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Introduction

Worksheets

don't grow dendrites

20 instructional strategies that really work!

Allow me to tell you a story. Visualise the following classrooms, if you will.

Mrs Dozier teaches a year eleven literature class. Lecture is her primary method of delivering instruction. Sometimes the lectures last for more than half the lesson. Today the lecture is about the Shakespearean play, *Romeo and Juliet*. Some of the higher achieving students are paying close attention since they know that much of the information will appear on the mid-year exam. Other students are maintaining eye contact with Mrs Dozier while thinking about everything except the play. Several students are engaged in conversation and are promptly reprimanded. Mrs Dozier doesn't realise that most of the class stopped listening to her lectures during the first few weeks of school. A few have retained enough information from the lectures to regurgitate it on the multiple-choice, teacher-made test, but, if asked, will admit that they do not really understand Shakespeare's work any better now than before the lectures began (see Figure 1.1).

Mr Pope teaches the same course at another school. He is the favourite teacher of most of the students in his class. He has very few, if any, behaviour problems. Mr Pope must cover the same curriculum as Mrs Dozier; however, the two classrooms bear little resemblance to one another. Mr Pope is also teaching *Romeo and Juliet*. Last week, he completed a graphic organiser on the board that accompanied his seven-minute mini-lecture, pointing out the traits of several of the main characters. Mr Pope's students also began working in cooperative groups to rewrite five different scenes from the play into dramatic presentations. Students have been assigned parts and today they will dramatise the scenes previously written. Students will mark one another's presentations according to a rubric they helped develop (see Figure 1.2).

WHY THESE STRATEGIES? ■

Which teacher would you rather have? Which teacher would you rather be? With the 1990s having been declared the Decade of the Brain, millions of dollars have been spent on brain research. As a result, teachers, as growers of brain cells, ought to know more today about how students learn than ever in the history of the world. Much of this recent knowledge has come from consultants such as Eric Jensen (1995, 2000, 2001), David Sousa (2001), Robert Sylwester (1995) and Patricia Wolfe (2001), who make practical application for educators from the research of the neuroscientists.

While caution against making immediate application of the neuroscientists' findings is certainly in order, teaching and learning cannot wait. Exemplary teachers have always known that active engagement of students is not a luxury but a necessity if students are to truly acquire and retain content, not only for tests, but for life.

Learning style theories that call for student engagement have been proposed for decades, as evidenced by the copyright dates of some research. Whether you are examining Bernice McCarthy's 4MAT Model (1990), Howard Gardner's theory of multiple intelligences (1983) or VAKT (visual, auditory, kinesthetic, tactile) learning style theories, similar instructional delivery systems appear to consistently emerge. In addition, because of modern technological advances such as PET scans, CAT scans and fMRIs (functional magnetic resonance imaging), neuroscientists now appear able to identify physiological reasons for why some instructional strategies simply engage the brain better than others. That is why most *Worksheets don't grow dendrites!*

TATE'S 20 ■

I have identified 20 strategies that, according to brain research and learning style theory, appear to correlate with the way the brain learns best. In my 28 years in education, I have observed hundreds of teachers – mainstream education, special education, and gifted as well. Regardless of the classification or year level of the student or the content area of the instructor, exemplary teachers consistently use these 20 strategies to deliver memorable classroom instruction and help their students understand and retain vast amounts of content.

This book will attempt to accomplish three things:

- Identify and describe each of the 20 brain-compatible strategies;
- Provide over 200 research rationales as to why these strategies appear to take advantage of the way the brain learns best;
- Supply over 150 examples of ways in which these strategies can be used to ensure that students are mastering curricular objectives and meeting state and national benchmarks.

Comparison of Tate's 20 instructional strategies to learning theory		
<i>Tate's 20</i>	<i>Multiple intelligences</i>	<i>VAKT</i>
Brainstorming and discussion	Verbal-linguistic	Auditory
Drawing and artwork	Visual-spatial	Kinesthetic/tactile
Excursions	Naturalist	Kinesthetic/tactile
Games	Interpersonal	Kinesthetic/tactile
Graphic organisers, semantic maps and word webs	Logical-mathematical/ Visual-spatial	Visual/tactile
Humour	Verbal-linguistic	Auditory
Manipulatives, experiments, labs and models	Logical-mathematical	Tactile
Metaphors, analogies and similes	Visual-spatial	Visual/auditory
Mnemonic devices	Musical-rhythmic	Visual/auditory
Movement	Bodily-kinesthetic	Kinesthetic
Music, rhythm, rhyme and rap	Musical-rhythmic	Auditory
Project-based and problem-based instruction	Logical-mathematical	Visual/tactile
Reciprocal teaching and cooperative learning	Verbal-linguistic	Auditory
Role – plays, drama, pantomimes, charades	Bodily-kinesthetic	Kinesthetic
Storytelling	Verbal-linguistic	Auditory
Technology	Visual-spatial	Visual/tactile
Visualisation and guided imagery	Visual-spatial	Visual
Visuals	Visual-spatial	Visual
Work study and apprenticeships	Interpersonal	Kinesthetic
Writing and journals	Intrapersonal	Visual/tactile

Strategy 1

Brainstorming and discussion



WHAT: DEFINING THE STRATEGY

The brain is a highly social organism. If you don't believe that statement, just arrive early at a faculty meeting or any other type of social gathering, particularly one where people know one another. Watch what happens as people begin to arrive. Most of them take the opportunity to converse with one another. Very few, if any, sit in silence.

Then visit a traditional classroom where students spend most of their time engaged in individual activity without the benefit of conversation and, in fact, are expected to sit in silence for a greater period of the day. What is wrong with this picture? Perhaps teachers are expecting students to exhibit behaviour that is unnatural to the brain. You see, discussion has many advantages, not the least of which is that simply opening the mouth to speak sends oxygen to the brain and facilitates dendritic growth.

When students are given the opportunity to brainstorm ideas without criticism, to discuss opinions, to debate controversial issues, and to answer questions at all levels of Bloom's taxonomy, wonderful things can happen that naturally improve comprehension and higher order thinking.



HOW: SAMPLE CLASSROOM ACTIVITIES

- Level/Subject area: Primary/Secondary (Cross-curricular)

Standard/Objective: Encourage divergent thinking.

Activity: Students are given a question to which there is more than one appropriate answer. Students brainstorm as many ideas as



REFLECTION



How can I intergrate Strategy 1: Brainstorming/Discussion into my lesson plans so that my students' brains are engaged?

Standard/Objective: _____

Activity: _____

Strategy 2

Drawing and artwork



WHAT: DEFINING THE STRATEGY

Artists, interior designers and architects are all professionals who have the amazing ability to perceive and transform the visual-spatial world around them. This ability serves them well in the real world but not always in traditional school settings.

For almost three decades, I have observed from the rear of classrooms as teachers imparted important content in the front. I have often watched students (perhaps future professional artists or architects) engaged in off-task behaviour, intently drawing wonderfully artistic pictures of cars, creatures, superheroes and other subjects of greater interest than the maths or science being taught.

What do you suppose would happen if that artistic ability, that spatial intelligence, were put to instructional use? How many vocabulary words could students actually acquire if they could illustrate the definitions rather than merely looking them up in the dictionary or glossary and writing down the first definition they encounter? Brain and learning style theories support the idea that drawing strengthens memory, not only for vocabulary, but also for everything else.



HOW: SAMPLE CLASSROOM ACTIVITIES

- Level/Subject area: Primary/Secondary (Cross-curricular)

Standard/Objective:

Increase vocabulary meaning.

Activity:

Students are given an opportunity to create a personal 'pictionary' by illustrating assigned vocabulary words. Each page of the pictionary consists of an assigned word written in

