

Chapter 4

Humanware

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A Few “Humanware” Principles: The key to successful use is Know-how. Too many people spend thousands of dollars on hardware, hundreds of dollars on software and zero dollars on humanware. Teachers are rarely trained on a consistent basis. The appeal of the quick fix causes many schools to buy computers or laptops for all when very few teachers know what they’re doing. Money must be budgeted for ongoing training or else the institution runs the major risk of computerization: not using the machines and thereby wasting money. The fact that computers become dramatically more powerful and cheaper every 2-3 years means that you don’t buy unless you have a concrete plan for the implementation of those uses. Our view in The Original Teaching Company is that computer salespeople generally tell you half of what you need to know. What they neglect might be best described in the following OTC guiding principles:

“HUMANWARE” PRINCIPLE #1 ***Computers don’t save time; they consume it***

Learning how to use software effectively consumes time. And even when you have mastered the techniques, you generally find that the computer consumes time, because now you have the flexibility to improve the quality of your work. In fact, rather than thinking that you buy a computer to save time, it is best to think that you are buying it to improve the quality of your output. Maintaining a database of poetic terms or creating a multimedia essay to post on the Web may actually be much more time-consuming, but the quality is more likely to be superior. Educational software and Web sites allow for a deeper, richer treatment of many subjects, not necessarily for a quicker means to process the material. Without question, computers consume too much time, but if the quality can be improved, then obviously we need to examine when and how to use them.

“Humanware” Principle #2

Computers resemble violins more than blenders

Buy yourself a blender, unbox it and you're ready to use it. But get yourself a violin, and it's most likely that you will need instruction. Without a good teacher, very few people can learn to play the violin. With one, most people can! And even if you don't absolutely need computer instruction, you can save yourself considerable time and frustration. We believe that learning each software tool — word processor, database, spreadsheet, desktop publishing — requires 10 to 30 hours of instruction. And even though many educational software packages can be looked at without instruction, an experienced user can save a first time looker hours of time with instruction. Yes, of course, some people require no instruction. But this is probably under one tenth of the population—people willing to read manuals carefully and spend hours fiddling with the features. Let's face it, most normal people greatly prefer reading novels to manuals!

“Humanware” Principle #3

The key to success is increasing overall proficiency

In the old days of 1980, businesses might typically spend about \$10,000 to \$20,000 on hardware and allocate 10% for initial training. In the 2000's, the machines are more powerful and much cheaper, but the training needs have not vanished. It is only the hype of computer salespeople and advertisements that makes us believe we can buy a computer, take it home, turn it on and instantly become productive—without any training or support. It is only the hype of computer companies and technology-rich schools that makes us believe that if we have a lab of 25 machines or laptops for everyone, our schools will improve. There are so many computers in schools that are not being used, it is absolutely amazing. Why? Because there is not enough know-how amongst the users. Not enough teachers who know how to use educational software to its advantage. Not enough English teachers who know how to use word processing to teach the art of writing. Not enough art teachers who know how to use graphics software. Not enough math teachers who know how to use graphing software. Not enough. Not enough. Not enough. We've got hardware and software ad nauseam. We ain't got enough people!



Crazy Contrasts: Computers and Music

How is parenting like driving through tunnels? How do the Boston Celtics' ups and downs resemble yours? Sometimes you can gain insights when you try to find meaningful connections between 2 seemingly unrelated subjects. So let's try to list connections between the world of music with its long and rich tradition and the world of computers which is so volatile.

- The computer is more like a violin than a blender.
- Access to hardware is crucial.
- Access to hardware is not sufficient.
- There are many people who believe they cannot become even moderately skillful. Most of them — with proper instruction — can be proven wrong.
- The software makes the hardware a lot more interesting.
- The copying issue with all of its moral and legal implications is a significant issue in both fields.
- Gaining proficiency in each field involves some degree of fine motor skill and physical dexterity.
- The time it takes to achieve proficiency is much longer than anticipated.
- The key to success is regular usage and regular practice.
- Children seem to be able to gain proficiency as well if not better and more quickly than adults.
- Both subjects are being taught in such token and inadequate fashion in most schools that the net result is poor.
- Some people can become proficient on their own, but most benefit tremendously by quality instruction.
- Teaching a large group of people — even 10 to 20 people — at once is incredibly challenging in these 2 subjects; small group and one-on-one hands-on instruction is invaluable.
- Each discipline is multi-faceted involving several of the established intelligences — logical, aesthetic, visual, auditory and motor skills.



Statement of Purpose: Mission not Impossible

The text below is from the Teaching Company's first workshop, conducted in March 1982 at Concord Academy for Independent School Teachers in Massachusetts. This speech has been presented to so many different teachers that perhaps even the jokes are growing stale.

In almost every fashion possible, the world is going crazy with computers — technology, applications, education, games, and businesses. Consider technology and this quote from Russ Walter:

The longer you wait to buy hardware, the lower the price will be; every year, computers get cheaper. A general rule of thumb is: If you wait two years, it will cost half as much. More precisely: suppose you do comparative shopping now, and buy the cheapest hardware that adequately handles your job; if you do the same comparative shopping two years later, you'll find that the cheapest adequate model then costs half as much as the cheapest model available today.

This price reduction is not some kind of wild idea of mine. Practically every year, since computers began in the 1940's, The total hardware price has been dropping 30% a year. If you take a dollar, and deduct 30% of it, you get 70 cents; if you then deduct 30% of 70 cents, you get 49 cents. So after two years, you're spending 49 cents instead of a dollar. And there's no sign of that trend stopping.

An interesting comparison with the airline industry serves as a wonderful illustration of this rate reduction. Both industries grew up in the late 40's-early 50's, and without question, airplane technology and service to the consumer in 1983 has advanced considerably since its infancy in 1950. However, if the airline industry had kept pace with the computer industry in the last thirty years, you would be able to travel today from New York to London on a plane with 10,000 other passengers, get there in one second, and it would cost you all of one cent.

Computers, memory, printers, disk drives — in the past ten years, the advancements have been incredible. Seven years ago, at Wooster School, we purchased a Wang computer system with 8K memory, 1 floppy disk drive, 1 terminal, and 1 matrix printer — all costing \$14,000. We developed software for the registrar, Development Office, Business Office; we even did the school's scheduling with 8k memory. We didn't even have word processing.

Just one year ago, my wife and I purchased an Apple for our home. For \$2400 we got a system that easily surpasses the "coal burning" Wang that we purchased for the school. And now, just one year later, our own system has been replaced by a more efficient, more powerful Apple 2e. The technology is simply going crazy. It serves as the best illustration of exponential growth. Consider memory storage — the device that holds your information, whether it is a file on your alumni, a computer program or a letter you are composing on your word processing software: Twenty to thirty years ago, a computer needed equipment the size of this room to store the equivalent of one short letter. Today, a Wang computer can store about 150 pages of double spaced text in its memory — which, by the way, is the size of a fingernail. Scientists are now developing a "bio-chip" — a mini computer made of organic molecules rather than silicon. It turns out that the circuitry in such a chip is unimaginably minute — much smaller than in today's