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1‡41::AID-ACP361□3.0.CO;2-1 The Impact of Mnemonics as Instructional Tool

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Abstract

Mnemonics have probably used subconsciouslybefore, even without the person's intentional knowledge. Mnemonic devices are any technique that helps translate information into a form that makes it easier to retain than in its original form. Mnemonics are visual images and organizational devices. This includes rhymes and poems, acronyms, songs and outlines tools. Parents and teachers should use them to help children/studentsimprove their memory to recall important information. During the present and future time of eLearning,the mnemonic can be an effective instructional device/ strategythat should not be overlooked. The article explains the following the major types of mnemonics and how to construct your own:Acronyms, Acrostics (First letter), Chunking, Connection, Keyword, Peg, Rhymes/Alliteration, Imagery.

Key Words: Mnemonics, Acronyms, Acrostics (First letter), Chunking, Connection, Keyword, Peg, Rhymes/Alliteration, Imagery.

Introduction

Definition (Adolescent literacy, n.d.; Drumm, n.d.; *Stemmle, n.d.*).

Mnemonics are recall devices making something easier to memorize by helping in the recall of information and concepts from log-term memory. Mnemonics are any memory aid/shortcuts that use visual images and organizational devices used to helpboost the ability to remember, retain, or retrieve information quickly.

Mnemonics help encode and recall through Reconstructing, or developing keyword-something familiar, acoustically similar and easily pictured, relating, by linking keyword with definition in interactive picture and retrieving, or processing to get an answer.

In education a mnemonic is an instructional strategy designed to help students improve their memory of important information. This technique connects new learning to prior knowledge using visual and/or acoustic cues. They create an association between the information that you're trying to remember with a visual picture, a unique sentence, or a single word.

History(Effective Learning Lab, n.d.; Harris, 2014; Stemmle, n.d).

Mnemonics is pronounced itknee MON icks and derived from the ancient Greek word mnemonikos/mneme. Mnemonics is anything that helps you remember, named after a Greek word memory and the Greek goddess Mnemosyne and first attributed to Simonides of Ceos in 477 B.C. Pure and simply mnemonics is a weird word that means "memory tool".

Mnemonics are methods for remembering information difficult to recall using triggering devices designed to aid the memory such as a pattern of letters, ideas, or associations that assists in remembering something.

These memory techniques allow your brain to encode important information in a unique way that helps you learn it. The authors of this article in addition to being teachers are parents. When we started talking about this article, we remembered 3Rs we had written about: Recollection, Recall, Recognition.

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Then one of us remembered THE 3Rs:Reading wRitingaRithmetic. We started with more examples of the 3Rs: Read Relax Refresh. We use them every day in our lives. If you live in Atlanta you recognize MARTA(Metropolitan Atlanta Rapid Transit Authority). Even if the term is new, mnemonics are often used in daily living. Many of these techniques are common, taught in school, or used in everyday language (*Stemmle, n.d.*).

Mnemonics are most commonly used for groups of items and in auditory format, but mnemonics are also used in visual or tactile forms. The basis of their use is that the human mind can quickly recall relatable information, such as personal, surprising, spatial, humorous, etc., while it is more challenging to remember abstract or impersonal bits of information (*Stemmle*, *n.d.*).

Regardless of age or school level,, using these mnemonic (pronounced ni-mahn-ik) strategies—think of them as very effective memory tips—can make it easier to remember facts, and they can be applied to almost any subject (Heerema, n.d.).

A mnemonic for mnemonics provides a good definition Memory Needs Every Method of Nurturing Its Capacity is a good example of how mnemonics uses the best functions of your brain to store information.

Teachers and parents are "the fonts of all knowledge". A grandson asked me a question in his 8th grade science class to name the planets in order. Both he and I found out the limits of my "the fonts of all knowledge". I remembered "My Very Excellent Mother Just Served Us Nine Pizzas" [Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto). My grandson reminded me there are only 8 planets now. WOW! We Googled and found out Pluto is no longer amongst us. So "My Very Excellent Mother Just Served Us Noodles."

Mnemonics can be used to boot learning and retention in the classroom. Particularly in science, students can use mnemonics phrase to remember all elements in the peridic table. Students can use the phrase "The Strong Man's Triceps Explode" to remember the order of the earth's atmosphere. This means Troposphere, Stratosphere, Mesophere, Thermosphere, and Exosphere.

Teachers and parentshave faced increased pressure to help students learn during the COVID19 pandemic. Learning is about retention of what we have learned. There are three ways we retain knowledge.

<u>Recollection.</u> To recollect is to reestablish an earlier personal experience based on a partial clue (Akpan, Notar, & Beard, 2019).

<u>Recall</u>. Recall is the human ability to perform some activity in the present based on past learning. An adult can use recall to swim although hemight nothave done so since childhood. Recall differs from recollectionthereinthe person cannot remember the circumstances under which something was learned. Ridinga motorcycle or learning the way toswim aresamples ofrecall. To understand and recall informationthenusethis dataduring asort of contexts to unravel problems and think critically and creatively isa crucialgoalfor manyclassroom teachers (Akpan, Notar, & Beard, 2019).

<u>Recognition</u>. Recognition means to become conscious of some one or something as familiar. It may be the way a person walks, the pitch of his voice or his accent. In such a case, the memory will generalize from familiar to similar (Akpan, Notar, & Beard, 2019).

At some point in life, individuals probably remembered an important fact with the help of mnemonics that link a new word or concept to information already known. Use of mnemonics is a highly effective way to help students (with and without disabilities) recall and retrieve the new information. They're fun, easy to learn and use, and cost nothing to implement. And once students learn the mnemonic, they can use and adapt these tools for the rest of their lives to keep important information from slipping through their fingers (Brookes Publishing, 2017).

Mastropieri and Scruggs (1998) wrote that mnemonics work best when they form a very clear link between known and unknown information, and when they are practiced routinely. Well-constructed mnemonics work so well initially that students sometimes assume that mnemonics never need to be practiced, but that is not true. To retain mnemonics for a long time they must be practiced a few times at intervals.

Mnemonics work by associating easy-to-remember clues with complex or unfamiliar data. Though mnemonics often seem illogical and arbitrary, theirnonsensical wording is what can makethem memorable. Teachers should introduce mnemonics to students when the taskrequires the memorization of information rather than to have a student understand a concept (Kelly, 2020).

Mnemonics promote transfer two ways: by memorizing the basic facts and then using the information without much effort. The second way is when a student has learned information a mnemonic can help make the information seem more meaningful. The following are the major types of mnemonics:

Acronyms Acrostics (First letter) Chunking Keyword Phonic & Spelling Mnemonic Rhymes/Alliteration Sound/Symbol Correspondence Visual Images/Cues

Reasons to Use(Effective Learning Lab, n.d.; The Best Education Blog, 2021; College Star, (n.d.).

Mnemonics are mental shortcuts. The learner associates the information to recall with a familiar image, sentence, or word. Instead of recalling the complex information first, remember the simpler device is remembered instead.

Mnemonics is more than a student study tool, and should be considered as an instructional tool. These versatile strategies can be used in many different disciplines to help students remember important information, and abstract concepts and connect them with previously acquired knowledge. This connection to familiar imagery allows students to better retain new information.

Mnemonic Devices for Instruction

Mnemonic devices can be divided into two broad categories, organizational and encoding mnemonics. While relying on mental cues they differ in how these cues are used. In organizational mnemonics, students organize previously acquired information so that they are more easily able to recall it later in organizational mnemonics. Organizational mnemonics allow students to organize information in a memorable way using the method of loci, the peg-word method, acronyms and initialisms, and acrostics.

Letter - Acronyms and Acrostics(Adolescent literacy, n.d.; Brookes Publishing, 2017; College Star, n.d.; Drumm, n.d.; Effective Learning Lab, n.d.; Kelly, 2020; *Stemmle, n.d.*; University of Kansas, n.d.).

Letter strategies include acronyms and acrostics (or sentence mnemonics). Acronyms and Acrostics are two parts of what is called the **Letter Strategy** where first letter mnemonics strategy includes an overall strategy (LISTS) and a sub-strategy for making a mnemonics device (FIRST).

Acronyms

Acronyms are one of the most popular and widely used mnemonic strategies used in everyday life. This letter-association strategy is especially useful for remembering short lists of items or steps.

The acronym "Roy G. Biv" can be used to list the colors of the rainbow. This is a popular example of an acronym mnemonic device. An acronym is simply an abbreviation that puts together the first letters of other words and then pronounced as its own word.

An acronym is a technique for remembering names, phrases, or steps by joining the first letter of a series of wordsto form a new, memorable word. Acronyms usually have their own easy-to-recall pronunciation.

Acrostics (First letter)

Acrostic letter mnemonics are like acronyms, except students memorize a simple silly sentence instead of a word to trigger their memory rather than forming a new word. The first letter of each word in the sentence correlates with an important fact they're trying to remember helping students remember several pieces of interconnected information.

An invented sentence where the first letter of each word is a cue to an idea you need to recall information. An example for rememberingmusic notes on the lines of the treble clef (E, G, B, D, F) with the sentence, "EveryGoodBoyDoesFine."

Chunking(Drumm, n.d.;Effective Learning Lab, n.d.; Harris, 2014; Heerema, n.d.; *Stemmle, n.d.*;<u>The Best</u> <u>Education Blog</u>, 2021).

It is a mnemonic strategy that works by breaking down information into small pieces easily remembered learned groups, phrases, words, or numbers. Chunking is grouping items together which can be remembered

only as one bit of information. Then all you need to remember is the key word or retrieval cue that will trigger the other items of information in each chunk.

Chase and Simon (1973 as cited in <u>The Best Education Blog</u>, 2021) developed the chunking theory an important attempt to formalize the mechanisms linked to chunking. Our brains <u>can only hold about seven pieces</u> <u>of information at once</u>, so their postulation that attention is serial and short-term memory is limited to about seven items [Miller's magical number] using chunking mnemonics helps to simplify complex details.

A good example of chunking is way we remember phone numbers in three chunks–area code, prefix, and final four. Area codes are easy because so many phone numbers that we call have one of the handful of same area codes. So, instead of memorizing 18005553012, we learn 1 800 555 3012.

Since our brains can only process so much information at a time by grouping each data point into a larger whole, you can improve the amount of information you can remember helping simplify information that might otherwise be too complex to remember.

Organizing is similar to chunking because it involves grouping things together. Objective organization is used by grouping items together in a logical way, by using subjective organization by grouping seemingly unrelated things together.

Scaffolding is breaking up the learning into chunks and providing a tool, or structure, with each chunk. When scaffolding reading, for example, preview the text and discuss key vocabulary, or chunk the text and then read and discuss as the class progresses.

Connection Mnemonics(Congos, 2005;Effective Learning Lab, n.d.;Kelly, 2020).

One way to store new information is to connect it with information you already know. This gives the new information meaning and makes it easier to remember. Making connections can be applied to almost any subject or type of information and allows students to remember sequences of unrelated items in the appropriate order.

Remembering the direction of longitude and latitude is easier to do when you realize that lines on a globe that run North, and South are long and that coincides with**LONG**itude. Latitude lines must run east to west, then because there is no**N**in latitude, or the 1st part of the word**lat**itude sounds like**flat**and**flat runs** horizontal or East and West.

Keyword (Adolescent literacy, n.d.;Brookes Publishing, 2017; College Star, n.d.; Effective Learning Lab, n.d.;Gajria, Jitendra, Sood, & Sacks, 2007; Heerema, n.d.;University of Kansas, n.d.;Zimmermann, &Reed, 2019).

Keyword is a system is a particular strategy that helps students learn and remember content-specific vocabulary by creating sounds like the content-specific vocabulary word.

Learning new vocabulary words and facts can be easier when students use keyword mnemonics to connect the new information/words that are familiar and that may rhyme or have some physical resemblance to the target word(s). The teacher creates an illustration that links the prior and new information in the student's memory and the student connects making the new information easier to store and retrieve as needed.

Using keyword mnemonics may increase the number of content-specific words students can understand and apply, thereby broadening their vocabulary knowledge and improving their abilities to access complex informational texts.Studying a second (or third or fourth) language keyword mnemonics are especially useful.

Here's how the keyword method works. First, choose a keyword that somehow cues the student to think of the foreign word. Then imagine that keyword connected with the meaning of the word the student is trying to learn.

Say your students need to learn the words for two different parts of the brain: cerebrum and cerebellum. Since the cerebrum is larger than the cerebellum, the keyword for cerebrum could be*drum*(a large instrument) and the keyword for cerebellum could be*hel*(a small instrument). Help students remember that the cerebrum is the largest part of the brain by connecting it with the image of a drum, which makes a big sound and takes up a large amount of space. (Brookes Publishing, 2017).

As with all mnemonic devices it is important to note that students should not be taught to create a keyword mnemonic for every single unknown word they encounter. Instead, this strategy should be applied to words that are:

- Critical to students' understanding of a text or topic.
- Difficult to remember and apply.

• The more interesting the mental image is the easier it will be to remember by providing them with a drawing that illustrates the keyword.

Loci (College Star, n.d.; Drumm, n.d.;Effective Learning Lab, n.d.;Heerema, n.d.; Universal Class. (n.d.). The method of loci is also referred to as the "Memory Palace/Roman Room". It's a form of imagery and visualization where the learner creates visual associations with familiar locations helping them in remembering things in a particular order.

This technique relies on visualization to organize information, connecting new content with familiar "loci", or locations. The route must be very familiar like the pathwalked through the house every morning getting ready for school, or the route taken to your school every day.

Each location within the route must be distinct from the others, so that students don't confuse them with each other. In other words, the simplest route is generally the best choosing landmarks that won't be confusing. If your route doesn't have enough landmarks or stopping points in it, the student should probably choose a different route altogether than to try an add more spots to a short route.

The route must be able to be followed in the same order in all circumstances.Don't make things confusing by using a Loci route forward one time and backward another time. Use a Loci route over and over to memorize different things, but always start from the same point, and move in the same direction, to avoid confusion and make memorizing things in the proper order easier.

Loci simply put is memorize familiar locations in natural order by Creating a visual image of word with each location and recalling by taking a mental walk.

Peg(Adolescent literacy, n.d.;Brookes Publishing, 2017;College Star, n.d.;Effective Learning Lab, n.d.; Heerema, n.d.).

Peg is a system of associating items employingkey/cue words represented by numbers.

These words are substituted for the number to be remembered and associated with new information with a pre-memorized list of words (or pegs) and numbers. Peg-words are used to remember information in a particular order and/or memorizing lists.

For instance, to remember that insects have six legs and spiders have eight legs, create a picture of insects on sticks and another picture of a spider on a gate. The most common implementation of the peg-word method is with number-rhyme pegsmemorizing a jingle and using imagery to associate items with the jingle.

| one is bun | six is sticks |
|---------------|-----------------|
| two is shoe | seven is heaven |
| three is tree | eight is gate |
| four is door | nine is vine |
| five is hive | ten is hen |

A peg-word example, the peg-word for "one" is "bun." Peg-words include the following:

Rhyming Peg-word System

Peg-words—words on which new information can "hang"—are another effective way to link new information with familiar information. Using this strategy, the student learns rhymes that can be easily connected with new words, facts, or numbers.

The rhyming peg-word system links between two concrete objects in a one-to-one fashion. This usually starts by linking nouns to numbers. It's common practice to choose a noun that rhymes with the associated number such as "30 is dirty" or multiplication facts $6 \ge 6$ (sticks ≥ 36 (dirty sticks).

Rhymes/Alliteration/Phonic & Spelling Mnemonic (Drumm, n.d; Effective Learning Lab, n.d.; Kelly, 2020).

Rhyme mnemonics can be the simplest ways to boost memoryby putting information in the form of a poem. A rhyme is a saying that has similar distinctive sounds at the end of each line. Rhymes are a great mnemonic device that makes things easier to remember because it can be stored using acoustic encoding to make concepts easier to remember. Examples are the ABC song and in fourteen hundred and ninety-two Columbus sailed the ocean blue.

Word associations are jingles, rhymes, short songs, and raps that work as memory tools to recall information. Righty tighty, lefty loosy (to remember which way to turn a bolt or to tighten a jar) is an example.

Imagery/Visual Images/Cues/Sound/Symbol Correspondence(Congos, 2005;Drumm, n.d.; Effective Learning Lab, n.d.; Harris, 2014;*Stemmle, n.d.*).

Our brains remember images much more easily than words or sounds, so things the student wants to remember are processed more quickly. "A picture is worth a thousand words" is one example. This is particularly true in short- and long-term memory. One key to memorization is that whenever possible, use graphics to aid learning. Obvious, visual imagery is a great way for visual persons to memorize information.

In simple terms, this means that pictures help rememorization. **Visualizing a specific picture, you can easily recall information that you previously associated with that image**. Imagery is used to memorize pairs of words. An image is formed because of each word given, and then two images are joined through mental visualization (Pig + money = piggy bank).

Think about how much easier it is to remember an image than it is to remember words.Companies use logos–Walmart, Nike, and McDonald's are now ingrained in everyone's brain.The sillier/ridiculousthe image is, the easier it is to recall the related information to be remembered. Artistic ability is not a requirement because images may be mental or sketched into text and lecture notes and as long as your sketch means something to you it will help you.

Chain/Combination Mnemonic(Brookes Publishing, 2017; Heerema, n.d.).

Mnemonic methods can also be combined—use keywords and acronyms together. These are used to associate one element in a series with the next elementand can be applied to almost any subject or type of information.

Limitations AndDisadvantagesof Mnemonics

(Adolescent literacy, n.d.; Campos & Gonzalez, 2003; Czekala, n.d.; Effective Learning Lab, n.d.; Gruneberg& Herrmann, 1998; Kelly, 2020; University of Kansas, n.d.).

The authors have touted mnemonics this whole article but to be fair they should also provide limitations and disadvantages of mnemonics.

The specific mnemonic strategy will need to be modeled and students should go through the steps of the mnemonic until they can use it independently. Allow students opportunities to practice orally and provide corrective feedback.

Mnemonics are one of the most misunderstood learning tools of all time. They are usually sold as the ultimate solution for all kinds of learning problems, which is far from the truth. As you can see, effectiveness and usefulness of mnemonics can be amazing but only if understood precisely what they do. And what they do is "inflate" short-term memory for some time.Manage to review the knowledge you acquired with mnemonics by performing some actions specific to that knowledge, and rest assured that the student's progress will know no boundaries.

Cautions On Mnemonic Use

- The keyword method, in general, isinferior to rote learning in the longer-term retention of vocabulary dueto participants 'lack of training. Some people (especially adults) arereluctant to create vivid images and crazy stories.
- Some people (especially adults) are unable and/orunwilling to resign from using previously learned strategies.
- Using mnemonic devices for memorizing words istime-consuming(especially at the beginning).
- Using mnemonics requiresmore effort(especially at the beginning) than rote-learning.
- Mnemonicsdon't guarantee understanding.
- Learning with mnemonics lacks context.

Construct Your OWN Mnemonics

(Bafile, 2011; Czekala, n.d.; Kelly, 2020; The Best Education Blog, 2021; University of Kansas, n.d.).

Up to this point we have described the types of mnemonics and provided some examples. In the reference section we have provided several urls to locations of mnemonics that may be helpful to you. However, those may not provide what you need, and the authors are hopeful the following will provide you with hints to make your own mnemonic.

To create an easy mnemonic for student's use acronyms or key word strategies. Identify the content (concepts, facts, terms, vocabulary) students have most difficulty remembering.Gather information and analyze the information where the student will apply a mnemonic considering whether learning the mnemonic will make learning more efficient.Once identified the information or associationspicture the answer, meaning, or associated information.

Where possible use imageryto introduce a mnemonic. Create mnemonics withpleasant images; vivid, colorful, images are easier to remember than drab ones. Use personal art, stick figures, cutouts from magazines, help from an artistic student or colleague, or clip art to create mnemonic pictures.

Mnemonics can contain sounds, smells, tastes, touch, movements, and feelings as well as pictures. Any type of mnemonic device must be simple, clear, and vivid and we tend to remember the unusual, the funny or the personal. Create mnemonics that use humor; funny mnemonics are easier to remember than normal ones.

Once the mnemonic check has developed, see if it is relevant to the information to be learned and has a minimum number of steps to learn.Be sure to provide a rationale for learning the mnemonic and introduce by linking the new information to information the individual/students already know. Reinforce the mnemonic by practicing each step carefully with the individual/class and measuring the effectiveness it has on thememory process.

Conclusion

Mnemonics are used quite often in the teaching/learning process. When trying to improve memory or looking for tricks tomemorize things, <u>mnemonics</u> are tools to use. Mnemonics work best when the learner engages multiple senses, breaks information into smaller chunks, uses association, repeats new information and improves the environment by shutting of the TV, cell phone and other distractions.

Mnemonics can be used for all sorts of things like learning facts and dates, for memorising lists of notable people in the arts, sciences, philosophy, medicine, shopping lists, sports, or any other field. Mnemonics used correctly should make learning easier not harder by streamlining the learning process.

Remember mnemonics are memory strategies, not comprehension strategies, giving students access to broad amounts of information. Mnemonics help in the recall of information and concepts from log-term memory by connecting new learning to prior knowledge using visual and/or acoustic cues thar bridge other information requiring less working memory. The three main components of mnemonics are location, imagination, and association (Weegy, 2015).

An advantage of mnemonics is that they can be applied to a multitude of content information. Mnemonic availability is seen by the University of Kansas (n.d.) internet search of "mnemonics" that yielded 41,460 hits.

Four urls that the authors found of interest/value are:

-https://images.search.yahoo.com/yhs/search?p=examples+of+mnemonics&fr=yhs-shnl-

001&hspart=shnl&hsimp=yhs-001&imgurl=http%3A%2F%2Fliteraryterms.net%2Fwp-

content%2Fuploads%2F2015%2F12%2FMnemonic2.png& guc consent skip=1584374532#id=3&iurl=https %3A%2F%2Fimage.slidesharecdn.com%2Fmnemonicdevices-120906134426-phpapp02%2F95%2Fhow-to-

improve-your-memory-mnemonic-devices-21-728.jpg%3Fcb%3D1346943455&action=click

-30 Mnemonics ideas | mnemonics, teaching, mnemonic devices (pinterest.com)

-Handy Mnemonic Devices to Help Remember Homework Facts (thoughtco.com)

-9 Lifesaving Mnemonics Every Man Should Know | The Art of Manliness

Use mnemonics for everything!

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| MNEMONIC vs ACRONYM | |
|---|---|
| Mnemonic is a | Acronym is an |
| learning method. | abbrevation. |
| In mnemonic, a pattern of letters, ideas etc. assists in remembering something. | In acronyms, a new is formed from the fist letters of a series of words. |
| Mnemonic can be a | Acronym is |
| word, phrase, poem | pronounced as a |
| or even a song. | single word. |
| Some mnemonic | Not all acronyms |
| devices are | are mnemonics. |
| acronyms. | Pediaa.com |