

## The Medium is the Message – or is it?

Steven Shepard

As many of you know, my background is a bit “professionally schizophrenic.” I studied Romance Philology at UC Berkeley (that’s the study of the origins of Romance Languages, for you engineering types), and snagged a second major in marine biology somewhere along the way. When I graduated, I went in search of the perfect career through which I could use my knowledge of the Spanish language and its roots, together with my love of all things water-related. In short order, I became a SCUBA diving instructor, opened a shop with a partner, and started an underwater cinematography and commercial diving business. We found that the bulk of our cinematography activity was offshore (no pun intended), and in 1980 we purchased a business in Sint Maarten, in the Netherlands Antilles, to use as a base of operations for all the work we were doing in that part of the world. The business as a whole did well for quite a few years –from 1979 until 1981, actually – until my partner decided that he liked it down there so much that he didn’t want to come back. Unfortunately, it’s an expensive place to live, so to support himself he drained our corporate accounts into a convenient numbered account in Nassau one weekend.

Bummer.

Once I figured out what had happened and had exhausted all methods to reach the guy, I folded the corporation, resigned as President, and went off in search of a job. I sort of had to hurry, because I was scheduled to marry Sabine not long thereafter, and it just wouldn’t do to be unemployed while getting married.

Dive shops are pretty cool places to hang out in, and they attract their fair share of groupies. One of the people who was a regular at Sea Hut (our shop) was a fellow named Jack Garrett. Jack was in the first SCUBA class I taught at Sea Hut, and he was a natural diver. He was so good that I certified him as an Assistant Instructor not long after he got his basic SCUBA certification, so that he could help out with classes.

Shortly after the shop folded, Jack came to me with a proposition. He was a District Manager with Pacific Telephone, and Pacific was embarking on a radical new technical training program. They were looking for people with management experience but no technical background to come to work for the company and be trained as Network Analysts. Please understand: I didn’t know a network from a box of spaghetti. Was I interested, he asked? Does it pay a regular paycheck, I countered? Yes it does, he replied, and I remarked that this sounded like a terrific career choice. The next thing I knew, with Jack’s letter of recommendation in hand, I had purchased a suit<sup>1</sup>, had been through the BSQT6<sup>2</sup>, had sweated through the initial interviews and physical<sup>3</sup>, and the

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<sup>1</sup> I owned lots of suits, but they were all made of neoprene.

<sup>2</sup> Bell System Qualification Test of Basic Skills. Sort of like taking the SATs all over again.

<sup>3</sup> Meanwhile, we *did* get married, and while I sat by feverishly waiting for the phone to ring to tell me whether I had a job, Sabine went to Hawaii for our honeymoon. The call came while she was gone.

next thing I knew I was employed at the Network Operations Control Center (NOCC) at 180 New Montgomery. I was both elated and terrified, because my experience with computers was somewhat limited<sup>4</sup> and they made it quite clear that it would mean the end of civilization as we knew it if we were to do something stupid.

By now, you're probably wondering what all this has to do with media selection, so let me tell you. I have been professionally involved with education for 20 years, ranging from high school teacher to SCUBA instructor to a hands-on technical trainer on a wide range of telecomm equipment to what I do now for Hill Associates. The buzzwords come and go, the presentation techniques pass in and out of favor, and the argument over "teaching style" vs. "learning style" waxes and wanes in popularity like the phases of the moon. One constant, however, is the need for learning effectiveness.

We'll get back to diving a little later.

## Corporate Trends

In today's corporation, there is a renewed focus on employee performance as a critical factor in corporate success. According to studies conducted by the American Society of Training and Development (ASTD), There are five key behavioral elements that affect employee and corporate performance. They are:

- A focus on those results that make a company competitive
- Measurable change
- People with the right skill, knowledge, and behavior to perform as desired
- Systems and processes that connect work effort to desired results
- Methods for analyzing and closing gaps between current and desired performance

Furthermore, their studies indicate that most successful organizations today share the following characteristics:

- They tend to have flatter, more horizontal (matrixed) managerial structures
- Work is done by teams organized around business processes
- Highly skilled workers are empowered to act as they see fit
- There is significant collaboration among teams, between labor and management, and with suppliers
- There is a widely accepted and recognizable focus on quality, customers, and continuous improvement
- They employ flexible technologies
- They have implemented a formal change management process

The ASTD has also identified ten trends that are underway in most corporations, and that affect the degree to which training is required:

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<sup>4</sup> As in zip. Zero. Nada. Didn't know a computer from a water cooler.

1. Skill requirements on the part of employees will continue to increase in response to rapid technological change.
2. The American workforce will be significantly more educated and more diverse.
3. Corporate restructuring will continue to reshape the business environment.
4. Corporate training departments will change dramatically in size and composition.
5. Advances in technology will revolutionize the way training is delivered.
6. Training departments will find new ways to deliver services.
7. Training professionals will focus more on interventions in performance improvement.
8. Integrated high-performance work systems will proliferate.
9. Companies will transform into learning organizations.
10. Organizational emphasis on human performance management will accelerate.

Clearly, employees play a central role in the success of the modern corporation, but there is a caveat: they must be trained to understand their role in the organization and to carry out that role in the most effective manner possible. “The need for speed<sup>5</sup>” dictates that training methods must be timely and accurate – smart bomb education as opposed to the shotgun approach.

## Media History in Adult Education

Multimedia education, believe it or not, has been around for about 60 years. Some of you will remember the days in elementary school when you fought over who got to sit behind the filmstrip projector and advance the filmstrip to the next image when the ‘beep’ sounded on the scratchy record spinning at the front of the room. Not very elegant, and certainly not integrated, but multimedia nonetheless. That technique and others like it evolved into truly integrated solutions encompassing CD-ROMs, videotape programs, audio lessons, computer-based and computer-assisted training packages, virtual reality MOOs and MUDs, instructor-led sessions, and various combinations of all of these.

According to “Study Projects Multimedia Industry To Quadruple by 2000” by Luc Hatlestad (InfoWorld, IDG Communications, San Mateo, California, May 8, 1995), the market for multimedia training increased by 53 percent between 1991 and 1995. Furthermore, a 1996 report on computer-based training, “A Comprehensive Study of CBT and Multimedia as Instructional Delivery Systems,” (SB Communications, Hingham, Massachusetts) by Floyd Kemske--author of *Human Resources: A Corporate Nightmare and The Virtual Boss* (Catbird Press)--found that the use of CD-ROM as a delivery platform for CBT had increased and that the emergence of CD-ROM and LAN-based delivery systems indicates a trend towards centralized CBT delivery overall. So the use of multiple media for training seems to be on the rise.

Years ago, Marshall McLuhan observed that “the medium is the message.” His words were taken to heart by a generation of educators and trainers who decided that the presentation medium is the key to any successful training program. To a point, that’s true; unfortunately, a radical splinter group decided that if one medium is good and

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<sup>5</sup> A student in a class in Dallas recently observed to me that “Time is money, but speed is profit.”

causes students to learn, then *lots* of media must be *great* and will cause students to *really* learn. Thus was born today's fascination with multimedia as the solution to the world's educational challenges. And while there is nothing wrong with multimedia, or with any of the media that comprise it, educators must be judicious in their use of alternative media to ensure that they maintain presentation balance in the classroom. Students – especially adult students – act like the variable rate diffusion filters we used to use in chemistry classes. They absorb material at a good clip for a period of time, but they do hit limits, after which *nothing* will be absorbed. It is this variable diffusion problem that alternative media are particularly good for.

McCluhan argued that modern electronic media such as computers, radio, television, and films have far-reaching sociological, aesthetic, and philosophical consequences, to the point that they actually alter the ways in which we experience the world. His observation is that “the medium is the message;” I prefer to modify that phrase (if you'll pardon the pun) by observing that “the medium is the *massage*.” That is, the medium should certainly shape the message, and provide emphasis, and increase penetration and absorption. It should not, however, be used just for the sake of injecting an alternative medium into a learning environment “because we haven't used one in a while,” or because there might be a perception that the teaching organization “isn't with it” because they haven't converted their entire curriculum to laserdisc.

One implication of the shift towards “technology-based training” or “computer-mediated training” as it is often called is the need for training professionals to work closely with technologists to develop delivery systems. Training departments must partner with information technology and information systems organizations. In a significant number of corporations, those departments are leading the way in the development of expert systems and electronic performance support systems, and in research on the delivery of training via computer networks.

## Back to Diving

The typical basic SCUBA certification course consists of about 16 hours of classroom time, 16-20 hours of pool time, and a minimum of three ocean or lake dives. In the classroom, students learn about such dry-as-bone-meal topics as Archimedes' Principle, Boyle's and Charles' Laws, equipment design and maintenance, the proper use of the U.S. Navy Decompression Tables, the physics of diving (sound propagation, the loss of color at depth, overpressure accidents), diving first aid, safety, and rescue, oceanography, and biology. Dry topics all, but topics that are critical for safe diving.

In the pool, students learn how to use the equipment, how to rely on a diving buddy, how to recognize the signs of fatigue or panic, and how to administer first aid or rescue in the water. They learn about physical limits, preparedness, and cooperation. Some of it seems corny, but a well-trained diver who responds immediately and correctly is a safe diver. The ocean is not a particularly friendly place for divers, and the only way to visit is on her terms -- First rule of diving.

When the instructor is satisfied that divers are ready to test their skills in open water, the first dive is scheduled. It is usually a free dive (snorkels, no SCUBA), and is conducted

as a means to test buoyancy control, surf entry ability, rescue techniques, and general comfort in the water. A few weeks later, the first SCUBA dives are conducted. This is the acid test, during which students *really* test their skills underwater. This is where all the pool sessions pay off, because it is during this first dive that Murphy arrives with a vengeance and wreaks havoc on most students. Masks flood. One fin disappears in the surf zone, never to be seen again<sup>6</sup>. Kelp and fishing line snag tank valves, weight belt buckles, and all the little gizmos that new divers festoon themselves with. If they've been paying attention, these annoyances are simply that. The new divers have learned techniques for dealing with these annoyances, and they *do* deal with them. They have a good time and at the end of the dive are jazzed beyond belief.

It is the instructor's job to ensure that students learn what they need before embarking on their first dive, and *certainly* before they are handed their certification cards. The classroom, pool and ocean sessions are critical components to the student's preparation as a certified diver, but it is what actually goes on in those sessions that makes for a truly prepared diver. At Sea Hut, we used – you guessed it – multimedia. Or perhaps better stated, multiple media. Let me explain.

## In the Classroom

While a considerable amount of the material presented in the SCUBA classroom is theoretical, we always augmented it with practical material wherever possible. All classroom, pool and ocean/lake sessions were conducted by a certified and licensed SCUBA instructor, because the law requires it. In the classroom, the Instructor would typically conduct a lecture for some portion of the three-hour session, but would augment the lecture with a 35mm slide show synchronized to an accompanying audio tape, designed for each of the eight lectures in the course<sup>7</sup>. To that course, the Instructor would add his or her own slides and hands-on demonstrations that were germane to the topic at hand.

We also used hands-on exercises to illustrate key issues. For example, when we studied the effects of deep diving on the human body, I locked the students in a decompression chamber<sup>8</sup>, compressed them down to 150 feet, and allowed them to experience the effects of nitrogen narcosis in a dry, safe environment. I had them attempt to perform simple tasks while exposed to the narcotic effects of high-pressure nitrogen, such as calculating decompression tables for the dive. Once they were compressed to depth, giggling uncontrollably from the effects of the nitrogen, I had them blow up balloons to illustrate Boyle's Law: as we slowly "surfaced," the pressure on the outside of the balloons dropped off, but the pressure inside remained the same. By the time we reached zero depth, the balloons had all popped, proving the linear relationship between pressure and volume ( $P_1V_1 = P_2V_2$ ): Boyle's Law. And what did that exercise

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<sup>6</sup> Somewhere off the California coast, there is an island built completely out of all the fins that my students lost over the years on California's north coast. The number is somewhere around  $6 \times 10^4$ .

<sup>7</sup> This was a professionally-prepared set of materials from Jeppesen Corporation.

<sup>8</sup> Purchased from the Navy at a surplus auction for \$50. Best investment we made as a business.

have to do with real-world diving? Simple: hold your breath during the ascent, and your lungs can rupture just like the balloons<sup>9</sup>.

When we discussed marine biology and diving physics, we often used pool exercises to further illustrate the concepts covered. For example, in the air, we often use sound to not only get the attention of another person, but also to determine where they are through the ear's directional abilities. In water, that doesn't work because sound travels so much faster in water than in air. A diver can certainly get the attention of another diver by banging a rock on their tank, but the direction of the sound cannot be determined.

To illustrate this, we would put the divers in the pool with SCUBA gear, wearing masks with blacked-out faceplates. We would then lower a hydrophone<sup>10</sup> into the pool at some random place, play music through it, and offer a substantial prize to the first student who found the source of the music. In all the years we did this, no student *ever* found the hydrophone. This exercise illustrated very effectively the fact that directional capability goes away underwater.

Giant kelp is a seaweed that grows in dense, thick forests along the California coast. It grows to enormous sizes, and is in fact the fastest growing plant on earth – more than a foot a day in larger plants. It attaches to the rocks on the sea bottom, grows a long, thin rubbery stalk to within a few inches of the surface, then sprouts four-foot leaves that spread into a thick canopy. The leaves are made buoyant by pickle-sized, gas-filled bladders,<sup>11</sup> and because the plants are so ubiquitous, divers often have to go through them to get to a dive site. They have two choices: they can go *under* the canopy, which requires air consumption; or, they can go *over* the canopy, which consumes no air from the tank but requires dexterity in a skill known as a “kelp crawl.” If done properly, a diver can crawl across the canopy as quickly as they can crawl across a hardwood floor. If done *badly*, the kelp will snag on every weight, strap, buckle, CO<sub>2</sub> cartridge trigger, and knife handle, at best slowing the diver down, at worst releasing buckles and sending weight belts plummeting to the bottom.

To teach the kelp crawl, we would fill the pool with weight suits, which float just below the surface when they are saturated with water. With all the arms, legs, and straps, they simulate the snagging characteristics of kelp pretty realistically, which allowed us to teach the students how to successfully crawl across the canopy.

One important aspect of diving that students are required to learn is the proper use of the U.S. Navy Decompression Tables, which teach divers how many minutes they can remain at a particular depth without having to make a decompression stop<sup>12</sup>. This is a

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<sup>9</sup> These overpressure accidents result in such trauma as cerebral air embolism, subcutaneous emphysema, mediastinal emphysema, and other nasties. They ruin your day.

<sup>10</sup> Basically, an underwater speaker.

<sup>11</sup> The bladders are filled with carbon monoxide. Each bladder contains enough CO to kill a chicken in less than a minute. No joke.

<sup>12</sup> While under pressure at depth, the air breathed by the diver dissolves into their tissues. When they surface, the air comes *out* of solution. If they surface too quickly, the air comes out of solution quickly, often in the form of bubbles that can lodge in tissues, joints, and backwaters of

critical skill, although beginning divers are taught that they should *never* dive in such a way that they need the tables.<sup>13</sup> Typically, students are given a series of “case studies” that involve multiple, repetitive dives (nitrogen accumulates in body tissues, so divers have to take into effect the combined effects of consecutive dives). They have to solve the problem by determining how many decompression stops they must make to off-gas following a dive to a particular depth for a certain amount of time. The process is tedious and error-prone, so to help the student gain confidence, I created an audio tape program that the student would play while they were solving the problems. The tape would talk them through the process, and at various times the student would be directed to stop the tape, do part of the exercise, then start the tape, at which time the narrator would explain what their results should be at that point. The tape provided a form of “hand-holding” for the students, and allowed them to have a virtual instructor at their beck-and-call to help them learn a particularly thorny and complex concept.

For oceanography lessons during which the Instructor had to convey to the students the forces they will encounter in the ocean and the dynamic nature of coastal water (surf, rip currents, subsurface surge), we conducted lectures to discuss water movement with schematic illustrations and line drawings. Once the basic concepts had been drilled home, we used 35mm slides to illustrate the various regions of water surface activity, and films that we created to show such things as a diver caught in a rip current, divers attempting to make surf entries and exits, the power of underwater surge and the danger it poses to unsuspecting divers, and proper techniques for dealing with all of these. We also used film to demonstrate proper boat, dock and reef entries, rescue techniques, emergency procedures, and equipment maintenance. We would often show the films and slides on a screen set up on the pool deck, so that students could watch the demonstrations and *immediately* try the techniques in the water while they were still fresh in their minds. That also gave us the ability as instructors to iteratively train the students until the techniques were perfected.

Please note that while the principal delivery technique used to teach these would-be divers was instructor-led, we relied heavily on audio, video (film), still images, hands-on practice, case studies, and iterative practice to augment the lessons presented in the traditional classroom. Note also that none of the media served as replacements for any other: the audio tapes supplemented the decompression case study exercises, the films supplemented the instructor-led classroom work, the still images, illustrations and line drawings enhanced the pool sessions, and the hands-on practice and pool work contributed to the lessons that would later be conducted in the ocean or lake. The combination of these “multiple media” made for a dramatically better and more effective experience for the students, and in our minds, made them much better equipped and more confident divers.

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the central nervous system, resulting in extreme pain, paralysis, and death in severe cases. This phenomenon is called decompression sickness, or more commonly, the bends. It is prevented either by staying within the depth/time limits stipulated in the Navy tables, or by surfacing gradually, allowing the gas to come out of solution slowly.

<sup>13</sup> Divers are taught that the only reason to dive deep is to learn that there’s no reason to dive deep. It’s cold, deep, dark, and nothing lives down there.

## From Diving to Data

The techniques described in the preceding section work as well in the telecommunications classroom as they do in the dive shop and pool.<sup>14</sup> The technical nature of much of the content is such that Instructor-led education is often the best presentation technique initially, because students often need one-on-one time or hand-holding to grasp the initial concepts. As their confidence builds, however, other techniques can be employed. In fact, many of the media described above are useful adjuncts in the traditional classroom, and provide supplemental richness and alternative learning options for students.

In the following sections, I'd like to discuss the benefits and liabilities of some of the more popular options, including instructor-led, audio tapes, video tapes, self-paced workbook exercises, computer-based training (CBT), and distance learning.

### Instructor-Led

In most traditional business environments, it can be argued that time is a constant and knowledge is the variable. Today, however, knowledge is a desired constant while time is the variable. Most corporations have large, heterogeneous audiences to educate and inform. Management wants them all to ultimately have the same knowledge about the subject at hand — hence the constant knowledge concept. Unfortunately, most companies do not have the luxury of putting all employees in a room at the same time to effect the knowledge transfer. Time is clearly a variable, and instructor-led is a viable option.

In traditional business situations where time is constant and knowledge varies, Instructor-led classes work extremely well for bringing all participants up to a required knowledge level. Instructor-mediated presentations are ideal for conveying large quantities of detailed information that may require audience interactivity for comprehension. Instructor-led can work well in both large (generic, easily understood material presented to a functionally, culturally, or educationally heterogeneous group) and small groups, including executive audiences where the material to be presented is highly sensitive or extremely interactive, such as material presented in a strategy session.

Instructor-led sessions are particularly effective because they allow the instructor to effectively gauge the level of comprehension of the audience and modify the presentation in real time to effect the highest absorption rate. On the other hand, instructor sessions tend to be expensive and logistically difficult to coordinate, since they require the ongoing presence of a living, breathing body. In the diving examples described above, we used Instructors to ensure that all participants shared a required level of competency before proceeding into the more complex, and potentially hazardous, open water phases of the course.

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<sup>14</sup> Although I wouldn't recommend teaching hands-on equipment courses in an ion-filled swimming pool. The sessions would be inspired, but rather short.

## Audio Tape

For situations that require the dissemination of broad-brush information that is high-level in nature, audio tapes are effective and low cost, provided they are well-written and well-produced. Audio also works well when a significant percentage of the target audience commutes, because they can listen to tapes in their cars. During that time, they represent a captive audience.

Audio also works well when the material to be presented can be “chunked” into small pieces and used in conjunction with other presentation media. Consider the diving case studies we augmented with audio tapes: in those situations, the audio tape provided a “virtual instructor” who was available at the student’s request to help them work through the problems. The tapes didn’t replace the written exercises, nor did they replace the Instructor: they augmented them. They *massaged* them. Ooh.

Audio can fall down for several reasons. If the information to be conveyed is overly complex or technical, or requires visual cues for maximum comprehension, or is overly long, audio’s effectiveness falters. On the other hand, I have listened to audio presentations that were so well-written and engineered that they evoked exactly the mental images that the writer wanted to create. The cost of audio is dramatically lower than video, because the data collection and post-production efforts are far less complex and time-consuming.

Finally, audio is a medium that can be used anywhere, and by virtually anyone.

## Video Tape

It is well known that more than half of the human brain is devoted to vision — it’s the single most important sense humans have. Therefore, any time information can be conveyed in a visual fashion, it stands a greater chance of being assimilated by the learner.

Video is most effective when the message to be conveyed is conceptual, or is of a nature that allows it to take advantage of the multiple sensory inputs that video provides. As a general rule, humans tend to be “multimedia devices<sup>15</sup>,” therefore, multiple-media interfaces work well for conveying information from “device to device.” In the diving classroom, we used video (film) to show students techniques that we could never have described as effectively through other means. We also used the medium to transport the students to the ocean, or the lake, or a river, to help them understand what they would confront during their first dives. We showed them animals, plants, physical locations,<sup>16</sup> and open water techniques, always delivering a consistent, *correct* message.

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<sup>15</sup> Thanks to Gary Kessler for this quote that I brazenly stole.

<sup>16</sup> The most popular tape had a shot of The Bathroom, a popular gathering spot in sixty feet of water near the end of the Monterey Breakwater. Years ago, someone dumped a pile of bathroom fixtures in Monterey Bay. They were collected over the years by divers and relocated to their current venue. There is a pedestal sink, two toilets, and a clawfoot bathtub with showerhead (someone even hung a shower curtain). Someone even purchased a copy of [A Fishwatcher’s](#)

Video is also effective for large audiences. It is the most expensive medium of all, but is also among the most effective. A well-written and well-produced video is acceptable to most everyone, and can be viewed whenever time is available. When large audiences are involved it is quite cost-effective, in spite of its relatively high up-front production cost. Furthermore, it can be viewed repeatedly for maximum effectiveness, and can be broadcast over closed circuit, cable, public access, corporate, or commercial television networks.

The downsides of video are worth considering. First, it is inherently linear, and thus the message that is linked to it is dependent on the linear nature of the medium. Second, it places the viewer in a relatively passive role that becomes more passive as the amount of video increases. Programs or courses that rely on long video segments must ensure that steps are taken to reduce this passivity.<sup>17</sup> Whatever the case, video and audio components must be used judiciously, because if used improperly, they reduce the degree of interactivity and can lessen the impact of the overall program.

### Self-Paced “Workbook” Exercises

Workbooks are effective when students require “asynchronous learning.” Workbook material can be studied whenever the student has time for it; the issue is that this kind of learning requires a dedication on the part of the learner that isn’t necessarily there for the student watching a video — or if it is there, it’s often in a different form. Workbooks require that the student engage with them, and actually do some proactive work. Video, on the other hand, especially good video, is like television. It requires virtually no interactivity, and can be a marvelously seductive learning environment.

One word of caution: You can lead a diver to the ocean, but you can’t make them dive. Giving students the ability to learn on their own time (often called self-directed learning) is good, but it places a large degree of responsibility on the shoulders of the student to actually do the work. There has to be a clear incentive in front of the student to ensure that they do it. In the case of the dive student, it was easy: learn it or potentially place yourself in harm’s way. Of course, we also had written tests and practica that students had to pass prior to certification, but the subliminal incentive of potential danger was fairly motivational. In the traditional classroom, incentives tend to be less obvious, and must be monitored more closely<sup>18</sup>.

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Guide to Pacific Coast Fishes, printed on plastic, and left it on top of one of the toilets. The reader can imagine the photographs that have been taken there over the years.

<sup>17</sup> In professionally-produced video programs, scriptwriters use routine scene changes to engage the viewer’s attention and prevent boredom. In the Hill Associates CommQuest videos, scene changes occur every three to six seconds. Television and cinema programs exhibit similar numbers.

<sup>18</sup> We had other incentives, as well. When we taught advanced courses, students were required to complete six dives in two weekends: a night dive, a deep dive, and a high-altitude dive the first weekend, and a rough water dive, boat dive, and navigation/search and recovery dive on the second weekend. By the time the students prepared to do the final dive on the final Sunday, they were exhausted and quite hungry. That dive required that they follow a complex compass course

While workbooks aren't always the best choice for standalone information transfer, they are effective as accompaniments to other media. The Jeppesen course materials that we provided to each student comprised a textbook, a study guide and workbook, and a laminated set of the Navy Tables. Students were required to complete reading assignments and homework exercises prior to each class which were tightly connected to each other and to the materials presented in the classroom and pool during each Instructor-led session.

## Computer-Based Training

Computer-based information transfer can be quite effective. It can also be quite bad, to the point that it can cause more damage than it corrects. For example, if the CBT product consists of nothing more than an electronic page-turner, then it becomes nothing more than a very expensive workbook. If, however, it forces the learner to interact with the information, to wrestle with it, to actually *use* the information, then learning takes place and the CBT works.

There is a battle underway in the hallowed halls of corporate training over whether custom-developed or off-the-shelf CBT products are more effective. Omnitech Corporation recently conducted a study after which they found that while a significant percentage (80 percent) of 150 Fortune 1,000 companies interviewed rely on off-the-shelf CBT products, more than two-thirds (67 percent) also develop customized CBT, either internally or using an outside consultant. The off-the-shelf products work well for broad-brush, large audience presentations that require a consistent, organization-wide message; the custom products fill specific needs and knowledge gaps.

We didn't have computer-based materials when I was in the diving business, because PCs hadn't really arrived yet. Today, however, there are all sorts of CBT packages, CD-ROM courses, interactive learning aids, online guides to marine wildlife, and decompression calculators. Many of today's certification courses rely heavily on CBT packages to teach students the basics, but Instructor-led remains the dominant delivery technique for core skills, for obvious reasons. Computer technology has even replaced the traditional analog gauges that divers carry: hose-mounted consoles today include digital depth gauges, dive timers, tank pressure gauges, and decompression meters.

Another downfall of CBT is that it requires a computer. And since there are at least two primary platforms (PC and Mac), a large audience requires the creation of a version that

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without surfacing. If they did it correctly, they found me, sitting in a folding chair in front of an enormous, waterproof box in 75 feet of water. The box weighed about 150 pounds on dry land. Written on a waterproof slate on the side of the box was this message: THIS BOX CONTAINS ALL OF THE SODAS, CHAMPAGNE, BEER, WINE, AND FOOD YOU CAN POSSIBLY EAT AND DRINK. YOUR JOB IS TO GET IT INTO THE BOAT. They then had an incentive to use their newly-acquired salvage skills to carefully raise the box to the surface (too much buoyancy and it will launch itself out of the water like a Polaris missile), make it buoyant at the surface, then transfer it into the boat. They ALWAYS got it into the boat, and it was ALWAYS empty when we got back to the dock.

runs on both (essentially two products). Unfortunately, even with products for both platforms, CBT is often less effective than other techniques because of the relatively low penetration of computers, compared to the virtually universal availability of audio tape players and VCRs used in other delivery media. More and more, though, PC penetration is increasing, and most PCs purchased today come fully equipped with multimedia packages that include huge hard drives, plenty of memory, high-quality sound, and CD-ROM drives. Thus, interactive CBT packages that incorporate multiple media such as text, video, and sound can be considered as serious contenders in the multimedia CBT basket of goods. Products such as those produced by companies like Eloquent fall into this category; for remarkably little expense, they can combine material from a content provider with their platform to produce a low-cost, reasonably good quality product for large audiences<sup>19</sup>.

## Distance Learning

Distance learning is a specialized form of instructor-led presentation. It can be very effective if the broadcast medium is good; unfortunately, on lower-end systems that deliver a picture that is not up to the quality level that most people associate with television, it can be quite distracting. However, for large, dispersed audiences, it is typically effective. Distance learning can be expensive, and must therefore be amortized over a reasonably large audience.

The trend, however, is to make use of distance learning wherever possible, particularly for large audiences. In fact, a number of companies have emerged in the last few years that have targeted this growing market. Westcott Communications, for example, an education and training firm in Carrollton, Texas, is working with eight business schools (including the Wharton School at the University of Pennsylvania) to provide high-tech executive education over their worldwide satellite-based network. The venture, the Executive Education Network, has nearly 100 corporate classrooms at Eastman Kodak, Walt Disney, and Texas Instruments, among others.

## Internet and Intranet Delivery Options

By the middle of 1998, most professional training organizations believe that both Internet and Intranet transport will be used to deliver significant amounts of just-in-time training to the desktop. Already, companies like Eloquent and Progressive Networks are positioning themselves to amass market share for their products, and many companies are already taking advantage of Intranet-based training. And while many believe that the delivery mechanism will be server-based, other differ, believing instead that CD silos are less expensive and more versatile. Time will tell, but rest assured: net-based training is just around the corner, representing one more delivery option.

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<sup>19</sup> The window that opens in Eloquent's CD product is nicely arranged. A quarter screen column on the left side of the window provides a head-and-shoulders Quicktime-like video of the instructor with synchronized audio and a scrolling text crawl of what they are saying, while the remaining three quarters of the screen displays the graphic that relates to the topic being discussed. And while the quality of the video is nowhere near full-motion, it is adequate for reasonably short programs.

## Conclusion

My goal in this paper has been two-fold: first, to provide a slightly different slant on the utility of a variety of presentation media, particularly as they complement each other in terms of relative effectiveness; and second, to make you all want to go out and get SCUBA certifications. More on that later.

All of the media discussed in this paper have their benefits and liabilities. There is no such thing as one technique that does it all; there are too many sensory inputs out there that affect the way people learn, and environmental variables that alter the relative effectiveness of each medium, not to mention economic, social, temporal, political, and logistic variables. Each medium must be assessed in terms of the greater context of the task at hand, and the role that that medium might play *collaboratively* with other delivery options. Contrary to popular belief, Instructor-led training is here to stay, but so are all the others. This is not a matter of competition: it is a matter of collaboration and mutual support, with effective learning the ultimate outcome. In reality, the two most important aspects of this drama are the content that is delivered via a selected subset of media, and the proper selection of that subset. One without the other simply doesn't work<sup>20</sup>.

McLuhan's belief that "the medium is the message" is off-base a bit, as far as I'm concerned. It is certainly a significant component, and can dramatically affect the successful delivery and absorption of the message. The message, however, lies in the content, and the delivery of the content is inextricably linked to the medium. Both are critical components; neither is dispensable.

Oh, I almost forgot: diving. Check out the National Association of Underwater Instructors (NAUI) at [www.naui.com](http://www.naui.com), and the Professional Association of Diving Instructors (PADI) at [www.padi.com](http://www.padi.com). Then, drop me a line and I'll convince you.

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<sup>20</sup> This "matchmaking process" is best facilitated by a skilled and qualified instructional designer who can guide the selection of the appropriate delivery media and match it to the content.

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