitate presentation and feedback

• modeling of problem-solving steps by teacher

• instruction in small groups

• strategy cues, reminders to use strategies; e.g., teacher verbalizes problem-solving steps, think-aloud models are used, teacher presents benefits of strategy use or procedures.

Reading instruction has been a major emphasis in intervention studies because 80% of students with LD experience language and reading difficulties. The overall best practices for teaching students with LD are evident in four themes that emerged from an investigation of the characteristics of teachers who effectively motivated and delivered early reading instruction to students with LD:

**Quality of instruction** - Delivery of quality instruction by effective teachers is flexible and geared towards student needs in an intensive, deliberate and cohesive way. All material is clearly interconnected and meaningful to the student, and instructional strategies are consistently integrated into the teaching in an explicit manner so students recognize the benefits of utilizing strategies.

**Response to student needs** - Teachers frequently interact with students during group instruction and individual work-time, check often for student errors in a positive and private manner, and positive, consistent and
constructive feedback to behavioural issues occur in a timely manner so that instruction and learning are minimally disrupted.

**Sociocultural climate** - Teachers provide a positive sociocultural climate; their classrooms are open, caring, supportive and positive. Purposeful academic activities are executed with the intent to promote a nurturing environment, and teachers display an observable curiosity and intentional questioning of student interests, family life, and events outside of the classroom. Teachers address student errors in a respectful and private manner with a spoken acceptance that errors are part of effective learning. Positive student interaction and peer support are encouraged.

**Self-regulation** - Self-regulation of behaviours is promoted, and student autonomy is encouraged by accepting student contribution while maintaining clear structure and expectations. Students are expected to make choices relevant to their learning, and encouraged to acknowledge and monitor their effective use of strategies (Seonjin, Brownwell, Bishop and Dingle, 2008).

The above themes reinforce the importance of the overall classroom climate and behaviour management. A positive learning environment and high levels of student engagement in learning are essential. A school-wide behaviour program is important to support the efforts of individual teachers.

**Intervention in the Early School Years**

Early intervention during the first three years of schooling is essential for children with LD. A primary focus of research over the past two decades has been on the prevention of reading failure. The early years are the focus for the prevention of reading difficulties and children who get off to a poor start in reading rarely "catch up" (Lentz, 1988; Neuman & Dickinson, 2001; Snow, Bums, & Griffin, 1998; Torgesen, 1998; Whitehurst & Lonigan, 2001). The development of literacy skills is the primary focus of instruction in the early
school years for students with LD, or for students who are at risk for LD. Critical considerations include early identification and early intervention for reading difficulties.

**Early identification of reading difficulties**

Ongoing monitoring and built-in opportunities for screening for literacy problems should exist in kindergarten and the early grades to help guide programming decisions. Several measures should be taken over the course of a year to update information and to ensure emerging issues are recognized. Schatschneider and Torgesen (2004) found that the best predictors of early word reading difficulties are:

- letter-name knowledge in early kindergarten
- letter-sound knowledge mid to late kindergarten
- efficiency in phonemic decoding and fluency when reading text measures in mid-grade one (when children are beginning to read)

**Early Intervention Strategies**

A multi-tiered approach to providing early intervention in reading has gained momentum in the United States and is referred to as "Response to Intervention (RTI)". The framework developed in the United States is primarily a prevention model and a response to the Federal “No Child Left Behind” legislation that is directed towards the literacy development of all children in general education. The framework is also seen as contributing to the identification of children with reading disabilities - those who do not respond positively to increasingly intense instruction are referred for special education services. RTI is a process that emphasizes how well students respond to changes in instruction and is designed to identify at-risk children early, to provide access to needed interventions, and to help identify children with disabilities. The core concepts of RTI include: 1) use of scientific, research-based interventions in general education; 2)
measurement of student response to the intervention; and 3) use of response data to modify the type, frequency and intensity of intervention. RTI involves a multi-tiered framework and refers to an array of procedures and is not a specific model, test or single procedure:

- **Tier 1:** High quality instructional and behavioural supports for all students in general education
- **Tier 2:** More specialized prevention or remediation within general education for students whose performance and rate of progress lag behind peers. This is typically small group tutoring
- **Tier 3:** Intensive, systematic and specialized instruction and comprehensive evaluation by a multidisciplinary team to determine eligibility for special education services.

There is currently considerable debate about the effectiveness of large-scale implementation of RTI in the United States. The knowledge base about RTI is developing, but at present more is unknown than is known and continued research is required. Debate surrounds what constitutes "scientific, research based interventions". In a position paper about evidence-based reading instruction, the International Reading Association (2002) has argued that evidence-based "practices" (actions teachers take and the practices in which they routinely engage children) for teaching reading can be identified, but that evidence-based "programs" (materials teachers use) have not been identified. They emphasize the importance of the teacher's knowledge of practices and flexibility in adjusting or responding to the specific needs of students. Others have criticized the formula-like approach to evidence-based practices that could ultimately limit teacher's responses to individual differences in the classroom. Most importantly, professional wisdom and knowledge possessed by teachers is critical in individualizing instruction (Cook, Tankersley and Webb, 2008; Sackett, Rosenberg, Gray, Haynes and Richardson, 1996).
**Instruction in literacy**

The focus of literacy instruction during the first three years of schooling for all students should be “balanced”, combining 'meaning' and 'code' emphasis:

- focus on mastering the alphabetic principle, letter/sound relationships, rhyming, phonemic awareness (separating and working with sounds) in kindergarten
- teaching and reinforcing more complex phonological skills, such as segmenting, blending and deleting phonemes (sounds) in grade one via a multisensory approach
- providing a "literacy-rich" setting with ample and intensive opportunities for reading and writing practice based on themes as a way to organize instruction
- increasing focus on word identification strategies, the elements of text, metacognition, vocabulary development, and strategies specific to comprehension and monitoring.

Children with LD affecting the acquisition of literacy skills generally struggle with phonological awareness affecting letter-sound association, fluent sight-word recognition, and phonetically deciphering unknown words. They require more explicit systematic direct instruction and strategy instruction; more intense (individual or small group) instruction and more time devoted to teaching and learning to read. Critical levels of phonological awareness can be developed through carefully planned instruction, and this development has a significant influence on children's reading and spelling achievement (Ball & Blachman, 1991; Bradley & Bryant, 1985; Byrne & Fielding-Bamsey, 1989, 1991). Researchers have suggested that intensive literacy instruction (up to one hour per day) may be necessary for students with severe LD at all grade levels.
Instruction across Content Areas

While 80% of students with learning disabilities experience language and reading difficulties, their difficulties go beyond the area of reading to other academic areas and their cognitive processing difficulties affect performance on many learning tasks and social interactions. Students with LD require instructional strategies that support their difficulties in the metacognitive domain, that is, in problem-solving and organization and in the information processing domain (language, attention, memory, visual-spatial functioning, etc.). Examples of strategies for effective instruction across content areas include:

- establishing clear classroom routines and expectations
- modeling simple think-aloud strategies
- using visual referents to help with the organization of thinking
- using multisensory approaches
- teaching strategies for remembering new information
- intentional teaching of new vocabulary
- actively involving the students by requesting paraphrasing and rephrasing to monitor understanding.

Social Domain

Explicit instruction and strategy instruction are also effective in developing social skills. Attention should be given to developing social skills through problem-solving, modeling appropriate behaviour and providing explicit and specific feedback to reinforce positive behaviours.

Grades 3 - 12

Instruction needs to be responsive to the changing needs of students as they progress through school. This section addresses the overarching concerns for students with LD in elementary through to grade 12. Specific attention will be given to what these students require as curriculum demands
in literacy, math and other content areas change and become more sophisticated and complex.

The move from grade two to three is challenging for most students as they transition from instruction in how to read to using reading to access information. There are increased demands for well-developed literacy skills, for the effective communication of ideas and for the demonstration of learning through expressive language and written work. Students with LD often continue to require intensive basic skill instruction and supported practice well beyond their peers to develop basic literacy skills. Mathematical skills become increasingly important as well, and competent literacy skills directly affect performance in mathematics and other content areas.

Adolescents with LD deserve access to the highest academic challenges matched to their cognitive ability, yet their LD may be a barrier to success as complex language tasks in all content areas increase in junior and senior high, and the demand for independence, effective organizational strategies and adequate memory become essential. Accommodations, differentiated instruction, modifications to curriculum and explicit and direct instruction in learning strategies are crucial to ensure the student can successfully access the curriculum. Based on research exploring the needs of adolescent learners with LD, Deshler et al. (2006) concluded that the intensity of instruction should vary depending on the severity of the disability, be comprehensive in nature, and be well-coordinated amongst teachers. Finally, ongoing assessment must occur to determine whether accommodations or more intensive instruction (or both) is needed to ensure equal opportunity for learning and demonstration of knowledge across content areas.
**Instruction in Literacy**

Researchers and practitioners are increasingly recognizing the importance of studying adolescent literacy problems (Biancarosa & Snow, 2004; Graham & Perin, 2007; NJ CLD, 2008; Torgesen et al., 2007). Torgesen et al. (2007) compiled a guidance document based on meta-analysis of best practices in developing literacy skills from grade 4 to 12 and listed the following recommendations for improving literacy-related instruction in the content areas for all students:

- explicit instruction and supportive practice in the use of effective comprehension strategies throughout the school day
- increase the amount and quality of open, sustained discussion of reading content
- set and maintain high standards for text, conversation, questions, and vocabulary
- increase students' motivation and engagement with reading
- teach essential content knowledge so that all students master critical concepts.

Effective communication of ideas and information via reading, writing, speaking and listening, and synthesis and evaluation of what is heard and read are essential in junior and senior high. Without focused teaching and appropriate supports, research has demonstrated adolescent students with LD do not adequately demonstrate their knowledge of age-level curriculum, and increasingly experience frustration and a lowered sense of self as a learner. Lack of appropriate support can lead to inappropriate program placements in high school that do not provide sufficient cognitive challenge, and contribute to the student drop-out rate.
Reading

Literacy is a multi-faceted and complex process that may take students with LD longer to acquire. Even though a student with LD may have positively responded to intensive explicit early intervention in phonological awareness, the alphabetic principle and word identification strategies, they may continue to struggle with reading fluency. This means they are not able to automatically apply the skills and reading is slow and laboured which hinders acquisition of knowledge and speed of learning. Therefore, it is imperative that fluency and reading comprehension strategies continue to be intensively addressed for students with LD in the elementary years and beyond. Prosody, or attending to meaning while reading, is a key component of reading fluency and a strong indicator of whether reading comprehension is occurring. Therefore, teachers must also deliberately encourage prosody to develop word recognition skills and subsequently comprehension skills.

Torgesen et al. (2007) offered the following conclusions from their meta-analysis of instructional research focused on struggling readers in the elementary years. The principles are also applicable to junior and senior high:

- Schools must provide superior instruction that varies in intensity and focus depending on the student’s challenges in word-level and comprehension skills. Professionals specifically trained in the area of reading are appropriate and necessary in upper elementary and beyond. Reading accuracy and fluency are specific areas of concern.
- Components of effective literacy instruction is the same for students with and without LD and include developing skills for applying reading comprehension at all points in reading, vocabulary knowledge,
motivating and engaging assignments, and improving knowledge of content

- Carefully coordinated instruction between reading specialists (resource teachers) and general educators so that common curriculum provides the foundation for teaching and practicing strategies.

Balanced reading instruction of both word-level and comprehension interventions is necessary to help struggling readers surpass the fourth grade “hump” experienced by many students and to allow the learner to acquire advanced comprehension strategies to compete in the working world. The National Joint Committee on Learning Disabilities (NJ CLD, 2008) compiled a report to describe the problems, consequences and factors of adolescent low literacy, and presented guiding principles for ways to assess and support students, and for professional development. Strategies previously mentioned in the elementary section pertain to older adolescents. The following is a synthesis of major considerations evidenced in the research for explicit instruction in reading specifically vital for students with LD in grades 4 through 12:

- Appropriately leveled and engaging (high interest/low vocabulary) materials both in print and computer format
- Strategies for accurately recording and remembering salient information via analysis and synthesis strategies
- Strategies unique to understanding and comprehending narrative (fiction) text (e.g., TELLS – (T) study story Titles; (E) Examine and skim pages for clues; (L,L) look for important and difficult words; and (S) think about Story settings)
- Strategies unique to understanding expository (factual/informational) text (e.g., MULTIPASS strategy: 1. become familiar/overview main
ideas and organization 2. get specific information by reading study questions guessing, checking; 3. self-test)

- Strategies to understand and use varied symbol systems
- Strategies to efficiently use the internet
- Critical thinking and reflection skills.

Guided reading is an instructional strategy appropriate for every grade level to support all students as they progress in learning to read. Teaching and then concentrated supported practice of various reading strategies to small groups of students enables the teacher to monitor students' progress and use of reading strategies in a strategic way with a goal to create independent readers. Guided reading involves pre-reading strategies, such as predicting, pre-vocabulary instruction, and activating prior knowledge; ongoing reading strategies, such as prompting and asking questions, summary and paraphrasing, and providing constructive feedback regarding the use of strategies (e.g., using contextual cues, decoding); and, post-reading strategies, such as reviewing what was learned and asking the student to summarize using their own words. Guided reading provides the foundation for adapting reading for specific learner needs, such as providing leveled reading materials, multiple ways to access text (e.g., AT) and tailoring methods for demonstrating knowledge (e.g., diorama based on text; oral presentation) (Lesesne, 2003).

Based on intervention research, Deshler et al. (2006) concluded that some adolescent students with severe reading disabilities, i.e., students who have not yet made sufficient gains in literacy development with intensive, small group support, will continue to require a class at least one hour per day of no more than 15 students focused specifically on “word recognition, fluency, vocabulary and strategies for encouraging persistence in reading” (p. 4) with a shift to comprehension strategies when appropriate.
Writing

Eleven elements of effective instruction for developing proficient writing skills starting in the 4th grade for all students were identified in a meta-analysis by Graham and Perrin (2007):

- writing strategies to encourage planning, revising and editing
- strategies for summarizing texts
- collaborative writing to practice how to plan, edit, draft, and revise compositions
- use word processors and computers as instructional supports
- sentence combining to construct complex and sophisticated sentences
- pre-writing activities and organizers to create structure and order
- inquiry activities to encourage analysis of immediate, concrete data to develop ideas and content
- process writing so student writes for authentic audiences in meaningful contexts
- writing models provided to encourage analysis of good writing
- writing as a tool for learning content.

For students with LD in upper elementary grades through high school, curriculum demands require a more intensive focus on intentional teaching of strategies to develop competent written language skills. In addition to the list of recommendations above, students with LD will require:

- rubrics and checklists provided to create external guide/organization for expectations
- planning/organizational strategies to handle quantity of work
- external structures to assist in organizing written work (e.g., a three step approach for writing stories: set goals, brainstorm ideas, sequence using graphic organizers).
In addition to learning strategies for written work, the need for accommodations increases in the later grades, such as:

- extended time to complete tasks and exams requiring extensive writing
- a scribe or alternative methods to ensure students with LD can adequately demonstrate their knowledge
- access to a computer to develop and practice keyboarding skills especially for students with fine motor challenges affecting printing and handwriting fluency and letter formation
- access to a computer for word processing (use thesaurus, spell check, semantic mapping programs)
- speech-to-text software as appropriate for generating written work.

**Instruction in Mathematics**

In the literature, researchers note that there are many differing definitions of 'mathematical disability' and that a diagnosis of a math disability is less common than any other learning disability. Math can be negatively affected by many of the characteristics of students with LD, even if a specific disability in math is not diagnosed. Language processing difficulties hamper a student’s ability to become skilled at understanding and using vocabulary, concepts, symbols, signs, or operations. Difficulties with directionality, sequencing, and organization affect math understanding and performance. Reading difficulties interfere with fluency and the comprehension of word problems. Picking out salient information is a challenge. Fine motor difficulties can be a barrier in math, and unfortunately assistive technology is currently less helpful to students with LD in mathematics. Auditory comprehension difficulties result in difficulty following verbally delivered lessons, which are very common in math classes. Slow information processing leads to difficulty being efficient with large quantities of math problems. Students with LD often rely on immature and
concrete strategies (e.g., finger counting) because they have trouble utilizing more abstract strategies, and so those strategies should not be discouraged if needed. Finally, students with LD are often challenged with problem-solving in math (e.g., choosing an approach, deciding how to do it, and then evaluating if it worked) (Wadlington and Wadlington, 2008).

It is important that the area of mathematics not be overlooked in teaching students with LD. The following strategies for intervention recommended for students with LD in elementary grades:

- focus on automaticity of math facts with an increased frequency of use and an emphasis on memory strategies
- focus on developing student's ability to handle complex computations, such as introducing accommodations (e.g. calculator) with supported instruction in its use
- use a multisensory instructional approach
- anchor math in real-world situations and link to all content areas
- increase emphasis on strategies for dealing with word problems such as problem-solving approach, identifying key words, pre-learning vocabulary, and encouraging use of compensatory strategies such as manipulatives. **STAR** is an example of a math problem-solving strategy: **STAR** - **S**earch the word problem, **T**ranslate the problem, **A**nswer the problem and **R**eview the solution
- adjust curriculum for students with language disabilities (e.g., utilize various levels of text to teach a concept); break assignments down into manageable pieces - modify/adapt curriculum to adjust to student needs (fewer questions, photocopy pages from a textbook with simpler language to teach/reinforce a concept)
- assist students with working memory deficits (e.g., reference sheets, memory strategies to reinforce sequences and order of operations)
• use everyday language to make sense of math symbols and processes
• encourage use of metacognitive, reading and memory strategies in math
• offer mock conditions to practice strategies, self-monitoring of procedural work, and error analysis.

In addition to the above list of strategies focusing on best practice, the following are a sample of suggestions compiled from research specifically focused on students with LD in the older grades:

• explicit focus on math vocabulary - how to identify, study and organize (e.g., flashcards); translate math symbols into user-friendly language
• teach strategies for the use of a calculator
• teach and practice error analysis
• provide advance organizers to lessons and build in review at beginning of each class
• even at higher grades, try to move from concrete to abstract (and back and forth) - multisensory approach
• use vocabulary in meaningful discussion
• provide access to a scribe and/or reader for exams depending on the student's needs.

Instruction across Content Areas

Much of the research tends to focus on reading and writing in language arts. However, the importance of presenting strategies across content areas to ensure meaningful generalization of strategies is highlighted in most recent research. Examples include explicit instruction and modeling of approaches to problem-solving, organizational and study skills and an increased focus on strategies such as note-taking, organization of school work, studying and test-taking in all subjects. Positive reinforcement and
discussion is important to encourage active learning and involvement when the student utilizes metacognitive strategies, such as monitoring when reading or actively using a problem-solving approach.

An increase in focus should occur in the later years on developing listening strategies, on making connections between new information and prior knowledge, on self-monitoring for understanding and on requesting clarification and paraphrasing. "Learning-to-learn" strategies become critical, including methods for handling and organizing schedules and larger quantities of homework and studying. Best practice includes collaboration among teachers to coordinate how much work is assigned, what strategies are being taught, and to make certain that accommodations are consistently in place and available to the student.

**Social Domain**

Skills for navigating social relationships must continue to be explicitly modeled and taught in all content areas. Finally, a student's sense of self and responsibility as a learner should be promoted through providing positive feedback to reinforce desired behaviours and strengths, and by creating a role for the student in IPP meetings and in setting personal goals.

**Emerging Issues**

**Co-existing AD/HD**

The review of best practices in teaching students with LD found very little consideration of the needs of students who have both LD and AD/HD. Given that 30% to 50% of students with LD have co-existing AD/HD, this lack of information was surprising. For students with LD and AD/HD, there are increased levels of challenge in the areas of attention, impulsivity, hyperactivity, social-emotional functioning and executive functioning. Difficulties with organization, time management, self-monitoring and task
completion add to the complexity of needs. The behaviour and academic needs of students with both LD and AD/HD warrant further research.

**Knowledge Base of Teachers**

The needs of students with LD are met in a range of settings from dedicated and specialized segregated programs to inclusive classroom settings, with the latter becoming increasingly the norm across North America, the United Kingdom, Australia, New Zealand and more recently South Africa. In Canada, as well as in other countries, there are growing concerns that teacher preparation programs do not adequately prepare teachers to meet the needs of the diverse learners in today's classrooms. Reviews of special education in Canada in recent years have suggested that teachers do not receive the training needed to respond to students with special needs (e.g., Mackay, 2006).

Regardless of the setting, the teacher's ability to identify, understand and respond effectively to the needs of students with LD is important to the success of these students. The powerful influence of teachers has been demonstrated in many studies. Teachers implementing the same program or using the same strategy may have different student outcomes and teachers using different approaches may have the same outcomes. The teacher and the learning situation make the difference (e.g., Bond & Dyskstra, 1967/1997). Teachers who have the knowledge of best practices in teaching students with LD are better prepared to choose strategies flexibly to meet the complex and individual needs of the students. A recent survey of practices across Canada found that teachers enter the profession with little awareness of LD or knowledge of their role in supporting these students (Philpott & Cahill, 2008). Currently, there is little empirical research revealing the most effective way to educate pre-service teachers, only that education of special needs is required in some way to help prepare educators for contemporary classroom settings (Sharma et al., 2008).
In addition to initial teacher preparation, there is a need for ongoing professional development. Practicing teachers often lack confidence and do not feel professionally prepared to meet the needs of diverse learners. A disconnect between best practice identified in research and practical application in the classroom influences the delivery of instruction and quality of support provided to students with LD. Teachers are reported to feel that research ideas are often not usable or concrete enough to employ in the classroom, or, if an intervention was regarded as usable, minimal time was allocated to “meaningful professional development” to encourage and develop competency in the area of interest (Fullan, Hill & Crevola, 2006; Greenwood & Abbot, 2005).

Follow-up to intensive workshops with professional development opportunities that are embedded in context and connected to daily classroom practice are promising practices for the future. Collaboration and teamwork to meet the needs of students with LD could include continuous sustained learning about teaching practices including observing other teachers, being observed by others who are knowledgeable about best practices in teaching LD students, team teaching and collaborative reflection on daily challenges.

Knowledge Base of Administrators

Strong administrative leadership and understanding of special education have been identified as essential to meeting diverse needs in today's classrooms. Administrative training for prospective principals in the United States often neglects preparation for the unique challenges of administering in schools with special education programs or inclusive classrooms (Torgeson, 2003). A survey of Canadian school principals investigated their perceptions of their leadership roles and responsibilities in special education (Zaretsky, Moreau, and Faircloth, 2008). The principals felt that their leadership training provided minimal training for issues unique to
special education programs, and expressed a need for more emphasis on special education issues to better prepare them to properly understand and support teachers in all settings working with students with LD.

**Cultural Differences**

The dilemma of teaching students with LD whose culture and/or language differ from the teaching environment is a rapidly emerging reality in North American schools. The 2006 Canadian census confirms an increasing diverse cultural profile with more than 20% of the population predicted to be from a visible minority by 2017 (Statistics Canada, 2007a). More than 200 languages are spoken in Canada and 20% of the population reported a mother tongue other than English or French (Statistics Canada, 2007b). The Aboriginal population in Canada is increasing faster than the non-Aboriginal population and is much younger with almost half of all Aboriginal people under 24 years of age (Statistics Canada, 2007c).

In their report on the current state of adolescent literacy in the United States, the National Joint Committee on Learning Disabilities (NJCLD, 2008) addressed the unique concerns of English Language Learners (ELL), i.e. students whose first language or culture is not the same as the language of instruction. In Canada, the term English as a Second Language (ESL) is more common. ELL students who also have LD are particularly susceptible to academic failure: “ELLs at grades 4th, 8th, and 12th are twice as likely as their peers to score below basic levels in reading and writing skills, and these achievement gaps have been generally stable for more than a decade” (Grigg, Donahue, and Dion, 2007, p. 3). They projected 25% of all children by 2025 in the United States will be ELL and therefore it will become paramount to determine whether “limited language proficiency is due to a language difference from those who have a concomitant LD” (p. 3). However, research is limited with regard to the assessment and intervention of ELL students or of the unique issues of students with LD from diverse cultural
backgrounds (Gersten & Baker, 2000, 2003). The authors noted that “most of our knowledge base in this area remains more theoretical and experiential…than based on controlled research” (p. 105).

The following key components have been proposed to address the distinctive challenge of supporting students with LD who are ELL or ESL:

- teach the use of the second language according to established conventions of grammar and syntax;
- provide opportunities to work on academic-based tasks in either the primary or English language to practice conventions;
- involve peers in both instruction and collaborative strategic reading to promote general language development, including strategies for comprehension and improved reading fluency;
- teach vocabulary that is meaningful to students and targets key concepts within content areas;
- utilize visual referents, such as graphic organizers or word banks, to reinforce vocabulary development; and
- balance “cognitive and language demands” (p. 106) so that challenging material requiring higher-level thinking and reasoning is presented or can be responded to using simpler language (Gersten & Baker, 2003).

With regard to Aboriginal learners, Alberta Education (2005) developed the manual, “Our Words, Our Ways”, focusing on education of aboriginal students, with a chapter dedicated to students with LD. The authors noted, “Traditional and contemporary Aboriginal cultures are diverse and unique, yet they share the perspective that each individual has the ability to become a fully contributing member of the community” and the conceptual understanding of a learning disability is “at odds with the holistic
framework of Aboriginal education” (p. 123). Sensitivity to the cultural values is important in supporting Aboriginal students.

**Differentiated Instruction and Universal Design for Learning**

The trend towards inclusive education requires that teachers attend to a diverse range of needs in the regular classroom. Two approaches are widely promoted as responsive to a wide range of learning needs: Differentiated instruction (DI) and Universal Design for Learning (UDL). Using these approaches, teachers attempt to reduce or eliminate barriers to learning by tailoring instruction to meet diverse needs.

DI involves providing choices with regard to content (broad based that addresses the same concept and adjusted by degree of difficulty), process (instructional procedures, such as flexible groupings and scaffolding) and product (how students demonstrate their learning, such as written proposal, video, speech) (Tomlinson, 2001). The choices are made based on understanding students’ readiness, interests, needs and learning profiles. Knowing the learner through pre-assessment strategies and on-going assessment to adjust instruction are critical to DI.

UDL as promoted by the Center for Applied Special Technology (CAST) includes technology and assistive technology as options for students to engage and access the curriculum in a manner that suits their strengths and needs. UDL involves instruction presented in multiple ways, multiple ways for students to demonstrate learning, novelty, and a number of different options for engaging students to encourage motivation and active learning. Strategy instruction becomes a natural part of the regular classroom experience. The need for specific accommodations for students with LD may be reduced. For example, a traditional method for in-class testing may be to administer an end-of-chapter test created by the text authors and to provide a reader/scribe, extended time, or other accommodations for
students with LD. In UDL, all students may be offered the choice of demonstrating their knowledge in a different way, such as an un-timed oral test.

The philosophies of DI and UDL are expected to become increasingly important for implementing best practices in teaching students with LD. Flexibility, recognition of the importance of ongoing assessment to guide instruction, responsiveness to the individual needs of students and the use of technology to engage and support students are potentially positive directions for the future.

Summary

Best practices in teaching students with LD have been presented in detail. The following summarizes some key points from the review of best practices:

- Explicit, intensive instruction combining direct instruction with strategy instruction is critical to equip students with LD with metacognitive strategies and academic skills.
- The intensity of instruction is a key element for success. Students must be engaged in learning and have extended opportunities for learning in response to the severity of their needs
- Early intervention involving literacy instruction in the first three years of school is most beneficial for students with LD
- Supports need to be in place across the school years in recognition of the interaction between changing demands and the needs of students with LD as they progress through school
- Instruction must address more than literacy and consider needs in the metacognitive, Information processing and social domains
• Instruction must be responsive to the specific needs of students with LD. There is no "one size fits all" approach to meet the needs of all students with LD.

• Ongoing progress monitoring should inform instructional decision-making and academic programming.

• Accommodations, including assistive technology, need to be selected carefully to match the needs of the student and the environment. Students need to be supported to use accommodations and their effectiveness should be monitored.

• The explicit development of self-advocacy skills needs to begin early and be supported throughout the school years.

• Transition planning also needs to begin early to ensure that the student has the opportunity to develop the skills and strategies needed in a new setting or grade. Student involvement and collaboration promote successful transitions.

Factors that support the implementation of best practices were also identified, such as:

• Collaboration is required at many levels - with the student and parent (meaningful parent involvement), among school personnel and with outside agencies. Teamwork contributes to organizing expertise to support students with LD.

• Individualized Program Planning provides a vehicle for problem-solving, planning (including transition planning) implementation and ongoing monitoring of progress.

• The knowledge base of teachers affects the implementation of best practices. Teachers can be most effective in flexibly adjusting instruction to meet the needs of students with LD when they have
knowledge of a range of instructional choices and the support and organizational structures to implement effective practices. Teachers’ level of confidence and their feeling of competence with regard to teaching students with LD affect their practice.

- The knowledge base of administrators contributes to the support provided to school personnel to organize instruction. Significant elements within a school setting include: flexibility in scheduling and delivery of instruction, time to plan and collaborate within the learning team, administrative support for a continuum of services, school-wide behaviour plan.

- Ongoing professional development is important, including opportunities for professional learning embedded in context and connected to daily classroom practice.

“Emerging issues” were identified. Future research and practice in these areas is expected have an impact on teaching students with LD:

- Co-existing LD and AD/HD
- Knowledge base of teachers
- Knowledge base of administrators
- Cultural and language differences, including Aboriginal issues
- Inclusive practices such as Differentiated Learning and Universal Design for Learning.
Section 3 - Models of Service Delivery

The search for an effective model of service delivery to support the needs of students with LD has spanned several decades. The elements of best practice in teaching students with LD as described in Section 2 were used as a basis for exploring models of service delivery to determine how well they align with best practice. Research literature was reviewed and current practices were explored through a survey of educators and a review of websites describing services for students with LD. The survey (Appendix 2) included seventeen questions to gather information about delivery, success and transition. These questions also guided the review of websites.

Canada has historically offered dedicated education programs for children with special needs, including special schools, specialized classes and varying degrees of integration into regular classes combined with pull-out/resource programs. Since 1999, several Canadian Provinces have reviewed their special education services. Information from these reviews is summarized in the “MacKay Report” (2006) prepared for the Department of Education of New Brunswick. The current trends towards more inclusive education practices are consistent with movements occurring internationally. MacKay and Burt-Garrows (2004) defined inclusion this way: “We are not referring to a specific program, service, or methodology. We are referring to a school system that in both its design and its effect continually strives to ensure that each student has access to and is enabled to participate in the school community, to be part of the community in positive and reinforcing ways and whose identity is reflected in the operations of the school community” (p.6). Many Canadian provincial education systems are exploring policies and practices to ensure that the goal of inclusion is achieved. At this time, most models of service delivery fit within the Cascade Model (Bunch, 2005). The models include: special...
placement (alternate setting); full-time self-contained class in a regular school (segregated or contained class); part-time regular class and self-contained (special or congregated class); to full inclusion (regular class with direct/indirect support; and regular class without support).

**How do various models of service delivery align with best practices in teaching students with LD?**

The general consensus in current research is that the implementation of the elements of best practice is important and is not dependent upon a particular model of service delivery. Reviewing the copious research on a range of models since the late 1970s, Zigmond (2003) provided the following observations:

- effective practice is more important than the location
- we know what we learn, and students with LD require more than the usual time to ensure they learn their basic skills
- explicit and intensive instruction is critical
- the ease of delivery of certain instructional practices may be dictated by the setting
- more research is required about “who learns what best where” (p. 120)
- new research designs are needed to help connect research outcomes and placement decisions.

Specific models of service delivery are described below beginning with the most segregated models to the most inclusive.

**Special placements (alternate settings) and full time self-contained classes**

Based on current literature, special placements and self-contained classrooms align with best practices as follows:

- lower pupil-teacher ratio allows for more intensive instruction
• time is available to teachers for planning and implementation of
direct and intensive instruction, and for development and
implementation of IPPs
• consistent and frequent monitoring of student progress is possible
• instruction is directly tied to individual needs
• teachers may have more specialized training.

Disadvantages of special placements and self-contained classes have also been identified, including:

• students are often isolated from the regular classroom settings
• there may be limited generalization of strategies to situations beyond the special setting
• students may experience challenges transitioning to other learning situations
• homogenous groupings may foster behavioural and social difficulties depending on access to appropriate social role-models
• the stigma of disability may be perpetuated
• options or extracurricular activities that tap into the strengths or interests of students may not be available.

Part-time regular class combined with pull-out program

Tutorial, Work Study, and Functional Skills models are examples of approaches to delivery in which students attend a pull-out program for varying amounts of time. For some students with LD, part-time support outside of their regular classroom can offer:

• a place of safety to learn or a direct connection with someone whose focus is to monitor and address their unique needs
• intensive instruction and supported practice of skills in conjunction with regular classroom instruction, and
• paced learning.

Criticisms of these pull-out models include:

• teachers in pull-out programs may face the challenge of dealing with unfamiliar curriculum or be placed in a tutoring role
• tutoring or reinforcement and practice of academic skills may not include teaching learning strategies
• a potential disconnect between skills or content learned and practiced in the pull-out program, and what is taught in the student's classroom.
• pull-out programs may perpetuate the stigma of 'disability'
• time spent in pull-out may place the student at a disadvantage if they do not obtain the pre-requisites or preparation to pursue post-secondary education.

Inclusion

In the full inclusion model, all students with LD are placed in regular classroom settings. The regular classroom teacher may have full responsibility for providing support to students with LD, or additional supports may be provided. In the Learning Strategies model, the regular classroom teacher delivers both metacognitive strategies and teaches core content to all students in their classroom. While the model aligns with best practice in terms of teaching strategies, and the concept of inclusion, several problems have been identified. Regular classroom teachers often lack the knowledge, training, or time to effectively plan and deliver both curriculum and learning strategies. Students with LD may require more intensive instruction to learn strategies, content, or both.
The most recent trend in service delivery is towards a non-categorical and cross-categorical approach, that is, offering differentiated instruction and additional resources to meet the individual needs of all students within the regular classroom setting by combining in-class and out-of-class supports. For example, in a Learning Strategies Team model as described by Deshler (2006), on-site support teachers, such as resource teachers or learning strategists, are involved in both planning and strategy instruction with LD students. Deshler described the teachers’ roles as follows:

- Content teachers specializing in the subject matter thoughtfully select, organize and deliver the salient information in their subject area in a participatory fashion

- Support teachers teach to specific skills and strategies to enhance students’ effectiveness as learners in their core curriculum classes.

The support teacher may team teach or one of the teachers (the content teacher or the support teacher) may take smaller groups of students and work with them either in the classroom or in a pull-out room. This provides the opportunity to engage students more intensely and to individualize the instruction in response to their specific needs. The goal is to ensure that strategy instruction dovetails with core curriculum to encourage generalization and consistent use of strategies in a meaningful way. To be effective, this approach is dependent upon the availability of specialized staff with knowledge of LD, time to plan, collaboration and coordination of services and a clear description of roles.

Great controversy has been generated by the concept of inclusion and its many interpretations. The dilemma dominating the literature is whether inclusive education is sensible for all students with disabilities, and if so, how is it accomplished in a reasonable and realistic manner within a general
classroom setting. Several elements have been identified in the literature as necessary for inclusive education to work:

- all pre-service training and ongoing professional development must always inherently take differences of abilities into account, and the concept of normalcy be discouraged in exchange for acknowledgement of a continuum of abilities
- all teachers must be receive professional development and support so they feel able to teach all children, regardless of ability
- collaboration with informed professionals and colleagues to learn strategies to deal with varied abilities in their classrooms must be available (Florian, 2008).

There are examples of schools and school districts that have re-organized instruction around the needs of individual students. While not exclusive to students with LD, the changes made in these schools align with the best practices described in Section 2. The Learning Disabilities Association of Canada (2005) and the National Joint Commission on Learning Disabilities (2003) in the United States have reacted to the concept of “Full Inclusion”, i.e., that students with LD must be served only in regular education classrooms. Both organizations clearly support a continuum of services and reject the arbitrary placement of all students in any one setting. Specifically, the LDAC (2005) policy statement includes the following:

“The LDAC does not support full educational inclusion or any policies that mandate the same placement, instruction, or treatment of all students with learning disabilities or the idea that all students with learning disabilities must be served only in regular education classrooms at the exclusion of all other special education options.”
Continuum of Services

Many jurisdictions are now using the term inclusive education to describe a commitment to meeting the needs of all students rather than in reference to a specific setting. A continuum of services and choices in service delivery may still be provided. In terms of alignment with best practices identified in this review, the continuum of services acknowledges that “no one size fits all” for students with LD and that flexibility to meet specific needs is required. A continuum of services may be needed to ensure that best practices can be implemented in response to the diverse needs of students with LD across the school years.

There are examples of schools and school districts that have re-organized instruction around the needs of individual students. While not exclusive to students with LD, the changes made in these schools demonstrate practical approaches to providing instruction to meet diverse needs. In 2007, The National Center for Learning Disabilities published Challenging Change: How schools and districts are improving the performance of special education students. They sampled five school districts in the United States with schools that had made changes and increased the academic success of students with special needs. The common definition of success was improved achievement levels of all students with special needs on state-wide testing. Many of the findings align with best practices in teaching students with LD. Common themes across schools were:

- All students with disabilities were included in general education classrooms
- Data was used to adjust instruction to each student’s individual needs
- The way in which teachers worked together was changed to ensure collaboration could occur
- Administrative organization and procedures were restructured.
Other features worth noting within specific schools included:

- instruction primarily tied to curriculum with clear standards
- implementation of a school wide behaviour management program
- flexibility built in for creative scheduling and planning
- administrators involved in a 3-year program to bridge research to practice in the field of special education
- opportunity for team-teaching between regular teachers or regular teachers with special education teachers
- ongoing monitoring of student progress
- pull-out provided where necessary by resource teachers for strategy instruction combined with academic skill development, although majority of student time spent in regular classroom
- ongoing professional development for teachers and paraprofessionals
- frequent communication with parents, and strong before and after school programs
- one school committed to year-round support programs for low-performing students including more intensive math and reading courses, tutoring, and differentiated instruction.

What are some examples of current practices in service delivery for students with LD? How do they align with best practices in teaching students with LD?

There is great variability in models of service delivery across Canada today. Most provincial departments of education provide non-categorical funding for LD, that is, funding is provided through general education grants to school districts. The school districts then determine how the resources will be used to provide services consistent with government policy. However,
some provincial departments of education provide additional funding for services for students with LD that are provided in segregated school settings. For example, Alberta provides some funding directly to designated special education private schools and parents pay the balance of the tuition. Nova Scotia has a tuition support program for students attending private schools serving students with LD. Ontario has established four provincial residential demonstration schools for students with LD, one of which is for French language speakers.

In practice, the majority of students with LD are in regular classrooms with varying levels of in-class and pull-out support. However, there are also segregated (or congregated) special schools organized at the provincial level or within public school systems and many private schools for students with LD. Examples of a variety of initiatives are presented below. The information for this review was gathered through a survey of educators (telephone and on-line) and a review of websites describing services for students with LD. This is not intended to be an exhaustive presentation of models of service delivery. It is a sampling to illustrate a variety of approaches to meeting the needs of students with LD at different age levels and in segregated placements to more inclusive models. The descriptions will highlight how each of these models incorporates best practices in teaching students with LD.

Residential Segregated School

Trillium School, Provincial Demonstration School, Milton, Ontario, is one of four provincial schools for Ontario children with severe learning disabilities. Application for admission is made on behalf of students by the school board with parental consent. The Provincial Committee on Learning Disabilities (PCLD) determines whether a student is eligible for admission. The Trillium School serves grade 7 to 12. The three other Demonstration Schools serve grades 4 to 8/9 (Sagonaska School in Belleville), grades 7 to 10 (Amethyst
School in London) and French-speaking students (Centre Jules-Leger, Ottawa).

Students attending Trillium School have severe LD or AD/HD. The program is a one-year residential program but the one year can be extended if deemed necessary or beneficial. Intensive instruction is provided individually or to groups of two to six students allowing for high levels of student engagement. All students participate in the Wilson Reading System and/or Fast ForWard phonological awareness program as well as the regular curriculum. All students have access to assistive technology.

Teachers do follow-up visits to the students in their regular classrooms. In addition, students have access to the services of child and youth worker. A psychiatrist is available to support students with anxiety and other issues.

In terms of success, students are reported to generally increase their reading skills by 2.5 grades with no technology support and by more with technology support. All students are able to write and pass the provincial literacy test at their level. There has been no formal long term follow up but many of the students do go on to post-secondary education.

All teachers are required to be involved in ongoing professional development. New teachers go through training on the specific reading intervention programs. A workshop is conducted each fall for new and returning teachers and internal workshops are held each Friday.

**Segregated School within a Public School District**

Dr. Oakley School, Calgary Board of Education, Calgary, Alberta, is a “congregated” special school that provides intensive instruction dedicated to improving the literacy skills of students with LD who have made minimal progress in response to instructional supports in their community school. The mandate is short-term intervention lasting no more than two years, with dedicated staff to support the students over one year as they transition back
to a regular setting. Maximum enrolment is 135 students ranging from grade 3 to grade 9.

The setting offers lower pupil/teacher ratio and an all-day literacy focus that is tied to curriculum. Direct instruction in literacy is combined with strategy instruction. Small group intensive literacy instruction is provided for one hour each day. Content areas including science and options such as music are not available. All teachers work in teams of two to meet the needs of students. Ongoing assessment is conducted to monitor progress and to guide interventions and accommodations, including assistive technology. Parents are involved in the IPP process and commit to a minimum of 20 minutes per day of home reading.

Transition back to the community school is planned from the time a student begins the program at Dr. Oakley and is described as “usually very successful as long as supports in the setting continue to be in place for the student”. Practices to facilitate successful transitions include a meeting between the Dr. Oakley teachers and the teaching team in the community school in June or September. A dedicated “Collaborative Support Team” of two teachers from Dr. Oakley support the transition of 14 students. This service is provided for students who are interested in weekly support in their community setting and for students in Senior and Junior High school settings. These teachers meet with the students and go over their assignments, assist classroom teachers with accommodations and modifications for the students and communicate weekly with the student’s parents. This support is provided for a one year period.

Teachers vary in terms of training in special education but they commit to professional development on a continuous basis and develop an understanding of LD and various interventions. Teachers meet every two weeks to discuss their literacy program, read research and ask questions.
In terms of success, many of the students gain up to 4 grade levels in their reading and 2 grade levels in writing. The staff of Dr. Oakley consider their interventions to be successful when students regard themselves as competent, confident and capable learners.

**Regular Class with Pull-out Support**

Toronto Catholic School District has entered into a license agreement with the Arrowsmith School (private school for students with LD) to provide specific repetitive programming which is computer generated to provide remediation in areas of memory, ability to focus, sequencing and automaticity of response. The Arrowsmith program is offered in seven elementary schools throughout the district at no charge to the families. Few details were available and the results of research with regard to this programming have not yet been released to the public. The initiative is included as an example of a partnership between public education and the private sector.

**Regular Class with Direct/Indirect Support (Grades 4 to 9)**

Learning and Literacy (L&L) Programs, Calgary Board of Education, Calgary, Alberta, provide a variety of opportunities and supports for grade 4 to 9 students with LD. The program has recently expanded from six to 11 schools. Students come to these programs based on system referrals. The goal of the L&L program is to assist each child in gaining skills, knowledge and competencies to reach their academic, social and emotional potential. The emphasis of instruction is on developing literacy skills (reading and writing) in a model of service delivery where instruction for L&L students is fully blended with regular classroom instruction. Program staff includes a regular classroom teacher and an L&L designated teacher in each classroom allowing for flexible instructional groupings throughout the school day. L&L students receive small group or individualized intensive instruction to meet their specific learning needs. Depending on the number of L&L
students at each site and on timetabling options, there may be teacher time directly assigned for assistive technology and/or additional small flexible instructional groups.

The L&L program has been intentionally designed to provide intensive, explicit instruction with L&L teachers working together with core subject area teachers. Universal Design for Learning, assistive technology, instructional accommodations and strategic planning are incorporated. All students have IPPs and collaboration between home and school is promoted. Transition planning, ongoing assessment and the development of self-advocacy skills are components of L&L programs.

Specific details about success were not provided on the survey as an evaluation report has not been released to the public.

**Regular Class with Direct/Indirect Support (High School)**

Cochrane High School Learning Centre, Rockyview School Division, Cochrane, Alberta, provides support for grade 9 to 12 students with LD. At Cochrane High School, students with LD are in regular classes with accommodations. They have the opportunity to receive additional support in a “Learning Centre”. Students attend the Centre for three or six 76 minute periods per week. The time spent in this situation is considered a “Learning Strategies course” for which the students receive high school credits. The student sets goals for each visit to the Centre and they are evaluated in terms of attitude, organization and use of class time. Students can also arrange to go to the Centre for at other times if needed, for example, to work on a particular English Language Arts (ELA) assignment during an ELA period if requested by the ELA teacher. There are four to 15 students in the Centre at any one time. Each student brings curriculum materials to work on and they receive individual support from a teacher or teaching assistant as needed. The focus is on teaching strategies to help students access the
curriculum. Support in learning to use assistive technology (e.g., Kurzweil reader) is provided.

The Administration at Cochrane High School is very supportive of the Learning Centre program. For example, students with LD are given preferential scheduling to ensure that they can access the supports they need within the school day. The staff includes two full-time teachers and a part-time teaching assistant who has assistive technology expertise. The teachers have special education backgrounds.

Students are involved in the IPP process and self-advocacy is encouraged through conversations with Learning Centre teachers about IPP goals, strategies, accommodations and assistive technology. Transition planning is formally addressed each year and students are engaged in problem-solving and goal setting.

One measure of success is academic achievement. The high school completion rate for students with LD participating in the Learning Centre is 95%. Other indicators of success are a student’s knowledge of themselves as a learner, their effective use of accommodations and assistive technology and their ability to advocate on their own behalf.

Private Segregated Schools for Students with LD

There are many private schools for students with LD across North America. The survey questions guided an analysis of the information provided on the websites of ten private schools. The following common themes were identified:

- small group settings with low pupil/teacher ratio
- provided strategy instruction in combination with academic instruction tied to mandated curriculum to encourage learner independence and improve self-advocacy skills
• listed graduation from school with the ability to pursue post-secondary studies as a measure of success

• offered instruction from grade 4 onward, although two schools started in grade one and two respectively

• provided counselling for students experiencing social/emotional challenges in addition to their learning disability

• included assistive technology as part of the student's educational experience

• delivered instruction via a multi-modal teaching approach.

The schools were found to differ in the length of attendance by students. Some schools focused on a two year commitment and emphasized planning for transition back into regular education. Other schools are flexible and the length of attendance depends on the needs of individual students. Other differences included the level of training in special education of the teachers, the focus of professional development for teachers, access to additional supports (e.g., speech and language therapists), the use of specific intervention programs or approaches, and the availability of instruction in the arts and vocational areas.

**Summary**

The general consensus in current research is that the implementation of the elements of best practice is important and is not dependent upon a particular model of service delivery. In terms of alignment with best practices identified in this review, a continuum of services acknowledges that “no one size fits all” for students with LD and that flexibility to meet specific needs is required. There are many models of service delivery in Canada today. Each has advantages and disadvantages that must be
considered in planning instruction to meet the diverse needs of students with LD across the school years.
## Academic/Instructional Accommodations

**Name**  
**School**  
**Grade**  
**Date**  
**Completed by**

<table>
<thead>
<tr>
<th>Reading Difficulties</th>
<th>Written Expression Difficulties</th>
<th>Attention Difficulties</th>
<th>Memory Difficulties</th>
<th>Fine &amp; Gross Motor Difficulties</th>
</tr>
</thead>
</table>
| ○ Use less difficult/alternative reading material within a subject area  
○ Reduce amount of reading required  
○ Allow student to tape record lectures and class discussions  
○ Allow alternative methods of data collection (tape recorders, dictation, interviews, fact sheets)  
○ Set time limits for specific task completion  
○ Enlarge text of worksheets and reading material  
○ Extend time to complete tests and assignments  
○ Use large print editions of tests  
○ Read directions aloud to student  
○ Read test items aloud to student  
○ Read standard directions several times at start of exam  
○ Record directions on audiocassette  
○ Provide written directions for exam ahead of time  
○ Use assistive technology (optical character recognition system, books on tape/CD, screen readers) | ○ Allow student to tape record lectures and class discussions  
○ Provide a written outline  
○ Individualize assignments (reduce volume of work, break long-term assignments into manageable tasks, allow extra time for completing assignments, offer alternative assignments, allow student to work on homework while at school)  
○ Allow alternative methods of data collection (tape recorders, dictation, interviews, fact sheets)  
○ Allow for spelling errors on written assignments  
○ Extend time to complete tests and assignments  
○ Permit use of scribe or tape recorder for answers (student should include specific instructions about punctuation and paragraphing)  
○ Waive spelling, punctuation and paragraphing requirements  
○ Accept keyword responses instead of complete sentences  
○ Use assistive technology (word processor, spell-check device, grammar-check device, text to speech software) | ○ Provide alternative seating (near teacher, facing teacher, at front of class, between well-focused students, away from distractions)  
○ Provide additional/personal work space (quiet area for study, extra seat or table, "time-out" spot, study carrels)  
○ Permit movement during class activities and testing sessions  
○ Allow student to tape record lectures and class discussions  
○ Provide directions in written form (on board, on worksheets, copied in assignment book by student)  
○ Set time limits for specific task completion  
○ Extend time to complete tests and assignments  
○ Allow untimed testing sessions  
○ Use multiple testing sessions for comprehensive tests  
○ Allow student to take breaks during tests  
○ Use place markers, special paper, graph paper or writing templates to allow student to maintain position better or focus attention  
○ Provide cues; e.g., arrows, stop signs, on test answer forms  
○ Provide a quiet, distraction-free area for testing  
○ Allow student to wear noise buffer/device to screen out distracting sounds  
○ Provide checklists for long, detailed assignments  
○ Provide a specific procedure/process for turning in completed assignments | ○ Provide a written outline  
○ Provide directions in written form (on board, on worksheets, copied in assignment book by student)  
○ Set realistic and mutually agreed-upon expectations for neatness  
○ Reduce/eliminate the need to copy from a text or board (provide copies of notes, permit student to photocopy a peer's notes, provide carbon/NCR paper to a peer to allow a duplicate copy of notes to be made)  
○ Extend time to complete tests and assignments  
○ Alter the size, shape or location of the space provided for answers  
○ Accept keyword responses instead of complete sentences  
○ Allow student to type answers or to answer orally instead of in writing | ○ Use assistive and adaptive devices (slant boards/desktop easels to display written work/reading material, pencil/pen adapted in size or grip diameter, alternative keyboards, portable word processor) |

Source: Calgary Learning Centre, 2002.
Appendix 2

Survey Questions

Program or School
Where do you deliver your programs?
☐ Nationally  ☐ Provincially  ☐ Locally

How do you deliver the services provided?
☐ Public  ☐ Private  ☐ Collaborative

How do you fund the programs for students with learning disabilities?

IF this is a specific program, is it provided:
☐ In a private school
☐ In a special school in a school district
☐ In a segregated setting within a school

What is your eligibility criteria?

How long do students attend?

How successful is their transition back into an inclusive setting?

What do you do to ensure the transition is successful?

Delivery Model
Intensity:
• Amount of time
• Size of groupings
• Student engagement

How is it tied to the curriculum?

How does the instruction differ from instruction in general education?

What is the commitment of students?

What is the commitment of parents?

Success
What successes have you had in teaching LD?
What does success mean to you?
How do you measure your success?
What training and expectations do you have of your teachers?
References


