

Math =
Success

Go figure!

Winning at Math

Learning Disability Association of Sudbury

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Other Information

Cambrian College offers an online course called **Winning at Math - Math Strategies** through the Continuing Education department

Dr. Paul Nolting's book **Winning at Math** is available from www.academicsuccess.com

Winning at Math – Assessing Your Math Strengths

By Marlene McIntosh, BSc, MBA, MEd

This is the second in a series of articles about how to learn math.

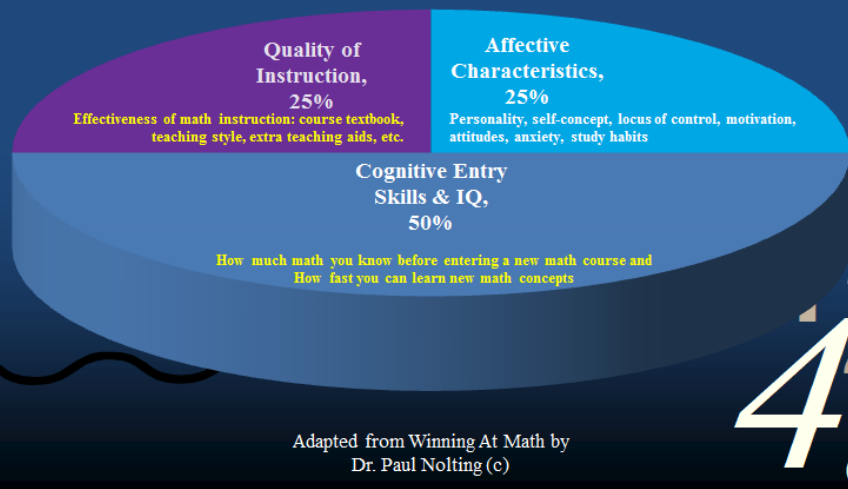
There are several variables to consider when someone wants to learn math. Surprisingly enough, the **quality of instruction** only accounts for 25% of someone's ability to learn math. You can see this when you have a student who just "gets it" right away, regardless of the teacher's ability to teach. Quality of instruction includes the effectiveness of the instructor, the course textbook, teaching style, extra teaching aids, etc. So, what about the other 75%?

The other 75% is you! Yes. It's you. **Cognitive skills and IQ** count for 50% of your ability to learn math. This includes baseline math – do you know how to add, divide, multiply, subtract? This is your ability to build upon your previous knowledge of math. It also includes how fast you can learn math. I cannot stress enough how valuable it is to have that base knowledge to build upon. So, if you get a 50% in math, you may only know 50%. Moving on to a more difficult math course may not get you any better grades because you don't have the base knowledge. Often, we're in too much of a hurry to move on, and it may be to your detriment to do so. Think about that...

The other 25% is **affective characteristics**: your personality, self-concept, locus of control, motivation, attitude, anxiety, and study habits. These are all in your control. Sometimes just knowing that you are in control is enough to make people sit back and look at what they're doing and know that they can change if they really try hard enough. Let's look at that. Can you change your personality? According to Psychology Today, you can change your behaviours which will reflect on your personality. Is it easy to do? Anything worthwhile takes hard work. There are many suggestions online to help. Using a therapist can help with your personality and your self-concept. We tend to linger on what we *can't* do instead of what we *can* do. Sometimes, we're our own worst enemy.

How about locus of control? According to Dictionary.com, locus of control is "A theoretical construct designed to assess a person's perceived control over his or her own

Figure 1 – Variables Contributing to Student Academic Achievement



behavior. The classification internal locus indicates that the person feels in control of events; external locus indicates that others are perceived to have that control.” If you feel that you are in control of your own life, you feel more power over your fate. You can see this when

people know the link between how long they study and their mark, for example. This is especially true with math. Doing math every day, seven days a week, studying longer, and looking at the mark is a direct link between what we do and the mark we get. Others who have an external locus of control say things like, “The teacher failed me,” instead of, “I didn’t study, so I failed the test.” Sound familiar?

Sometimes students will not even try to learn something new. They’ve given up before they even start. “I can’t learn math, so why try?” This is called **learned helplessness**. How do you change that? As parents and educators, we can teach small amounts to students. Allow them to experience success. Once they experience success, students are more likely to try new things. It sounds simple...

What about your **math learning style**? How do you know what to do? I’ve attached some handouts that I’ve produced to help you to try different study methods. There are more than just one way to study. Einstein once said the insanity means trying the same thing over and over and expecting different results. Try something new! Look at these and see what you think. Use them and share them.

My final suggestion is this – do NOT **procrastinate**! Do math every single day, and always finish with a problem that you know. If you become frustrated, stop. Go back and redo the math problems that you know. Always end with something that is successful. When studying math, **do math right before going to bed**. Then, go to bed. Do not talk to anyone, watch TV, etc. Go right to bed. Your brain will still process the math that you’ve done. Do this every night. See what happens!

The next article will be on overcoming test anxiety.

For more information, please contact Marlene at marlene.mcintosh@cambriancollege.ca.

Auditory Numerical Learners

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Say the numbers to yourself or move your lips as you read problems

Record your class and play it back while reading your notes

Read aloud any written explanations

Make sure all important facts are spoken aloud with auditory repetition

Read math problems aloud and try solutions verbally as you talk yourself through the problems

Record directions to difficult math problems and refer to them when solving those specific types of problems

Record math laws and rules in your own words, by chapters, and listen to them every other day (auditory highlighting)

Have the tutor **explain** how to work problems instead of just showing you how to solve them

Explain to the tutor how to work the math problems

Explain to group members how to solve math problems

During the test, sub-vocally talk yourself through the problems

Take the test in a private room and talk to yourself out loud to solve the problem

Social Individual Learners

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Study math, English, or other subjects alone

Use DVDs or CDs to learn by yourself (eg video or record yourself)

Prepare individual questions for your tutor or instructor

Obtain individual help from a tutor

set up a study schedule and study area where no one else will bother you

Study in the library or in some other private, quiet place

Use group study times only as a way to ask questions, obtain information, and take pretests on your subject material

Use math learning websites like www.academicssuccess.com - Student Math Practice and Learning Sites

Use the math homework sites from your textbook

Set up virtual tutoring if available

Social Group Learners

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Study math, English, or other subjects in a study group

Review your notes with someone in a group

Obtain help in a math lab or other situations where you can work in groups

Watch math DVDs with a group and discuss it

Listen to taped lectures and discuss with a group

Obtain several "study buddies" so you can discuss them with the steps to solving math problems

Form a study group. Each member should bring 10 test questions with explanations on the back of the page. Group should complete all test questions and share the answers.

Arrange a meeting with your instructor and several other students to go over math problems

Develop an online chat group to help each other solve math problems

Tactile Concrete Learners

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Cut up a paper plate to represent a fraction of a whole

Fold up a piece of paper several times and cut along the fold marks to represent a fraction of a whole

In order to understand math concepts, ask to be shown how to use manipulatives

Try to use your hands and body to "act out" a solution. For example, you "become" the car in a rate-and-distance word problem

Obtain diagrams, objects, or manipulatives and incorporate activities such as drawing and writing into your study time. You may also want to do some physical activity while studying such as walking

Try to get involved with at least one other student, tutor, or instructor that uses manipulatives to help you learn math

Use the Hands-On Equations Learning System using manipulatives to learn basic algebra - www.Borenson.com

Go to one of the "learning stores" in the city to see if they have manipulatives

Go to a K-12 learning resource store to see if they have manipulatives - one good example of this is a magnetic board with numbers and letters that you can move around

Tear up a piece of paper into several pieces and put an x on some of the pieces. Mark the other pices with numbers 0 to 9. The pieces with the x and represent the variable and the other pieces can represent the numbers. You can now use the pieces of paper to se up and solve equations.

Use the virtual manipulatives websites as www.academicssuccess.com.

Visual Numerical Learners

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Use worksheets, workbooks, handouts, additional math texts, other additional written materials

Play games with visual printed materials such as flash cards

Use visually oriented computer programs and internet sites

Check out DVDs and such from math lab or learning centre

Rework your notes

Make 3x5 note or flash cards putting **variables** and **numbers** in different colours

Use study stacks to develop your virtual flash cards (www.academysuccess.com - Student Math Practice and Learning Sites)

Use video websites from text or www.academysuccess.com or Khan Academy

Use different **colours** to emphasize different parts of each math formula

Visualize numbers and formulas in detail

Ask tutor to **show** you how to do the problem instead of telling you how to do the problem

Write down each problem step the tutor tells you to. **Highlight** the important steps or concepts that cause you difficulty