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"School Won't Change – Until We are Brave Enough to Change the Way We Teach Teachers"*

***Said by Harry Roman's High School Science Teacher, Morris Lerner.**

(Continued from April-May 2015 Issue)

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Teacher, Author, Inventor & Retired Engineer

Teaching Teamwork

The currency of the business world today is team-based, head and hands, problem solving….so teach teachers to do this while in school, study the dynamics of team-building and operation, and the leadership of student teams. This is where giving student teachers a big dose of STEM/STEAM concepts will go a long way. Using invention notebooks and being able to seriously work with students on written and oral communication will produce big dividends in college and on-the-job. Demanding and grading good communication skills should be the job of all teachers.

Co-Teaching

Teacher teams that experience the co-teaching of subject matter is vitally important, as business prides itself on inter-disciplinary, multi-faceted problem analysis. For example, when attempting to install large scale applications for a solar power station – something on the order of several hundred acres…have a team of student teachers (in the disciplines of science, math, environment, history, and geography) assemble to discuss the analysis and explore how these disciplines are connected. Develop solutions that take into account all subject concerns, a mediated solution if you will.

Paying Extra Attention to Grades K-4

Whenever I visit a school, I always ask K-4 teachers why they became teachers, invariably learning they love children….and that is a good thing. I also learn that most of them shoot for these grades because they are not good in math or science…a big problem. Turning children off to math/science in the early grades makes it very difficult to get them back, especially when 70% of the annual economic growth of our country comes from high tech; and critical jobs that need to be filled in areas that support such growth are going unfulfilled. Target K-4 teacher education for major overhaul, teaching teachers to pay lots of attention to math and science! It is vital to our national economy and the rounded education all students deserve. Build the math especially into the lower grades. Show how it works.

Subject integration is an important issue here as well. Students in the formative grades need to think in an integrated manner, seeing problem solving as an iterative process. Coupling this with good communications skills is a powerful approach that will demand new teaching paradigms for collegiate schools of education.

Asking Questions is Very Important

Teachers need to encourage students to become question-askers, seeking to know as much as possible about things being discussed in the class, or where trying to complete a team-based design challenge. It has often been said that smart students know the answers to questions, but gifted students are the ones who ask the key questions, cutting to the heart of the problem.

Oral/Written Communication Skills

Teachers must have great oral/written communication skills – the enablers for all the other skills; and they must be able to work these skills into everything they do in the classroom – exercises, design challenges, general written work, etc.

No More Zero-Sum Outcomes

I see this all the time when the new teaching process *du jour* comes to town. It gets treated like a new course to teach….and since most of the academic day is already assigned to subject matter, the new approach becomes something like an elective, a special class, and after-school activity, or even something else. I see this in the current STEM/STEAM model, and it frosts my "you-know-what." Integrate the damn curricula and move toward a two-tiered kind of educational model. Start with selected dissertation delivered topics in the morning with the cherished class bells; and by afternoon, the students work in studio formats applying what they are learning…..and no class bells. Eventually, no bells at all. In the world of business, there are no bells and the employees are learning all day from each other.

Look for the connections between subjects and how clusters of subjects can be taught together such as math, music, science, and art; or maybe social studies, civics, geography. Turn the pizza-pie slice model of education on its head as it should be. In the 1970s, industry abandoned the piece-meal model of the assembly line on its head and started concentrating on the total quality of the whole product, using employee teams as their central focus for continuing education on the job.

Remember the Ford mantra…."Quality is Job 1." That was 45 years ago. So isn't it time for schools to catch-up? Total product management is just an analogy for on-the-job integrated learning and problem solving. Business employees are constantly applying what they just learned. Why can't students do so every day in their schools?

In retrospect we not only need a radical new way to teach teachers…..but the collegiate professors as well, the delivery system for making new teachers…..needs to change as well.

Epilog

As I look back on that life-changing two years in high school, I think it really was a high school G&T course, an urban oasis, with many incredible innovations. About half of the students who took Morris Lerner's integrated science class placed in the top 30 students out of a graduating class of 635. The school's three co-valedictorians came from that group. It was the best educational experience of my life; and I was incredibly fortunate to have met and befriended such an incredible science teacher, who incidentally was president of the National Science Teachers Association (NSTA) in the 1970s. Morris later went on to found Newark's nationally recognized Science High School, still vibrant and challenging as he had original conceived it. I owe this man more than I can ever repay. Before he passed in 2008, he gifted me with his personal technical library, books I treasure beyond description. I miss him terribly; but know full well my responsibility to influence others to make school better than it is today…..to pass the torch and keep the light glowing bright.

Additional Reading

For more about my thoughts on gifted education and what tomorrow's school might look like, check out my previous writings listed below.

Teach STEM Right – Change the Academic Day! ***Gifted Education News-Page***. Volume 23, No. 2, Dec. 2013/Jan. 2014.

Solving Real World Problems in the Classroom – A Realistic Application of STEM/STEAM Principles. ***The Journal of the Illinois Association for Gifted Children*** (IAGC). March 2014.

Changing Education-Thoughts about Creating and Inventing Tomorrow's School. ***The Journal of the Illinois Association for Gifted Children*** (IAGC). March 2015.

Defining What Characterizes a Great School for the Gifted. ***Gifted Education Press Quarterly***. Volume 29, No. 2/Spring 2015.

See information on Harry Roman's Latest Book, Just Published by Gifted Education Press:

How an Engineer Uses Math – Real World Practical Examples for the Gifted Classroom in Environmental, Power, and Energy Areas – Middle and High School (2015) by Harry T. Roman**.**

Excellent introduction to real world math, science and engineering problems. http://amzn.to/1GEklCn