

## Getting Started in Educational Futuristics\*

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### Abstract

*K – 12 administrators, teachers, and students can better appreciate the learning rewards possible from Educational Futuristics through employ of action projects. Twelve are outlined below, each well suited to student age and course-specific adaptation. Affordable, engaging, and pragmatic, they combine fun with "take away" lessons of lasting value. Careful to mix research with discovery, and scholarship with creativity, the exercises foster cautious optimism, a value at the core of Educational Futuristics. In combination they should help everyone in K-12 education feel a bit more equal to our responsibility to promote a still finer future.*

**Keywords:** Action Projects, Cautious Optimism, Educational Futuristics, Finer Tomorrow, K-12 Education

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Using Educational Futuristics is far easier than the little-known term itself might imply. Below are twelve introductory projects that build on many others in my 2008 volume, *Anticipate the School You want: Futurizing K-12 Education*, and still more demanding ones in a 2010 book now at press – *Creating the School You want: Learning @ Tomorrow's Edge*). The first three projects call the attention of youngsters to false claimants, to future-shaping role models, and to future-shaping events in the year of one's own birth. The next nine projects involve a wide array of forecasts students should profit from exploring - forecasts I label Solid, Pop Culture, Film, Body-Building, Simulation, Social, Green, IT, and "Way Out." Best when custom-tailored to the unique "chemistry" of a class, school, or district, the twelve projects can help everyone (youngsters and adults alike) begin one of the most engaging and rewarding of all across-life learning adventures – the tracing and assessing of links between past, present, and future, the better to help us make progressive choices among consequential alternatives.

1. Pretenders. Educational Futuristics can be introduced into a school's culture by helping students differentiate between serious forecasting and the smarmy stuff they too often confuse it with. Unscientific hoaxes here include astrology, card reading, clairvoyants, Edgar Cayce forecasts,

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\* A longer and more detailed version appears as Chapter 3 in Shostak, Arthur B., ed., *Create the School You want: Learning @ Tomorrow's Edge*. Lanham. MD. Rowman & Littlefield, 2010 (at press).

Jeanie Dixon forecasts, the I Ch'ing, Ouija Boards, palm reading, Nostradamus forecasts, Tarot cards, and other shams shamelessly promoted to the gullible in supermarket tabloids and through mind-bruising cable TV stations.

Youngsters are especially vulnerable to "truth claims" of seductive infotainment TV or movie units like "Fast Forward," "The Twilight Zone," "The Outer Limits," "That's Incredible," "The Sixth Sense," "Poltergeist," and "Zeitgeist the Movie" – all of them artful exercises in mind-bruising nonsense. TV's "FastForward," for example, asks in a doltish way akin to astrology silliness - "Are our life paths written for us when we come out of the womb, or do we have a choice?"<sup>1</sup> The claims of such pretenders reduce to "an obfuscating amalgam of theory and conjecture, reality and fantasy, nonfiction and science fiction" best shielded against 24/7.<sup>2</sup>

Each of these forecast pretenders, alas, has its loyal supporters, many with a colorful bevy of supportive anecdotes, even if only secondary in nature ("I heard of someone who actually ..."). Accordingly, care must be taken to keep the challenge to unscientific hoaxes as civil, responsible, and even as cordial as possible. The target here is mis-education, and not its unfortunate victims. Diplomatically and softly, EdF-guided students could politely take a Skeptics Stance; that is, "show me an Ouija board that spells forecasting words with securely blindfolded participants." "Show me a Nostradamus forecast quatrain that unambiguously predicted anything before the fact." The principle of positive evidence, in short, applies to all such forecast claims, and appreciation of this should help K-12 students recognize and protect themselves against false forecasters.

2. Role Models. Having begun by helping young learners differentiate between serious forecasting and unworthy stuff, it might be wise to move next (or simultaneously) to highlight the ability of individuals – such as Aung San Suu Kyi (Burma), Bishop Tutu, Vaclav Havel, Nelson Mandela, Lech Walesa, and many others - to actually influence the future for the better – this a sound refutation of the veiled fatalism at the core of astrology and other such shams.

Contemporary future-shaping change agents like Greg Mortenson could get classroom attention. The famed author of *Three Cups of Tea* continues to open secular schools for girls in remote regions of Afghanistan (48 through 2009) and of Pakistan (131). His archenemies, the Taliban, want children educated only in their tightly controlled mosques – untouched by modernity and isolated from other faiths, so as to ingrain fundamental zealotry, recruit militants, and disempower females. Mortenson fights back by opening one-story rural schools for girls "that will bring along a new generation of kids who will have a broader view of the world ..."<sup>3</sup> His allies in native tribes "want to embrace modernity, open Islam to new ideas and empower Muslim women as much as men."<sup>4</sup>

Likewise, classroom attention could go to two future-shaping Americans who passed away in 2009 – Eunice Kennedy Shriver and Norman Borlang, as the accomplishments of both provide constructive role models. Mrs. Shriver is owed credit for helping to change how we relate to children with intellectual disabilities. Her work on behalf of the developmentally challenged included the founding of the first Special Olympics in 1968, an annual world-wide contest which now involves almost 3,000,000 athletes in over 180 countries. The Games made clear that through sports

children with mental retardation could realize their potential for growth, and their lives (and ours) have been better ever since. On her death her family's statement read in part – "She set out to change the world and to change us, and she did that and more."<sup>5</sup>

Norman E. Borlaug, in turn, is "arguably the greatest American of the 20th century," as thanks to his Green Revolution agriculture techniques "he saved more lives [perhaps a billion] than anyone who has ever lived."<sup>6</sup> The high-yielding low-pesticide "semidwarf" wheat and rice varieties Borlaug created in the mid-'60s raised yields as much as sixfold. This starved off famine in many developing countries, slowed deforestation, and led to slower population growth as education became more important to family success than muscle power. Winner of the Nobel Peace Prize in 1970, he defended the use of synthetic pesticides, inorganic fertilizers, and genetically modified foods as indispensable if millions were not to starve to death. Very much in tune with futuristics, Borglaug warned shortly before his death "the civilization that our children, grandchildren, and future generations come to know will not evolve without accelerating the pace of investment and innovation in agriculture production."<sup>7</sup> Little wonder that a journalist wrote on Borlaug's death - "Often it is said America lacks heroes who can provide constructive examples to the young. Here was such a hero."<sup>8</sup>

3. Birthyear Markers. One can "pick a year, any year, in the last, say, 250 years, and you will find it pregnant with consequential births and battles, inventions and publications that made modernity."<sup>9</sup> Youngsters can be asked to study the year of their birth and identify in it some of the major events that seem to have had the greatest impact to date on their own lives, and on those of over 300 million Americans and over six billion other people alive today.

For example, in 1937, the year of my birth, GM, introduced the automatic transmission option, a technological game-changer that enabled many new millions to drive for the first time. DuPont patented a new plastic called nylon, and changed fabrics for all time. The first Dr. Seuss children's book was published, and that genre forever after glowed with covert lessons in morality. The first McDonald's restaurant opened, leading far too many to indulge in "fast food" over-eating excesses which we are only now seeking to rectify. F.D.R. "gave in to the deficit and inflation hawks, with disastrous consequences both for the economy and for his political agenda."<sup>10</sup> Were I still a student in the K-12 progression I would profit as a learner from having to explore and later explain to my peers the lasting significance of one or more of these benchmarks.

Care should be taken to note the benefit of hindsight, the extraordinary variety of elements in how things unfold, and the idea that the future is almost never a linear extension of the past or present; e.g., "Gutenberg thought he'd print a few Bibles, and that'd be that; in the 1940s the head of IBM said America would need about half a dozen computers; and Alexander Graham Bell believed the telephone would be used only to tell people to expect delivery of a telegram."<sup>11</sup>

When youngsters have enjoyed learning more than ever about the year of their birth, they can try their hand at "connecting the dots" between events back then and current matters. In this way they can learn to appreciate the ability of select events to cast a long, though not a linear shadow. As well, they can learn that an understanding

of where major policy arguments seem to be heading, as in the case of global warming responses, or efforts to expand job opportunities, requires first knowing the history of where the issue began.<sup>12</sup>

4. Solid Forecasts. Youngsters will appreciate learning how some aspects of tomorrow can be forecast with useful accuracy and reliability. An EdF -oriented teacher could explain the development of weather forecasts, a very familiar and widely accepted aid. Students could discuss what difference such forecasts as part of radio and TV "edutainment" makes in our lives; e.g., "Americans are weather junkies. ... An intelligent forecast enables them to plan their lives a little, instead of passively awaiting the atmosphere's surprises. Foreknowledge mitigates the tyranny of nature ... if you know what the weather (a prime force in the world) is up to, you are somehow, obscurely, but actually, in control of it."<sup>13</sup>

Each class member could be assigned to uncover a like example of a forecasting tool worth knowing about, that is, one that is comprehensible, cogent, and significant. In 2009, for example, we learned for the first time how to accurately forecast which side would win a case in the Supreme Court. Research into some 2,000 arguments and more than 200,000 questions from the Justices confirm that the relative number of questions asked is a powerful predictor of outcome: "The more attention justices pay to a side, the more likely that side is to lose." Lawyers appearing before the Court are well advised to avoid being questioned – lesson youngsters might recognize from tense interactions with their folks.<sup>14</sup>

5. Pop Culture Forecasts Youngsters can be invited to analyze the lyrics of music groups and solo performers (long past and current alike) to uncover what, if anything is said about tomorrow. An EdF-oriented teacher could guide discussion of the findings, and ask class members what they might urge performers to say about the future? Particular attention could be paid to bands with seemingly relevant names; e.g., in July, 2009, groups that call themselves "Dear Future," "Culture Hacking and Networking," "Sonic Youth," and "High Council" all played in Philadelphia, my home town.

EdF students could pay special attention to the remarkable 20-year old pop culture phenomena known as the Oprah franchise, an operation with a distinct future-making orientation. Forty million people – undoubtedly including some in a student's extended family or his or her neighbors - watch the Oprah Winfrey TV show each week, and two million copies of her "O" magazine sell each month. Oprah also has her own satellite radio channel and a very popular Web site. Much good advice is offered about ways to improve your diet, enjoy exercise, take charge of your household finances, reduce stress, and in 101 other ways, work to secure an ever-finer personal future. Forecasts-of-a-sort by guests are a mainstay, as her show is "all about second and third chances to fix your life, and the promise that the next big thing to come along will be the one that finally works."<sup>15</sup>

Critics, however, warn many guests pitch wonder cures and miracle treatments that "are questionable or flat-out wrong, and sometimes dangerous."<sup>16</sup> EdF-guided students could assess the quality of certain claims and counterclaims made concerning future-shaping items (products and behaviors, like diets and dieting), noting carefully the reliance Oprah puts on viewers and readers to take responsibility for shaping their

own finer future. As well, they could discuss the part such mass media shows play in shaping the general public's understanding of our responsibility for the quality of the personal and public tomorrow we pass along.

6. Film Forecasts. Students could do a content analysis of films like "A.I.," "E.T.," "Close Encounters of the Third Kind," "Wall-E," and other Hollywood explorations of tomorrow (including far darker post-catastrophic films like "Children of Men," "Cloverfield," and "I am Legend."). They might discuss aloud chilling future-set films that would scare them with implacable interstellar menaces intent on ending human survival or mad scientists intent on weaponizing weather to create droughts in the southwest or sandstorms in Saudi Arabia.<sup>17</sup> They might explore their feelings after watching "Defying Gravity," a weekly TV sci-fi series whose star, a flight engineer, is "tormented by memories of a previous mission when he had to abandon two fellow astronauts on Mars."<sup>18</sup> Guided by an EdF-oriented teacher they could use media as a springboard for getting at rich learning material.

The "Star Trek" phenomena, a collection of eleven feature films, six TV series, and the promise of still more to come, offers rich EdF-related material. It began in 1969, "quick and wry, injecting the frontier spirit into the galactic void, and it managed to touch on weighty themes:<sup>19</sup> Students will be quick to recognize Chekov, Kirk, Picard, Scotty, Spock, and others from the multi-ethnic U.S.S. Enterprise, along with creatures born only (thus far) of the fertile imaginations of writers of science-fiction. Lessons can be drawn in matters of American exceptionalism, conflict resolution, cultural diversity, cultural relativism, ethics, exobiology, human relations, immigrant individuality, inter-species relations, space settlement, tolerant exploration, utopian thought, and war and peace, among scores of K-12-relevant topics.

As well, students can wrestle with the Dark Side: "There are cultures that seek the destruction of others, desires that disrupt harmonious ambitions, powers that render virtue powerless ... Kirk, after all, is an iconoclastic military leader, the Enterprise is often in combat, and best intentions are often stymied by the need to fight."<sup>20</sup> To top it off, students can assess many science falsehoods scattered across the series, such as the seeming ability of mankind to out fly the speed of light, and discuss the ethics of putting mis-education in front of mass audiences. (As Scotty often said, "Ya canna change the lays of physics, Cap'n.")<sup>21</sup>

7. Body-building Forecasts. Youngsters could be given an opportunity to "engineer" a better human out about 25 years from now – a time when many may be at a peak in their personal development, their earning power, etc. This project requires uncovering assumptions about everything possible, probable, preferable, and preventable between now and then – one sweet learning exercise.

After students have divided themselves into small project teams (the better to practice vital social skills), they should be asked to do research on the Internet and in the school library to help answer several key framing questions; e.g., what do they imagine the climate might be like a quarter of century from now, and why? Which of the human senses might one want to augment, and why? And what contribution would they hope to get from incredibly small, powerful, and "smart" computer chips – possibly as embedded body parts – and from advances in artificial intelligence, biotechnology, genetics, nanotechnology, etc.?

Classroom discussion should explore the answers; care being taken to underline the legitimacy of wide variance and the utility of alternative perspectives. Then the fun can really begin, as each team is set loose with art supplies or model-building balsa wood to create the most desirable human body a quarter century from now – perhaps a hybrid of natural and inanimate parts as glimpsed today only in science-fiction. On completion of their Frankenstein-like/"Terminator"-like creation, each team would explain and defend their choices in a wrap-up class likely to prove one of those talked favorably about long after.<sup>22</sup>

8. Simulation Forecasts. Over 40 million copies of SIMS games and their various expansions have been sold since 2000, in large part because youngsters appreciate how they differ from standard escapist video games in their "exuberant, big-hearted, unabashedly joyful embrace of the minutiae of daily middle-class life."<sup>23</sup>

Students in an EdF-guided curriculum may learn much of value from the newest SIMS release, *The Sims 3*, as it offers a rare opportunity to explore the consequences of future-shaping choices made across a lifetime for the player and his/her significant others. The player begins by making a person, and defining its personality. Then he or she autonomously ages, makes friends (or not), falls in love (or not), gets married (or not), has children (or not), advances in a career (or not), and dies. Across a life the player interacts with many co-workers, neighbors, and others according to the personalities and schedules of them all, since the game takes up and manipulates the lives of the others.

While immersed in a virtual world of remarkable similitude EdF-guided players will find themselves challenged by such maturing questions as what kind of person am I, and would I like to be? How do I treat others? What is really important to me, what are my core values? Above all, what sort of future do I want to help shape, and how can I go about it? An admiring critic has written of the experience: "Most video games exist to allow the player to forget completely about the real world. The Sims accomplishes the rare feat of entertaining while also provoking intellectual and emotional engagement with some of life's fundamental questions."<sup>24</sup>

9. Social Forecasts. Special attention could be paid to non-material innovations of direct relevance to K-12 students; e.g., the Free Range Movement is a new effort to give youngsters a different kind of childhood, one far freer and more trusting of children than the parent-centered model now in vogue. Among other things it exposes how low are many scary future risks – such as that of child abduction – which are exaggerated by the media, and therefore, irrationally feared by unnerved parents: "... we have it all wrong. Our kids are more competent than we believe, and they're a whole lot safer, too."<sup>25</sup> Young learners could study the Movement's upbeat origins, its rapid spread from coast to coast, and the implications of its 14 Free-Range Commandments (Avoid Experts, Be Worldly, Get Braver, Listen to Your Kids, etc.) for the style of child-rearing they themselves might chose later in life (to say nothing of an effort some might then make to get their folks to adopt a Free Range style).

Likewise, students could study and assess the ongoing social movement that targets certain behaviors of young people and seeks to redirect them. For example, momentum grows to tax the sugar-sweetened beverages that appeal to young people. This would allegedly help curb that desire, help reduce obesity, help reduce health-

care costs, and also help pay to reform health care. Obesity is the core issue, as along with diabetes, it is the only major health problem getting worse in the U.S. Some 19 percent of youngsters are obese.<sup>26</sup> The proportion of overweight children, age six to eleven, has more than doubled since 1999, while the proportion of overweight adolescents, age twelve to nineteen, has more than tripled.<sup>27</sup> Teachers consistently hold lower expectations of overweight children, and three out of five of the heaviest youngsters have been teased at school.<sup>28</sup>

Today, soft drinks, which account alone for about seven percent of all the calories consumed in the U.S., are "the number one food consumed in the American diet."<sup>29</sup> Prohibiting soda and candy machines in schools is being tried across the country, as the soft drink industry caps calories and reduces portion sizes. Ban supporters liken it to the crackdown on smoking, especially the September 2009, ban on the sale of favored cigarettes that allegedly lure children and teenagers into smoking.<sup>30</sup> Opponents think it – and a related call for a penny per ounce "fat" tax on sugary drinks – a sure cause of price increases and an "unnecessarily punitive and stunning example of the government acting in loco parentis."<sup>31</sup> Backers, in turn, forecast at least a 10 percent reduction in use of sweetened drinks and the ability to use tax revenues to fund health programs.<sup>32</sup>

EdF-guided students could weigh the merits of school bans on soda sales on the premises versus reliance on consumer education, the preference of the soda pop industry association – as the dispute links to a major future-shaping matter, the question of whether the market or the government should decide such personal matters as what we eat or drink.

In their turn, college-bound high school seniors could learn that for the first time they can now rent, rather than have to buy their textbooks. As these books are the largest expense, after tuition, room, and board, and their cost has kept rising outrageously over time, this would seem a useful bit of future-aiding information. Students could assess its value, the origins of the idea, the ways in which the idea might be replicated, and other such spin-offs.<sup>33</sup>

Attention could also go to ways of assessing future-shaping and age-relevant innovations that presently elude trustworthy assessment. High school seniors, for example, could learn that while online-dating services may have changed romance for millions, experts agree it is presently much too difficult to reliably forecast where such dating relationships wind up. After a decade in which "electronic winks and flirts may have proven more fruitful than bar pickup lines," academic researchers can still not find reliable ways of counting online-originating marriages: "Claims that such dating leads to hordes of newly wedded couples may be fairy tales."<sup>34</sup> Students could analyze barriers here to research, and gain a healthy skepticism where similar situations have vendors plying insupportable forecasts of product prowess.

10. Green Forecasts. Given our increasing desire to mitigate the worse effects of Global Heating, students could pay special attention to marketplace offerings of untried variety. For example, vendors are forecasting impressive gains if households (and school buildings) switch to white or "cool color roofs," or the use of a shiny plasticized white or brown or green covering that "experts say is not only an energy saver, but also a way to help cool the planet ... turning all of the world's roof 'light'

over the next 20 years could save the equivalent of 24 billion metric tons in carbon dioxide emissions." As this is what the whole world emitted in 2008, it would be the equivalent of turning the world off for a year – a far-reaching claim for white-roof installations likely to captivate youngsters.<sup>35</sup>

EdF-oriented attention here might begin by noting the idea has a "long and humble history. Houses in hot climates have been whitewashed for centuries." As well, students could usefully ponder the forecast that a conversion to white-flat roofs and cool-color sloped roof as far north as Chicago and as far south as Buenos Aires would reduce carbon emissions by an amount greater than taking over one-half of the world's passenger cars off the roads.<sup>36</sup> Impressed by such arguments, California, *the* point state in Green matters, began in 2009 to require all newly constructed commercial buildings with flat roofs to use white roofing, and in 2010, will pressure that new home and remodeling projects in the five hottest regions use "cool" color roofing.<sup>37</sup> Young learners could discuss how the pace might be quickened, as by tax lures, and whether or not it should be.<sup>38</sup>

Less conspicuous, but no less significant are new-to-the-market biopesticide pest-control products, such as botanical oils and boric-acid bait. They are being promoted as far less toxic than conventional synthetic-chemical pesticides. Fans of the new green products claim they primarily harm only target pests, which can help beneficial bugs and other animals. Students could study this new frontier in the age-old war between humans and insects, fungi, and weeds ... especially as Global Heating makes likely the arrival of new pests in places in America unaccustomed to them, this a vexing forecast well-worth student attention.<sup>39</sup>

EdF-guided students should study green reform ideas too readily dismissed as improbable, the better to help sharpen their skills in assessment of mind-stretching ideas. A radical plan, for example, calls for moving farms into the city, and growing crops in urban high-rise specially constructed (or renovated) buildings. Use would be made of soil-less hydroponic and aeroponic technologies, both of which require less water than conventional agriculture. The vertical farms could produce organic crops year round, free of risk of drought or flood damage. Jobs would be opened up for city-dwellers, tourists would be attracted to the sites, the crops would not have to be trucked great distances to reach consumers, and farmland could be returned to its original ecological state. Best of all, the systems could be installed in schools (and other buildings), thereby bringing agriculture directly to K-12 urban youngsters for the first time, an obviously rich source of learning.<sup>40</sup>

11. IT Forecasts. Students could assess the varied implications of cutting-edge IT products, especially items with particular interest to young people. Typical is Auto-Tune, a brand of pitch-correcting software invented in 1997 to make sure singers hit the right notes in the recording studio. It has been repurposed to allow performers to transform their voices into a robotic warble (or pixilated croak), a sound no human can sing in tune. Critics condemn it a symbol of all things artificial, unnatural, and dehumanizing: they insist natural flaws have contributed to the power of some of music's most acclaimed voices. Students, especially the music fans among them, could join an already heated debate, as the issue goes far beyond the Auto-Tune particular, and touches on the nature of desired reality in a preferred future.<sup>41</sup>



Apropos schooling per se, attention could go to the pros and cons of an ongoing revolution in educational technology. Typical are advances being made by cyber charter schools in the creative use of online learning. These virtual schools are of increasing interest to home schooling parents, charter school developers, and critics of "plain vanilla" public and private schools. Whereas only 13 states had 57 such schools in 2002-3, some 25 states had 190 schools in 2009-10, and more states and schools were being added to the ranks yearly.<sup>42</sup>

Critics warn darkly that distance learning risks neglect of inter-personal skills, as these are thought best nurtured in actual human contact. They also worry about an absence of non-computer-based activities, like community service projects, physical education, field trips, shop work, and so on. Some freely admit to being nostalgic for the brick-and-mortar model, and suspicious of a design that would seem to relegate it to the dustbin of history.

Proponents, in turn, counter that a mix of real and virtual schooling (say, 25/75) can adequately address the matter (as by having students come in to a hybrid school once every two weeks for lesson-based dialogue and socializing in clubs, sports activities, and the arts). They focus instead on the unique availability of asynchronous instruction by outstanding teachers offering a limitless range of subjects otherwise too costly to offer in actual school buildings.

The superintendent of a 500,000-student county in California, for example, explains, "we're still in a brick-and-mortar 30-students-to-1-teacher paradigm. But we have to get out of that framework to having 200 to 300 kids taking course online, at night, 24/7, whenever they want."<sup>43</sup> For example, at the NYCiSchool, Nobel laureates and NASA scientists deliver lectures and answer questions remotely. Its renown is such the city's Department of Education is now replicating the school's success in "incorporating technology into everyday learning."<sup>44</sup>

Students could join the debate, especially as some might then become future-shaping advocates, one way or the other. Given the momentum the cyber school movement demonstrates, questions about its future would seem to merit searching attention throughout the K-12 world.

Likewise, e-readers warrant attention by EdF-influenced students curious about possible, preferable, and preventable IT impacts on education. In 2009, Amazon's Kindle DX model stored 1,500 books, and offered another 300,000 for low-price sale (including magazines and newspapers). Better yet, it provided a text-to-speech option that had the machine read the material on the screen out loud. A rival product, the Sony Reader, while storing only 1,000 books, and offering only 150,000 for low-price sale, could hold more if you added extra memory cards. As well, it provided access to one million free books via Google, and had a touch-sensitive screen. Raising the bar still higher, Apple was expected to offer early in 2010 an e-reader that fops the features of preceding machines and can receive movies – this a very likely hit with many young people.<sup>45</sup>

Students can join the dialogue that has some worried about the future of print books, even while others forecast a welcomed rise in lifelong eagerness to read attributable to the fun many associate with e-readers. Related here is an ongoing shift away from print textbooks to digital versions, or lessons assembled from the wealth of free

courseware, educational games, videos, and projects on the Web: "Teachers need digital resources to find those documents, those blogs, those wikis that get them beyond the plain vanilla curriculum in the textbooks."<sup>46</sup>

A more general focus could involve students in the assessment of the mobile Web (where users browse the Web more on their cell phones than on PCs or laptops), a wireless breakthrough many expect to soon trump other portals. It could give youngsters better-than-ever 24/7 access to one another, from anywhere, even as it also improves oversight contact that parents and other authority figures commonly seek. In this age of constant connectivity and astonishing potential, students in an EdF course will readily appreciate we are only "at the beginning of what we can do with this knowledge-at-a-touch."<sup>47</sup>

Likewise, students might explore what IT industry insiders hailed in 2009 as the next killer app, the emerging social Web (Bebo, Facebook, Flickr, LinkedIn, MySpace, Unionbook, YouTube, etc.). Enthusiasts claim it will help users create distinctive high-tech electronic (virtual) "communities" that bolster high-touch solidarity among real folk.<sup>48</sup> Networked members will mingle, "trading information, creating alliances, doing favors."<sup>49</sup> Such claims are likely to intrigue young learners, so eager are many to find easily accessed settings, even if only virtual, in which they might feel newly valued and at home.

12. "Way Out" Forecasts. Even as "a man is not free to do that which he cannot imagine doing," so also are youngsters unable to imagine possibilities way outside their present awareness.<sup>50</sup> This can be remedied by a deliberately "silly"-seeming assignment, namely, the task of bringing in for class discussion a "way out" idea for helping to achieve a pro-future gain. For example, we might consider requiring high schoolers to serve immediately on graduation a two-year term in the military, the Job Corps, Vista, or any of many eligible NGOs. Or require the owners of vacant lots in cities to lease them at no cost to community vegetable gardeners. Or provide day furloughs for carefully screened prisoners who volunteer to tutor K-12 youngsters in school. The goal here is to stretch the minds of youngsters, and whet their appetite across life to consider high-quality offbeat notions worth a second thought.

In this same vein, but to turn to the natural sciences, a class could pass around a beaker containing algae from a pond in the wood near a school, and then learn wide-eyed about the incredible possibility here of our soon drawing on algae-based fuels. Around the world scientists are busy trying to develop next-generation biofuels from photosynthetic algae. Certain algae produce oils that can be converted into diesel and other fuels. What is not yet known is whether companies can make affordable, large-scale quantities of algae fuel.

Students could study the development process entailed in bringing this future-shaping matter along: "Getting algae fuel from the lab to the local gas station will be a tremendous undertaking – one that could require decades of work by experts in engineering, chemistry, biology, and an array of other scientific field ...If efforts to turn these single cells into 'oil wells' are successful, algae-based fuels could help meet the world's growing energy demand and help reduce emissions."<sup>51</sup>

Still more exotic, and likely of keen interest to certain students, is the "way out" possibility of our soon discovering we are not alone ... thanks to the 2009 launch of

the Kepler space telescope whose mission is to find planets outside our solar system that might be hospitable to life. Earth-like planets are common, and may occur in 10 to 20 percent of the stars, with about 330 already of interest. Kepler is "likely to send us evidence of hundreds of Earth-like planets revolving around hundreds of Sun-like stars."<sup>52</sup>

Experts in the matter are not Earth chauvinists, and they trust to the laws of physics working the same everywhere and producing the same conditions: "... if you have that many earths and you have some prebiotic soup, comets that bring in the organic chemicals that you need to have life, something is going to grow. You might not always end up with dinosaurs and cavemen, but there are going to be planets out there that will have primitive life. Life on Earth is so vigorous and so able to thrive and fill every niche, how could it not be elsewhere?"<sup>53</sup> This entire matter, of course, is a juicy matter for student reflection on significance and impact.

Summary. Employ of the twelve introductory EdF projects above should mix fun with effort, enjoyment with revelation, and peak "ah ha!" moments with regret the project is over. Similar projects are readily imagined, as in inviting youngsters to "invent" holidays worth marking in the future, such as annual celebrations of July 20, 1969, when a person from Earth first set foot on the Moon. Or a day hence when humans begin to live at a permanent Moon Station. Or achieve via synthetic biology cures for deadly forms of cancer, and so on. Or, class study of the 30 articles in the Universal Declaration of Human Rights, as adopted and proclaimed by the General Assembly of the United Nations on December 10, 1948.

EdF learning experiences should combine a modicum of (age-adjusted) research with much freewheeling creativity. All of them should help bring awareness of otherwise embedded value judgments about the past and present, and especially about the future. Grounded in cautious optimism, they should encourage responsible reform actions. Youngsters should take away from the experience a commitment to make as much of our future as our human limitations would seem to allow ... and then some.

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## Notes

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