

Observations on effective education

Montessori through a retired professor's eyes



ROC ORDMAN

The *Rockford Register Star* in Illinois printed a column that I wrote on January 11th that included praise for the Montessori Public School in Rockford, IL. The article described my experience as a substitute teacher in the Rockford public schools. That resulted in a request for me to write for this Montessori newspaper. So here is my story.

In 1977 I began teaching biochemistry at Beloit College. In college, I had been a mediocre student because I had an awful memory, yet teachers seemed to simply expect students to memorize things and regurgitate answers for tests. I wanted to be different than those teachers, helping students to develop a love of learning and a joy in asking creative questions.

As a professor, I encouraged students who did poorly on exams but clearly loved working in the lab: "You will be very successful one day! Keep trying and do not worry about exams!" One such student got a job in an entrepreneurial lab and called five years after graduation, saying, "Those stocks they gave me are worth a fortune now!" He retired at age 40. This taught me that love of learning mattered a lot. Grades measure only your performance by a standard. What is important to measure is your desire to learn and your enjoyment of the process. That desire and enjoyment will set you up for success in life and a career. I have encouraged many stu-

dents who were doing poorly in other classes. In my class I see their excitement about a subject, and assist them to keep at it. Reassurance can have a dramatic effect on their tenacity.

I also realized is that students work better in small groups, discussing and finding hypotheses on their own. Sitting in class for lectures was boring for many of them, as much as I loved to lecture. But when given questions to discuss and figure out on their own, they were involved.

My favorite introductory chemistry text was written by the Dalai Lama, "The Universe in a Single Atom". A highlight of my career was an invitation to lecture at the Dalai Lama's Library in Dharamsala, India. Instead of giving a traditional lecture, I divided the audience, half Buddhist monks and the rest tourists, into small groups, and had them discuss the question, "Is Buddhism a religion or a philosophy?"

To my delight, in about 15 minutes, a group of 5 monks raised their hands, and said "Both!" I happily agreed, and explained that this is how I teach science, and how science is done – think of a hypothesis, gather evidence, discuss with colleagues. After my discussion was over, several monks approached me. "You are the best speaker we have ever had!"

During the decades teaching at the college level, I developed my ideas about how students learn effectively, and how teachers can influence young minds to enjoy and value education.

Memorization and regurgitation are boring and frustrating for many. During my own education, it seemed that the worst teachers had memorized information by reciting it for decades, and they expected us to memorize the same information even

when it was out of date. When DNA became the hot topic in biology, most teachers did not know about it, and ignored it.

Questions are more interesting than answers. What makes a good scientist is not the ability to recite old information, but to ask questions and develop hypotheses. So in teaching, I ask the students what questions they have about a topic. In my first Advanced Biochemistry class, I asked the students what questions they had. We selected ten and spent a week exploring each of them.

One of the biggest questions in science for many years has been "what is consciousness?" I developed a course that I taught for eight years where we tried to develop and test hypotheses to find the answer, and explored current articles about what the answer might be. For real science, there is no right answer. There is simply the most accepted current hypothesis. Theories and even laws are periodically found to be incorrect. Once students learn they can advance knowledge with new ideas, science becomes thrilling.

Small group interactions allow student involvement. For developing questions, making hypotheses, finding evidence, and then seeking better hypotheses, small groups can get students involved.

Laboratory, hands-on, experience develops many useful skills beyond book, lecture, and discussion learning. My greatest success in developing Beloit's biochemistry program was obtaining Federal funding to purchase modern equipment so students could learn the latest techniques for manipulating proteins and DNA. Actually seeing the DNA bands

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on a gel was thrilling for them.

Each child is an individual. I was fortunate that most of my classes have been small. But even with 30 in a class, I remind students that each of them is an individual who learns in a different way. Some have great memories, some love math, while some are only there to fulfill a requirement. But I also tell them I expect them to help each other, cooperate, and respect their differences.

When I left the college and began teaching in the public schools, what a difficult change it was! K-12 teachers have so many demands on what they teach and how they teach it. It seemed like about half the teachers were still trying to reach their students, but half were discouraged and just surviving until they could retire or find another job.

Many of those teachers reminded me of my high school chemistry class. I had a substitute teacher for the entire year. Each class she would simply read the notes of the chemistry teacher next door. Whenever I asked her to explain something, she would get angry and yell at me to stop interrupting her. The only acceptable question was “will you please read that last sentence again?” After that experience, I hated chemistry. In college, I majored in biochemistry, and suffered through many chemistry classes. It wasn’t until my second year of teaching chemistry in college that I realized it was fun to learn.

In conventional public school classes I experienced in Rockford, the teachers have a specific lesson plan for every day, typically teaching the material that will be covered on standardized tests. Bright kids are often bored because they learn rapidly the first time. But for average students, the teachers review the material again, and students are not able to get support for their learning outside of school are sometimes lost and give up hope, often just staring at their cellphones.

So many of the students I saw were

bored. Observing students at all grade levels, I found most high school students bored by class and engaged only with their phones. Junior high kids were wrestling with puberty, fighting and teasing each other, and sometimes sleeping during video presentations. In elementary grades, many students were far behind by third grade, antagonistic to math and unable to read.

But Rockford Public Schools has one Montessori elementary school. And the day I substituted there, it seemed so different. The children all walked in a circle at the start, opening space as each child joined the circle. They all sat quietly then, and each child had the opportunity to make a statement, if they chose. And all of the other students sat quietly and listened intently to what the other children were saying. They clearly cared about each other. Then they got to select which project area they wanted to start their explorations in that day.

The children were happy and engaged and respectful of each other. Students study what they want, they can take a break to something different when they choose, and they get to work with friends or be alone. The whole experience was dramatically different from what I had seen before.

I wandered the classroom, but I was really superfluous. In other elementary schools, I was policing children to see if they were working or if they understood what they were doing. But in Montessori, I asked kids to explain their projects, and they proudly helped me understand. They knew exactly what they were doing and why. Occasionally kids changed projects. There were rare disagreements, as kids wanted to work alone, or with a special friend. But instead of screaming and tantrums, they went to me or the teacher to get assistance in finding a compromise. “I want to be alone now, but I’ll work with you when I finish this by myself.”

Many teachers in conventional classes are struggling. Many are devoted to the children, and see them suffering, especially when parents are not able to support their children with homework or to attend parent-teacher conferences. But many who have been at it for several years are looking to get out of teaching, discouraged by frustration with the system. However, in the Montessori class, learning looked like fun. The teacher and students were having a blast, and loved learning.

I wish that all adults in this nation, especially school board members, parents, taxpayers, and senior citizens, could have the opportunity to visit and observe a Montessori classroom. How wonderful it would be if everyone started their education enjoying learning, being kind and respectful of others and themselves. Thanks to Montessori for showing us one way to get there.

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