

Good Roads and Potholes: Teaching Foresight to Younger Children

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Abstract

"Good Roads and Potholes" collects some of the lessons learned by the World Future Society (WFS) in exploring the concept of foresight with groups of children of elementary and secondary school age. The article covers past presentations, tactics and techniques and catalogues a range of appropriately successful outcomes. Groups range from Pre-K summer programs, to Cub Scouts, to national science and engineering competitions, as well as model programs in the environmental area. In addition, it captures a range of visions of the future developed by some of the groups of children with whom WFS has worked.

Keywords: Education, Foresight, Art, Visioning, Environment, Children, Youth, Engineering, Science, Futures, Trends

Introduction

This article will address lessons learned at the World Future Society (WFS) regarding teaching about the future to younger students. A good deal has been written about college and graduate programs on foresight and futures thinking, so this discussion will focus on the challenges of explaining the future to elementary, pre-elementary and early secondary students. The experiences in communicating ideas about the future and proactive thinking to audiences of students from Pre-K through Middle School have been very useful in refining our youth outreach programs. Although WFS has recently begun an annual international essay competition for high school students, that program has not amassed enough longitudinal data to offer any useful insights at this point.

I am reminded of an Asian Futures conference held on the Tamkang University campus in 2004. A number of educators and futurists were there and we were able to arrange some very useful discussions about the teaching of foresight to students of all ages. One of the common concerns among the presenters at this conference was that in most settings, futures studies was not introduced to students until post-secondary levels and many felt this was too late – that habits of thinking had

already been shaped. Ideally, the elementary or early secondary levels would be the best point to begin thinking about the future.

Joseph Coates, noted futurist and evangelist for foresight education, noted in a recent article in a collection edited by Arthur Shostak¹ that, "Each part of education is connected to the future – as preparation for a better, more satisfying or richer life; the preparation for successful and satisfying employment; continuing to expand one's horizons of knowledge and information; better understanding of public and political issues (which are always future oriented) to lure the student into better citizenship."

"We need," Coates goes on to say, "to run through the whole school system the teaching of how to explore the future, as an integrated part of all the substance of K-12. Included would be building the tools for thinking systematically about the future and about alternative outcomes and their consequences, and giving students experience in using those intellectual tools." He notes that, "Experience in exploring the future would give the students tools and the imagination to think through the choices that a local or national situation faces; how to size up a candidate for office and his or her agenda, and finally, to define new goals for one personally, for one's group or family, and for our nation and the world This is a very ambitious goal, a revolutionary one, and Coates admits that "Wishful thinking will not make this revolution come about" and that "Scholarly analysis will be of little or no help."

Our own approach has been more incremental, one institution or group at a time, demonstrating that interest in the future can be generated, creative ideas developed and constructive change planned. It has been a strategy of action more than words, especially with younger students. While I have spoken a number of times to high school groups around the world, I always feel I have made the most difference at the middle school level and younger.

We will start with our experiences with the youngest students and progress by age up to middle school, (grades 6-8, 7-9 or 6-9 – sometimes called Junior High). The information will be offered in a narrative and somewhat anecdotal format, with presentation materials included where useful. Some of the middle school programs were done in partnership with strategic partners, which consistently expanded our teaching capabilities. Finally, we will touch on one program in California in which the World Future Society was not directly involved, but which provides additional insight concerning the principles WFS is working to explore and refine.

Those experiential principles are as follows:

- Although different students do learn best through different media, we have found that the younger the student, the more likely it is that graphics will be the most effective mode of communication. This includes pictures and images combined with some basic verbal explication, but it also includes sessions of graphic creativity for the students to share their own visions of the future with visitors, teachers and fellow students.
- The most success has been achieved with learning-through-doing approaches, whether drawing, oral description, physical or CAD modeling, web site design, or essays. Comprehension and retention appear to be improved over mere reading, repetition or rote recitation.

- One measure of the success of educational materials or approaches lies in the level of student response, especially at earlier ages....the longer the undistracted engagement, the more effective the presentation or activity.
- As the age of the audience increases, the quality of response can be measured more directly, although the issue of third party influence becomes more problematic. While the Future City competition was intensely monitored to minimize excessive parent or even teacher coaching, the new WFS essay contest for high school students was done entirely as a remote exercise, and while participants were provided with guidelines, their observance was a matter of faith on the part of contest managers and judges (although some teacher certification was required).
- The best way to share the experience is to present the materials as they were offered to the student audiences....along with the responses (where available) received back from the students.
- Finally, although the future is not a subject that draws energetic response from all students, it does generate impressive results from those that do respond. Once again, this is related to age, with younger audiences demonstrating nearly 100% response within a classroom, but older groups becoming more self-selective in their interest and participation.

Encounters with Future Generations

Case 1: Summer Space Camp – pre K students – ages 3-6 years – Anne Arundel Community College near Annapolis, Maryland – AACC Institute for the Future.

The Summer Space Camp was an innovative pre-kindergarten program which combined traditional programming with some Montessori elements and visits from guest 'lecturers' (should such a term be appropriate at this age level). Appendix A offers the transcript of one such voice over presentation which was accompanied by graphic only slides. It provided an interlude from regular morning routine and appeared to positively engage the children. It is included as an example of how to initiate a discussion of future thinking, although unfortunately the follow-on discussion with the students was not recorded or otherwise preserved. However, the exchange was a spirited one and included discussion of a class project ongoing at the time, which was a space ship/space station built by the students from an appliance box.

PLEASE DRAW PICTURES OF YOURSELVES AND YOUR FAMILIES IN THE FUTURE ...

As the conclusion of this talk, the invitation for listeners to draw pictures of themselves and their families in the future was a key element, because it transformed what could have been simply watching another entertainment show to actively engaging the imaginations of these children in ways of their own choosing – literally placing themselves and their families inside that strange and open-ended "other world" the future.

Who Is the Future For? It's for You!

Case 2: Cub Scouts of America – local blue and gold dinner, Bethesda, Maryland - picturing the future

Essentially, any age group can think about foresight, either for themselves or society, but the level of self-guidance and abstraction increases with chronological age. Accordingly, when working with Cub Scouts, who are in grades one through three (six to ten years of age) there needs to be more structure and visual aids. In this case, I began with a stimulating set of materials to begin thinking in new directions. This meant a fifteen minute slide presentation with photos of cars, houses, space travel etc. in the future. The transcript for that presentation is included as Appendix B below:

The follow-on from this presentation was that the Cub Scouts were asked to think up answers to four questions about specific aspects of the future. The boys responded enthusiastically, and many produced intriguing and sometimes original ideas (see Appendix C below) But before we look at these, I'd like to review briefly the specific questions we proposed, and the general guidelines we asked the Scouts to keep in mind as they prepared their answers. First the guidelines:

The Guidelines:

- A. All ideas are good, even when they seem silly at first, because people made fun of many great ideas because they were too new.....
- B. Give everybody have a chance to talk about their ideas....
- C. Make sure somebody is writing down the ideas for the group, so they will not get lost even if we don't get them on the big sheets [see explanation below] and get them up here to us
- D. Actually, if one of the parents could do that, it would give the kids a chance to think about the questions and the most ideal arrangement is if family members from the same family are in different groups....just for something new... How about groups of four scouts and one adult?

The Questions:

1. Look at possible inventions...what are some things you can imagine that haven't been invented yet? How about a flying belt to wash windows on a skyscraper..?
2. Talk about your own future.....what kinds of jobs will people have the in the future that they don't have now.... How about space ship mechanic?
3. Talk about needs....what problems do we need to solve—some people think that this is the most important thing to think about in looking at the future...
4. Or tell us what you think is the most important thing to be concerned about for the future...Environment, Peace, Health, Jobs or what else? And why?

Try to talk about a few of these when reporting to larger group at the end, but even if you don't get a chance to talk then, we will get all your ideas from each small group and put them in the future story. We will get these answers back to you as part of a story about your future with your ideas included. We will try to see that each one of you have a piece in it....

Think about what you are doing as sending a message into the future, kind of like a letter to yourself – saying what you want your future to be like ..

Case 2: Follow Up

The images and ideas in this presentation were simply priming the pump for the flood of ideas and stories that poured from the boys after they were asked to describe the future as they saw it. While some ideas from the presentation were reflected in the pictures and narratives that emerged, it was much less than fifty percent. A substantial amount was new material, drawn from concepts the Scouts had previously internalized.

They divided into groups of five and worked on large sheets of butcher paper, both drawing and writing their ideas on the paper... Largely the boys did the many drawings on each sheet and volunteer scribes, often an adult or parent would write down the ideas as the boys expressed them. They spent nearly 30 minutes on this process, and a number of parents and scout leaders said during and after the ideation and recording process that 'they had not seen their boys so focused on any single project for so long before.'

As the boys were promised, we collected all of the short descriptions of the future and provided copies of every list to the whole troop so that each group could see the work of the others. We then took a subset of the ideas they had produced and wove these into a short narrative (1,500 words) for the boys to consider (as we had promised to do during the presentation). The list of future descriptions the Scouts produced are included as Appendix C below.

Case 3: Future City National Competitions - personal experiences... background

The Future City Competition <www.futurecity.org> is an educational outreach program of the National Engineer's Week Foundation. A secondary school program started in 1992 in five cities in the United States; it has expanded over the years to 40 U.S. regions and three international pilots, plus one spin-off program in Delhi, India at the high school level. This program has impacted over 500,000 middle school students during its existence, as well as the teachers, engineer mentors, judges, parents, and sponsors involved.

In addition to bringing the regional winners to that year's WFS annual meeting for a presentation of their designs, Future City staff have been active volunteers in Society planning and fundraising, and Society publications and reports have provided background for the research and writing aspects of the Future City Program. The Future City program involves four major steps. The student teams design a city of the future using SimCity4 software, and then build a tabletop model of that city on a budget, using recycled materials. They research and write an abstract of the city design and functions and an essay discussing the specific engineering challenge designated for that year's competition, such as the utilization of nanotechnology. Finally, they orally present their city design and issues before a panel of judges, as they proceed from the local level to regional and finally to a national finals.

Besides combining the physical and social sciences interactively, this program offers a much-needed focus on STEM [science, technology, engineering, and math]

skills. This is a positive aspect in a time of global economic downturn, especially relating to such areas as health care, information technology, environmental (green) industries, and manufacturing, which are presently in dire need of more interested students and ultimately more workers with those skill sets. As well, the experience provides an experiential learning opportunity in better understanding the critical 21st-century issues surrounding energy, water, transportation, and other infrastructure challenges, which every individual needs to better understand as citizens of their own countries and the world.

The opportunity for teachers in participating middle schools to team teach this range of social and physical sciences, as well as to enhance written and computer literacy development is very valuable at a time when team building has become a central activity in global business networking. The cooperative strategies that are developed in such an exercise have become highly valued in business and professional settings worldwide.

Each year, the Future City Competition progresses through its various regions up to a national final, held in Washington DC, which involves the students, teachers, and their professional mentors, working as a team, with the students taking the lead in the oral, written and construction elements, while the adults serve in advisory roles. The final round includes judges from national professional leadership positions as well as inspirational presentations to the competitors from by well known figures in the STEM fields. My own experience as a representative of World Future Society included speaking on the value of foresight to students at competition finals events in DC and judging a number of competition team presentations. In addition, my consulting firm was lucky enough to have been chosen to design the US curriculum elements to be used in middle schools nationwide when the Future City program was just getting started in the 1990s.

Case 4: Alice Waters – Edible Schoolyard Program

While it may seem odd to include a discussion of what might have once been called a "Home Economics" program in an article about educating elementary and secondary school children about the future, it is in fact highly relevant, based on the following principles of foresight education. These principles involve demonstrating the practical aspects of: 1) Consequences; 2) Intention; 3) Relevance and 4) Interactivity. Placing all of these factors in one paragraph about the future would result in something like the following:

Actions in the present always have consequences in the future, but sometimes not what the actors intended. However, intention is the best way to help guide the future toward relevant outcomes which are positive or at least not negative. This is a complex process, as many interactive factors are involved, each acting in its own way, but often being influenced by each other.

Accordingly, if students can understand the social, scientific, economic, and aesthetic concepts of a relatively simple process such as growing vegetables in their social, scientific, economic, and esthetic aspects, those students will have come quite some distance along the path towards understanding how the past influences the present and how the present evolves into the future.

'Edible Education' is a program developed and supported by the Chez Panisse Foundation of Berkeley, California <www.chezpanissefoundation.org>. The edible education approach includes not just vegetables grown in a garden on school ground tended by middle school children, but also apples, flowers, herbs, chickens and, in the prototype, even olive trees. One of the basic principles of edible education is that children learn by doing – and not only in core academic subjects but in understanding how these relate to the world around them.

The edible education prototype in Berkeley CA has been in place for fifteen years at Martin Luther King Jr. Middle School and produces over a thousand pounds of vegetables annually. Each week, three hundred public school children visit the Edible Schoolyard, hearing lectures on ecology, botany, health and related subjects, picking and cooking food from the garden, and even undertaking the chores which keep it all running. Often student groups, grades six through eight, are self organized around reaching an agreed upon goal. They learn responsibility, consequences and the results of intention in action. They also learn to work together in teams and the positive outcomes of hard work generally. Social and organizational skills are also part of the educational package.

As well, the prototype Edible Schoolyard draws over a thousand visiting educators and public administrators from across the US and around the world each year and has inspired similar programs in other places, similar to the historical John Chapman, also known as Johnny Appleseed.

Conclusion

Among younger students, the future is fun! It offers a chance for them to exercise their imaginations, and to think creatively about problem solving in a non-traditional setting – you could call it "elementary school brainstorming". As such, it generates high energy, well focused periods of graphic and descriptive output of longer than usual duration, and is seen as a positive experience by both students and adults.

The best way to characterize the older students who respond to futures thinking are those students with an affinity for systems thinking and a desire to explore consequences, especially interactions among knowledge sets traditionally held in separate categories by conventional pedagogy. For example, 'How does scientific discovery and new technology implementation affect economic systems?' or 'What political obstacles prevent environmental initiatives from being implemented?' or 'How does brain science innovation relate to nanotechnology?' These more non-traditional areas of investigation are what draw older students to the study of the future.

Finally, substantial results have been made through the environmental studies route, bringing forward thinking to students as part of an ecology club or community project approach.

Introducing the future as a concept can begin at any age – and the earlier the better. While it is important for teachers and guest speakers to select material appropriate for different age groups, adults need to prepare themselves to listen and respond imaginatively to children's comments and questions. Because there is no single "correct" future vision, all ideas and concepts, even the wildest or most seemingly trivial, can

provide a springboard toward valuable innovations and value shifts that hold long-lasting consequences for children and for the world they will inherit and, if properly inspired and motivated, can help to shape and bring into reality.

Appendix A: Transcript of Address to Summer Space Camp Participants (ages 3-6) Good Morning –

I am here to talk to you about the future. When people talk about the future, it sometimes sounds really interesting, and sometimes a little scary and sometimes just plain silly. So, of course, when we talk about outer space, we have to figure out how to get there....

PICTURE #1 The first step is to get off the ground, but this idea never made it more than a few feet high (hover belt)

PICTURE #2 And if people start flying around, there will also be police to make sure they fly safe – And sooner or later you may see a space car in your back yard... (flying police car)

PICTURE # 3 But it won't look like this....People used to think you could just shoot a rocket to the moon up into the sky like a really big cannon shell,....but that didn't quite work out. (Cartoon Man in Moon with Shell Stuck in his Eye)

But outer space is a lot bigger and more complicated than we ever imagined... And there will be all sorts of ways to get there and places to go...

PICTURE #4 As soon as people started thinking about space, they got worried about creatures from space coming here...and made movies about it! (Movie: *The Day the Earth Stood Still*)

PICTURE #5 Or wondered about girls with electric parts to make them smarter (Female Cyborg)

PICTURE #6 Or tried to build silly little space robots to keep them company! (Dancing Japanese Robot)

But the most likely thing about space is that it will be a lot like here on earth, only with a lot more equipment to breathe and keep warm...and in the future there will be jobs in space just like here on earth.

We all can have different ideas about the future in space – some people get worried and other people get excited and full of hope. But what is sure is that some of you in this room could be involved in our future in space.

One way to understand more about the future is to share our different ideas about what the future might be like. And we can do it by talking or drawing pictures.

So we are going to try to see what kind of space futures you guys can imagine. And don't be shy, because there are no wrong ideas, anybody can think about the future they want and can even work to make it happen....

Appendix B: Presentation to Cub Scouts (ages 6-10)

I am here to talk to you about the future. And what I really mean is YOUR future. What might happen 10 or 20 years from now and what it might be like. AND what we actually would want to happen.... So it is really a combination of thinking about and maybe even working for the future we want.

What I want to do today is think about the future together. When people talk about the future, it sometimes sounds really interesting, and sometimes a little scary and sometimes just plain silly. So, of course, the first thing that comes to mind when I start to think about the future is cool stuff...what kinds of new gadgets will there be?

In five to ten years, you cub scouts will be in high school, and might have a driver's license....So how would you get around, like going to school? How about this?

1. Wheel Motorcycle With Hood – Goes as fast as a car, stay dry and easy to park
2. One man hovercraft – Also easy to park but first it has to get more than two feet off the ground
3. Police Aerocars – This looks neat but may also be a silly idea, as people have been trying to get cars like this to actually fly for over 20 years, so sometimes things don't work out like you hope they would. But they can also keep trying, and sooner or later you may see a flying car in your backyard...
4. (Comic shell in Man in Moon's eye) Another thing that comes up when you think about the future is space travel. People used have ideas that seem funny now, because they tried what they already knew about, like a rocket to the moon that could work like a really big gun, and you could just shoot it into the sky....but that didn't quite work out.
5. (Science Fiction Movie) But as soon as people started thinking about space, they got worried about creatures from space coming here...and made movies about it! The lesson here is that the future makes some people nervous and other people get excited and full of hope. But what is sure is that we are already out there and that some of you in this room could be involved in our future in space.
6. (Ocean Surf) But what we think more about when looking at the future is existing problems and how to solve them in the future. Like how oil and gasoline gets more and more expensive and where else could we get our electric power from? How about oceans, they are certainly powerful...
7. (Tidal Electric Power Generator) And people are already working to figure this out...
8. (Very Small Experimental car) Here is a car that goes 1,600 miles, which is greater than the distance from New York to Florida, on just one gallon of gas, but it sure doesn't have room for the whole family.

The adult who built that car is kneeling next to it, but kids can also get involved in solving important problems, which is another thing we do at the World Future Society – helping kids get involved in their own future....for example, the high school robotics competition (where they build robots to see whose works best) is right down the road at the Naval Academy next weekend, and you can watch it on WebTV at www.nasa.ntv... So one future could involve finding out more about building robots and getting involved in fun programs.

9. And speaking of watching things on TV, what about the future of television?
..... For one, there will probably be TVs you can wear, but you will have to look at these ones in a mirror (TV screens on t-shirts)
10. And there could even be three-dimensional TV, but you shouldn't stand too close...it could get messy...(milk spilling out of screen onto college students)

11. And there will be all new kinds of ways to make a TV show, like this one about flying like a bird – and using real birds to take the pictures... and this also helps scientists design new planes that fly like bird wings do, shifting and flexing...(live bird with camera attached)
12. Finally, there are many people who think that in the future, people and computers and TVs will get more and more connected, so you might not be able to tell the people from the machine....This is actually a picture from the announcement of the WFS Futures Art contest. It is for computer art and is another fun area that will continue to see a lot of change in the next few years...(female cyborg)
13. Another kind of problems in the future will be people problems, not just how they will travel or get power to entertain themselves, but how they will live. And many places, cities are getting pretty crowded, and they run out of room like this one where they had to start build up the side of the mountain, which gets pretty dangerous if not done right. (cliff slums in Rio de Janeiro)
14. One idea people have had for the future is to take that stacking and do it right, so that regular houses are piled up safely but with trees and playgrounds and it might look like this... (stacked housing development)

But the real problem with cities that get so crowded is how can people get along better, so that there is less crime and violence. That is one problem I am relying on guys like you to solve when you get older....

One way to look at all of these possible futures is to create stories. And then we look at each of these stories and decide which of them deserves the most attention or which one we should work hardest to prepare for.

We usually tell these stories in more than one way, cause we all have different ideas about what the future might be like. And we do it by talking in a group, just like this one.

So we are going to try to see what kind of futures you guys can imagine....and we are going to ask four questions....You tell us your ideas and after the dinner is over we will put them into a big story about your future using all your ideas and get it back in the next couple weeks to the pack leaders who will get it out to each den for you guys to have.

You don't have to have any special information, because you can use everything you already know to wonder about your own future in pretty useful ways... And don't be shy, because there are no wrong ideas, anybody can think about the future they want and even work to make it happen....

Appendix C: Ideas Collected from the Cub Scouts

The Cub Scouts see the world of the future as an exciting place.

- Sports in the future are very fast, including spaceball, which is like baseball but the bases are floating and the ball is jet propelled. People can wear jetpacks to get around and even take trips into the TV with their TVJ (Television Jumper).
- Many robots are huge, so big that a human can sit on their shoulders and ride, guiding the robot where they want to go. Jet powered cars are very common and go along at incredible speeds..

- Planes are very big, and many even have room for basketball courts. Cars can turn into submarines. And windows are washed by robotic flying window washers
- Flying cars are common and a wrist watch is part of your skin. Cars are so fast that one can even go nine million miles per hour.
- Laser guns, time machines, real light sabers (and many kids will have them), flying buses, repair robots with many arms, flying transports and even food guns.
- Many cars will be voice controlled, so they will do what you tell them to do. They will also have remote controls like a television.
- Transports will be able to stack people up in pods, so there will always be enough room for everybody.
- People who have light sabers will carry them around in bags like golf bags and some people will be weapons sellers. Time capsules will allow people to go into the past or future, and some time cruisers will be just the size of regular clocks
- There will be missile launches in the future and lots of people will come to watch them.
- Pollution will be a problem, especially industrial run off.
- One of the great inventions of the future will be the super duper hydro power pogo stick fun gun robot flyer.
- Robot servants will be common and clean machine robots will have pickup hands and vacuum feet. Aliens may come from outer space to meet us. But they might control the world, so we will need to be careful.. Flying scooters could get us around and computers will be so small they will fit in a watch. Machines that control animals are possible and very interesting.
- Becoming invisible will be possible in the future, and inventors will create invisible spray that will never run out...
- Someone will invest a home with TV built right into the walls. Cars that fly and run on water are very common in the future.
- One of the most interesting planes will be a huge jet liner that will be solar powered, so it does not need fuel..
- Many machines will be time saving and laser sniper cannons will be mounted on flying navy super dreadnaughts. Super hydro cannons will shoot water
- Suits and ships that can survive on Mercury in space will be invented, as will teleporters. Machines that give you superpowers will be common and so will robot police men. Finally, the best will be pizzas that make themselves..
- Possible future jobs could be building countries and controlling the world..
- Future inventions could include rockets strapped to cars, schools that float in the air, and pencils that write by themselves. We will need medicines that cure all diseases and three dimensional books.
- Unicorns will be created as well as floating school desks Geologists will cut up rocks with diamond chain saws and we will have better kinds of fuel.
- One of the most terrible things that might happen is that the sun blows up....but we can invent ice suits and frozen cities when that happens.

- Cars that can change shapes and be just like your own room inside will be wonderful.
- Paper airplanes with rockets will also be very interesting...as will cars that run on water and paper.
- People might have robot parts built into them..
- And we will have to look out for exploding watches
- Evergreen grass that you never have to cut will be a very nice invention!

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Notes

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