



Knowledge Builder

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Inside this issue:

1

What to Do When Adult Learners Struggle to Remember

By Connie Bumbaugh

4

Mathbusters: Helping Adult Learners Crack the Mystery of GED Math

By Pilar Oberwetter and Ellie Philips

6

A Matter of Debate

By Cara Fulton

About D.C. LEARNs: The D.C. Literacy Education, Advocacy and Resource Network, Inc. (D.C. LEARNs) is a coalition of literacy providers and stakeholders in the District of Columbia. We are a not-for-profit organization. Our mission is to build the capacity and effectiveness of adult, family and children's literacy services in Washington, DC; mobilize resources to support literacy in the District of Columbia; advocate for effective public policy that benefits District residents at the lowest levels of literacy and the organizations that provide services to them.

What to Do When Adult Learners Struggle to Remember

By Connie Bumbaugh

Because memory is a key factor in successful learning, it is vital for adult educators to be aware of how memories are made and how they affect learning. The human brain is capable of remembering a wide variety and vast amounts of information. Unfortunately, the process of memory is less than perfect and can lead us to remember things differently or even things that never actually happened because memory is affected by mood, emotion, the environment, and our own biases. Since memory is a rebuilding of facts and experiences based on the way they were stored, not as they truly happened, it is critical to store information correctly so that it can be recalled easily and accurately.

The reality of adult education is that many adult learners struggle to remember new information and have difficulty retrieving information learned previously. This is often due to a lack of knowledge about memory and limited practice using memory strategies. However, the problem can also be exacerbated by a number of factors including, but not limited to: substance abuse, poor health, certain medications, abuse or neglect in childhood, and a lack of practice regarding memory strategies. Contrary to popular belief, age is not necessarily a barrier to successfully remembering information. As adult educators we can help learners to improve their memory skills by teaching mnemonics, or specific memory strategies, and by encouraging frequent practice of those strategies.

Types of Memory

The first step in understanding and teaching memory strategies is to understand the various types of memory and their relationships to learning. Conditioned responses are some of the earliest types of memory we gain. These conditioned responses are those things that are learned when we are provided with immediate and consistent feedback. For example, we learn not to touch hot surfaces because each time we do, it burns. Alternatively, students learn to raise their hands when they have questions because teachers respond to a raised hand more positively than when students interrupt the class by calling out.

continued on page 2

A Word From the Editor!

It just so happens that with each new issue of this publication, comes a new season. As such, I like to take this time to reflect on the changes happening around me and to step up my efforts, both personally and professionally.

The mornings are chillier, the days are growing shorter, and school is back in session. It's the perfect time to revitalize best practices, stock up on new teaching activities, and broaden our vision.

In her continuing series on learning disabilities, Connie Bumbaugh discusses the importance that memory plays in successful learning. She describes techniques that teachers can use to help learners better remember information.

Do you have students that struggle with GED math? Pilar Oberwetter and Ellie Phillips showcase their Mathbusters workshop and illustrate how it can improve GED math scores.

Finally, Cara Fulton demonstrates how she sharpens her students' critical thinking skills by using classroom debate that focuses on opposing viewpoints.

Enjoy the change of season,



Jennifer Cavalet

Editor

The Knowledge Builder is the quarterly journal of D.C. LEARNs, written by and for adult, family, and children's literacy professionals. It highlights best practices, current research, teaching and program management strategies, and lessons from the field. We are dedicated to voicing the experiences and ideas of individuals in the field of literacy.

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The acquisition of skills refers to movement or motor memory. In this type of memory, individuals learn physical activities such as how to ride a bicycle, dance, hit a ball, or shuffle cards. With the acquisition of skills, the trick to committing them to long-term memory is regular and frequent practice. However, once these skills are learned, they are rarely forgotten.

Another type of memory is procedural or the ability to recall specific sequences and processes. This enables individuals to remember the route they take to work, how to bake a cake, or on a very basic level, the order of the letters of the alphabet. Similarly, episodic memory is the recollection of events and situations like a birthday party or a vacation. These types of memory are formed by linking new information to contextual clues and developing a routine.

Semantic memory is for language and factual information. This is the type of memory most often called upon in the classroom for memorizing state capitals, the spelling of words, and the dates of historical events. Semantic memory is also the type of memory most often scrutinized by standardized tests.

Often, these different types of learning are tied to emotional memory which can be both a powerful tool and a hindrance. Think back to an early classroom experience that was positive, for example, being praised each time a word is spelled correctly. That most likely invoked strong feelings of pride and perhaps the desire to learn to spell other words. On the other hand, if someone recalls negative classroom experiences, such as being reprimanded or mocked for reading words incorrectly, he probably chose not to read aloud again. As adults, we often remember most clearly those events which were emotionally charged for better or worse. If adult learners carry with them memories of negative classroom experiences, they will likely continue to be intimidated by learning. In these cases, it is crucial to help adult learners create positive memories of learning by making the experience a pleasant one.

Key Principles

There are four principles which need to be in place before we can effectively improve memory (Kelly, 1994). First, individuals must want to learn. This may sound simplistic but if individuals do not consider the information interesting or significant, they will not take the time to commit it to memory. As educators, we need to ensure the material is relevant and motivating to the learners. Secondly, there is an abundance of new information available to individuals everyday, more than any one person can reasonably retain, so people must choose what they want to remember. By limiting the content of lessons to just a few concepts at a time, we can assist the learners in this process. Another aspect of memory is choosing to focus on and pay attention to the information presented. If people do not concentrate, they will not be able to recall the information later. The fourth and final principle needed for memory is the ability to effectively encode or store information. It is this last

principle which will we address here – strategies for improving memory.

Teaching Memory Strategies

Even though memory is so critical to learning, we rarely teach learners how to remember. Especially when teaching adults, it is imperative that we first explain the process of memory, then help learners improve this skill by providing them with simple strategies on how to effectively store and recall information. When teaching learners about memory, I have found it helpful to start with an image like a filing cabinet (Weisel, 2003). When we are given some important information that we need and want to save, we can place it in a folder, label it, and store it neatly in a drawer with other similar information. When we need that information again, it will be easy to find. However, if we randomly stick information into the drawers, we make it difficult to retrieve that information easily. Memory works the same way. If we properly encode new information, we will be able to move it into long-term storage and recall it when we need it. Once learners understand the importance of memory, we explain that there are a number of memory activities or tricks that will help them to store new information. A few of those strategies or mnemonic devices are described below.

Visual Imaging – Can you easily find Italy on a map? It's the country that is shaped like a boot right? This technique encourages learners to associate some fact or information with a picture or an image that is easy to remember. This is the same technique we used above to explain memory as a filing cabinet.

Rote Practice or Repetition – Do you remember learning the multiplication tables? Most of us remember memorizing this information through the use of flashcards and frequent verbal drills. In order for rote memorization to be long term, it requires many repetitions. The most effective use for this technique is for short-term memory needs such as remembering a phone number or address long enough to write it down on a piece of paper.

Acronyms - Can you remember the names of the Great Lakes? Huron, Ontario, Michigan, Erie, and Superior. By taking the first letter of each lake and creating a word (HOMES), it is easier to remember the list. The letters in the new word act as retrieval cues which help us locate the "file" containing the names of the lakes.

Verbal Elaboration – Similar to acronyms, this method uses the first letter of each word that is to be remembered and creates a sentence or a story using other words with the same letter. An example would be the notes on a musical staff (E, G, B, D, F). We memorized this in school by remembering the sentence, "Every Good Boy Deserves Fudge."

Rhymes and Songs – When you are asked to say the letters of the alphabet do you find yourself singing the tune? Songs,

rhythms, and melodies are useful tools for remembering information and learners can often remember lengthy amounts of information by setting it to a beat or familiar tune.

Unusual Associations – This can best be described as a "Slap in the Face." By pairing something sudden, creative, or out of the ordinary with new information, it makes the information very memorable by the sheer unexpected nature of the association. For example, I still remember how to graph certain mathematical equations because my math teacher jumped up onto his desk and yelled, " $x = y^2$ " while using his arms to make a giant U shape.

Story Telling – This is similar to verbal elaboration but takes it a step further by creating a short story about a piece of information. For example, to remember the meaning of a word, we might use it in a sentence or short story – the more unusual or silly, the more memorable it will be.

Chunking – How do you remember phone numbers? In a string of 10 unrelated numbers or in small groups? This technique organizes new information through meaning or association. Help learners to group information or make connections between seemingly random facts.

Advance Organizers – This method sets the stage for what is going to be learned during the lesson through a visual representation (e.g. outline, drawing, or timeline). This helps learners to retrieve information they may already know about the subject in order to assimilate the new information and store it accordingly.

Ranking – Also known as the "funnel" approach, this is a technique for instructors to structure lessons in a format that goes from general to specific or by level of importance. In this technique, instructors would first teach a general framework or concept then provide more and more specifics or details. For example, when learning about animals, plants, and minerals in science class, the teacher might start with a broad classification such as kingdoms and work down through the system to species.

R.A.P. – This technique is a great tool for reading comprehension and memory. The acronym stands for "Read, Ask, & Paraphrase." It reminds learners to read a passage (short or long depending upon their reading level), ask some thought provoking questions about the material (from recalling facts and themes to analyzing meaning), and then to put the story into their own words. This process will not only help the learner to understand the information but will also help them with remembering it.

Sensory or Emotional Impressions - When you smell fresh apple pie, what do you think about? When you hear the song that was played at the prom, what comes to mind? We discussed earlier the significant impact that emotions can have on

memory. With this technique, we would pair some smell, taste, sound or feeling with new information to create a lasting impression or memory. For example, we can use the taste of a lemon to describe the concept of sour or we could take it a step further by writing the word “rough” on a piece of sandpaper. The impression of this activity will help the learner to relate the texture of sandpaper to both the concept and spelling of the word rough. Because these impressions are so strong, they are particularly useful for learners who are struggling.

These are just a few of the mnemonic devices or strategies that can be used in the classroom and taught to adult learners to help improve their memory. Used alone or in combination, these tools will help learners to bridge the gap between short-term and long-term memory.

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About the Author

Connie Bumbaugh is the Executive Director of Literacy Volunteers of the National Capital Area (LVA-NCA) and is an advocate for adults with special learning needs. She provides LD screenings for adult learners and conducts training for educators on how to effectively support these learners in the classroom. Connie received her Master’s degree in Adult Learning from Virginia Tech.

Mathbusters: Helping Adult Learners Crack the Mystery of GED Math – and Pass the Test in the Process!

By Pilar Oberwetter and Ellie Phillips

Ms. Ellie Phillips and Ms. Pilar Oberwetter have spent several years teaching in a variety of adult education program settings. In their collective experiences in six of DC’s adult education programs, both Ms. Phillips and Ms. Oberwetter realized that a disproportionate number of adults lack numeracy. Although numeracy challenges adults in many areas of their lives, the authors became particularly concerned when they realized that this deficit was the primary obstacle standing between many adult learners and their GED credentials. Even worse, both women observed that many GED programs were not acknowledging or actively attempting to remedy this deficit. Working independently of each other, both devised strategies for successfully addressing the GED math gap—and in late 2004, compiled their findings in the form of a professional development workshop that they named “Mathbusters.” This workshop pulls program strategies and classroom teaching tools together into a comprehensive track that leads both students and programs to GED success.

What Is the Problem?

Many adult learners “have everything but the math.” That is, they can pass four out of five sections on the GED exam. They read and reason well. But that math – it’s just light-years behind! It shouldn’t be this way. Too many people in Washington, DC and elsewhere should have GEDs but don’t. The GED is a standardized test, so it’s made to be cracked. And failure just isn’t an option.

Take a simple but revolutionary approach to teaching GED math and running GED programs. This approach, developed through years of classroom and administrative experience, is called Mathbusters because of its fun, high energy, never-say-never attitude.

Mathbusters results speak for themselves. The fiscal year ends June 30. At the time this article was written, both of our programs had 25 GED graduates EACH for the current fiscal

year. This is an increase from single digit outcomes just one or two years ago. Mathbusters is part of that success.

Retention and persistence are two of the biggest challenges facing adult education programs. Most GED students will leave your program before “learning math” in the traditional sense. They can leave with or without a GED. Mathbusters works because it is designed to reflect the realities of the field.

Mathbusters Rules of Engagement

Because it advocates, in part, that some adult learners bypass the traditional “ABE math” track, Mathbusters has generated some controversy among workshop attendees. The following are a number of points that cannot be over-emphasized as we explain the Mathbusters approach:

1. It all depends on the student. Go with the student’s strengths and weaknesses. Mathbusters is not a silver bullet.
2. This is not K-12. This is GED. Teach and administer accordingly.
3. Mathbusters goes beyond “teaching the test” or “cheating” or “cutting corners.” In reality, the GED itself emphasizes problem-solving skills and conceptual knowledge over traditional arithmetic. If we do the same in our programs, we aren’t shorting the students. We’re joining the 21st century – and helping them pass the test in the process.
4. Mathbusters is not an ABE curriculum. It is a fast-track program for those GED students who “have everything but the math.” It works for students reading on an eighth grade level and above.
5. Attendance, commitment, and drive (on the part of learners and teachers) obviously factor into Mathbusters results.
6. Test-taking anxiety is real, and must be dealt with as part of any Mathbusters regime.
7. This is not an “all or nothing” approach. Mathbusters advocates a shift in emphasis, not a total abandonment of anything.

Nuts and Bolts: What’s It Really All About?

Old School vs. New School Approach

The “Old School” (non-Mathbusters) approach is the K-12 model. In our observation, many GED programs use this model because it is what the instructors and students themselves are used to. This prescribed approach takes a regimented view on mathematical comprehension and class progression. In the “Old School” approach, the GED student enters class after assessment. First, he or she completes the textbook unit on place

value. Then he or she is moved to basic operations with whole numbers – addition, subtraction, multiplication, and division. If he or she completes all of these topics successfully, fractions will come next. In our observation and in our personal experience (before the onset of the Mathbusters enlightenment), somewhere around subtracting fractions with borrowing, the student mysteriously disappears from the program. (The traditional progression continues for those remaining in the class, of course, with decimals and percents.)

Although we always emphasize the importance of learning multiplication tables, rare is the student who actually masters them before moving on. Sometimes, the teacher’s insistence on this “Old School” mantra – learn the times tables before moving to ANYTHING else – stymies the adult learner’s progress and stops him or her, leading to frustration and, ultimately, dropping out. (Please note Rule #1: It all depends on the student.)

Although computational skills are valuable, especially for reinforcing conceptual understanding, rare is the student who doesn’t become tired and bored doing computation drills day after day. Frustration may be part of life, but why does it have to be the predominant emotion associated with math?

In the Mathbusters “New School” approach, we always assess the student. In our programs, we are mandated to use the CASAS Life Skills Reading tool. If a student scores 235 or above on this test, (note that we use only the CASAS reading; CASAS math scores are interesting but not prescriptive), we immediately administer the Official GED Practice Test. Based on a student’s performance on the practice test, a number of things can happen next. If a student scores solidly on three of the five subjects (reading, social studies, and science), but noticeably lower on the math section, he or she is an exemplary candidate for Mathbusters. An example would be a student who scores 440 or above on everything except math, where he or she receives a 350, and writing, where his or her essay receives a score of 1 (we also have developed a GED Essaybusters workshop, but that’s another article!).

In our programs, every math practice test is thoroughly analyzed to gain insight into students’ strengths and weaknesses. We then create folders for each student based on that information, the student’s input, and Mathbusters standards. These folders are Individualized Education Plans (IEPs), which guide students and teachers.

Tools of the Trade

•**IEPs:** A typical IEP contains a checklist of Mathbusters “Hot Topics,” a copy of the student’s practice test scores and analyses, and a progress log, where students can monitor their own progress by writing down what they’re working on, which books they’re working from, and which pages they’ve completed in those books. Students should be frequently assessed; IEPs track that, too.

•**Calculator:** Many students and teachers resist using the calculator because they consider it “cheating.” But this is the Information Age, and the GED calculator (Casio fx-260 solar) is a little computer. More importantly, it is a tool provided to adult learners on the GED exam. Our motto is, “They ought to be using that calculator like they use their left hand.” For the teacher and student, the calculator is a liberator. It liberates us all from the endless computation that turns even the simplest word problem into a nightmare.

•**Formulas page:** Another tool provided to adult learners on the GED math exam is the page of formulas included in every math test booklet. Students should become skilled in recognizing what kind of problem they’re solving, which formula they need, finding that formula in their references (ie, the formulas page), and, finally, applying it. Talk about a life skill!

•**Mathbusters PowerPak:** This is a compilation of the handouts and exercises that we kept coming back to over and over. It is a binder full of chapters and sections from various math books. In our programs, every Mathbusters student gets their own PowerPak, which actually becomes their textbook. The PowerPak correlates with the topic checklist in the IEP folders, and provides practice with Mathbusters “Hot Topics”(see the following section for a description).

Hot Topics

We have found that certain topics yield the biggest return on investment—and so we named them “Hot Topics”. Focusing limited time and resources to go in-depth on these areas is often a far more effective approach than starting on page one of a GED math book and going forward. We have found that these topics can be taught in relative isolation—and that students who do not come to class regularly acquire a basic knowledge of the Hot Topics in one or two class sessions.

In our programs, we create Topic Checklists for Mathbusters students. After they complete their initial Official Practice Test, students agree that they will master the topics on the checklist before they take another one. These checklists go into students’ individualized folders:

- Mean, Median and Mode
- Ratio & Proportion (R&P)
- Triangles (directly relates to R&P)
- Pythagorean Theorem
- Tables, Charts and Graphs
- Calculator
- Percents
- Coordinate Plane

Recommended Texts for Classroom Use

Kwil, Linda, ed. (2002). *Contemporary’s GED Mathematics*. McGraw Hill.

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Pilar Oberwetter has been Program Administrator for Educational Services for the Catholic Charities DC Region for 3 years. Prior to that, she served for two years in the Peace Corps in the Youth-At-Risk sector in Jamaica. She completed the Graduate Certification in Adult Education from the University of the District of Columbia in December 2004 and earned a BA in English and African-American Studies from Johns Hopkins University in 1999.

A Matter of Debate

By Cara Fulton

Want to give your GED or higher education students a challenge they will rave about? Set up a debate using the *Opposing Viewpoints* series. This will exercise their skills in public speaking, critical reading, writing, and listening. The *Opposing Viewpoints* books (published by Greenhaven Press) present several aspects of an issue, such as discrimination, the family, health care, poverty, the war on drugs, welfare, and work. Your local public library will have many titles for you to choose from.

Once you've chosen the overall topic, you can set up a debate into two opposing teams.

A recent group of mine at Howard University Continuing Education chose poverty since they were already debating the issue informally. They all come from developing countries (mainly Africa) and the issue of foreign aid had hit the press; holding a debate on worldwide poverty allowed us to formalize the discussion.

We chose the fourth chapter: Is Worldwide Poverty a Serious Problem? Within that chapter are four subtopics of opposing viewpoints:

- Global Poverty and Terrorism – Does poverty cause terrorism or not?
- Globalization – Is globalization reducing poverty or not?
- Population Growth – Can the planet support an ever increasing population or not?
- Genetically Modified Crops – Are genetically modified crops helping to reduce world hunger or not?

These college level readings will challenge your students and give them the opportunity to use all five levels of close reading as outlined in the critical thinking concepts and tools developed by Dr. Richard Paula and Dr. Linda Elder of the Foundation for Critical Reading (see *How to Read a Paragraph and Beyond: The Art of Close Reading – How to Read a Text World Reading and Take Ownership of its Important Ideas* at www.criticalthinking.org). The five levels of close reading are the following:

- Paraphrasing – Stating in your own words the meaning of the text.
- Explicating the thesis – Elaborating on the meaning, giving examples of the meaning by tying it to concrete situations in the real world, and making a comparison of the meaning to something else already understood.
- Analyzing the logic of the reading – Asking questions regarding the author's purpose, point of view, assumptions, implications, etc.
- Assessing the logic of the reading – Evaluating the author's clarity, precision, relevance, depth, breath, fairness, etc.
- Speaking in the voice of the author – Role-playing the views of the author as part of a debate. This is the ultimate test of understanding what we read.

Once students fully analyzed the texts, we organized a simple debate format. One student acted as master of ceremonies, explained the rules, and introduced the overall question and presenters. Then the first pair debated the first aspect of the

question (global poverty and terrorism). Each person spoke for three minutes and then each received one minute for rebuttal. After each pair had debated, the master of ceremonies asked the audience members to turn in their scorecards indicating which debater had won each round to determine which team won the overall debate. The audience had been prepped in advanced on how to vote for the best the debater, not the person with whom they agreed the most. You can use rubrics from Education World (http://www.educationworld.com/a_lesson/lesson/lesson304b.shtml) to help you. The students rehearsed once before the public debate. This gave them a chance to receive feedback on their delivery as well as refine their rebuttals.

Is worldwide poverty a serious problem? Set up a debate of your own and find out what your students think. According to John Stuart Mill, "the only way in which a human being can make some approach to knowing the whole of a subject is by hearing what can be said about it by persons of every variety of opinion and studying all modes in which it can be looked at by every character of mind. No wise man ever acquired his wisdom in any mode but this." Studying opposing viewpoints will help your students make gains beyond the usual reading, writing and arithmetic.

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About the Author

Cara Fulton provides the full spectrum of English language instruction from Workplace Writing to English for Academic Purposes to American Accent Development training as well as teacher training. She has taught University Intensive English at Howard University Continuing Education since 1997 and American Accent Development, workplace English, GED with Maestro, LLC since 2001.

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- All articles should be between 1,200 and 2,000 words.
- Submissions should be typed double-spaced, in Times New Roman, including quotations and references.
- Follow the Publication Manual of the American Psychological Association (APA), Fifth Edition for reference style guidelines. Present important information in the text and do not use footnotes or extensive endnotes.
- Include a biography of the author (50 words maximum).
- Please include a cover sheet with the author's name, address, phone number and email address.
- Compensation is in the amount of \$200 for each article that is published and follows the above guidelines.

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