

Neuroeducation

By Julia Volkman

As Montessorians, we have been applying the scientific method to our work with children for over a hundred years. And now, in this still young millennium, our job has an official name that is recognized in the world of traditional education: Neuroeducation. A neuroeducator is a scientist, clinician, teacher, and/or policy maker all at the same time. S/he is clinically (through working with children) and theoretically (through study) knowledgeable in both neuroscience and education. I believe that authentic Montessorians are all neuroeducators.

The term “neuroscience” has a rather lab-coat distance to it but we Montessorians are already neuroscientists. Our discussions of neuroscience just use terms like hormone, memory, and adaptation. It would be highly beneficial for all of us to re-ground ourselves in contemporary neuroscientific terminology like glia (the cells that are 10 times more numerous than neurons and do all kinds of jobs to support neuronal functioning), fMRI (a functional Magnetic Resonance Image that measures the flow of oxygen in the brain), plasticity (how the brain adapts and adjusts *throughout life*), and genome (our genetic code created at the moment of conception but that is not even remotely set in stone; our genes are constantly turning on and off in response to our environment). Here are a few free internet sources that may help refresh your knowledge:

- National Research Council. (1999). Chapter 5, mind and brain. *How People Learn: Brain, Mind, Experience, and School*. J. Bransford, A. Brown, & R. Cocking (Eds.). Washington D.C.: National Academy Press. <http://www.nap.edu/html/howpeople1/>
- National Scientific Council on the Developing Child. (2007). The timing and quality of early experiences combine to shape brain architecture. Working Paper No.5 [Online] <http://www.developingchild.net/pubs/wp.html>
- National Human Genome Research Institute. National Institutes of Health (NIH). (2007). A Guide to Your Genome. Publication No. 07-6284. <http://www.genome.gov/>

The neuroeducator (that means you!) is in a pivotal role. Neuroeducators are guiding the introduction and ethical integration of neuroscience into national educational practice and policy. And I believe we have an obligation to take on this role...with great vigor. It is too big of a job for anyone to do alone. We need each other. Here is what I propose.

1. Reaffirm our pedagogy.
2. Become Neuroeducational Ambassadors
3. Have a voice in the published/scientific dialogue.

The Pedagogy

If you begin to research the studies gaining importance in the field of neuroeducation (also called Mind, Brain, Health, and Education), you will start to notice some themes. Many of the discoveries being made point to the need for specific approaches to education *that are already part of the core Montessori teachings*. So by simply remaining true to the theory, we are offering children learning environments that are supported by the research. Some of the key pedagogical points I am noticing in the literature are:

- **Logical Sequence of Materials:** The logic inherently built into the classroom (through the sequencing of materials on the shelves and requiring the child to progress through that sequence) makes a direct imprint on the child's brain. Dr. Montessori was right: the information not only enters the brain, it forms it. So, get your shelves in order! If you need guidance, look at the table of contents in your album. If you feel your training/album is missing something or if you just want a second opinion, you can refer to the logical shelf sequences I will be posting on my website (www.maitrilearning.com).
- **The 3-hour work-cycle:** Really, 3 full hours...I'm NOT kidding! But don't believe me, try it for a few months and see for yourself.
- **Freedom of Choice/Individualized Education:** Children must be *inspired not required* to do specific works; our job is to show them how to do the work and then guide and, really, entice them to engage with it. We must meet them where they are and give them what their inner drives are seeking. We help them adapt (their very genes/nature) through our rich environment (nurture).
- **Scientific Observation and Intervention:** Everyday, sitting down, without interfering, collecting objective data (not "she is happy" but "she is smiling"), and then adjusting as necessary to meet the children's needs (e.g., giving *another* practical life lesson on how to wait patiently instead of interrupting someone).

Being Ambassadors

All of the amazing events that occur in our classrooms every day have tremendous value even if no one ever notices them. Our work is deeply useful even if it goes unrecognized. However, it is of greater use to more children if we allow ourselves, our work, and our classrooms to be in the spotlight. This takes courage but we are following in the footsteps of a woman who outwitted Mussolini to keep her discoveries alive. Courage is inherent in our lineage.

Here are some possibilities. Reach out to the local community and media through press releases and public events (like parent-child nights where the children teach the parents how to do the work). Write letters to the editor highlighting the gorgeous learning experiences we see all the time and how misguided policy tramples the child's very spirit. Speak with kind words about the positive changes in traditional education while offering inspiration for deeper and deeper levels of change. And most importantly, partner with local colleges and universities. This last point is critical. As we link with educational institutions, we begin to be included in their research projects and teaching efforts. Invite their students to observe, intern at your school, attend a Parent Education night. Offer to be a guest speaker at the university and provide an overview of the Montessori method. This work leaves an imprint in the minds of young teachers and professors of traditional education and may inspire them to join our great work.

The Scientific Dialogue

Today's educational policy is data driven. The data we have the most of are those [insert expletive of choice here] standardized tests. We must give policy makers an option. They have no choice but to rely on data. So I ask you, what data can you offer them? What studies have you done in your classroom or your school to support the Montessori method? Where have you published this data?

Maybe you realize it and maybe you don't, but you are most likely conducting scientifically valid experiments in your classroom right now. You notice that Taariq picks up the vocabulary cards, pokes his finger on the prickly square corners, puts the cards promptly back down, and doesn't choose them again. So, you round the corners and reintroduce the work. This time, he uses it. Right there, you have done a

clinical study and a scientific intervention. You noticed a problem, developed a hypothesis, introduced an independent variable (something the researcher chooses to do, in this case, round the corners), and recorded the result (dependent variable). You may then go around snipping off all the corners on your card materials and find a rebirth of this material throughout the classroom. You know it worked because last year you didn't do it and your card materials were rather dusty. That was your control group. You could simply tally how often the materials are used for a month before you snip the corners and how often they are used for a month after you snip off the corners.

If you are at all interested in this work, I have two books to recommend:

- American Psychological Association (2010). Publication Manual of the American Psychological Association. Sixth Edition. Washington DC: APA.
- Lapan, S.D. and Quatroaroli, M.T. (2009). Research Essentials. An Introduction to Designs and Practices. San Francisco: Jossey Bass.

If you're really into this, you may also want to take a course or pick up an introductory textbook on statistics.

We are living in a remarkable era. Technologies are arising that can measure cognition within our very flesh and bones. But who will lead this field? What questions will we ask of these technologies? What data will we generate? It is the data that currently drives policy. So let's check our oil, fill our tanks, and drive.

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