



Long term memory

Evidence that storing and retrieving information is an issue:



Student has trouble retrieving words when asked to name something.



Summer break often shows a significant loss of academic ability.



Student can choose a correct answer (recall) but cannot retrieve an answer successfully.



Time between reading and then thinking about what was read must be immediate or the ideas are lost.



Math can be the most frustrating since so much of it is based on recalling varied processes to solve even simple problems.



Remember hearing a song you used to sing and not being able to remember the words? All of life is like that for students who have difficulty with long term memory. It doesn't matter how hard you try, the words just can't be dredged up. In fact, if pressured, a lot of us really get stuck. It may be a day or two later that the snatch of lyrics will come forward. It is inconvenient for us to have "part timer's disease." It is frustrating and thwarts desire to learn for students who have it happen whenever they are trying to work or take tests.



Solutions

- Use memory strategies like mnemonic devices to trigger recollections.
- Make an acronym (first letters - like HOMES = Great Lakes - **H**uron, **O**ntario, **M**ichigan, **E**rie, **S**uperior).
- Use a pegword strategy (rhyming reminder) or key words to connect new concepts to those already learned.
- Learn to use grouping to build a set of ideas that are remembered together.
- Set up a chant or rap to group ideas or facts together. Reciting things aloud helps retention.
- Use visualizations - like walking catty-corner across the grass for hypotenuse of a triangle.
- Make up jingles and tunes to bring the clustered words or concepts to mind.
- Do not expect a student to do well on short answer tests, so make them open note and open book.
- Use overlearning on concepts that will be required to perform more complex portions of a task.
- Set up category models for student to be able to assimilate and accommodate information more rapidly.
- Use partner chats (collaborative exchange) to move from the receiver to perceiver or owner of a task.
- Teach compare - contrast processing of ideas to support more rapid acquisition and retention of new learning.
- Use cue cards and keep reviewing them until material is overlearned.
- Take new concepts and build them into personal paradigms or maps before moving to the next set of ideas.
- Use "what's wrong with this...." stems and activities to help the student self test understanding and mastery.
- Color code information -- like using red to underline major facts, yellow for the subtopics that contribute to theories, green to underline statements or quotations, purple for suppositions or intuitive leaps.
- For important facts, have students make up a wild and wacky association and imagine a comedian acting it out.
- Make a personal connection or story of facts as soon as they are presented -- moving into ownership of facts.
- Use note cards with key words to trigger recall if the situation will call for time pressure and remembering.

Value of rehearsing information as the student is acquiring and learning facts.

Days after initial learning	Amount remembered with no review	Amount remembered with review
7	33%	83%
63	14%	70%



Consolidating materials into meaningful constructs

Evidence that constructing and utilizing theories to make meaning is an issue:



Student seems to be unable to learn from experience.



Homework cannot be completed since the student does not recall directions or concepts.



Concept building across different contents does not seem to occur; little cross-over among life experiences or coursework.



Student asks "but what does it all mean?" -- That means, I need to see the big picture.



Student comments, "I'll never need this stuff. My dad says he never used it. "



Remember a time when you were taking a class and everything seemed to require memorizing? We often teach grammar and math like that. The things all go together, but the teacher has broken them into a bunch of pieces and then taught each one. We have trouble seeing the big picture. It is also like doing a jig saw puzzle and needing to look at the picture on the box to figure out where it goes. Our instruction can do that for students who need to see the whole picture to learn..... We can give them the vision of where the information connects to help them learn, and it usually also sharpens our teaching of the subject or concept, as well.



Solutions

- Homework Students with severe and multiple disabilities often find homework frustrating and parents may not be able to help without straining the relationship
- If the student is having a hard time remembering things, use picture or story boards for steps in a task.
- Most have a short attention span... so the teacher could provide short segments and then get the student started on a personal assignment rather than trying to follow a long lesson.
- As soon as a concept seems to be making sense to the student, provide an opportunity for the student to teach it to others, overlearning it.
- Tutoring in a class of younger students allows overlearning while building esteem and incidental connections.
- Use themes the student likes to teach new idea.
- Give the student time to build a mind map, using tangible items.
- Use a story sequence (metaphor or animal fable for example) to imprint the set of concepts together.
- Have the students make a short movie that feature the concepts, to show the rest of the class.
- Find a similar life experience that requires all the concepts and have the student compare/contrast the notions.
- Use video games that reinforce and consolidate the skills, using student motivation to increase repetition.
- If there are any school or classroom tasks that utilize the constructs, have the student engage in them frequently.
- Keep each piece simple when first introducing the initial piece and each added construct.
- Keep instructional time brief and use humorous forms of recall, including story, voice changes, visual assists.
- Use hearing, visual and kinesthetic ways of understanding something, and when possible add tactile and taste. Lets say you want to introduce the denominator. Take a chocolate bar out and have students write down if 1/2 or 1/10 is the size piece desired. Then break off the piece they chose. Now have them talk about why some people got a lot and some people got a little. Finally, have them break something up by the number you decide....1/5 pack of gum, 1/4 cup of milk, etc.
- Use novel ways of teaching ideas. If Conjunction Junction helps with parts of speech, great! If not, try using a car model to show how the different parts work together to get the car running. If one idea doesn't work, try another --- how the ingredients all come together to make a cake..... It is a great place for creativity, and sometime the student can give us help in building a new way of understanding the ideas.



Assimilation

Evidence that new concepts do not change old ways of thinking is an issue:



Student seems surprised or unclear about learning taught earlier in the day or day before.



Protests from student suggest s/he has no recall about hearing the material.



Teacher finds self saying things like, "Are you listening?" "What did I just say?"



When working alone, the student seems to understand concepts better than when actively involved in instruction..... so the student can get a right answer - almost mystically, when not required to show work, or stop to explain or show work.



Many times the student knows the answer, but does not realize it. This often suggests a failure of communication between the right and left hemispheres. The one side knows the concept but cannot translate it to the conceptual information the other side can recognize or retrieve. It is the classic conundrum. "He knows and knows not that he knows," or "he knows not and knows not that he knows not."



The student guesses, and keeps getting the answers right, but believes s/he doesn't know.



Remember putting down a book, and having no idea what you were reading? Maybe you cannot even recall the last ten minutes of a discussion, or come back into hearing focus and realize you have no idea what the conversation is about. Some students must actively attend to retain any information, and the automatic process of hearing and understanding is not so automatic. Its like the physics principles I was learning. I heard the words, but I could not find any Velcro to hang them to in my head.



Solutions

- Avoid interruptions during instruction.
- Utilize scaffolding, adding just one or two concepts to those that are firmly in place, well understood.
- Make expected connections clear to the student rather than expecting the "intuitive leaps" most students make.
- Put the student in a teaching position as soon as the concept seems intact -- "Tell me what you know." Explain this to your neighbor now. Have your neighbor explain this to you and see if they are correct."
- Have the student make a visual image of the idea before moving to the next lesson.
- Teach self talk that supports the newest concepts, including music, rhymes, rap beats. A good example is the old spiritual - the head bone's connected to the neck bone, the neck bone's connected to the backbone . . .



- Help the student take a concept apart, and reassemble it, sometimes with didactic aids to represent each piece.
- Set up a puppet skit with student acting out the concept or idea.
- Use metaphors and don't be surprised if these are more effective than direct instruction. There is a lot happening in the mind, and when on automatic pilot, it often shows up, while concentrated effort seems to send it in retreat. Remember, it is getting it to happen, not being able to give it a name or immediately retrieve it that shows learning is taking place.
- Keep changing formats so that the student has a chance to learn and store on both sides of the brain-- if it is a cognitive concept, also have the student do kinesthetic or artistic processing.
- Use activities that support information moving back and forth in the brain. The stronger the pathways, the more likely the student will be able to gain facility. There is no guarantee, but minds are amazing and resilient.



Slow processing speed

Evidence that new concepts do not change old ways of thinking is an issue:



Student writes very slowly.



When something novel occurs, one can almost see the moment of recognition for the student, like a light going on after the rest of the class is laughing, or responding.



If the routine changes, the student may lag all through the day and may even get upset and yell or blow up because there is too much going on.



Students often ritualize things in the day because they know what is coming next and do not have to struggle to see what is about to happen and try to anticipate what they should do.



In a song, this person is completing the words after everyone else is finished singing the line.



In the classroom it is especially difficult, because it means that students never consolidate the current idea, and miss most of the initial parts of any instruction or introduction.




A while back I went to see my daughter at the school. She did not know I was coming. I walked across the playground toward her. She stood by the teacher, not moving or responding. It was like she could not see me, though I could see her. After what seemed like the longest time, she hollered, "Mommy" and started running toward me. It was the first time I realized just how long it took her to make connections, for her brain and her eyes to have a chat and come up with what was happening. This is what slow processing is about.



Solutions

- Give students a few extra minutes of instruction once the class is started on an assignment.
- Use nonverbal cues when possible, since it seems to shorten processing time.
- Stick with routines as often as possible to allow the student to anticipate what is coming next rather than having to work at understanding every process in the day.
- Provide a kind and loving assistant who likes to help and enjoys being in the "know" without diminishing the well being of the other student.
- Often stand near the student and do some of the preparations with the student --- like showing the correct page, using their book -- so the student has some of the advantage of your support.
- Lower the pressure, since that takes a chance of sending blood out of executive functions and into fight/flight responses, wasting time and potential for problem solving.
- Use groupings to combine procedures -- instead of get ready to get dressed, "Brush, wash, comb" as a litany.
- Use short bursts of information. Get out your pencil or pen Try the first question Who is done? Try question two
- Try a clip board instead of folder, with assignments in sequence at the start of the day.
- Use key cards for cueing

 Math	Get book Turn on calculator Use green graph paper and mechanical pencil Find one that is easy and get started
--	--

- Bookmark the student page for the next day, since it can use up several minutes at the start of each lesson.
- Pair the student with a peer helper so a second pair of hands is propelling the student forward