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**Education and Training  
The Road Ahead**

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## Introduction

*We process more information in a 24-hour period than people did in a lifetime 500 years ago.* That was a quote from Tony Carlson, in his book *The Power of Wow*, when he was proposing new techniques for achieving visibility in the midst of the information tsunami that engulfs us daily. And worse yet, that rising tide of information and knowledge seems to be growing daily. Going back only a couple of generations, we now process more information in a single 24-hour period than our grandparents did in a month.

Looking at the field of medicine, libraries of information build exponentially every year as thousands of new drugs are released, volumes of new articles on treatments are published and diagnostic methods and technologies continue to proliferate. In this discipline alone, the amount of information doubles every 4 years. Imagine the potential for disaster when a physician has to decide on a diagnosis and a course of treatment where the choices involve more than 30,000 drugs with possible interactions, and over 400,000 articles of best practices produced by the profession.

Turning to the world of the IT professional, we are witness to a near 100% renewal of knowledge every 12-18 months. Software, hardware and application vendors constantly compete to improve their technologies in a race to keep from dieing a death of "the status quo." New languages, improved database architectures and functionality, broader and deeper applications, growth in chip technologies that doubles the prior release, improvements in

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equipment design, new network architectures, and more, all compete to obsolete their prior generations.

Add on top of that pace, the growth of governmental controls, regulatory oversight, the huge penalties for breaches of sensitive information, and an endless attack by armies of hackers sporting new weapons, and you can easily see that the problem of dealing with this IT information propagation is reaching epidemic proportions. And although "sitting still," translates to falling behind in most industries, the financial and organizational penalties for a misstep are so painful, that progress seems blocked at every passage.

Couple all of this with ever-tightening budgets and headcount restrictions, and even the education and training remedies that could help deal with all this information become problematic.

To add injury to this overwhelming assault of information and knowledge, a Wharton School of Business recommendation suggested in a Wall Street Journal article that if a firm is faced with significant marketplace and technological changes, the firm is "better off hiring workers from the outside labor market who have the skills it needs, rather than investing in developing those skills inside the firm." The study went on further to say that as more industries evolve in comparable ways to the fast paced high-tech industry, more and more firms will adopt this same strategy.

As a company executive and shareholder, I'm not sure how I feel about our intellectual property and source of competitive advantage suddenly walking out the door and into our competitors' shops. When our own company can electronically process a loan application on a Friday afternoon, why on earth would we

want the people who built those elite systems to leave and do this for our competitors who are struggling to get loans processed in 30-45 days? Even further, how do I get the new IT professionals, that we're supposed to hire from outside, trained on our products and procedures?

This is not to say that I don't appreciate the problem of retraining a workforce if our primary delivery modality is the classroom. It's more that I have a different view of where our company's true intellectual property resides.

Ironically, this recommendation to retire versus retrain is a problem brought about by many academicians and training professionals. The insistence on classroom training as the predominant methodology of delivering knowledge has so lengthened the time to make an individual proficient, that the Wharton School recommendation stands as loomingly valid, given today's education and training methods. In fact, that elongated path to proficiency may well be the result of many conceptual, as well as structural shortcomings in the use of classroom training.

Given the task of training an individual to "full proficiency" in a technical product, the education teams will do a complete functional decomposition of that product, and then proceed to train an employee on each of those product functions. This ritual of "full proficiency" training ignores the fact that much of this knowledge will probably never be used that frequently in the employee's job, and in a lot of cases, simply forgotten once the employee leaves the

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classroom. As a result, we tend to scope our education and training for the “just in case” scenario, instead of thinking about what the employee needs to perform at a “working proficiency.” This over-scoping of classroom events, combines with varying skill levels present in the classroom, to render it an inefficient model to deal with today’s volume of information that needs to be processed.

### Problem Statement

Simply put, the world of education and training needs to refocus its efforts on employee performance and a “working proficiency,” instead of delaying productive use of an employee while we teach every possible nuance of a technology in the classroom. We need to identify the “essential knowledge” that an employee will need, and scope the training venues appropriately. We need to find the 20% that provides 80% of the value, and then we need to move to a new model of delivery for the remainder.

### Previous Options

Unfortunately, like with every other new idea, a storm of challenges will erupt. Doomsayers will spread their FUD (fear, uncertainty, and doubt), and warn that what is being suggested is the academic equivalent of handing a set of keys to a Ferrari to a 16-year-old who has never driven a car before. In fact, this is not what is being proposed at all.

What is being proposed is to shift much of the burden of training into the work environment. Isn’t that better than delaying the productive use of an employee while we attempt to cover every possible topic on a subject in the classroom?

To illustrate this over-reliance on the classroom take a look at this simple example. Using a very common application, Microsoft Word, to construct this example, the question we must ask is “How much do we really need to teach in the classroom, before we can turn a person loose to use this tool in their jobs?” What is the “essential knowledge” that we must impart?

Perhaps we only need to show an employee how to open Word, how to create, save and print a new document, some formatting commands, and how to use online help to discover the rest of the functionality. That turns out to be a 4-hour course, versus a 4-week course that would show you how to use templates, columns, tables, graphs, headers and footers, picture and media clip insertion, speech recognition, and all of the other host of functions that are available in Word. And if you wanted to go even further, if you also told the education teams that 60% of your population spoke English as a second language, it would not be out of the realm of possibilities to suggest that we should include a complete course on spelling and grammar in the curriculum, as well.

Of course, what makes more sense for the business and for the employee would be to teach “just enough” to get the person to a “working proficiency” with Word, so that he or she can use it to perform the basic functions in his or her job. At the same time, we now need to shift the burden of learning to the workplace and to the employee. We need to give the employee a job aid and

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a glimpse at a list of functionality available in Word, so that he or she can deal with the academic notion of “not knowing that some function or solution existed.” This other education and training can be accomplished with non-classroom training on specific functions within Word, digital partners (a notion we will talk about later under “digital tribes”), and even the imbedded help that resides in Word.

Contrasting this “working proficiency” approach to a training venue that might be 4-6 weeks long, any rational person would view the latter as a total misuse of the classroom and a financial burden for the firm. All we would have done is lengthen the time it takes to get an employee to a “working proficiency.”

### The Practical Solution

The better solution would be to provide other tools for learning many of these topics, instead of the classroom. In this article, I will discuss how to begin that journey of moving from a classroom-dominated model of delivery, to a model that blends classroom, non-classroom, and performance support systems (PSS). While this notion is fairly easy to understand, the level of reduction in classroom dependency being proposed produces a complete re-thinking of previous models. In addition, the tools we need to deploy in the workplace part of our solution are still being defined.

As a “stake in the ground,” this new model should yield the following blends of each delivery modality, in the next 5-years:

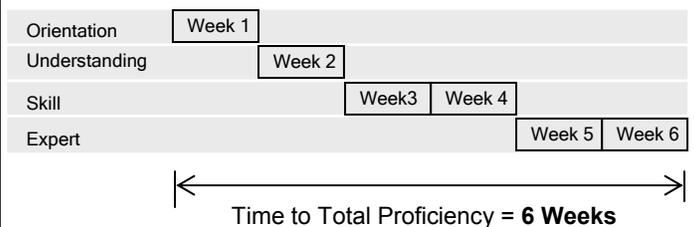
- 20% Classroom
- 30% Non-Classroom
- 50% Performance Support

Using Word as our example, let’s look at various ways of teaching Word, and contrast those paths to proficiency using the classroom-only model and the “working proficiency” model.

Here is how we might construct a classroom-only model around a list of topics for an Executive Administrative Assistant (EAA):

- Week 1 – Using Word XP for Professional Documents
- Week 2 - Reinforcing Your Message with Tables, Charts, Diagrams, and Pictures
- Week 3 - Designing Pages for Maximum Visual Impact
- Week 4 - Publishing Long or Complex Documents
- Week 5 - Collaborating Online and on Team Projects
- Week 6 - Advanced Word — XML, Forms, and VBA

Simplifying Bloom’s taxonomy to four levels of knowledge (Orientation, Understanding, Skill, and Expert), and using traditional classroom-only models, we see that this curriculum becomes increasingly difficult, and takes 6 weeks to complete.



Coming back from this 6-week hiatus, we would expect that the EAA would be fully proficient, and ready to go. Many would argue that this 6-week curriculum would produce the ultimate EAA. That would be true, if all of the functions taught were usable within the next

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couple of months, and if the entire EAA job was one-dimensionally reliant upon proficiency with the Word application.

However, both those conditions are atypical in the workplace. Invariably, projects and tasks will demand other tools and skills when the EAA returns to his or her job. Now the problem increases in complexity. Do we train the EAA in telephone courtesy, PowerPoint, Excel, Access Databases, event planning, and the host of other duties that may be encountered in that role? How many weeks are we willing to keep this employee in a non-productive mode while they learn these new tools and skills? The business, educators, the employee and the employee's manager must ultimately make a collective decision on how much non-productive time we can afford. With a complete dependence on the classroom delivery model, the impact of that decision will definitely affect the productivity of the individual as well as the team.

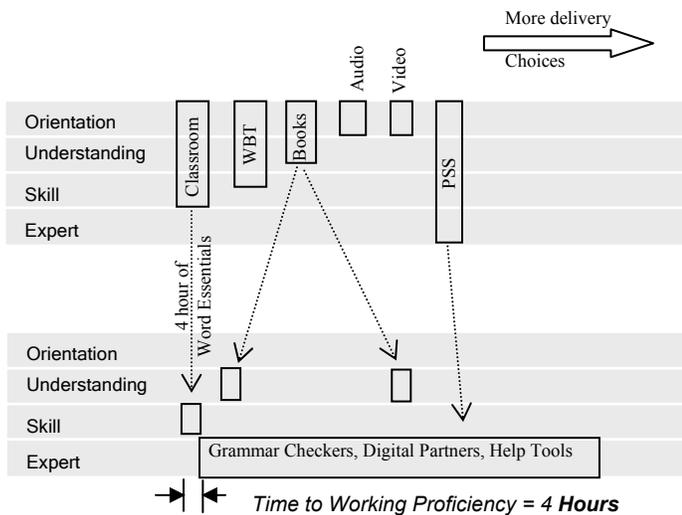
Let us now look at the impact of putting a different model to work. Consider the notion of generating a training strategy based on giving the employee only the "essential knowledge" needed to perform at a "working proficiency." Using our 20/30/50 model of delivery for this same Word example, we restructure the course material that we teach in the classroom to focus on those functions that we deem critical to a "working proficiency." This requires that we thoroughly understand a person's job, including what components of the new technology they will use most frequently, the employee's current level of knowledge, as well as the limitations of the various delivery tools. We may sit with the manager and the employee to see the scope of the person's job, or we may look across the entire population in that job role, to determine what 20% of the functionality

produces 80% of the benefit. We then use other delivery methods to finish the job in the individual's workplace. As the classroom is many times the best place to teach a skill, because of the presence of an instructor and a lab, it will also be important to look at the limitations of some of the delivery methods we might want to use.

The following example shows the ability of each of the various delivery tools to get through the 4 levels of knowledge that we're using in this example, as well as how we would redeploy the curriculum so that the individual can return to their job function almost immediately.

The reader must remember that we are using a software example when we talk about the level of knowledge each delivery method is capable of achieving. For instance, it would be nearly impossible to teach the technical Database Administrator certain technical topics using audio. However, audio might be very effective as a tool to teach a language skill like Spanish or Italian. The relative depth that each delivery modality can achieve is dependent upon the presence of an instructor and a lab. If one or the other is missing, it limits the tool's ability to get through the four levels.

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The new time to a “working proficiency” is now 4-hours in the classroom, by deploying other training aids, reference books, quick reference guides, and other on-the-job performance support tools. In the case of Word, many of the performance support system tools (PSS) come built into the product, such as spelling and grammar checkers, formatting, templates, and a pop-up office assistant makes this an easy tool to deploy.

### Digital Partners

One of the newest tools emerging in the 50% category is a result of the Internet and instant messaging, and relates to the term “digital partners” that I’ve been using. A funny short story will show how the newest generation of workers thinks, and is accustomed to working.

A friend of mine who is a CEO of a small company greeted one of his new employees on her first day of work. She was a graphic artist, attired with multiple ear piercings, sandals, and the casual work clothes of some

of the younger generation. As she got settled near her computer, he said to her, “It’s a tradition on a person’s first day of employment to have lunch with the CEO. Would you like to join me for lunch today?”

She looked him square in the eye and said, “Don’t you have a DVD?” With a surprised look on his face he said, “Why on earth would you want a DVD, when you can simply talk to me live?” Without losing a beat, she said, “Well I might want to fast-forward through some of the parts.” My friend must have looked crushed, so she quickly added, “And there may be other parts that I want to replay several times.”

They seemed to get through that rough start, and to his pleasant surprise, she became one of his best employees within the first few months. She was turning out stunning designs, excellent copy, and her work was receiving praise from a lot of my friend’s customers. So one morning, he decided to walk over to her work area and congratulate her on her fine work.

When he got there, he was surprised to find that she had several Instant Messaging (IM) sessions open on her desktop. He looked at the array and said, “Who are these people - friends?” She turned and said, “This is my “Digital Tribe.” I come to work with them every day.” He pleaded, “Please explain.”

She went on to explain that she had come to know them from comments they posted on technical forums or from documents they published on the internet. Some were good at graphic

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design, while others were good at copy. Some had an in-depth knowledge of PhotoShop and Illustrator, while the rest were expert at other parts of her job. They simply helped each other every day. One supplied design advice, while another helped to untangle copy. Her own contribution was an in-depth knowledge of Corel Painter. They in fact had created a virtual community of practice.

I'm sure you can see how these digital partners helped each other master the volumes of information and knowledge that it takes to perform the job of a graphics designer. The notion of a "Digital Tribe" is new, and only one of the ways of dealing with the knowledge and information that we need to provide an employee in their work environment.

It is also in this environment that we encounter the expert, and we begin to understand that these tools were already in use. As strange as it might seem, most experts rarely go to a class, seldom pull out a book unless it's been recommended by a colleague, and instead, satisfy their learning needs by frequenting forums and chat rooms to learn about the latest technologies. Only when a colleague or a manager recommends a course or a book, will the expert actually engage in these traditional forms of learning. Instead, they compare notes with a mentor, visit vendor forums, or use the internet to search for information on a topic. In fact, over 95% of IT Professionals will tell you that their primary way to find data is through "Googling."

### Re-thinking the IT Model

Applying this thinking to the world of IT, we can do similar things when we teach new technologies. We need to establish the "essential knowledge" that we need to teach in

the classroom, and then search for tools that can support the IT professional on the job. Examples of these types of tools would be code judges, code and web services repositories, expert forums, a Wizard Directory that identifies all the topic experts in the organization, and so forth.

An equivalent example to teaching Word would be to teach a new language in this same fashion. We might teach the "essential commands and language elements" in the classroom, use reference material to give the coders the rest of the command or language sets, and then use code judges and digital partners to accomplish the rest. A tool like JTest, which is a code judge for Java, is a good example of these new performance support tools. JTest is an automated unit testing and coding standard analysis product for Java. It automatically generates and executes JUnit tests for instant verification, and allows users to extend these tests. In addition, it checks whether code follows over 500 coding standard rules and automatically corrects violations of over 200 rules. This functionality is analogous to the spelling and grammar checker in Word. If we then add the notion of a "digital partner" to the mix, we now have a way for questions to be answered on the spot. It's like an always-on help desk.

After we decide to limit the classroom venue in favor of workplace training tools, the role of IT Education & Training becomes clearer. The role simply moves out of the classroom and away from the routine creation of events and training courseware, to the day-to-day

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needs of the IT professional in the workplace. The role transforms from owning training event creation, to owning the performance of the employee. That simple change in focus impacts how we would then think about solutions. Instructors become coaches and facilitators. Curriculum developers decide on how the knowledge will be imparted across the new delivery model, as well as the scope of the classroom. And CLO's would be responsible for the business results linked to the new changeover in technology.

### **The Benefits of the New Model**

#### *Benefit 1*

This new approach will shorten the time to a "working proficiency" for all IT professionals, and reduce the need for a complete upheaval in staffing whenever a new technology comes into the company. "Working proficiency" is defined as the time it takes to teach the employee the "essential knowledge" to perform his or her job function – the 20% that will be used 80% of the time in the job.

#### *Benefit 2*

This notion of a "working proficiency" will also allow the company to entertain new technology introduction much earlier than its competition, and thus keep the company at the forefront in their industry.

#### *Benefit 3*

Finally, the lessening role of the classroom will free facility space, teaching resources, and other assets that can now be devoted to the real job of education and training – facilitating the learner through coaching and performance support.

Businesses can look forward to the following key benefits:

- A faster time to market with new products
- Quicker response to competitive moves
- Increased revenues from educational interventions
- Lowered operational costs from education interventions

Individuals can look forward to similar benefits:

- Faster absorption of new tools and ideas
- Longevity with the company
- A greater ability to blend multiple technologies together when crafting a solution
- A greater exchange of information with colleagues
- Improved job satisfaction

The education and training industry must continue to refine this statement of direction as new ideas and technologies surface, and as clearer direction from our implementation efforts materialize. But in the end, we will have effectively dealt with the ever-increasing flow of knowledge and information that bombards us each day.

### **Summary**

Although this new concept will take several years to implement, and necessitate the cooperation of vendors who need to imbed training into their products, the value of this approach

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goes beyond the education and training organization. It most certainly helps to position companies and individuals for the next millennium. As with earlier moves away from the classroom, this move will face challenges on many fronts. This model proposes to eliminate the primary dependence on a 2,000+ year old model of classroom instruction. We expect to have to set goals carefully with departmental employees, industry experts, academia, and other influential parties. Just as it took years to get the Internet to where it was a viable way of doing business, it will take time to move to the notion of dealing with “essential knowledge” and a “working proficiency.”

Many discussions will need to take place with the Human Resources department, Corporate Information Security, Legal, and other groups that might be impacted by information coming from both inside and outside of the company's firewall. When we are successful, the rewards will benefit both individuals and corporations. The gains in productivity for corporations will allow them to move even faster in the marketplace. IT professionals, who once faced either a “be promoted or perish,” 12 to 18-month extinction cycle, can now look forward to long careers as a technical professional.