Dr. Montessori: Scientist & Innovator

Mark Berger
“education for human development?” is

“education that serves the optimal development of the human being”.

“most innovative entrepreneurs were… raised in an atmosphere where inquisitiveness was encouraged. We were stuck by the stories they told about being sustained by people who cared about experimentation and exploration… *A number of the innovative entrepreneurs also went to Montessori schools, where they learned to follow their curiosity.*”

(Harvard Business Review online editor’s blog, September 28, 2009)
A brain-based, developmental educational method that allows children to make creative choices in discovering the people, places, and knowledge of the world. It emphasizes hands-on learning, self expression, and collaborative play in a beautifully environment of respect, peace, and joy.

- Dr. Stephen Hughes
• “Montessori education is the embodiment of all I learned while studying for a Ph.D. in Child Development.”
  - Fiona Anderson, Ph.D. (neuropsychologist)

• “It’s like education designed by a gifted pediatric neuropsychologist!”
  - Steve Hughes, Ph.D. (pediatric neuropsychologist)

• “It’s like education designed by a gifted developmental psychologist!”
  - Fiona Anderson, Ph.D. (developmental psychologist)
<table>
<thead>
<tr>
<th>What do neuroscience and developmental psychology tell us that education should be like?</th>
<th>what does the research tell us?</th>
<th>what this requires in a school setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>provide movement opportunities</td>
<td>allow students to get up, move around and not be required to sit still for long periods of time. Also, movement connected to what is being learned is important.</td>
<td>children are not sitting still for extended periods of time outside of their own control</td>
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<tr>
<td>individual variation / differentiated instruction</td>
<td>children do not learn at the same pace or with the same strengths.</td>
<td>each child has the chance to learn at his/her own rate and also each child has the chance to learn at their own change of rate</td>
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<td>use intrinsic motivation</td>
<td>Self-motivated students/people perform better and are more highly engaged with their work.</td>
<td>downplay outside motivators such as grades, prizes, praise and teacher marks. Involve the child in setting goals.</td>
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<td>provide opportunity for autonomy/self-direction</td>
<td>allow for some aspect for control over the work, daily schedule, etc. When students are able to direct their activities and learning their engagement increases and learning improves.</td>
<td>provide the opportunity to make one's own choices and act with independence: make work choices, set goals</td>
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<td>building understanding vs. memorization</td>
<td>Meaning-making is more important than retention of disconnected information.</td>
<td>allow for exploration and self-discovery, avoid “teaching as telling”, or &quot;chalk and talk&quot;.</td>
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</tbody>
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Occipital Lobe: vision

Parietal Lobe: touch, spatial

Temporal Lobe: hearing, language

Frontal Lobe
   Motor cortex: planning, regulates movement
   Prefrontal cortex: reasoning, memory, self-control, attention, planning, judgment

Prefrontal cortex: reasoning, memory, self-control, attention, planning, judgment

Cerebellum: movement
What are Executive Functions?

• Reasoning
• Problem solving
• Understand what we read/hear
• Allows us to exercise choice, self-control, self-discipline
• Makes creativity possible
• Allows us to flexibly adjust to new information (cognitive flexibility)
Core EFs:

- **Working memory** – being able to do math in your head, making sense of language, considering alternatives, translating instructions into action plans, seeing connections between seemingly unrelated things.

- **Inhibition** – self-control (self-regulation), resisting temptation, resisting acting impulsively. Choice depends on this since if we couldn’t “resist” we’d be impulsive. Being able to control one’s attention, behaviors, thoughts and emotions.

- **Cognitive Flexibility** – including “thinking outside the box”, seeing different perspectives, and quickly adapting to new circumstances. This builds on WM and IC, and creativity relies on CF.
“The performance of the task provided intrinsic reward.”
Finding Flow

Harnessing Montessori Education

“We both went to Montessori school and I think it was part of that training... being self-motivated, questioning what’s going on in the world, doing things a little bit differently”

- Google founder, Larry Page, on the major factor behind his and Google co-founder Sergei Brin’s success, The Wall Street Journal, April 2011

“Montessori taught me the joy of discovery.”

- SimCity Founder, Will Wright, the New Yorker, November 2006
“Educating for Life”

“Education should no longer be imparting of knowledge but must take a new path, seeking the release of human potentialities.”

- Maria Montessori

In Montessori we focus on providing the necessary skills to “thrive in the new world of work”:

➢ Critical Thinking and Problem Solving

➢ Collaboration and Leadership

➢ Agility and Adaptability

➢ Initiative and Entrepreneurialism

➢ Effective Oral and Written Communication

➢ Accessing and Analyzing Information

➢ Curiosity and Imagination

“Even our ‘best’ schools are failing to prepare students for 21st-century careers and citizenship. Today’s students need to master seven survival skills to thrive in the new world of work. And these skills will enable students to become productive citizens who contribute to solving some of the most pressing issues we face in the 21st century.

Montessori Prepares Students for Life

Wall Street Journal, April 2012

“Most of our high schools and colleges are not preparing students to become innovators. To succeed in the 21st-century economy, students must learn to analyze and solve problems, collaborate, persevere, take calculated risks and learn from failure... At the most innovative schools, classes are "hands-on," and students are creators, not mere consumers. They acquire skills and knowledge while solving a problem, creating a product or generating a new understanding... [The] discovery-based learning leads young people to find and pursue a passion, which evolves, over time, into a deeper sense of purpose.”

- Tony Wagner, Innovation Education Fellow at the Technology & Entrepreneurship Center at Harvard University

Wall Street Journal, April 2011

“The Montessori educational approach might be the surest route to joining the creative elite which are so overrepresented by the school’s alumni that one might suspect a Montessori Mafia: Google founders Larry Page and Sergei Brin, Amazon’s Jeff Bezos, videogame pioneer Will Wright, and Wikipedia founder Jimmy Wales... Montessori Mafia showed up in an extensive, six-year study about the way creative business executives think.”

Harvard Business Review, July 2011

"Montessori builds innovators."

- Andrew McAfee, principal research scientist at the Center for Digital Business at the MIT Sloan School of Management.
Returns to a Unit Dollar Invested

Source: Heckman (2008)
THE BUSINESS CASE FOR MONTESSORI

Any business-minded person wants to understand the return on investment for the private school dollars they spend on their children’s education. Nothing less should be expected.

What can a parent expect from a Montessori education for their children?

Someone who can communicate effectively
Someone who is versed in divergent thinking
Someone equipped with confidence
Someone who is resourceful in the problem-solving realities of day to day life and work
Someone who is motivated by self-worth and pride and not external rewards
Someone who possesses a high degree of adaptability
Someone who is both independent and able to collaborate