Harvard Think Tank...Advanced Leadership Initiative

April 23-25, 2015

Harvard Graduate School of Education and the Charles Hotel

Change in schools/education is both a complex and a challenging task. SLIDE 2, 4 & 5. The sheer enormity of the numbers can take one's breath away. Slow change is characteristic of both K-12 and Higher Education (private and public) because it requires consensus, in many cases. And, of course, since everyone has attended school, everyone knows what is best at K-12, at least!

Often the change requires retooling the educators and then maintaining the new skills and knowledge before an idea can be introduced/translated into practice. Educators must know their subjects. Too many teachers are instructing out of their certification right now and are not being properly trained.

The president of Mitre Corp, who was helping me to organize a Superintendents' group focused on technology use in schools in the 1990s- with the resources of that company— which addressed Virtual Reality technology in the late 80's, (I was able to try some of the early prototypes) was astounded that I needed agreement to move any agenda item. He said in his field, he, as CEO, could command responses and get results.

There are issues that are relevant today that have not made it into the fabric of K-12 schools. And because K-12 education is state controlled and some states allow local control (MA), the principle of "if it isn't invented here, forget about it" often prevails with much unnecessary duplication of effort and squandering of the valuable and scarce resources of time and money.

So what to do about sustainability? The solution is actually not rocket science! but it requires leadership and persistence. And it is urgent. At this

time, we exceed Malthus' prediction about the viable population of the world.[1]

First, it can be incorporated into the curriculum starting quite early, in pre and elementary school where students are natural engineers and scientists. Either by mandate or adoption. MA has several examples of how changes can be effected by mandate: Chapters 766 and 622, the MCAS are the most prominent ones. But that requires a state plan and we have a model in the MA STEM plan.

Just last month (04/06/15) an email announced 4 Super Sustainability Apps for Students. SLIDE 6. People are beginning to get what I stated above!

Teaching children about how important conservation is, how to avoid waste, can be done. I think back to the days when we paid no attention to how much paper we used with the mimeo and ditto machines…. I remember when the junior high school in Newton I was teaching in, was chosen to be given a Xerox work horse machine and we were able to control the number of copies we made!!

I was pleased when we renovated/built schools in three (Lexington, Easton and AB) of the six districts I served in, how we could use the project and the plans to get students involved in analyzing what is needed for infrastructure rather than simply the adult (which is also not to be overlooked) since educators have to create the appropriate environment and model the behavior they want students to engage in.

In the schools we would have 21 century learning (or next generation education), that is,

• Active relationships between practicing STEM professionals & educators in the schools & between students & the community…students working collaboratively to solve authentic challenges the world faces…such as sustainability

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[1] Malthus, among a long line of thinkers, worried in 1798 that the earth can sustain 5B people. We are at 7 B.

• Places in the schools where kids could play, make "things" with their hands (Maker spaces!), experience materials

• A technology device for everyone

The last item is almost unnecessary to mention. Once when he was asked about to whom he would give the newest technology, David Thornburg, the futurist, said, "Kindergarteners not HS seniors. The former will need to deal with tools more closely related to the latest current version when they grow up." The topic of technology is now a given…it is not will it be used it but how will we use it wisely and appropriately?

We need to encourage students to use the technology for sustainable objectives:

- **mining gold from discarded electronics (Boston Globe)**
- **creating peat moss from paper (Sharks)**

Second, sustainability can be modeled. I used to walk the school corridors and pick up trash. Often I was told by students as well adults "to leave it alone" because the custodian could do that.

In the areas in the school where it made sense (cafeteria and hallways), we allowed students to paint murals…the lesson was "respect the environment because your colleagues contributed to its enhancement."

We need an educator preparation program which enables teachers, particularly for early childhood and elementary education which provides them with the knowledge, practice and tools to enable 21st century learning including the concept of sustainability and of developing "habits of mind." (Art Costa). Habits, once formed, are difficult to change…that can be good or bad, as we all know. We must help students develop the good habits, both of mind and of body. We can teach such small habits as:

Turn off the car engine

Turn off the lights

Replace light bulbs with energy efficient ones

Recycle paper

B. Schools can recycle and reuse (MITRE's word). This is a visible continuous act that everyone in a school can engage in which reinforces good behavior. All of us are now used to seeing and participating in recycling in our homes, the streets of the city and in many cases (but it should be in all cases) in schools.

One interesting challenge right now is food service…how to make it appealing to and nutritious for students so there is no "plate waste". Schools can compost organic food waste from the cafeteria. SLIDE 7

Another tack is to build new schools to be green. There is a Green Schools Alliance. SLIDE 10 and the Boston Architectural College has been working on green architecture for a while.

And schools can involve the opinion makers…the stars and the athletes…for better or worse they play an important educational role. SLIDE 8

Thirdly, in MA and Iowa where I am working on STEM education…actually I am interested in global STEM education...that is preparing students to work in STEM professions in the global arena…we are asking students to solve challenges presented to us by multinational companies …we are asking students to model the behavior they will need in their future—actually now it is their present…starting on the road to being able to claim that studying STEM will create great solutions to the world's problems and interests. SLIDE 9

4