The Paradoxes of Learning

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   Surviving rapid changes in society and technology requires all of us to be students. As Plato so aptly said, "the learning and knowledge that we have, is, at the most, but little compared with that of which we are ignorant." You can measure each day by what you have been learned or by what you have achieved. Under the pressure of technical obsolescence and global competition, however, most of us choose the latter, not the former. There is an imbalance.

   For most of us, learning rarely exists outside of a formal setting. Should one take courses at a local university, read dozens of books and journals on weekends, or experiment with new technology in precious spare time? Is the effort worth it? Knowledge and curiosity are useless if they have no personal or professional relevance to improving the quality of our lives.

   Acquiring knowledge then provokes two related questions: what is worth learning, and how does one learn? The answers are highly interdependent because one can be less selective about what to learn if the process is extremely efficient. At the other extreme, classical learning methods are notoriously inefficient because they implicitly aim towards accuracy, completeness, and expertise.

   For example, the typical textbook on accounting or software is written as the first step toward becoming an accountant or computer programmer. In contrast, most of us need only a feeling for a subject, with exposure to its questions, assumptions, methods, dilemmas, and philosophy. The details are irrelevant unless one plans to eventually become such an expert. Yet authors and teachers, for their own egotistical reasons, mostly design their teaching style to make students just like themselves. And classical methods try to create an aura of detached objectivity by removing the personal components, even though we learn best from personal experiences.

   Parenthetically, I should mention that in the Middle Ages students of wealthy families were in charge of the relationship with their teachers. Students hired them, selected topics, and specified where and when they would meet. In contrast, today's schools place the teacher in charge of all aspects of the relationship, including, and especially, the evaluation of success. There are few if any checks-and-balances. Modern universities are like a feudal institution where the choice of subject matter and the requirement for graduation are supervised by the same group of people who may only be interested in raising the *perceived* value of their services and certificates. Students are too passive.

   The most efficient learning method is the most obvious but least used. We all meet experts in various fields but do not take advantage of such encounters because we do not know how to do so. Moreover, we also ignore the fact that people like to talk about what they know, what they have achieved, and how clever they are. They are all potential teachers, but only if one places oneself in the role of a student. Try inducing an expert to talk in a focused discussion- most people are expert

at something. Do not ignore what you can learn from janitors, plumbers, firemen, executives, or even your children, each of whom is a master at something.

Ask a lawyer about how he learned to practice law, and how legal assumptions are different from those of ordinary life. For example, lawyers have three definitions of truth, none of which corresponds to facts as viewed by an engineer. Similarly, accountants are far more than number crunchers, and computer programmers are also psychologists. Ask an engineer to talk about his experience with bugs, defects, design risk, and contradictory requirements. Ask your supervisor to describe his most difficult dilemma. Collect a list of non-fiction books that others found useful. You will learn a lot with very little effort, perhaps only for the cost of a cup of coffee.

Having used this method for years, and having acquired an intuitive feel for dozens of arcane fields and subjects, I know that the method works. And it is very, very efficient, at least when measured by the ratio of expended effort to acquired knowledge. Actually, it is not that I am smart, but rather I have used everyone I know, at one time or another, as a teacher. At the age of 62, I have therefore accumulated a vast collection of knowledge from hundreds of experts. There is a fundamental error in the old wisdom: learn from your own mistakes; it should be: learn from the successes and mistakes of others.

But there is a psychological cost to this approach: being a student can be experienced as humiliating and self-devaluing. In our status-oriented society, teachers are perceived as parents, supervisors, and leaders, while students are thought of as children, interns, and followers. For some personalities, this psychological cost is too high and it is better to fake knowledge than to admit that one has something to learn. I once knew a professor at MIT who decided to learn software in the early 1960s, but unfortunately he had already created the image of being knowledgeable in that subject. Hidden from everyone, he tried to learn from obsolete books rather than from the many experts around him. He elected a very inefficient and expensive method just to preserve a useless illusion: the façade of intelligence. Remember, humility produces efficient learning, while arrogance produces mental paralysis.

Consider a personal example. Even though I have designed several digital audio editors, if I were to have a cup of coffee with a broadcast production engineer I would ask him several open-ended questions, as if I knew nothing about the subject. What kinds of tasks do you do? What makes your job hard or easy? How did you learn to become skilled? How do you recognize competence? What were some of your biggest successes and failures? How did your profession evolve as it did? Why did you choose this profession? The discussion will not make me a production engineer, but it will give me a good feel for the activity of sound editing. If I had this kind of conversation with many sound editors, I would quickly notice consistent patterns. In the end, I would have acquired the surface wisdom from dozens of man-years of sound editing. Keep in mind that the goal is not to practice sound editing but to acquire a feel for the activity. However, if I suddenly needed to become an expert, I would know who to talk to and how to gain additional skills.

Veteran broadcast journalist Peter Jennings said of his life that he never had a day where he did not learn something new. Jennings reached the pinnacle of his profession, yet was a high school drop out. Over the years, I have noticed that the best educated are frequently those without any formal degrees or professional certificates. Educational insecurity motivates them to become

information vacuum cleaner, forever sucking in particles of knowledge from the nooks and crannies of life. This contrasts with the humorous poster at MIT that read, "With this advanced degree you are judged to know everything that you will ever need in life."

In closing, ask yourself: what have you learned today or this month or even this year? If the answer is difficult, then you have an imbalance in your life, both personally and professionally, and it is time to reexamine you life style. We have now answered the opening question: broadcast engineers must take advantage of those that they meet: equipment vendors, consultant specialists, technical writers, acoustical engineers, network technologists, senior executives, and so on. End users and designers should routinely share a cup of coffee. If nothing else, when faced with a new problem, you will be sufficiently knowledgeable to have an informative dialog, asking the right questions and understanding the answers.