

Online Journal of Space Communication

Volume 1
Issue 1 *Issue #1: Education and Training*
(*Winter 2002*)

Article 14

January 2002

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Recommended Citation

Elbert, Bruce (2002) "Where To Go With Space Education?," *Online Journal of Space Communication*: Vol. 1 : Iss. 1 , Article 14.

Available at: <https://ohioopen.library.ohio.edu/spacejournal/vol1/iss1/14>

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Critical Perspectives: Bruce Elbert



Where To Go With Space Education?

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For those of us who are practitioners as well as educators, the space industry has become a complex, sophisticated environment. In my case, it's been a wonderful journey seeing its evolution from basic science in the 1960s to consumer electronics in the 21st Century.

Having graduated in engineering in 1965, I feel I was provided with the basic tools to understand the science part. On the other hand, what makes space so special for me are the business opportunities that it delivers. This is why I think education has to be treated in a more comprehensive way.

If you were fortunate enough to have started in the 1960s and grown with the industry, the elements and their interrelationships are second nature. I had the privilege of being there in the early days at COMSAT and at Hughes Aircraft Company, where satellite communication was brought down to practice. What I have always tried to do in my writing is capture the essence of that journey for those who come later. Books are a good way to show the history, methodology and systems relationships needed to understand how the industry works and how we got here. Teaching now occupies a considerable amount of my time. This aspect I find to be very rewarding, because of the response I get from college students and from those employed who are still learning.

The conclusion I draw is that those who are learning the ropes and climbing the ladder are thirsty for more understanding of solutions. Their job situations don't seem to provide as much opportunity for learning as was once possible. Many employers don't take the time or expend the resources to make a range of experiences available to all employees. This is understandable in today's competitive world. Instead, it is up to other institutions to take this on. On a positive note, Boeing is unique in its support of its employees' desire to learn by sponsoring engineering short courses from UCLA Extension.

This Online Journal will provide one of the important vehicles for the learning I refer to. The total resource of the World Wide Web is awesome, and provides much of the material one needs to learn. The problem is finding ways to navigate the incredible range of information. One needs a guiding star - a Yahoo! that knows what's important in space.

While there is really nothing new under the sun, so to speak, it is through innovations and applications that our industry grows and extends itself for greater utility. There are enough successes (international television, DTH, remote access to the Internet, and mobile satellite service) to give us comfort about the future. However, not every attempt has succeeded and one must understand that not every idea is feasible and not every project will be competitive in the global market. For these reasons, the lessons of history must continue to be taught.

Education starts the formal route through technical schools, colleges and universities, graduate schools, and continuing education. Each has played and must continue to play the appropriate role. Young people should select their programs of study based, most importantly, on what interests them and what they can handle. Continuing education has become a much richer medium than in the past. As a service veteran, I had the opportunity to use correspondence courses to learn more about electronics. Now, we have online learning, which is far more interactive than what was contemplated for the correspondence medium. The new style offers a combination of programmed instruction and Web-based interactive exchange of real time and asynchronous information.

The Web is an important vehicle of learning but it cannot fully substitute for direct human interaction. The traditional comprehensive universities and technical schools are still the main producers of professional staff. The key here is to be sure that after obtaining their diplomas, these professionals embark on a course of lifelong learning through the variety of means now available to us. One of my colleagues at UCLA Extension, Don Hausknecht, used to say, "Everything I need to know I learned after graduation." That's not a condemnation of formal education; it's a reinforcement of the meaning of continuing learning.

Because I am an engineer and business person as well, I value both the Ph.D. scientist and the marketer. The Ph.D. has the wherewithal to examine a concept in great detail and transform it into something that can work. The marketer, on the other hand, has insight into what people might want and the energy to push the idea out there so potential users can look it over. Between these extremes, we find the engineers, managers and operators who connect the pieces and assure that the application runs as a system. Everything and everyone must be there, and all must function as smoothly as a symphony orchestra.

Application Technology Strategy, Inc., (www.applicationstrategy.com) is a satellite communications consulting firm based in Thousand Oaks, CA. Bruce Elbert has held senior management positions at Hughes Electronics and teaches courses at UCLA Extension and on-line through the University of Wisconsin - Madison. He is the author of more than a half dozen books including Introduction to Satellite Communication, Artech Hous, 1987/1999 and The Satellite Communication Applications Handbook, Artech House, 1997 (which he is currently updating). You can communicate with Bruce at bruce@applicationstrategy.com