Education as Rocket Science

(A new metaphor)

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"they [the television networks] are still counting horses,
while the world has moved on to counting locomotives."

– Andrew Rasiej

The metaphor of locomotives vs. horses—i.e. of newly acquired, greatly enhanced power in the world that is not yet fully recognized—is a useful one. In education, we can, and should, I suggest, take the metaphor several steps further.

Although we still do herd our kids into classes, they are not, metaphorically speaking, horses. Nor are they locomotives, which, although more powerful, need to stay on tracks that have been laid for them. Nor are they cars, or other vehicles that must remain on a two dimensional surface (they have, among other things, all moved to 3D.) And they are not even jet airplanes, which, although fast, typically fly through the sky on fixed routes so they won't crash into each other.

No, metaphorically, our kids are rockets. Which makes educators, metaphorically, rocket scientists. (Who knew!)

What makes today's kids rockets, rather than anything else? Certainly, at first blush, it's their speed—they operate faster than any generation that has come before. Although nothing may have changed in the rate kids grow up emotionally, there has been enormous change in what today's kids learn and know at early ages, and, therefore in the rate they grow up intellectually. "Kids getting older younger" is a term long in use at MTV. Although parents

and teachers still struggle with old definitions of "age appropriate," the term's meaning has changed so much we can hardly recognize it. Even followers of Piaget, such as Edith Ackermann, suggest it is time for a new look at his categories. And while some bemoan this increased speed and want to slow kids down, speed is clearly the reality of today's life, and especially the life of the young.

But what makes today's kids rockets is not just the increased speed. Like rockets, our kids are headed to far away destinations, places that often those who launch them can't even see. They have been designed (by their 21st century upbringing, especially by the Internet and the complex games many play) to explore, and find out for themselves what works. Like rockets, they often cannot be controlled at every moment, but are initially aimed, as best we can, in the right direction, with mid-course corrections to be made as necessary. And because both kids and rockets are difficult to repair in flight, they both need to be made as self-sufficient as possible.

As with all rockets, our kids' fuel mix is volatile. Some blow up. Some lose their guidance, or their ability to follow direction. Some go off course or stop functioning unexpectedly. Some are faster, and go farther, than others. But many more hit their mark, and it is the job of the rocket scientists to help them do so.

Perhaps most importantly, today's rockets—and kids—can, potentially, go much further, and do things far beyond what any such voyager could do in the past. With the arrival of widely distributed and easy-to-use digital tools, our kids already accomplish, on a daily basis, things that still seem, for many of us, far-off science fiction. They communicate instantaneously with, and learn from, other kids around the globe—*ePals*, the electronic interchange site for kids, reaches every country and territory. They regularly make videos and post them for the world to see and comment on—*You Tube* now has now more video than the US TV networks have created in their entire lifetimes. They organize themselves socially and politically across and throughout the planet—governments have already changed policy because of this. *The Globals* is the name the pollster Zogby gives to our "rocket" kids. *The Galactics* is perhaps even a better name. Most of today's kids realize this, at some level, even though many of the adults in their lives don't.

Educators as Rocket Scientists

What does this imply for those whose job is to educate today's kids—kids who can fly around the globe and beyond, further and faster than we ever thought possible? It tells us that we must conceive of what we educators do in a new

metaphorical way—not as teachers, but as rocket scientists, building and sending off the best rockets (i.e. students) we possibly can. This means, for one thing, not filling our rocket students up with the old educational fuel of the past, because that fuel just doesn't make today's kids go. We need new fuel, new designs, new boosters, and new payloads.

How do "real" rocket scientists prepare their charges for success? For one thing, they understand that their rockets will likely encounter many unforeseen events and trials, so they work hard to build into the rockets' "brains" (i.e. their software) enough intelligence to get the job done with the minimum of outside help. They build in to the rockets the ability to self-monitor, to self-assess, and to self-correct as much as possible. They create the ability for their rockets to use whatever devices and instrumentation are available to regularly gather data and then analyze it, even as they are speeding along. They perform rigid quality control—not of what the rockets' brains know—that is updatable on-the-fly—but of what they can do with the information they encounter. And while they may pre-program a target, they know that the target will likely change mid-course, and that there are likely to be other changes during the course of the rocket's life.

A Useful Perspective

Seeing our students in this new way—i.e. as rockets—and ourselves as rocket scientists, is incredibly useful and helpful for educators to do. One key reason is that it encourages educators to set the bar for student achievement extremely high—much higher than we currently do. I have often heard educators say that they were "blown away" by what their students accomplished. We should not be blown away by our students, we should be expecting *even more* from them.

Rockets are high-maintenance, and often do require more of our effort and skills to build and keep-up. They are also useless on the ground, so that is not where we should prepare them to stay (many of the skills of the ground, have, in fact, been taken over by machines, are no longer needed for them.)

Exploration or Destruction?

What we want is for our rockets, and our kids, to "boldly go where no one has gone before." Depending on the payload installed in their heads at the beginning of the journey, our kids (like real rockets) can be powerful forces for exploration and change, or potential weapons of destruction. Educators (along with parents) install the payload in the rockets that are our kids. Then they send them off to fly into the future, hoping they have prepared them

well for what they will meet. Obviously, it is preferable to make the payloads positive, which is why installing ethical behavior—the ability to figure out the right thing to do and to get it done—should be our number one concern as "rocket scientist educators." Our task is to best configure students' brains so they can constantly learn, create, program, adopt, adapt and relate positively to whatever and whomever they meet (and in whatever way they meet them, which increasingly means through technology.)

The most important changes required of educators are not technological, but rather conceptual—and thinking of themselves as rocket scientists, working with their living, breathing "rockets," as partners. No one—certainly not me—advocates throwing away the past completely. But unless we start preparing our kids to fly really far, and land safely we won't be doing them much good. If we don't start putting some new and different payloads and fuel into the rockets that are in our charge, they will never get off the ground.

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