Learning Disabilities Training: A New Approach

Building an effective training plan: Incorporating learner-centred strategies

Learning objectives

- Define strategy

- Describe different types of strategies and their functions

- Understand good strategy features

- Describe what factors can impact strategy effectiveness

- Understand how to effectively teach strategies to learners

- Describe various intervention strategies:
  - Strategies to teach reading comprehension and written expression
  - Memory strategies
  - Other skill-based strategies (mathematics, spelling, vocabulary and listening)
  - Behavioural strategies

Chapter outline

- Building effective training plans for adults with learning disabilities
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- What is a strategy?
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    - Types of strategies and related functions

- Factors that can impact the effectiveness of learning strategies
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- How to teach learning strategies
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Building training plans for adults with learning disabilities

Principles of an effective training plan

"Each of us is unique. Everyone has something to offer. I can't breathe alone under water. I'm disabled that way. I need accommodations – tank, suit, flippers, etc… I need someone from the ocean to teach me how to swim and dive."[1]

The first step to building an effective training plan is an assessment that focuses on the learner's needs. A good assessment should provide information on the following:

- A rationale for the difficulties the adult experiences and;
- Information on the adult's strengths and struggles.

Providing objective evidence of a learner's strengths and weaknesses is not only empowering for the adult but is essential for planning an effective training plan.

Any support should be carefully planned and relevant to the learner's personal circumstances and individual goals. The learner must not only be active in the planning, they should also be involved in the constant cycle of evaluation and strategy adjustments. One of the most valuable contributions to the plan is what the learner thinks his/her strengths and struggles are and what areas he/she views as needing to learn.

"It appears that the best educational tool for people with disabilities is patience. Self-esteem, building on strengths, advocacy for a student's disability, and increasing the awareness of other staff and students are paramount. These students need to gain respect from others by having knowledge about their rights as a student with a disability.

Often, individuals have struggled their whole life not having been diagnosed with a disability, but knowing that learning was more difficult for them. **Their disability has a psychosocial, a technological, and an educational impact. Any approach that successfully works with these students will address all three of these parameters**.

We need to change the ecology for the learning disabled student by addressing their need for support, acknowledging their experience of helplessness, and providing access to the appropriate assistive technology. We must pull all of these things together to develop the best transition plan possible."[2]

A balanced approach

The Dyslexia Institute states that there are two views about the most appropriate approach to providing support for adults. Some argue that this should be a 'top-down' or 'problem-solving' approach, focusing on the specific difficulties that a person is having in work or in daily life – prioritizing what is causing the greatest problem 'there and then'. Others argue for a 'bottom up' approach through which key skills and strategies are taught that can then be applied in different situations.

The Dyslexia Institute argues that a combination of these approaches is necessary and that what determines the combination mix depends on the learner. The LBS program also reinforces this through the belief in a learner-centred approach. Every adult who enters a LBS program has varying needs, strengths and goals. In order for the training plan to be truly learner-centred, it must meet the individualized needs.

Someone with confidence, who can learn and implement strategies quite easily, would have lessons that are more top-down in nature. Whereas, when dealing with adults who have poor self-esteem, practitioners would first concentrate on the positive and show them that they can learn. Then they would start to tackle the struggles one at a time. Once learners have got past that initial bit, they can start to talk about problems, which need to be addressed.[3]

Regardless of the approach taken, a training plan should be:

- **Individualized** - based on the learner's strengths and struggles.

- **Participatory** - input comes from both the learner and the practitioner.

- **Flexible** - able to adapt to change according to the effectiveness of particular strategies or approaches.

- **Balanced** - covers a number of the learner's strengths and struggles.

- **Continuous** - it is ongoing and is revised and modified as needed.[4]

The following supports should be considered for each area that the learner has identified as a need. These supports are applicable across all areas of need (social, employment preparation and/or educational).

Adjust the Setting/Environment
Alter the environment or provide ways to screen out disrupting environmental stimuli.

Adapt the Task
Find ways to avoid/bypass the problem or devise strategies that the adult can use to lessen the impact of the problem.

Adjust Instruction/Presentation of Information
Alter the way you present information to the adult (in a workplace setting) or adapt your instruction in response to individual needs and strengths (in the classroom).

Make Accommodations in Testing/Performance
Work around specific difficulties to devise a true measure of abilities. Do not allow disabilities to prevent an individual from showing what he/she can do. Allow an adult to respond and demonstrate competence on the job by using his/her strengths and abilities and when possible, bypassing disabilities.[5]

Module 3 and 4 will address learner-focused interventions. Both Modules 3 and 4 will provide content on how to develop interventions that address teaching learners the necessary skills and strategies to enable them to successfully meet their goals. In Module 5 we will address practitioner-focused interventions, which will outline instructional strategies. The interventions will focus on how the information is selected and presented so that it is more understandable and memorable and enhances learner engagement and retention.

What is a Strategy?

Adults with learning disabilities require a number of skills and strategies to help manage their disabilities in education, training and employment situations. Through the initial assessment process, both the practitioner and the learner should have gained a better understanding of the learner's strengths and struggles. Based on this information and an ongoing assessment process, three areas of assistance may be identified in the training plan: "**psychosocial, educational and technological**."[6]

Psychosocial assistance pertains to building self-esteem, motivation and independence. Often adults' self-esteem may be low due to previous negative experiences with school and possible ongoing struggles with employment. Many adults may not understand why they struggle and they accept their difficulties as a lack of "smarts".

Educational assistance refers to helping adults build their skills through the development of strategies, appropriate instruction and/or accommodations.

Technological assistance pertains to the use of technology as an accommodation -a tool for organizing and/or developing skills. Often technology is used to help compensate for specific learning deficits.

This module will deal specifically with educational assistance through the discovery of various skill-based strategies. Module 4 will focus on psychosocial and technical assistance.

Definition

"Strategies are techniques that are used to help: understand and learn new knowledge and/ or skills; integrate this new information with the information we already know; and be able to recall the information/skill later, even in a different situation. When we learn a new skill or gain new information, the strategies include what we think about (cognitive aspect) and what we physically do (the action we take)."[7]

Strategies can be as simple as re-reading something when it doesn't make sense or be more complex like a strategy that requires a number of steps, such as learning the components needed to write an essay.

Types of strategies and related functions

Strategies can be divided into two types:

- **Cognitive** - Help learners process and manipulate information (i.e. filling out a chart, taking notes).

- **Meta-cognitive** - Help learners to plan, monitor and self-evaluate. Learners need to be aware that learning is a process. Examples would include monitoring comprehension, re-reading a passage when something doesn't seem right, or using steps to develop a composition.[8]

Strategies can be categorized by the different functions they serve for the learner.

- **Acquisition and restore strategies**: Used to gain new information or skills, or take advantage of strengths while working on performance skills that are weak and keeping learners from achieving desired outcomes (i.e. a new way to solve a math problem).

- **Storage strategies**: Help learners manipulate or transform information so that it can be effectively placed in memory (i.e. mnemonics).

- **Demonstration strategies**: Help learners recall or demonstrate what they have learned (i.e. reading comprehension strategy such as PASS).[9]

- **Modify/adapt strategies:** Address features of the context and the task so they support the learners' performance. They build on learners' strengths and needs, so that weak areas do not interfere with performance (i.e. use symbols when reading text to indicate areas they know, have questions about or don't understand). These strategies don't fix the problem but reduce its influence on performance.

- **Prevent strategies**: Used to anticipate a problem in the future. Offer a strategy for making the potential situation better (i.e. to help with transition from a one-to-one situation to a small group or classroom).[10]

Factors that can impact the effectiveness of learning strategies

This module was developed based on the need identified by LBS practitioners who frequently asked - **What instructional strategies are effective with adults with learning disabilities?**

It can be a challenge to answer this question. This module will include numerous strategies and identify what strategies may address the various learning disabilities (visual, auditory, organizational). However, given the unique characteristics that each adult brings to literacy programs, finding an easy fix should not be expected. What works for one person may not necessarily work for another. Strategies should be seen as dynamic and ever changing. In addition, for learners with histories of failure, teaching learning

strategies alone may not be enough to encourage them to persist and improve their skills. Adults' previous educational experiences and present emotional states can affect the effectiveness of the strategies and whether learners will even use them.

Learner Motivation

A learner's motivational state can have either a negative or positive impact on his/her willingness to learn. Attribution theory points out that adults who have experienced frequent failure may attribute their failure to bad luck or task difficulty and their success to good luck or ease of task, instead of seeing success and failure as a result of their own effort or ability. Thus adults may be less willing to persist with or even try a new learning strategy if they feel they have no control over the situation. When learners' motivation levels are low, practitioners need to help them understand that the success of the strategy is a result of their effort and not just a case of good luck. As learners continue to experience success, their motivational levels should improve and they will begin to see the relation between their efforts and success.[11]

The St. Thomas University study guide identifies 4 steps to learning which emphasize the impact of an individual's motivational state and previous experiences. The path for most effective learning is through knowing:

- Yourself
- Your capacity to learn
- The process you have successfully used in the past
- Interest in and knowledge of the subject you wish to learn.

Adults need to fully understand their profile of strengths and weaknesses. They should be encouraged to talk about their difficulties and feel free to ask questions. Practitioners need to be open with their learners and emphasize their role as facilitators. Practitioners are encouraged to state any limitations in their knowledge of learning disabilities. This approach creates a more even playing field and helps to develop equal working relationships with learners. Learner independence will be encouraged and fostered by taking this open approach from the beginning

Learning Environment

Numerous studies have found that the most successful individuals understand and use a variety of strategies to assist and monitor their learning and day-to-day functioning. In addition, successful learners can describe the strategies they use and can describe whether or not particular strategies prove useful in particular situations. This requires learners to be aware of how they are learning; to self-evaluate and detect whether particular strategies are working in certain situations; and to modify them accordingly.[12]

The following characteristics should be present in the learning environment to increase the potential for success:

- A positive and supportive climate
- Minimal distractions
- Appropriate levels of structure and feedback
- The independent use of strategies
- A multi-sensory instructional approach.[13]

"At all times, support must be focused on the individual's circumstances and specific goals and tailored to their unique pattern of strengths and weaknesses."[14]

Features of effective learning strategies

Strategies that are both effective and efficient share characteristics found in the following three features:

- **Content features** - The steps in the strategy and what they are designed to facilitate during the learning process.
- **Design features** - How the steps are put together to facilitate learning and future use of the strategy.
- **Usefulness feature** - The potential transferability of the strategy to everyday needs.

Each strategy should provide information on how to use the strategy. This information should include when, how and where to use the strategy. The following table was adapted from Features of Good Learning Strategies written by Edwin S. Ellis and B. Keith Lenz at
 http://www.ldonline.org/ld_indepth/teaching_techniques/ellis_strategyfeatures.html

Features	Characteristics	Examples
Content	Lead to a specific and successful outcome.	"How well is the student performing the second step in the test-taking strategy?" and "Did the strategy help the student pass the test?" The learner can examine the result of his or her effort and begin to evaluate the effectiveness of the strategy.
	Are sequenced in a manner that leads to an efficient approach to the task.	A strategy taught to students must be a collection of "best" ideas organized in the "best" sequence that leads to the "best" mental and physical actions for the task.
	Cue students to use specific cognitive strategies.	Cognitive strategies such as activating background knowledge, generating questions, summarizing, organizing, imaging, and so forth.
	Cue students to use metacognition (learning to learn)	Reflection on and evaluation of the way a task is being approached and accomplished (e.g. self-questioning, goal-setting, checking, reviewing, self-monitoring) should be included in the steps of the strategy when they are important in completing a task.
	Cue the student to take some type of overt action.	
	Can be performed by the student in a limited amount of time.	A strategy must be performed in a relatively short time. Otherwise the self-instruction process involved in performing the strategy will be undermined, rendering the process ineffective.
	Are essential and do not include unnecessary steps or explanations.	

Design	Use a remembering system.	Such as COPS – an acronym used to remember the steps in editing (capitals, overall appearance, punctuation and spelling).
	Use simple and brief wording.	Each step contains only a few action words to facilitate a direct association to the cognitive and physical actions that are necessary to perform the step and that have been presented to the individual already as part of the full explanation of that strategy.
	Begin with "action words"	
	Use seven or fewer steps.	
	Use words that are uncomplicated and familiar to students.	
Usefulness	Address a common but important existing problem that students are encountering in their settings.	Strategies tend to be learned and generalized more quickly than strategies that seem to have less utility from students' perspectives.
	Address demands that are encountered frequently over an extended time.	Strategies that are useful immediately and whose benefits are apparent immediately.
	Can be applied across a variety of settings, situations, and contexts.	The strategy instruction is necessarily intensive and extensive; therefore the relative cost-benefit ratio plays an important role in the effectiveness of strategies.

How to teach learning strategies

"Because adults with learning disabilities often lack a strategic orientation to learning, it is difficult for them to achieve independence without instruction in learning strategies."[15]

Before learning can be productive and beneficial, learners need to understand why they have experienced difficulties in the past, believe that they can succeed and have a positive approach to making mistakes. Because of the uniqueness of each learner, the time and supports needed to get to this level of self-realization will vary. Practitioners can help learners work towards a more productive learning attitude by providing effective teaching of key skills, being flexible in their approach, providing constant feedback and encouraging independent learning.[16]

A question commonly asked by many practitioners is, "how can we discuss errors with learners without negatively impacting their motivation?" Often learners have only heard about their weaknesses throughout their school experiences. One way to address errors is by using "Directed Discovery Learning." This method shares the principle that it is more helpful to teach learners to investigate mistakes, rather than to just point them out.

"First, adults need to accept that making mistakes is normal. Then they can learn how analysis of mistakes can help to identify areas that need more attention. This might involve learning strategies to check their work and to correct it themselves. This is a skill that they can take away with them and leads to greater independence and self-confidence. Ideally practitioners should very rarely point out where a person is going wrong but encourage them to find this out for themselves."[17]

Practitioners need to respect adults' personal ideas about the way in which they want to be taught and the goals that they expect to achieve. When they are instructing, it is important for practitioners to be flexible and have an understanding of how to adapt to each learner's particular needs.

The key to success is for practitioners to understand and acknowledge the importance of the actual "teaching process" of the strategy itself. If a strategy is not taught properly, then it is less likely that the learner will see success, repeat the strategy and learn to use it independently.

Strategies need to be chosen and developed for learners based on an assessment of their strengths and weaknesses. Many adults have developed strategies but these strategies may be ineffective. Due to adults' habitual patterns, they often don't want to give these strategies up.

Learners need to identify with and understand why and how the strategy is used before it can be implemented. When learners take ownership of their strategies, it is more likely they will utilize them independently and transfer the strategies appropriately to other situations they may encounter.

Steps to successful acquisition of a strategy

The Strategies Integration Model (SIM) has emerged from the research conducted at the University of Kansas. Based on cognitive behaviour modification, the SIM is one of the field's most comprehensive models for providing strategy instruction. It can be used to teach virtually any strategic intervention to students.

Both learning strategies and teaching strategies can be addressed using the Strategic Instruction Model. The learning strategies for learners will be addressed in modules 3 and 4, and Content Enhancement (teaching strategies) will be addressed in Module 5. The SIM is an integrated approach to address both the challenge of meeting the content demands for learners with diverse needs in a small group or classroom environment, and the performance gap. In this module, the use of the SIM will address how to deal with the performance gap through learning strategies.

The model can be used in a one-to-one situation where practitioners can teach learners the strategies that meet their identified needs. But how do practitioners implement the diverse learning strategies required in a classroom setting? First, they must accept the fact that they can't possibly use

every individual strategy that may have been identified, when teaching a number of learners at once, but they can teach strategies that can be applicable to most learners at any given time. Effective learning strategies are ones that can address a significant learning area and that can be applied in various situations. For example, a reading comprehension strategy such as Paraphrasing strategy – RAP can be applied by all learners regardless of the varied levels of reading skills that may be found in one classroom. This reading strategy encourages learners to read a section of the material, ask questions regarding the main idea and details of the section, and encourages them to paraphrase the information in their own words. This paraphrasing strategy is an effective learning tool for all learners to help improve comprehension.

 Once the strategy has been selected the SIM involves 6 main steps:

1) **Pretest learners and encourage them to become interested in learning the strategy.** Practitioners should determine how much the learners might already know about using the strategy and secure learner commitment to learning the strategy from top to bottom. It is important to explain to learners what strategy they are going to learn and how it can help them with whatever skill is being addressed through the strategy.

2) **Describe the strategy.** Give a clear explanation of the strategy, the various steps, as well as some of the benefits of learning the strategy. Identify real assignments or tasks where learners can apply the strategy. Ask learners if they can think of other work where the strategy might be useful.

3) **Model the strategy.** Modeling the strategy for learners is an essential part of strategy instruction. In this stage, practitioners use the strategy to help demonstrate a relevant classroom assignment or authentic task. Practitioners should talk aloud as they work so that learners can observe how a person thinks and what a person does while using the strategy, including: deciding which strategy to use to perform the task at hand; working through the task using that strategy; monitoring performance (i.e. is the strategy being applied correctly and is it helping the learner complete the work well?); revising one's strategic approach; and making positive self-statements.

4) **Practice the strategy.** Provide repeated opportunities to practice the strategy. The more learners and practitioners work together to use the strategy, the more learners will internalize the strategy. Initial practice may be largely practitioner directed, with practitioners continuing to model appropriate ways of thinking about the task at hand and deciding (with increasing student direction) which strategy or action is needed to work through whatever problems arise in completing the task.

5) **Provide feedback.** Providing feedback to learners on their strategy use is a critical part of helping them learn how to use a strategy effectively and how to change what they are doing when a particular approach is not working. Much of the feedback can be offered as learners become involved both in thinking aloud about the task and about strategy use in the modeling and practice steps described above. It is also important to provide opportunities for students to reflect upon their approach to and completion of the task. What aspects of the task did they complete well? What aspects were difficult? Did any problems arise, and what did they do to solve the problems? What might they do differently the next time they have to complete a similar task? It may be valuable to incorporate these questions into a self-evaluation checklist for the learners' reference.

6) **Promote generalization.** It is important for learners to apply the strategy in various situations and to other tasks. This transfer is often not automatic for adults with learning disabilities. Consistent, guided practice at generalizing the use of strategies in various settings and when completing various tasks is therefore vital for adults with learning disabilities. [18] It would be beneficial for practitioners and learners to document the demonstrated success of using the generalizing strategy, so that it is not only learned, but also confirmed at the same time.

The steps outlined in the SIM are not linear. Quite often a practitioner may model the strategy, encourage the learner to practice providing feedback and go back to modeling the strategy again to help the learner utilize the strategy more effectively. In addition, the modeling phase of the SIM can be a process within itself. The transfer from modeling to having the learner practice will most likely be gradual, with the practitioner providing less and less support as the learner practices more with the strategy. The following example highlights the movement within the model.

INSTRUCTION STEPS	EXAMPLE
Discuss	With the learner, discuss the strategy steps, which you have written down and kept visible for reference.
Self-instruct	Have the learner explain in their own words the purpose and how to do the strategy.
Practice	With the learner, simultaneously apply the strategy steps to the materials they are currently using while stating the steps (referring to the visual cues, if necessary).
Provide Feedback	Both the learner and the practitioner provide feedback – what is working, what isn't, can revisions be made, or do we look at a different strategy? (continue the steps if they're working!)
Practice	Encourage the learner to apply the strategy to another problem while stating the steps; watch the learner and provide corrective feedback as needed.
Practice	Ask the learner to apply the strategy to another problem without stating the steps; provide corrective feedback as needed. Make sure the learner has mastered the strategy before moving on.[19]

To help facilitate the generalization of a strategy, practitioners can model and discuss how it can be used in other academic and nonacademic settings. Controlled practice activities enable learners to become proficient strategy users of materials they are comfortable with and capable of performing. Once they are comfortable using the strategy independently, have learners use the strategy with material they want to learn. This practice is often referred to as "Scaffolding." When building a house, workers often use wooden supports and braces to keep the structure in place, until the bricks are placed to keep it in place on its own. The same principles apply when teaching strategies to learners. The practitioners provide the scaffolding and gradually remove it as learners work towards using the strategy independently. The number of practice steps may vary depending on the needs of the learners.

"Scaffolding needs of learners will vary according to the strength of what they already know. What doesn't change is the structure we are working at making strong."[20]

Example of how to build in positive attribution in math using the various steps in SIM

1. Model correct strategy application, stressing the strategy's value to learners.

2. Model positive attribution statements often, as the kind of self-talk that successful math students use (i.e. "This math problem has a lot of steps – I just need to do one at a time and complete as many steps as I can rather than giving up when I run into a road block.")

3. Model positive self-talk when discovering errors in your own work or create intentional errors to discuss (i.e. "I noticed that I reversed my 6 and 9 quite often during this math exercise – I need to make a note to double check this before I complete my math exercise in the future").

4. Allow learners to periodically reflect on class math tasks and reasons for their success or failure through the use of self-reports or journals.

5. Encourage learners to keep personal records of the positive attribution statements they make when working.

6. Encourage learners to set specific goals and use goal statements by doing the following:

   • Keeping a list of individual goals and reading them silently before beginning the day's assignment.
   • Self-checking test-taking goals, such as "Check all basic operations when finished," or "Read the directions twice."

- Using positive attribution statements for test-taking, such as:
  - I have done problems like this before so I can think positively about these.
  - If I use my strategies carefully, I will probably be successful.
  - If this problem feels kind of hard, that means I need to try a little harder; then I'll probably be successful.
  - I'm usually successful when I work carefully and use the learning strategy correctly.
  - If I make a mistake, I can probably find it and correct it.

Helpful pointers when teaching and working with strategies

- **Less is better**
  It is more effective and efficient to choose a few strategies and teach them to mastery rather than trying to implement a wide range of strategies.

- **Instruct explicitly**
  A direct approach to teaching strategies is more effective than a "discovery approach." Examples of direct approaches are providing clear expectations, stating objectives, giving specific instructions and providing numerous examples.

- **Use real life examples**
  Strategies and skills should be taught and practiced in the context of "real life" and relevant situations.

- **Explain what strategy will be learned and why**
  Explain the purpose of the strategy prior to using it with the learner to clarify expectations.

- **Model what is to be learned**
  Provide a clear demonstration of the strategy before practicing it.

- **Use supportive practice**
  Provide a series of prompts and/or questions to help guide the learner through the strategy.

- **Use easy material first**
  This allows the learner to focus on practicing the strategy rather than the skill itself (i.e. using memorization techniques – start with something simple to memorize).

- **Provide lots of opportunity for practice**
  Learners with learning disabilities require plenty of opportunities to practice retaining new skills and/or information.

- **Provide corrective feedback**
  Provide corrective feedback immediately in a straight-forward manner. Learning is enhanced when this approach is taken.

- **Ask frequent questions**
  Maintain communication with learners as they practice the strategy. Ask questions to ensure they are focused on the task and understand the steps in the strategy.[21]

Resource Guide: Strategies for Successful Learning. Email at phdaln@interlog.com ($10.00 for resource and $5.00 for shipping)

The SIMS homepage. Go to:
http://www.ku-crl.org/htmlfiles/sim.html

A summary of strategies and related research. Go to:
http://www.ku-crl.org/archives/2002/0602spot.html

An exercise using a flowchart to help learners gain a complete understanding of a concept. Go to:
http://edservices.aea7.k12.ia.us/framework/strategies/know.pdf

Characteristics of strategic learners

The ultimate goal for both the practitioner and the learner is for the learner to become an independent learner. Strategic adult learners are aware of their strengths and weaknesses and can apply strategies independently to help them reach their goals. The following outcomes can be expected from strategic learners:

- Learners trust their minds
- Learners know there's more than one right way to do things
- They acknowledge their mistakes and try to rectify them
- They evaluate their products and behaviour
- Memories are enhanced
- Learning increases
- Self-esteem increases
- Learners become more responsible
- Work completion and accuracy improve
- They know how to "try"
- On-task time increases; learners are more "engaged"[22]

Learning strategies

Learning strategies are important for the completion of tasks, information storage and expression and demonstration of tasks. They help learners address common challenges, such as:

- What to do when they come to an unknown word (i.e. a decoding strategy for word recognition)

- How to ensure that they understand and remember information as they read (i.e. a strategy for self-directed comprehension questions as they read)

- How to integrate visual and text information (i.e. a strategy for repeatedly viewing a graphic as they read about it).[23]

What are the most essential strategies to learn?

Although adults with learning disabilities will have varied skill-based needs, the following are the common areas of difficulty for adults with learning disabilities. This section will provide some suggestions of skill-based strategies in the following areas.

- **Computation and problem-solving**: Verbalization, visualization, chunking, making associations, using cues.

- **Memory**: Visualization, verbalization, mnemonics, making associations, chunking, and writing. These are usually more effective when used in combinations.

- **Productivity:** Verbalization, self-monitoring, visualization, using cues.

- **Reading accuracy and fluency**: Finger-pointing or tracking, sounding out unknown words, self-questioning for accuracy, chunking, and using contextual clues.

- **Reading comprehension:** Visualization, questioning, rereading, predicting.

- **Writing:** Planning, revising, questioning, using cues, verbalization, visualization, checking and monitoring.[24]

Reading

Phonetics and word identification

"Phonological awareness requires that an individual be able to segment words into syllables or sounds auditorily before letters are even introduced. Many students do not learn to read even when provided written phonics instruction, because they lack the prerequisite understanding of the basic syllable and sound units within spoken language."[25]

For many adults with learning disabilities, struggles with reading can stem from their limited understanding of phonetics. Basic sound-symbol association does not come naturally for many adults with learning disabilities. Research has shown that programs designed to teach sound-symbol correspondences directly, following a systematic sequence from simple to complex and emphasizing multi-sensory instruction help improve adults' abilities to read. This approach encourages practitioners to teach learners that words are made up of blocks of sounds, i.e. "brush" has two units of sounds – bru/sh, instead of "brush" has five letters.[26]

Phonetic Strategies
Keith Stanovitch (1993) outlines several activities that enhance phonemic awareness:

- Phonemic deletion: What word would be left if the /k/ sound were taken away from cat?
- Word-to-word matching: Do pen and pipe begin with the same sound?
- Blending: What word would we have if we put these sounds together: /s/, /a/, /t/?
- Sound isolation: What is the first sound in rose?
- Phoneme segmentation: What sounds do you hear in the word hot?
- Phoneme counting: How many sounds do you hear in the word cake?
- Deleted phoneme: What sound do you hear in meet that is missing in eat?
- Odd word out: What word starts with a different sound: bag, nine, beach, bike?
- Sound-to-word matching: Is there a /k/ in bike?[27]

When assisting with word identification, words should be taken from the content materials that the learner is having difficulty reading. According to the Council of Learning Disabilities, instruction should focus on: sound-symbol correspondence, recognition of phonetically regular consonant-vowel-consonant words and recognition of some sight or high frequency words. The following are some suggested strategies.

Word identification strategy: Adults learn how to break words into parts to facilitate decoding. It is helpful if learners know prefixes and suffixes and have some knowledge of phonics.

Overt word parts strategy: Learners circle word parts at the beginning and end of the word and underline letters representing the vowel sounds in the remaining part of the word. Learners pronounce the parts quickly to say the word.

Making words: Learners use their knowledge of sound, letter correspondences, orthographic patterns, structural analysis, and content-specific vocabulary to form words.[28] Through this process, a number of new concepts will be introduced to learners, such as prefixes and suffixes. To help with the management of the new "language", together practitioners and learners can develop small resource books that list the key concepts and examples. The learners can use their resource books when they come across a term without having to rely on the presence of a practitioner.

- **The Efficacy of Alphabetic Phonics-Based Instruction: Contemporary Orton-Gillingham Approaches to Reading and Spelling** Go to: http://www.neuhaus.org/paper4.htm

Reading fluency and cueing strategies

It is important to help learners become fluent readers so more emphasis can be placed on comprehending the content. Many adults with learning disabilities who struggle with reading often focus so much on understanding a single word that it interferes with their fluency and comprehension of the passage or text.

The Seeds of Innovation Project, which asked practitioners to review various instructional strategies, found that cueing strategies were essential in assisting adults with learning disabilities to read. They found the use of cueing strategies must be taught first by modeling. In addition, time must be taken to "sell" the use of cueing by explaining why these strategies are important. **They listed the following cueing strategies in order of importance:**

CUEING STRATEGIES	EXAMPLES
Background knowledge	What do we already know about: The time of the story? The story setting? The people in the story? The story events?
Pictures	What can we predict about the story from the pictures? Pictures can jog background knowledge of setting, time, or familiar experience.
Meaning	Understanding the context of a story helps to get the particular meaning of a word, e.g. the word "warrant" in text. What does it mean in this passage?
Structure/Grammar	What word would "make sense" here? e.g."She ate____and eggs for breakfast."
Sound/Symbol Correspondence	This helps to support/deny our guess about what a word might be, based on past experience or common sense. For example, in the sentence below, the initial consonant would help us to support/ deny a guess. "She ate b____ and eggs for breakfast. "If we had guessed "bacon", our guess would be supported. If we had guessed "ham", our guess would be denied and we would think again.
Supporting techniques	**Examples**
Re-tell periodically during the discussion of background information and pictures	What do we know so far? Use symbols for whom, what, where, when and how as memory devices.
Re-read when needed to consolidate meaning	This also helps in proof-reading. As learners read over the passage each time they gain more word recognition – initial reading is focusing on the meaning of the words not the meaning of the text, but as word recognition increases there is less interference with the meaning of the text.
Pause-Prompt-Praise	When a learner struggles with an unknown word or has misread a word, practitioners should pause, prompt and praise.[29]

Practitioners need to help learners increase their automatic reading by decoding and sounding out words without breaking the flow of the reading process. The following are suggested strategies:

- Have learners read orally with the use of a tape recorder. Have them listen to the recording and then have them do silent reading or a combination of these – with the first reading to be focused on the words and then eventually focused on the meaning.

- Have two learners read together. One reads and one follows along and then the roles are reversed. This helps increase the practice time for the learners.

- Utilize a chunking strategy by using familiar text and dividing it into phrase groups of words and use a slash mark to indicate the phrases. Learners practice reading the phrases until they can read them fluently and then the slash marks are removed.[30]

Vocabulary development

Before reading

- Pre-teach unfamiliar words from the text

- Have learners use mapping techniques, such as Semantic Mapping, to help them think about the meanings of the new words

- Help learners relate new vocabulary to their prior knowledge and experiences

During reading

- Have learners add new words and concepts to their maps

- Use content-area word walls as a resource

- Teach learners to use word parts such as prefixes and suffixes to read new words

- Teach learners how to use the context of expository text to figure out word meanings

After reading

- Teach unfamiliar words that were not learned before or during reading

- Have learners use their own words to explain the meaning of new words

- Play vocabulary games (e.g. using synonyms, antonyms) to provide enrichment of new word meanings

- Provide numerous opportunities through activities and reading to extend word knowledge and to develop a deeper understanding of word meanings.[31]

Suggested strategies

The best method of vocabulary instruction depends on the goals of instruction, the words to be learned, and the characteristics of the learners.

Word building: is a strategy to teach prefixes, suffixes and combining forms. Learners select a root word, select a prefix and/or suffix, and add them to the root word. Learners write a sentence using the newly created word. Root words should be selected from the text to be read.

Illustrate and associate: is a strategy to introduce associations among words, including synonyms, antonyms, and analogies. The strategy involves listing the vocabulary word, writing a brief definition, drawing a picture to illustrate the meaning, and identifying an antonym for the word, if possible.

Word map: is a strategy for learners to map concepts (key vocabulary) by identifying characteristics of the concept and providing examples for the word.[32]

Reading Comprehension

"Adults with learning disabilities often fail to realize that they must pay attention to how well they understand a text as they read so that they can go back and reread as necessary. It is essential for learners to understand "repair strategies" to use when they find themselves not understanding the text they are reading. They also process information inactively and they have difficulty differentiating relevant and irrelevant associations. Possible solutions could include techniques that force learners to focus attention on the material being read."[33]

Comprehension is a process of combining new information with prior knowledge, a process that involves both understanding and memory. It is an active process with the participant interpreting and making inferences from readings. We know that adults with learning difficulties often find this hard to do. Finding and understanding the structure such as picking out important information, making inferences and identifying characters is an ability that is difficult for adults with learning disabilities.

Strategies should attempt to increase understanding by giving meaning to new information by relating it to past experiences, and to increase memory skills by providing strategies that trigger memory associations.

Studies have shown that children with learning disabilities can learn reading strategies, which in turn improve their reading skills. Techniques to teach learners to ask questions, paraphrase, and summarize what they have read have proven to increase reading comprehension.[34]

Typically, adults with learning disabilities must learn self-monitoring techniques, such as asking themselves questions after reading a passage or summarizing in their own words the material they have read. Generally, learners who are taught self-monitoring strategies experience more improvements in comprehension, than by learning only one specific comprehension skill.

Adults with learning disabilities may not see the difference between relevant and irrelevant information in a text or passage. Possible solutions include using techniques that help them to focus attention on the material being read and help them more readily identify the theme of the passage. Those who cannot process meaning easily may benefit from multiple organizers. This could include reading the passage, listening to the passage on tape, taking down notes while listening to what they hear, and then organizing their notes to make meaning of what they heard. The multi-sensory approach involves a combination of seeing, hearing, speaking, and organizing.[35]

Regardless of the reading strategy, the following guidelines should be used.

Before reading: learners should become familiar with related vocabulary, make connections with background knowledge, understand the purpose for reading the text and be given strategies to help them preview the text.

During reading: learners should be taught self-questioning strategies, and utilize graphic organizers such as story mapping.

After reading: teach learners self-questioning strategies to reflect on what they have read, and encourage them to summarize and retell what they have read.[36]

Reading strategies

Many of the following strategies have incorporated the recommended guidelines. These guidelines can be helpful if practitioners want to look at developing their own strategies in cooperation with the learners and/or to evaluate pre-existing strategies prior to using them. There are many reading comprehension strategies available and they are too numerous to include them all. However, we have included a few that have been frequently mentioned and/or when research studies have shown significant evidence to support their effectiveness.

Story Grammar: is an organizing guide for reading. It refers to the principal components of a story: main character, action and outcome. Many of the strategies incorporate the components of story grammar in their steps. For example, this technique has been applied using story maps and by asking generic questions based on the components.[37]

Questioning and paraphrasing (Reciprocal Teaching- Brown and Palincsar 1988): involves questioning, summarizing, clarifying and predicting. It is organized in the format of a discussion. The practitioner models the strategy first by:

- Reading a portion of the text orally and summarizing the main idea in his/her own words
- Self-questioning during the reading and posing post-reading questions for the learners
- Clarifying the meaning during the reading
- Predicting what will happen next.[38]

Once the practitioner has modeled this process a few times, learners can be encouraged to take a leadership role. This strategy is designed to improve comprehension by focusing on the important information in the material and stimulating active involvement with the material.

Story mapping (Idol 1987): uses the elements of story grammar. The learners can fill a map with the setting, characters, time/place of the story, the problem, the goal, the action that took place and the outcome. Once again, this strategy is only effective if the learner is taught how to use the strategy first.[39]

PASS reading strategy:

P - **Preview, review and predict**: learners read the heading and one or two sentences, they think about what they already know about the topic and what the text might be about.

A - **Ask and answer questions:** learners ask content-focused questions (5 – w's), monitoring questions (is my prediction right? does this make sense?) and problem-solving questions (do I need to reread this section? should I get help?).

S - **Summarize:** learners ask what the passage is about?

S - **Synthesize:** learners state how the short passages fit in with the full passage, what they have learned and how it fits with what they already know.[40]

The following are strategies for understanding textbooks – for more advanced readers:

ConStruct procedure: this strategy involves doing several readings of a passage and developing a diagram that depicts the context of the passage. There are four steps to this procedure:

1) Learners quickly read the passage and determine the main topic and any subtopics; they try to discover as much as possible from the title, subtitles, introductory paragraphs, illustrations or figures.

2) Then the learners read the text thoroughly to find meaning and add information to the framework developed above; non-essential information is to be ignored at this point.

3) Before the learners read again, they look over the diagram to see if there is information they don't understand and if so they should go back for clarification.

4) Finally the learners scan the text for non-essential information and determine if it should be added to the diagram.[41]

Multipass: this strategy is helpful when learners only need to gain the essential information from the text. It is similar to the ConStruct procedure but doesn't require the thorough reading and diagram. It recommends that learners make three "passes" through the text.

- **First pass**: become familiar with the main ideas and organization of each chapter.

- **Next pass**: look at the questions at the end to determine what should be learned from the text and take a guess at the answers.

- **Final pass**: read the text to find the answers and self-test by answering each question with the information gained from the final pass.[42]

A simpler method encourages learners to go through the text and use symbols to indicate their understanding by recognizing:

- What they already know (use a checkmark).
- What new things they are learning (use an exclamation mark).
- What questions remain or have been raised (use a question mark).

The above methods or models follow basic good reading practices that many of us take for granted. The process of thinking about what we have read and monitoring our understanding has become so automatic for us that we may not even be conscious of the activity, let along view it as a strategy. In summary, any of the strategies can be helpful as long as the teaching of the strategies is carefully developed, given sufficient time and is closely monitored by the practitioner.
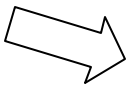
- **Additional Strategies**. Go to:
  http://www.resourceroom.net/index.asp
  British Dyslexia – resource room
- **On-line training to use the SQ3R technique for comprehending textbooks.** Go to**:** http://www.ucc.vt.edu/stdysk/stdyhlp.html

Expressive Writing

If learners are hesitant about their writing, start with tasks that interest them and that can lead to quick success. As learners' confidence in their writing skills increase, begin introducing more difficult writing tasks.[43] The areas to focus on will depend on the assessment of the learners' strengths and struggles and their end goals. Many adults with learning disabilities have

always struggled with their writing and try to avoid it as often as possible. Generally, they have problems with product and process. Product problems include the use of few words, incomplete and/or very limited sentences, poor organization and structure, spelling and punctuation errors, etc. Process problems include learners having trouble with putting ideas on paper, monitoring their writing, and editing.

Graham and Harris 1999 conducted a meta-analysis on instructional approaches for teaching written expression to students with learning disabilities. Based on their analysis, the following three components stood out as consistently leading to improved outcomes in teaching expressive writing to learners with learning disabilities:

- **Adhering to a basic framework of planning, writing, and revision.**

- **Explicitly teaching critical steps in the writing process through modeling.** Explicit teaching of how to write different types of expressive text. The more explicit the examples, the more effectively students learn these writing conventions (i.e. components for an essay, a thesis and supporting arguments and/or a narrative writing, characters, theme, etc.).

- **Providing feedback** requires showing learners how to develop and organize what they want to say and guiding them in the process of getting it down on paper. Feedback can be about the quality of work, missing pieces, and the strength of their work. Feedback from a practitioner or a peer helps learners develop a writing style. This process is combined with ongoing instruction. It takes learners through self-reflection, realization and redress of problems.[44]

Most of the strategies use a basic framework based on planning, writing and revising, modeling and providing feedback. The steps are not necessary linear, for example learners may revisit the planning stage during their writing process, if they are running into organizational difficulties based on the feedback given by the practitioner.

The following two strategies incorporate the three components:

Cognitive strategy - **instruction in writing** (Englert et al.,1995; Englert & Mariage,1991). This strategy includes brainstorming strategies for preparing to write, organizing strategies to relate and categorize ideas, comprehension strategies as students read and gather information for their writing, and monitoring strategies as they clarify their thoughts and the relationships among their items of information. All of these strategies are applied prior to the actual writing.[45]

Self-regulated strategy development (SRSD) (Graham & Harris, 1989b) An important outcome in instructing expressive writing is to help learners to integrate self-monitoring processes into their writing and promote the development of a positive attitude about writing. One means for accomplishing this outcome is by explicitly instructing them on the SRSD procedures.

The SRSD technique involves self-directed prompts that require the students to (a) consider their audience and reasons for writing, (b) develop a plan for what they intend to say using frames to generate or organize writing notes; (c) evaluate possible content by considering its impact on the reader; and (d) continue the process of content generation and planning during the act of writing.

Within the SRSD other strategies may be used at different stages of the writing process. For example, often learners when faced with a writing task struggle to think of subject matter. A THINK sheet may help them to brainstorm and discover that they already have subject matter for writing. The THINK sheet should be set up with write-in lines after the questions. In addition, adults with learning disabilities often don't use revising and editing as an automatic process. Thus a learner may utilize the COPS (capitals, overall appearance, punctuation and spelling) strategy to assist with this part of the writing process.

For more details on the Cognitive Strategy Instruction in Writing and the Self-Regulated Strategic Development Strategies refer to the following websites:

- http://www.msu.edu/user/suwalaco/link.html

- http://faculty.washington.edu/gtroia/chapter2.PDF

- http://www.ldonline.org/ld_indepth/writing/harris_writing.html

- http://www.msu.edu/user/suwalaco/link.html

- http://olam.ed.asu.edu/barak/barak1.html

- http://ncrtl.msu.edu/http/rreports/html/pdf/rr917.pdf

Support strategies that can be integrated into the writing process

For Planning

The "Planning Think Sheet" uses a series of prompts:
- Who am I writing for?
- Why am I writing?
- What do I know?
- How can I group my ideas?
- How will I organize my ideas?[46]

Writing

The next step of putting the information into actual sentences can prove difficult for adults with learning disabilities. It includes dealing with grammar, spelling, and producing properly formed letters and symbols. The use of the computer has proved helpful along with a spell checker, a list of common spelling mistakes, a list of spelling rules, the Horn spelling method, and the use of a tape recorder to dictate what learners want to say and then translating it into written form.

POWER is an acronym to highlight the steps in the writing process.

Planning: learners think of audience, purpose, and background knowledge

Organizing: learners may choose to use a graphic organizer

Writing: practitioners demonstrate and use self-talk; then individual learners apply

Editing: self-evaluation includes rereading and starring things the learner likes and using question marks for those areas of which they are unsure. The learner creates two questions for the peer editor and then reads aloud the paper to the peer editor. The peer editor points out areas where writing can be strengthened and together they brainstorm how the paper can be improved

Revise: the learner revises his/her own writing

DEFENDS: is the acronym for a strategic approach that helps secondary students write a composition in which they must take a position and defend it (Ellis, 1994). Each letter stands for a strategic step, as follows:

Decide on audience, goals, and position
Estimate main ideas and details
Figure best order of main ideas and details
Express the position in the opening
Note each main idea and supporting points
Drive home the message in the last sentence
Search for errors and correct.[47]

Semantic mapping
The learners develop a map prior to writing to organize information and questions. The center has the topic and then the learners organize their thoughts around the topic by addressing the key questions: what, when, where, how, who, why.[48]

Sentencing combining

Use a graphic organizer for the content such as semantic mapping. Take each word or item and write a sentence on an index card. Next, organize the sentences by topic or subject. For each topic, prioritize the sentences as to which one should come first. Then prioritize the topics and input the information either by entering it into a computer or by handwriting.

Editing

This process of reviewing is not automatic for adults with learning disabilities. They not only need to be taught about what areas to edit, but some learners may also need to utilize cues because they do not easily see their own mistakes.

Simple strategies to help with editing:

- Use a diary or index cards (areas of difficulty are noted in the diary and/or problem areas are noted in the index cards and listed alphabetically for quick reference while reviewing).

- Have rules for spelling, punctuation and capitalization available.

- Pair learners together to edit each other's writing and have them go over their editing together. Give them one thing to edit at a time, i.e. capitalization then punctuation, etc.

- Use the tape recorder to read the information and listen to it. Make changes if it doesn't make sense.

COPS: This strategy helps learners to monitor their writing.

- **C** = Edit capitalization
- **O** = Overall editing and appearance (handwriting, margins, complete sentences)
- **P** = Punctuation
- **S** = Spelling[49]
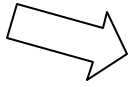
- **Helping students with the writing process – tips for tutors**. Go to:
  http://literacy.kent.edu/eureka/strategies/help_writing_process.pdf

- **Resource room has strategies for communication and math**. Go to:
  http://www.resourceroom.net/index.asp

- **Writing and proofing strategies database**. Go to:
  http://www.muskingum.edu/~cal/database/writing.html#Strategies

Spelling strategies

"Spelling is a process which involves a variety of skills including visual, auditory, memory, language, attention and motor abilities. Proficient spellers must form a clear, sharp image of the correct spelling of a word, associate sound-to-letters, remember the correct sequence of letters, have an understanding of language which will aid in word analysis, and possess the visual-motor skills necessary to write the correct form of the word."[50]

It is not surprising given the many processes that are involved in spelling, that many of our adults with learning difficulties seem to have very frustrating experiences with spelling. Both visual and auditory processing disabilities can clearly create challenges for adult learners. Learners may find that their minds go blank or they may find it difficult to hear sounds accurately, and even if they can, they discover that English spelling is not consistently phonetic. If learners have auditory processing difficulties, a selection of visual imaging strategies may be helpful. Likewise for a visual processing disability, a number of auditory or pronunciation strategies may prove beneficial. In addition, practitioners should understand learners' memory strengths and weaknesses and incorporate appropriate strategies.

The initial assessment results and ongoing evaluation of learners' spelling will help determine what areas to focus on and appropriate strategies to help with the challenges learners may face.

When planning what strategies to utilize, consider the following principles:

- Select words that learners want and need to learn and provide instruction in the context of writing and language activities.

- Encourage learners to generate their own lists of words for spelling practice.

- Incorporate a multi-sensory approach by utilizing as many modalities as possible (visual, auditory, kinesthetic and tactile).

- Actively involve learners in selecting strategies and discuss existing strategies they may use.

- Encourage learners to access a small pocket dictionary and teach appropriate dictionary skills.

- Help learners to develop their own personal dictionaries of commonly misspelled words.[51] The words should be from different types of writing assignments.

- Encourage learners not to try to learn all the words at once. Even if an adult learns them all in one sitting, practice them a few at a time. Find out what works best for learners; it may be one or two words or as many as three or four. Encourage learners to go back and practice the ones they have learned before, to increase retention.[52]

Findings indicate that most learners have insufficient spelling strategies. Learners need to be taught various spelling strategies and when they should be applied.

"Students with learning disabilities do not use appropriate strategies when spelling words, so they need curricula which provides an intense, systematic method for teaching specific spelling strategies." … students with learning disabilities who frequently experience problems with spelling, benefit from programs that incorporate rule-based strategies that are intensive and skill-directed, and provide specified correction and practice procedures".[53]

Questions to help determine learners' existing spelling strategies

- When you spell words, what kind of things do you do to help you spell correctly?
- If you are having trouble with a word, what do you do to try and spell it correctly?
- How do you feel if you can't spell words when you are writing?

If learners have difficulty answering these questions, have them do a spelling activity and then ask the following questions about the actual activity they just completed:

- Tell me the words you had trouble spelling.
- Why did you spell this word like that?
- How did you come up with this word?

Suggestions for adults with visual memory/perception disabilities

- Use structural phonic programs.
- Exaggerate the pronunciation of words to help learners focus on auditory cues.
- Help learners to understand the structure of words (i.e. root words, suffixes and prefixes); provide a word format table indicating the participle, noun, verb, adjective and adverb for related words, i.e. empowered.
- Work with syllables – if they can't distinguish the syllables, have them put their hand under their chin and count how many times it drops for each word.
- Use spelling drills where learners are asked to spell the words out loud.
- Use word searches, exercises that have letters omitted from the words, and spelling games such as Spill and Spell or Scrabble to help strengthen visual perceptual abilities.
- Incorporate tactile and kinesthetic cues.[54]

Suggestions for adults with auditory memory/perception disabilities

- Reinforce the spelling of words by focusing on words with similar patterns.
- Utilize the chunking technique by breaking words into smaller chunks.
- Teach syllabication rules which help learners see the syllables even when they may not hear the vowels within the syllables i.e. when there are two or more consonants between vowels the words are generally divided between the first and second consonant - *fac/tor, chal/lenge.*
- Continue practice with breaking words into parts for learners who have difficulty tracking the sound sequence.
- Utilize various visualization techniques.[55] (For spelling, visualize the difficult part of the word to help improve retention of the correct way to spell.)

Sample strategies

Word sorts:

This strategy helps learners identify and remember spelling patterns by associating words with the same visual or structural formation, e.g. *pine, rate, like*, all of which have the final silent *e* that has an effect on the preceding vowel. Word sorts change learners' perceptions of spelling from the attempt to spell hundreds of unrelated words to a more systematic approach. Words for word sort activities are printed on cards or pieces of paper. The sorts are either open (sorted into whatever categories learners can identify for themselves), or closed (sorted with the direction of a practitioner who wants to demonstrate a particular pattern at that time). Words for open sorts are drawn from learners' own sources of words, so they can be identical to the personal spelling lists that they may have composed.[56]

"Trace, Copy and Recall"

- Make a 3-column chart with the headings: Trace, Copy and Recall. Fold over the "recall" part, so that only the first two columns show. Select three or four spelling words learners want to learn.

- Encourage learners to say the word, then trace the word in the first column and say the letters as they trace it, and say the word again.

- Learners then go to the second column, say the word, and write it the same way. While the rhythm, the sound and the feeling are fresh in their minds, have them flip the paper over and say the word and spell it out -- the same way, saying each letter.[57]

Reverse chaining by letter

1. Learners say the word. Then they write it, saying each letter (being enthusiastic and expressive!) W - O - R – D
2. Learners skip a line and say the word and write it again -- minus the last letter. They say the last letter, but they don't write it. W - O - R - ____
3. Learners skip a line and say and write the word again - minus the last two letters.
   Learners say them, but they don't write them. W - O - ___ ____
4. They do that until they're only writing one letter.
5. Learners go back to the top, read the word, and then they spell it out loud.
6. Learners fold the page over so they can't see the whole word. They say the word, spell it, and add that last letter.
7. Learners fold the page back again. They say the word, spell it, and add the last two letters.
8. They keep going until they spell the whole word.
9. Learners should GO BACK AND CHECK -- making sure they didn't leave out a letter![58]

Reverse chaining by syllable (this is more difficult, for longer words)

1. Learners say the word. Then they write it, saying each letter (being enthusiastic and expressive!) S-E-P-A-R-A-T-E
2. They skip a line and say the word and write it again -- minus the last syllable. Learners say the last syllable and spell it out loud, but they don't write it.
   S-E-P-A-_____
3. Learners continue until they aren't writing anything -- but they still say the spelling out loud.
4. They go back to the top. They read the word, and then they spell it out loud.
5. Learners fold the page over so they can't see the whole word. They say the word, spell it, and add the last syllable.
6. They fold the page back again. They say the word, spell it, and add the last two syllables.
7. Learners continue until they spell the whole word.
8. They should GO BACK AND CHECK -- making sure they didn't leave out any letters!
   [59]

Highlight the difficult parts

This is a good strategy for learning rules and patterns, or remembering how to spell a word that learners continue to struggle with. Have learners make the 'hard part' a different color than the rest. Encourage learners to make a mental picture of that card, read the word aloud and spell it aloud, and change the way they would *say* the "hard part," maybe by saying it louder. When they write the whole word, encourage learners to think about the hard part, what it looks or sounds like.[60]

Use a tape recorder

Have learners read the words – make sure they are pronouncing them correctly into the tape recorder. Have them record the word in a format similar to a spelling test i.e. word, example sentence, and word. Once they have done this, have learners play it back - and try to say the spelling before the tape plays it.[61]

Multi-sensory Sight-word Strategies found at:
http://www.resourceroom.net/Sharestrats/sightwords.htm

These procedures can be used to teach any rote skill: i.e. math facts, formulas, an alphabet, foreign languages, periodic charts, etc.

1. Practitioners write the letters of the word in the air in front of them, using whole hand and whole arm motion. Learners follow this example.
    Practitioners fade their spelling prompt. Practitioners say the word before and after the spelling.

2. Closed-Eye Visualization (visual and auditory):
    Learners close their eyes and try to visualize letters as the practitioner says them.

3. Blind Writing (auditory, visual, tactile and kinesthetic):
    This is similar to Closed-Eye Visualization, but adds the tactile and kinesthetic. As the practitioner says the letters, the learners, with eyes closed write the words. Use the following sequence:
    · Air Writing: learners use index fingers and middle fingers to write.
    · Chalkboard: learners use index fingers and middle fingers to write words on board. Then they use "chunky" chalk to write on board.

4. Velvet Board (auditory, visual, tactile and kinesthetic):
    Learners use lapboards covered with a rich textured fabric to write their words. Learners say the word, use their index fingers to write the letters as they say them and repeat the word.

- **For additional strategies go to:**
  http://www.resourceroom.net/index.asp
  British Dyslexia – resource room

Listening strategies

In most cases, adults with listening challenges may not even be conscious of their behaviour. They may not realize that they interrupt conversations or tune out when someone is speaking. The first step is to help learners become aware and understand how their struggles impact their listening abilities and social interactions with others. When learners are conscious of the behaviour, they can develop self-monitoring strategies that are the best fit for them.

The following are additional tips to help improve adults' listening skills:

- Be sensitive to the fact that some learners with auditory disabilities may miss parts or misinterpret what is said

- Use eye contact, appropriate touch and individuals' names

- To help with listening – provide visual summaries that outline what the learners will be hearing or learning

- Vary your speech (loudness, inflection, and speed, etc.)

- Provide information in smaller chunks; confirm learners' understanding and repeat if necessary

- Be brief, concrete; carefully define directions, etc.

- Complete directions before handing out materials

- Have learners paraphrase what they heard

- Encourage learners to take brief notes to help with their retention of what was stated and to help them focus on the information they are receiving

Math challenges

The most common areas that adults may struggle with are:

- Remembering basic mathematical facts

- Having difficulty with word problems and terminology as a result of language disabilities

- Being reliable in written computation – they frequently reverse numbers and/or symbols and make careless errors

- Having an inability to develop a connection between math and meaning- that it is more than memorizing numbers and computations.

Individual adult learners may have unique strengths and struggles with math. They could have a combination of difficulties, which may include language processing problems, visual spatial confusion, and memory and sequencing difficulties. In most cases, if adults have struggled with math as a result of their learning disability, they will likely bring related anxiety to the tasks.

To meet the varied processing needs for each learner it is important to use a multi-sensory approach when teaching math. Objects should be visual, touchable and moveable. In addition, applying math to real life examples will help build meaning for math. This helps to make problems functional and applicable to everyday life. Information should be taught both orally and visually to meet the varied learner needs and to help strengthen areas of weakness.

Sample math strategies

- **Remembering the multiplication table**:

    - Make use of regularities in the number system – i.e. 2, 5, 10

    - Show shortcuts to memorizing i.e. if 8x7 = 56 then 7 x 8 = 56.[62]

- **Computation:**

    - Build on existing knowledge and work from what learners know: i.e. if they know 2 x 6 = 12 then 3 x 6 = 12 + 6 or 9x facts can be estimated as 10x facts and then adjusted (10 x 7 = 70:70 – 7 = 63: 9x7 = 63).[63]

    - Use modeling. Practitioners demonstrate, while verbalizing the key words associated with each step; the learners then perform the steps while verbalizing and looking at the practitioner's model; and then learners complete the process with just the model available.[64]

    - Break down new information into the sequential predicating concepts that need to be known before the new skills can be learned, i.e. you have to know addition before you multiply.[65] Steps can be shown visually with the use of flow chart or verbally modeled – all depending on learners' needs.

    - Present various methods for computation, and together with the learners, determine which strategy works best for them. Go to http://www.ldonline.org/ld_indepth/math_skills/adapt_cld.html for examples of various algorithm strategies.

- **Calculation difficulties**:

  - Teach learners sufficient understanding so that they can estimate, and then have them use the calculator. By having enough knowledge to estimate, learners can at least recognize if the answer appears within range or determine if they entered in a number wrong.

- **Word problems**:

  - Practice what operations are needed and have learners make up their own word problems from number statements. This helps learners to understand how the language is structured.

  - Highlight the key words, numbers and /or calculations.

  - Alter instruction, i.e. give the answers and allow learners to explain how the answer was obtained.

  - Help learners with auditory disabilities visualize the word problem i.e. if the problem mentions two cars at different prices –have the learner draw the cars with the prices.[66]

  - Teach problem-solving steps to use with each math problem:
    - Read and understand the problem
    - Look for the key questions and recognize the important words
    - Select the appropriate operation
    - Write the equation and solve it
    - Check your answer
    - Correct your errors[67]

- **Makes careless mistakes and errors in copying:**

    - Help learners to recognize this challenge

    - Use matrix paper to keep numbers aligned

    - Identify common errors made and practice checking over work

    - Practice tracing and writing any numbers that are reversed, omitted or inverted

Overall, practitioners need to provide a flexible environment and recognize that math can be solved in a number of ways. Focus on the process; not just the outcome. Provide as many opportunities for manipulation and real life application as possible. Focus on understanding; not just memorizing. Encourage reinforcement and continually practice to encourage retention. Provide extra processing time when teaching new skills.

Break the learning into small units and move at the learners' pace. Provide positive reinforcement on the process even though the final answer may be wrong.

For more tips and sample lesson plans for teaching math – go to:

- http://www.resourceroom.net/Math/index.asp

- http://www.gsu.edu/~wwwrld/Resources/math.htm

- http://www.gsu.edu/~wwwrld/Resources/strategiesmath.htm

- http://www.ldonline.org/ld_indepth/math_skills/geary_math_dis.html

- http://www.ldonline.org/ld_indepth/math_skills/garnett.html

Storing and remembering information

In this section we will not attempt to capture all of the memory strategies but instead identify some common factors and key principles. Strategies for storing and remembering information are often integrated into the various strategies that we have covered. A key point to understanding memory is to think of how all us seem to retain information in general. The literature often talks about learning styles and that everyone has a preferred way of learning (visual, auditory and kinesthetic). However, research often states that when information is presented frequently, in a variety of forums, our retention increases regardless of our "so-called" preference for learning. Now this is not to say that learners who have an auditory disability will prefer to see information rather than hearing it, but that by offering information in a variety of ways it will help to strengthen their weaknesses and build on their strengths. A key role as practitioners is to build learners' independence. Often when adults are confronted with information outside of the learning environment, it may not be presented in a variety of formats, nor presented in a way to favour their preferred learning style. Thus, a key role of practitioners is to help learners recognize their difficulties and give them strategies to help store information independently.

Understanding how the memory works will help practitioners to instruct more effectively. Mnemonics is a common strategy found in the learning disability research. Mnemonics are strategies that help a person remember information, especially isolated details that a person often has the hardest time retaining. Mnemonic systems use mental images and unusual situations to link new information with familiar memories already stored in long-term memory. They rely on linking and framing information .The following four principles for mnemonics build on our knowledge of how the mind stores information. For example, it is a known fact that information is stored in an organized way and to learn anything we need to associate it to something that we already know. However, adults with learning disabilities that affect their ability to store information need to be conscious of how our memory works and be given strategies to help them with the breakdown in storage that they experience.

Four principles of mnemonics

Association

Mnemonic principles include associating thoughts. This is accomplished by substituting words, exaggerating out of proportion, or action associations. Simply put: set cues with sound-alike words or visually associate words using some outrageous exaggeration connecting the two. Visualize the picture out of proportion.[68] The more outrageous and exaggerated the association, the more likely you are to remember it later.

Concreteness

A second principle revolves around the concreteness of the items being associated. Tangible objects are much easier to visualize than intangibles. Picturing an apple in your "mind's eye" is not a difficult task, but picturing "truth" is difficult. Connect it to what you already know. Another way to get information into long-term memory is to connect it to information already stored there. If some facts or ideas in a chapter seem to stay in your memory easily, associate other facts with these concepts.[69] Transfer of information from short-term to long-term memory is aided by making it meaningful.

Automaticity

A third principle is that the other principles can be automated. Learning the principles and using them leads to a point where no conscious effort is needed to apply them.

Forced awareness

A forth principle is the forced awareness resulting from actively observing your memory habits. You are becoming "mindful", actively perceiving your environment and observing the nature of your thoughts.[70]

Difficulties with memory can affect all skill areas rather than just causing problems in one specific area. Adults with learning disabilities often struggle due to problems with storing and retrieving information. As previously mentioned, the first step is to discover together with learners how they learn or process information best. In addition to using mnemonics, practitioners can adapt their instruction and presentation of information to help aid in the storage and retrieval of information.

The following are possible instructional tips that can assist learners with their memory challenges:

- Use concrete examples before teaching abstract concepts

- Break demonstrations and/or assignments into segments of shorter tasks

- Use short sentences

- Relate information to the learners' world - build on individuals' interests and likes

- Provide an overview of the lesson prior to beginning

- Continue to review material before any new information is presented - teach one concept at a time

- Repeat and restructure continually

- Continue to monitor and discuss learners' comprehension of what is being learned

- With adults, have them take notes on verbal directions

- Highlight important concepts to be learned in the text

- Encourage learners to explain the new concepts in their own words

- Use a variety of senses when doing a task (read, write, visualize, manipulate, apply) - physical performance of sequential activities[71]

Web sources for strategies – Go to:

- http://www.demon.co.uk/mindtool/memory.html

- http://snow.utoronto.ca/Learn2/resources/memorylinks.html

Strategies to deal with behavioural challenges

The following strategies were obtained from Wilson, Pamela. How Learning Disabilities are Addressed in Adult Education and Literacy Programs: Project Summary and Findings of a Michigan Focus Group for Development of Future Practitioner Training. Michigan: Michigan Adult and Literacy Technology, Central Michigan University, Michigan Department of Education and National Institute for Literacy.1998

Difficulty Remembering

Signs:

- Unable to remember tasks from day to day
- Unable to remember new information

What to do:

- Establish a routine of daily tasks
- Encourage the consistent use of memory aids such as calendars and notebooks to plan, record and check-off tasks as completed
- Encourage learners to write down new information in their memory notebook
- Encourage review and rehearsal of information frequently throughout the day
- Provide opportunities for repeated practice of new information
- Try to pair new information with things that learners are able to recall
- Provide spoken cues as needed for recall and, if necessary, help fill in memory gaps
- Allow extra time for learners to respond to any request or question as it sometimes takes longer for them to respond to questions

Difficulty with Initiation

Signs:

- Has trouble getting started
- Appears disinterested

What to do:

- Help learners develop a structured daily routine
- Provide specific choices for daily tasks (would you like to do A or B?)
- Simplify tasks - break tasks down into simple steps and complete one step at a time
- Encourage the use of a notebook or calendar and set specific deadlines for tasks to be completed
- Praise individuals when they get started without assistance

Difficulty Carrying Out a Plan of Action

Signs:

- Lack of follow-through with a task
- Difficulty in planning a sequence of tasks
- Appear disorganized

What to do:

- Provide a clear and detailed explanation of an activity before starting
- Begin with small, realistic projects (i.e. find skills and knowledge required for the job they are pursuing – short order cook)
- Include learners in planning the activity (i.e. where, how, when and who will get the information)
- Ask learners to verbally repeat the task to be done to ensure understanding
- Break down new or complex tasks into several easier steps (i.e. to address where to get information, both the internet and local employment centre were identified – so steps to connect with each resource will need to be identified)
- Have learners write down the sequence of steps to the task
- Encourage learners to refer to their plan, and check off each task as it is completed
- Repeat and explain the sequence of activities as needed
- Keep abrupt changes to a minimum
- Encourage learners to "stop and think"
- Allow extra time for learners to complete tasks

Attention Problems

Signs:

- Short attention span
- Distractibility
- Difficulty in attending to one or more things at one time

What to do:

- Be sure you have learners' attention before beginning a discussion or task
- Decrease distractions when working with learners (turn off noises)
- Praise any improvement in length of attention to activity
- Gently refocus learners' attention to the details of activity as needed
- Keep abrupt changes to a minimum
- Ask learners to repeat the information they have just heard to be sure they followed the conversation

Difficulty with Decision-Making – Poor Judgment

Signs:

- Hesitation with decisions
- Inappropriate decisions
- Difficulty reasoning
- Ineffective problem-solving

What to do:

- Help learners explore various options to problems
- Have learners write down possible options in their notebook
- Discuss advantages/ disadvantages of each option
- Simplify new or unfamiliar tasks
- Practice role-playing to prepare learners for various situations
- Encourage learners to "stop and think"

Impulsivity or Lack of Inhibition

Signs:

- Acts or speaks without all the information or without considering the consequences
- Has difficulty taking turns
- Is socially out of place, displaying inappropriate behaviour or comments

What to do:

- Explain and simplify the steps and reasons for tasks
- Encourage learners to slow down and think through tasks or responses
- Limit options from which learners can choose
- Encourage a break in activity when frustration is evident
- Encourage learners to "stop and think"
- Plan or rehearse social situations to reduce unfamiliarity and unpredictability
- Establish cues to signal the need to improve social skills
- Praise and reward desired behaviour
- Provide verbal and non-verbal feedback for reassurance
- If undesired behaviour occurs, discuss the consequences privately in a calm and confident manner
- Treat learners appropriately for their age
- Provide clear explanations of expected behaviour

Case studies

The following three case studies are fictional, but have been developed from an extensive review of learning disabilities research and collections of case studies gathered from Canadian, American and international sources.

Case study A – Tom

Information gathered during initial meeting
- Male, age 29, resides on his own.
- Divorced 4 years ago and has one son age 8 with whom he spends every third weekend.
- Attended high school until he was 16 but left due to poor attendance, lack of interest and failing grades.
- Worked in a beer manufacturing plant for 13 years and recently lost his job due to plant closure – he was making good money and is bitter about the plant closure.
- Over the past 6 months he has tried to get a "good paying job" at the local factories but they won't look at him since he doesn't have his Grade 12 diploma
- Tom often mentioned that it is the "company's" fault that he is in this situation.

Tom came to the learning centre to get high school upgrading. After three months he was close to dropping out because he was continually failing his written assignments. However, Tom's English teacher convinced him to give it another chance and referred him to the "literacy program" in the learning centre.

Assessment results

Expressive writing:
- Tom had frequent and some inconsistent spelling errors.
- He tended to add or miss parts of multi-syllabic words.
- Tom had spelling problems with suffixes and prefixes.

- Tom used poor grammar: mixed tenses, fragmented and run on sentences.
- He used limited vocabulary when writing, most likely due to poor spelling because his verbal vocabulary is strong.
- He had difficulty organizing thoughts in his writing. He just put down the thoughts as they occurred.
- Tom's handwriting was poor – his letters were hard to distinguish.
- Tom was unable to see most of the errors in his writing – but could spot a few spelling errors when he really struggled with the words.
- He had difficulty hearing the letters when he asked for the correct spelling of a word - the letters had to be stated very slowly in order for him to write the word.

Reading and comprehension:

- Tom struggled with oral reading when confronted with new words or multi-syllabic words – poor word attack problem skills (could not sound out the word and missed parts of the word).
- While reading orally, he was faced with a number of words he was unable to pronounce and his comprehension declined, as compared to when he was able to read silently.
- Tom's comprehension was much stronger when he was given time to silently read the passage versus when he heard the passage orally.
- He was able to find factual answers, predict and discuss inferences from the passage and he enjoyed making conclusions and judgments.
- His verbal expression of his understanding of the passage was stronger than his written expression.
- Tom was able to follow multi-step instructions when he read them, versus when he heard them orally.

Oral communication:

- Tom often interrupted before the speaker was able to finish his/her comments.
- He often picked up on one point and seemed anxious to express himself by blurting out his response, even though it wasn't the key point in the discussion.
- He often asked the practitioner to repeat what they said.

- His verbal vocabulary appeared stronger than his written vocabulary, however when he was asked to read some of his words that were misspelled, he did not notice that he mispronounced them as well (i.e. valentime, libary).

Auditory versus visual:

- Tom's score was much higher when he was asked to circle the word that was different versus having to hear the different word.

Math skills:

- Overall, Tom's math skills appeared to be fairly strong.
- He tended to rush through and thus made careless mistakes.
- He did not see his mistakes and often it was a result of recording the numbers incorrectly (i.e. 256 he would write 265).
- His poor writing also created errors since he was unable to read his work and had difficulty keeping the column of numbers straight – this was problematic when he had to do 3 digit calculations (+, -).
- When making change he found it difficult without the use of scrap paper to figure out the answer.
- Although he did struggle with fractions, once he was reminded of the rules he improved.
- Tom appeared to understand calculations but once they were combined in a word problem, he could not figure out what calculation to use and which one to do first.
- Tom had difficulty verbalizing large numbers (i.e. 156,342 – he got his thousands and hundreds mixed up).

Overall attitude and motivation:

Tom tends to minimize the importance of spelling and writing, given that he really hasn't had to use it a lot in his job; his verbal skills have compensated for these areas. He feels that teachers are picky and don't know what you really need to survive. He is motivated to get his Grade 12 diploma but tends to want immediate action. He appears to know when he has a problem but hasn't ever thought of why and how he can fix it.

Areas to focus on and suggested strategies

Reading:
- Work on vocabulary development by having Tom go through the text and identify unfamiliar words, break down the prefixes and/or suffixes and the content of the text to help decode the words.

- Work on reading comprehension by building on his strength of predicting and teach him strategies to help increase his comprehension. Point out the difference in his comprehension when reading versus listening, and discuss ways to help deal with this. Provide strategies for dealing with more advanced reading (textbooks) to help prepare for credit programs (Construct and Multipass).

Expressive Writing:
- Reinforce the writing process and provide editing strategies (COPS) to help him recognize his errors. Encourage the use of the word processor for his writing assignments.

- To work on spelling, discuss his possible auditory disability and its impact on his spelling and find out what strategies he presently uses. Teach him the basic rules for spelling, develop a personal dictionary with rules and troublesome words, and work on chunking, word groups, and syllables.

Math:
- Help Tom manage his errors by making him aware of them and develop a checklist to "edit" his math work. Suggest that he utilize graph paper to help keep his work organized.

- Work on word problems by helping him highlight the key information in the problem. Encourage him to develop his own word problems from number statements and teach problem-solving steps with an emphasis on checking his answers for errors.

Listening:
- Help Tom to recognize and be sensitive to his listening skills and the impact of the auditory disability.

- Develop some listening techniques to ensure that he hears all the information and build on his ability to decrease his tendency to disrupt. Encourage him to write down his thoughts before speaking and to pace himself.

Case study B – Samantha

Observations and information gained from the general intake
- A 24-year old female who just enrolled into the LBS program at a local college to work towards her ECE certification.
- She left school at 16 due to pregnancy – her son is now 7 and attending Grade 1.
- Samantha is highly motivated and is ready to make this step, although she is nervous since her previous school experience was not positive.
- She has a good support system – her grandmother provides daycare when needed.
- Samantha indicates she struggled throughout elementary and high school with her reading skills and often disrupted the class during quiet time when they were required to read.
- She took basic courses during her short time at high school and remembers being sent to a small group for extra help in reading during elementary school.
- Her rebellious behaviour began to interfere with her academics in Grade 7. Samantha's parents went through a difficult divorce at that time and limited attention was focused on her.
- She reports no medical history that would interfere with her learning and has had her eyes checked in the past 8 months.

- During her upbringing, Samantha recalls her mother always reinforced the need for her to do well in school and get a college degree, so that Samantha would not wind up like her mother.
- Samantha's mother worked as a cashier in a grocery store and currently is working at a major department store. Although her mother has average reading abilities, Samantha knows that her mother avoids reading when possible.
- Samantha hasn't seen her father since her parents' divorce and believes he did get his Grade 12 diploma. He was a mechanic.

Initial test results: (CAAT – Canadian Adult Achievement Test and Math Skills Inventory)

- Vocabulary 10.3, reading comprehension 6.5 and spelling 7.7.
- Math results indicate that she can add, subtract and multiply single-digit numbers but has difficulty with double-digits and division. As a result, she struggled with her percentages and fractions. Although her adding and subtracting were strong, when they were put into a word problem format she was unable to solve them.

Need to assess her reading further to understand her difficulties

- Her reading was slow and she struggled with decoding the words, which interfered with her comprehension.
- She often missed words and left endings off.
- Samantha often lost her place when reading the passage.
- She would read some of the syllables backwards (*saw* for *was*).
- Her comprehension was excellent when the passage was read to her orally along with the questions, as compared to her oral and silent reading of the passage.
- When given sight words she was able to read them, but when nonsense words were mixed in she struggled with breaking the units down in the word to sound it out. She most likely scored higher on her vocabulary due to her good memory skills and ongoing exposure to reading materials.
- Samantha struggled with cloze paragraphs.

Expressive writing and spelling

- Samantha was asked to write why she was interested in getting her ECE certification. She did take time to think about what she wanted to say.
- Although her grammar and spelling were weak, there were some signs of process (she used an opening and concluding sentence).
- Some common errors found in the written passage were:
    - Samantha omitted and sometimes substituted vowels and consonants.
    - She would leave out silent letters (i.e. instead of an "ous" ending, she would write "us").
    - If she wasn't able to recall a word from her memory she relied only on her phonetics for spelling (wrote payn for pain and laf for laugh).
    - She left out punctuation and often didn't capitalize her sentences.
    - Her writing included a number of run on sentences.
    - She left little space between her words.
    - There were letter reversals and she only caught them when she read over her work, not when she looked over her work (she said this weakness has been drilled into her head so she is very aware of it).

Math skills:

- Samantha had difficulty with multi-step calculations.
- She found it very difficult to find information on a graph or a chart.
- She struggled with operations when they involved more than two digits that required columns (long division, multiplication).
- Samantha was able to make change and deal with simple math involving single digits.
- She was able to recite her multiplication tables based on her strong memory skills.

Overall conclusions:

Samantha appears to have some visual learning disabilities that affect her reading, writing, spelling and math. Her strong verbal skills and good memory have helped her cope with her weaknesses and have allowed her to develop good comprehension skills when information is given to her orally.

Areas to focus on and suggested strategies

Reading:
- Work on decoding and fluency first before comprehension – help Samantha recognize when she leaves off endings and reverses words, so that she builds in a self-monitoring system.
- Provide Samantha with decoding and cueing strategies.
- As her fluency increases begin to build in comprehension strategies, especially for dealing with textbooks.

Expressive Writing:
- Build on Samantha's strengths of organizing material and using beginning and closing sentences.
- Teach her the writing process with a focus on editing and sentence structure (grammar and capitalization) – could use COPS for editing.
- Create a personal resource book that identifies common errors so she can monitor these errors.
- Samantha relies completely on phonetics when spelling – integrate word groups and structure of words, spelling rules, and incorporate word searches and games to help her visualize the words.

Math:
- Focus on strategies that help Samantha with multi-step calculations.
- Investigate different strategies together for completing algorithms that involve more than two digits.
- Develop steps and use a mnemonic technique to help her find information on graphs.

Case study C – Frank

Information gathered during initial meeting:
- Frank is 52 years old and has been unemployed for the past 2 years, since his company shut down.
- He is currently receiving Ontario Works benefits.
- He has learned about the "new way "to search for a job, but recognizes that he needs to upgrade his skills.
- He is quite handy, has done renovation projects and is interested in starting his own business.
- He was referred to the community-based literacy program from the school board credit program because he was having difficulty in the classroom environment and with submitting assignments on time.

General observations from the interview:
- Frank has a good vocabulary and appears to understand what is spoken to him.
- He did seem a bit disorganized at the beginning of the interview – he had to look through his wallet several times before he could find the report the school had sent with him.
- He was quite fidgety and he was given 4 breaks during the 1.5 hour interview.
- He had no problem reading the self-assessment tool and completed it independently.
- His writing was sloppy when he added information on the self-assessment form and his sentences although brief were coherent.

Overall conclusions
- Although no informal assessment has been completed, the CAAT results indicate that he is not struggling with his basic communication and math skills. However, he is struggling with completing his homework and assignments based on the report from the credit program.
- Based on Frank's description of his academic background, his self-assessment and his most recent upgrading experiences, it appears that he may have some type of organizing or cognitive processing breakdown and may have attention problems that interfere with his learning.

Assessment areas

Frank needs to focus on the process and not just the product. How does he go about completing a task?

Writing sample:
Frank was asked to prepare 3 to 4 paragraphs about why he wants to start his own business and what skills he has to offer. The topic was written on the top of the paper that was given to him. After 10 minutes he had nothing completed and was quite frustrated. He had no idea where to begin. As a result, a dynamic assessment technique was used. Frank was given the steps for composing a small report, one step at a time. He was able to complete the task only when each step was given to him. Most of the errors found in his writing were minor and any spelling errors were a result of a lack of understanding of basic spelling rules. During this process it was observed that Frank was easily distracted and needed several breaks before he could move onto the next step.

Reading:
- Overall, Frank's decoding and comprehension was good with short passages.
- As the length of the passage was increased, his attention span, decoding skills and comprehension deteriorated even though the reading level was the same as the short passages.

Overall conclusions:
Frank appears to have organizational learning disabilities and a short attention span. He struggles with how and where to begin with any writing assignments. His short attention span interferes with his reading and ability to comprehend meaning when the text is detailed. Further observation of Frank's attention span would be valuable to develop appropriate strategies. Some suggested ways to assess this area further are by self-monitoring, self-assessment, practitioner observations, and learner participation. All of these approaches emphasize the importance of the learner/practitioner relationship.

Areas to focus on and suggested strategies

Writing:

- Frank needs help with organizing his thoughts and putting them down on paper.   Possible strategies could include: planning think sheets, using graphic organizers such as semantic mapping, and putting sentences on index cards and then having him organize them into paragraphs.

- Encourage Frank to use a word processor for his writing which will make it easier for him to move material around and organize.

Reading

- Build on Frank's reading strengths for short passages – help him see that a reading passage of many paragraphs is really a combination of many small passages. Incorporate strategies that help to break down the units of information and build in graphic organizers to help pull the key information from each section to increase his overall understanding of the text.

Attention and organizing

- Frank will need help to organize tasks. Help him to learn to break large tasks into small tasks – incorporate his renovation work to help him identify with the tasks. Build in time management and organizing tools (checklists, etc.) to help him recognize signs that he is getting overwhelmed. Provide stress management techniques and encourage him to stop and think before going any further.

- Encourage Frank to rephrase what has been said to ensure he understands and build in short breaks.

- Incorporate decision-making strategies to help decrease his frustration when he feels overwhelmed or does not know what to do first.

Summary of key points

- Any approach that successfully works with adults with learning disabilities must address their psychosocial, technological and educational needs.

- An effective training plan is:

    - **Individualized** - based on learners' strengths and struggles

    - **Participatory** - input comes from both learners and practitioners

    - **Flexible** - able to adapt to change according to the effectiveness of particular strategies or approaches

    - **Balanced** - covers a number of learners' strengths and struggles

    - **Continuous** - it is ongoing and is revised and modified as needed

- Strategies help learners process and manipulate information and help them to plan, monitor and self-evaluate. They need to be chosen and developed for learners based on an assessment of their strengths and weaknesses.

- Strategies that are both effective and efficient share the following features:
    - **Content** - the steps in the strategy and what they are designed to facilitate during the learning process

    - **Design** - the steps are put together to facilitate learning and future use of the strategy

- **Usefulness** - the strategy has the potential to be transferable to everyday needs

- The actual "teaching process" of the strategy itself, is the key to success. If a strategy is not taught properly then it is less likely that learners will see success, repeat the strategy and learn to use it independently.

- Regardless of the strategy being taught the following practices should be followed:

  - **Use real life examples**

  - **Explain what strategy will be learned and why**

  - **Model what is to be learned**

  - **Guide learners through a series of prompts and/or questions**

  - **Provide lots of opportunity for practice**

  - **Provide corrective feedback**

  - **Ask frequent questions to ensure learners understand the steps**

Appendix A

Characteristics and strategies chart

The following information was adapted from Bridges to Practice: Guidebook 1 *Preparing To Serve Adults With Learning Disabilities*. Washington, D.C.: National Adult Literacy and Learning Disability Center. 1999 at http://www.nifl.gov/nifl/ld/bridges/materials/bridges_docs.html; Ontario Literacy Coalition. *Learning Disabilities: Best Practice and Innovations*. Toronto, ON: Ontario Literacy Coalition. Issue 3 of 3, 2001.; Johnston, Janet. *Literacy and the Learning Disabled Adult*. St. Catharines, ON: Learning Potentials. 1994.

Reading characteristics	Potential Strategies
Engages in leisure activities other than reading; prefers more active pursuits.	Discuss with learners why they have limited interest. Find out about other interests and begin introducing material that is related to their interests.
Cannot easily use materials like newspapers and classified ads to obtain information.	Demonstrate how the documents are organized. Provide reading comprehension strategies such as PASS, questioning and paraphrasing and provide a step-by-step process to search the material in an organized manner.
Does not attempt to sound out words in reading or does so incorrectly. May read words with syllables backwards (*was* for *saw*; *net* for *ten*)	Introduce phonetic strategies such as word-to-word matching, blending and overt word parts. Build a list of words that are challenging to help learners to learn to self-monitor by watching for reversals and encourage learners to self-correct.
May encounter a newly learned word in a text and not recognize it when it appears later in that text.	Before reading, pre-teach unfamiliar but important words, during the reading have learners add new words to a list and after reading have learners review the words and use their own words to explain the meaning. Use word-building strategies to teach prefixes, suffixes and combining words. Use the illustrate and associate strategy for synonyms, antonyms, and analogies. Have them build their own dictionaries of new words.

Reading characteristics (continued)	Potential Strategies
Reads slowly and labouriously, if at all. Words may be skipped; endings can be left off and there are frequent repetitions. May refuse to read orally.	Work on fluency and use a variety of cueing strategies such as background knowledge, pictures, meaning, structure/grammar and sound/symbol correspondence. Build on word identification and overt word parts strategies. Offer to read together to build confidence in oral reading.
Loses the meaning of text, but understands the same material when it is read aloud. – Visual processing disabilities	Have them read the text or passage in a tape recorder and then listen to increase reading comprehension. Introduce reading comprehension strategies for silent reading.
Does not understand the text when it is read to him/her (auditory disability).	Provide a copy of the material so they can follow along – help them recognize this disability and encourage them to review chapters prior to lessons if in a classroom format or if they plan to access further education/training.
When prompted to do so, does not describe strategies used to assist with decoding and comprehension of text.	Introduce the concept of strategies. Teach reading and decoding strategies and work with learners to build their ability to use the strategies independently.
Recognizes and uses fewer words, expressions, and sentence structures than peers.	Before reading, pre-teach unfamiliar but important words, during the reading have learners add new words to a list and after reading have learners review the words and use their own words to explain the meaning. Use word-building strategies to teach prefixes, suffixes and combining words. Use the illustrate and associate strategy for synonyms, antonyms, and analogies. Build personal dictionaries.

Writing Characteristics	Potential strategies
Rarely writes letters or notes. Needs help completing forms such as job applications.	Start with tasks that interest them and as they see success begin to introduce more difficult writing tasks.
Struggles to produce a written product. Produces short sentences and text with limited vocabulary. Makes spelling errors, may confuse letter order, misses middle syllables, spells exclusively by sound and/or some words may be completely unrecognizable.	Teach the basic framework for writing (planning writing and revision) within this, incorporate strategies to assist with the process such as: planning think sheets, semantic mapping, put sentences on index cards and organize into paragraphs. Work on vocabulary and spelling by introducing word-building strategies to teach prefixes, suffixes and combining words. Use the illustrate and associate strategy for synonyms, antonyms, and analogies. To also help with spelling you may choose to access some of the following strategies: overt word parts, develop a list of trouble words and highlight the problem areas, use chunking, help with tracking the sound sequence, use trace copy recall to increase visualization of the word.
Omits critical parts or puts information in the wrong place. Writing lacks transition words.	Build vocabulary and writing process. Teach self-regulated strategy development. Build vocabulary list of transition words (chronological, cause effect, comparison and contrast words). Work on using the words in sentences and understand the meaning.
Does not communicate a clear message. Expresses thoughts that don't contribute to the main idea.	Introduce story grammar so they understand the basics of a narrative. Use semantic mapping to help organize thoughts. Use DEFENDS strategy to help write a composition.
Uses sentences that contain errors in syntax or word choice. Fails to clearly indicate the referent of a pronoun. Unable to determine which noun they are referring to, i.e. She glanced at him while looking through the window.	Work on sentence structure – provide grammar checklist to help them recognize and self-monitor problem areas.

Writing Characteristics (continued)	Potential strategies
Spells only phonetically. Leaves out letters. Writes numbers or letters backwards or upside down. Refrains from writing words that are difficult to spell.	Discuss spelling strategies with learners to help determine cause of errors. Develop a list of words and letters they reverse to help them recognize and self-monitor. May choose to incorporate some of the following spelling strategies: Horn Spelling method, trace, copy and recall, use a tape recorder to make sure they are pronouncing the word correctly, chunking, highlight the hard parts so they visualize the correct spelling. Regardless of the strategy selected, use a multi-sensory approach.
Omits or misuses sentence markers such as capitals and end punctuation, making it difficult for the reader to understand the text.	Determine their level of understanding for capitals and punctuation – teach them the basics if necessary and model editing strategies such as COPS to help them self-monitor for these types of errors.
Has awkward writing grip or position. Letters, words, and lines are misaligned or not spaced appropriately. Makes frequent punctuation errors and mixes capital and lower-case letters inappropriately.	Check learners' writing positions, their pencil grip, paper angle and general balance. If learners sit side-by-side, ensure that left-handers are correctly placed so as not to crowd out their right-handed neighbours. Encourage a cursive hand writing style, linked to the printed form, so that a movement memory can be established.
Is reluctant to proofread or does not catch errors. May spell the same word differently in the same writing sample. Focuses mostly on the mechanics of writing	Introduce story grammar along with semantic mapping to work on style and content. Use DEFENDS or POWER to help understand the whole writing process including editing and revising. Teach them editing strategies such as COPS.

Listening characteristics	Potential strategies
Misunderstands a message with a word mistaken for a similar word. Might say, "Pick up the grass," instead of, "Pick up the glass."	Ask learners to repeat what they heard or encourage them to paraphrase to make sure they heard the instructions correctly.
Recognizes and uses fewer words than peers when engaged in conversation or when gathering information by listening.	Build vocabulary through word-building, illustrate and associate strategies.
Requests repetitions or more concrete explanations of ideas. Frequently asks for examples.	Reinforce this strategy and encourage them to paraphrase their understanding instead of asking the person to continue to give examples. Teach listening skills and clarifying questions.
Will eat lunch first if given the direction, "Eat lunch after you take this to the mail room."	Help them become aware of this challenge – encourage them to paraphrase to make sure they heard the instructions.
Doesn't remember directions, phone numbers, jokes, stories, etc.	Help them become aware of why they have this challenge – encourage learners to ask people to write out directions and phone numbers , and/or encourage the person to record the information.
Gets lost listening in classroom or to large group presentations, complaining that people talk too fast. Becomes inattentive during the presentation.	Help learners become aware of this disability and of ways to advocate for themselves, such as asking the teacher to give details on what will be covered in the classroom so they can read the material prior. Ask the teacher for an outline of the lesson prior to class. Teach note-taking strategies.

Speaking characteristics	Potential Strategies
Adds, substitutes, or rearranges sounds in words, as in *phemomenon* for *phenomenon* or *Pacific* for *specific*.	Help learners recognize this challenge. Work on vocabulary and phonetic skills such as: overt word strategy, and visually highlighting the differences in the words. Make a list of words that they commonly substitute to help them increase their awareness and ability to self-monitor. Provide practice listening for, identifying and producing the sounds.
Omits or uses grammatical markers incorrectly, such as tense, number, possession, and negation.	Help learners become aware of this challenge. Determine what areas are incorrect most frequently and make these the focus areas for remediation.

Speaking characteristics (continued)	Potential Strategies
Uses a similar-sounding word, like *generic* instead of *genetic.*	Help them recognize this challenge. Work on vocabulary and phonetic skills such as: overt word strategy, and visually highlighting the differences in the words. Make a list of words that they commonly substitute to help them increase their awareness and ability to self-monitor. Provide practice listening for, identifying and producing the sounds.
Uses the wrong form of a word, such as calling the *Declaration of Independence* the *Declaring of Independence.*	Same as above
Uses the same words over and over in giving information and explaining ideas. Has difficulty in conveying ideas.	Work on building vocabulary. Encourage learners to write down their thoughts prior to speaking.
Uses mostly simple sentence construction. Overuses *and* to connect thoughts and make statements.	Build vocabulary through the use of word-building, word maps and illustrate and associate strategies.
Has problems giving directions or explaining a recipe; talks around the topic, but doesn't get to the point.	Help learners recognize this challenge. Have them write down key points and use as a reference when talking or providing information. Teach learners to plan, make notes and rehearse when preparing for important communications.
Interjects irrelevant information into a story. Starts out discussing one thing and then goes off in another direction without making the connection.	Help learners recognize this challenge. Utilize story grammar to help them understand the components of a story. Encourage learners to write down their thoughts before speaking. Encourage learners to slow down and pace themselves.
Can't call forth a known word when it is needed and may use fillers, such as *"umm*m," and *"You kno*w." May substitute a word related in meaning or sound, as in *boat* for *submarine* or *selfish* for *bashful.*	Help learners recognize this challenge.
Does not follow rules of conversation like turn taking. Does not switch styles of speaking when addressing different people.	Help learners recognize this challenge. Provide individualized practice listening for and identifying different styles of speech, and practice taking turns and following the rules of conversation.

Thinking characteristics	Potential strategies
Asks to see ideas on paper. Prefers hands-on ways of learning new ideas.	Provide information visually where possible.
Resists new ideas or ways of doing things and may have difficulty adjusting to changes on the job.	Help learners develop a daily routine. Model how new tasks can be broken down into manageable chunks and make tasks simpler. Encourage them to complete tasks one step at a time. Build in praise and constant feedback.
May have good ideas that seem disjointed, unrelated, or out of sequence.	Teach strategies to help organize information. Encourage learners to take time prior to speaking to organize thoughts.
Pays too much attention to detail and misses the big picture or idea when encountering specific situations at home or at work.	Use a form of semantic mapping to look at all aspects of the task or situation. Teach and model problem-solving.
"Shoots from the hip" when arriving at decisions. Doesn't use a structured approach to weigh options.	Help learners explore various options to problems, model problem-solving strategies and integrate into training activities. Encourage them to stop and think. Practice role-playing to prepare learners for various situations.
Approaches situations without a game plan, acting without a guiding set of principles.	Model effective action planning – involve learners right from the beginning in assessment and training plan development. Begin with small and realistic projects to practice and model. Encourage learners to refer to their plan and check off each task as it is completed. Encourage them to stop and think. Utilize mnemonics to help remember steps to effective planning.

"Other difficulties" characteristics	Potential strategies
Doesn't focus on a task for an appropriate length of time. Can't seem to get things done. Does better with short tasks.	Help learners break tasks into manageable chunks, teach and model time management techniques.
Doesn't know where to begin tasks or how to proceed. Doesn't work within time limits, failing to meet deadlines. Difficulty prioritizing tasks. Workspace and personal space are messy.	Model effective action planning – involve learners right from the beginning in assessment and training plan development. Begin with small realistic projects to practice and model. Encourage learners to refer to their plan and check off each task as it is completed. Encourage them to stop and think. Utilize mnemonics to help remember steps to effective planning.
Omits or substitutes elements when copying information from one place to another, as in invoices or schedules. Often confuses left from right and up from down.	Help learners recognize and understand why they are having this challenge. Encourage them to double-check work and make note of words or numbers that they often miscopy. Get them to stop and think before acting.
Avoids jobs requiring manipulation of small items. Becomes frustrated when putting together toys for children.	Help learners break down tasks into smaller chunks. Encourage a break in an activity when they become frustrated.
Stands too close to people when conversing. Doesn't perceive situations accurately. May laugh when something serious is happening.	Discuss undesired behaviour with learners. Work on role-playing and discuss appropriate behaviour in certain situations. Helping learners become aware of their behaviour is the first and most critical step.
Does not seem to know how to act and what to say to people in specific social situations and may withdraw.	Discuss undesired behaviour with the learner. Work on role-playing and discuss appropriate behaviour in certain situations. Helping them become aware of their behaviour is the first and most critical step.
Demonstrates over reliance on others for assistance or fails to ask for help. Blames external factors on lack of success. Doesn't set personal goals.	Provide modeling and teach goal-setting. Actively involve learners in the learning process by encouraging self-assessments. Involve another learner who has experienced similar challenges but has learned to work with them.

MATHEMATICS CHARACTERISTICS	POTENTIAL STRATEGIES
Uses a calculator or counts on fingers for answers to simple problems; e.g. 2 x 5.	Make use of regularities in the number system such as 2, 5, 10's, show short cuts to memorizing the multiplication table i.e. 2x 5 = 10 then 5x 2 = 10. Build on existing knowledge and work from what learners know: 2 x 6 = 12 then 3x 6 = 12 + 6 = 18. Encourage them to use the calculator but help them build their estimating skills, so that they can recognize if an error has been made while inputting the numbers if the answer seems incorrect on the calculator. Provide practice frequently but in small doses (two - 15 minute sessions per day). Have them chart their progress.
Can't do math in his/her head and writes down even simple problems. Has difficulty making change.	Build in real life manipulative to do basic math problems. Provide learners with strategies to make change. Show that math problems can be approached in many different ways – adding or subtracting. Use a multi-sensory approach. Try to teach as many ways as possible of solving a given type of problem, so that if they forget one way, they will have an alternative. For example, 3 x 4= 2 x 4 + 4. A game-oriented approach to fact learning may be productive. For example, using number cards or dice pick a sum (addition) or a product (multiplication) and see how many different cards or dice can be used to create that answer. Practice with real money, writing down the problems and responses as they are completed.
Confuses math symbols. Misreads numbers. Doesn't interpret graphs or tables accurately. May make careless mistakes in written work. Has trouble maintaining a chequebook.	Help learners become aware of this challenge – encourage review of work and double-checking of information. Practice tracing numbers they reverse or misread. Build in self-monitoring strategies. In most cases learners understand the concepts but make mistakes with their calculations. Encourage the learner to circle the symbols.

MATHEMATICS CHARACTERISTICS	POTENTIAL STRATEGIES
Leaves out steps in math problem-solving and does them in the wrong order. Cannot do long division except with a calculator. Has trouble budgeting.	Teach problem-solving steps to use with each math problem: read and understand the problem; look for the key questions and recognize the important words; select the appropriate operation; write the equation and solve it. Help learners chunk the information into smaller units. Use mnemonics for long division to help remember the steps. Model manipulation so that learners understand that math problems can be looked at in a number of ways. Use real-life situations to understand the meaning. Continually model that concrete materials can be moved, held, and physically grouped and separated – this provides more vivid teaching tools than a pictorial diagram or grouping.
Doesn't translate real-life problems into the appropriate mathematical processes. Avoids employment situations that involve this set of skills.	Practice what operations are needed and have learners make up their own word problems from number statements. This helps learners to understand how the language is structured. Highlight key words, numbers and /or calculations. Alter instruction, i.e. give the answers and allow learners to explain how the answer was obtained. Help learners with auditory disabilities visualize the word problem, i.e. if the problem mentions two cars at different prices, have them draw the cars with the prices.

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A select listing of articles and books is available on the subject of learning strategies. Some of these materials present overviews of the entire field, from research to practice, while others are short, detailed descriptions of actual strategies taught to learners in the classroom. The bibliography is divided into the following sections:

- Three general strategy materials
- Three strategies for studying, thinking, test-taking
- Three strategies for reading
- Three strategies for writing
- Three strategies for mathematics
- Three strategies for science and other subjects
- Three strategies for teaching social skills

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