

# Author! Author!

BY BOB YEAGER

*You can use authoring systems to create, store, and deliver computer-based lessons tailored to your learners' needs. Here's a primer to get you started.*

**Y**ou've decided to use computer-based training for a course, but you can't find any off-the-shelf packages that meet your needs. So someone says, "Why don't you create the course yourself? All you need is an authoring system."

A what?

Welcome to the brave new world of do-it-yourself computer-based training.

You can use an authoring system to create and deliver such common training tools as tutorials, drills, and tests. You also can use an authoring system to create simulations and other more exotic instructional tools.

## What is an authoring system?

Authoring systems are a type of software package that enable you to create, store, and deliver computer-based lessons, just as wordprocessing packages enable you to write, store and manipulate text.

When you "author" computer-based training, you create and combine text and graphics into lessons; you also write the instructions that guide how the system delivers, or "plays back," the lessons to students.

The term "authoring system" once referred exclusively to software used to create computer-based training. Now the term refers to software for other applications as well. For example, software packages that enable you to create presentations are sometimes called authoring systems.

Authoring systems for computer-based training have four distinguishing features. Other types of software might have one or more of these features, but to develop effective training you need a system that allows you to accomplish all of the following tasks:

**Present information.** CBT authoring systems enable you to create screen displays out of text and graphics. Interactive-video authoring systems enable you to incorporate video and audio elements into your displays.

**Ask questions and judge answers.** CBT authoring systems enable you to ask questions, evaluate answers, and provide appropriate feedback.

In a typical CBT tutorial, students may respond to as many as 60 questions—also called "interactions"—per hour. The questions can be in multiple-choice, true-or-false, fill-in-the-blank, or a variety of other formats. Authoring

systems have special software that can judge whether a student's answer is an acceptable variation of the correct answer, based on information that the training designer enters.

**Create "branches."** Authoring systems enable you to tailor lessons to individual students' needs by linking different "branches" of instruction. "Navigational branches" let students decide how to work through lessons; for instance, a student could opt to review earlier screens of information or skip ahead to a quiz.

"Conditional branches" guide students through a lesson depending on their performance. For example, you might create a branch based on how students respond to a quiz. Students who answer two or fewer questions incorrectly automatically move to the next topic. Students who answer three or more questions incorrectly branch into remedial instruction.

**Save data.** CBT authoring systems save information about how students perform. At a minimum, a CBT authoring system will record the lessons each student has completed. This data helps you and your students keep track of their progress.

More sophisticated authoring systems have computer-managed instruction systems built in. These systems record lessons completed, test results, and other data; you can instruct the system to compile the data into reports. Some CMI systems help students navigate complex curricula by "advising" them about which lessons to take next.

### Choosing an authoring system

Once you decide to get your feet wet in computer-based training, you'll find yourself awash in a sea of choices. Dozens of suppliers sell authoring systems, and each company describes its system as unique.

Here are some sources for identifying authoring systems:

▶ *The International Directory of*

*Performance Support Authoring Systems*. Ariel PFS Corporation, 100 View Street, Suite 114, Mountain View, CA 94041; 415/694-7880. The directory costs \$295.

▶ "1992 Buyer's Guide to Interactive Videodisc Products and Services," in the May/June 1992 issue of *Instruction Delivery Systems*. Communicative Technology Corporation, 50 Culpeper Street, Warrenton, VA 22186; 703/347-0055.

▶ *Videodisk Compendium for Education and Training*. Emerging Technology Consultants, 2819 Hamline Avenue North, St. Paul, MN 55113; 612/639-3973. The cost is \$39.

Don't make the mistake of thinking the best system is the one with the most features; it might be harder to learn and use. And you might wind up paying for features you don't need. Most authoring systems that are at least two years old have similar features. No system can fulfill every item on your wish list, but most systems can meet most of your needs.

To narrow your choices to a short list of systems, consider the following criteria:

- ▶ What type of computer will learners use to play back the lessons?
- ▶ How much can you spend?
- ▶ What matters to you more—simplicity or flexibility?

Let's take each of those questions separately.

First, what type of computer will learners use to play back the lessons? You need to select an authoring system that is compatible with the computers that the learners will use. Currently, more than 60 percent of authoring systems operate on DOS-based personal computers. Others operate on Macintoshes, mainframe systems, or systems that use other operating systems.

If your workplace uses several types of computers, you might want to use one of the relatively few authoring systems that run on more than one type of operating system. Otherwise, make your choice based on the type of computers available to most users. Your aim is to minimize the amount of training it takes to get users up and running—and to avoid purchasing any new computers.

How much can you spend on your authoring system? As with other

## The You You See...



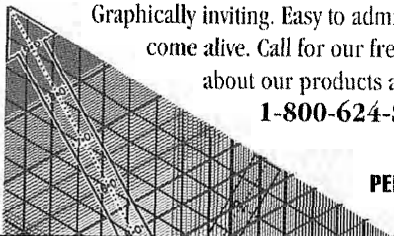
## The You They See.

If you're so true blue, how come some people don't take you seriously? The Strength Deployment Inventory® (SDI) and its companion instruments have helped over a million individuals and organizations improve teambuilding skills, conflict resolution, communication and morale. Interactive. Cross cultural.

Graphically inviting. Easy to administer. Insightful. Make your training come alive. Call for our free quarterly journal or more information about our products and upcoming training seminars:

**1-800-624-SDIS (7347).**

Altruistic  
Nurturing



**PERSONAL STRENGTHS PUBLISHING**



Circle No. 135 on Reader Service Card

software products, the cost of an authoring system reflects the number of users. On average, you will pay about \$3,000 for each person who will use the system to create lessons, but prices vary widely.

Some PC-based systems cost \$100,000 or more, a high price to justify; others sell for as little as \$50 but deliver even less than they cost. Most authoring systems for personal computers cost between \$1,000 and \$4,000. The average is about \$3,000.

Authoring systems that work on mainframe computers typically cost about \$35,000 for 10 to 12 authors. Some suppliers offer starter systems, which offer a limited number of features, for about \$15,000. You'll probably need the features that come with a more expensive system.

Most suppliers allow you to make and distribute as many copies of your lessons as you want at no extra charge. But beware—a few suppliers charge you for each copy you make of each lesson. (They justify the charge based on the proprietary "presentation" software that runs your lessons; every time you make a copy of a lesson, you also have to copy the presentation software.)

Make sure you find out if and how much you'll have to pay for the rights to copy lessons for your students. Some users have purchased reasonably priced systems and then discovered they would have to pay tens of thousands of dollars for the rights to copy lessons for all their students.

Suppliers also charge annual fees for maintenance, typically about 20 percent of your original cost. Plan to pay the fee—you'll need the user support it covers, including help hot lines and system upgrades.

The third question to ask yourself may require a little more thought: What matters to you more—simplicity or flexibility? You need to decide what kind of system interface best meets your needs. An interface is the way you use a system—how you learn the software, what you see on the screen, and how you enter information and give instructions to the system.

Authoring systems for computer-based training used to have one of two interfaces; they were either language based or menu based. Now most systems are hybrids of the two, but you

## TANGOES® TRAINING GUIDE



### AN EXERCISE IN CREATIVE THINKING

SHARPENS SKILLS FOR TEAM BUILDING,  
LEADERSHIP AND COMMUNICATION  
IN MANAGEMENT, EDUCATION,  
MARKETING AND SALES.

INCLUDES 2 TANGOES GAMES  
AND 6 EXERCISES:  
COMMUNICATION PATHWAYS • GROUP DYNAMICS  
CREATIVITY • INNOVATION  
CONFLICT • PROBLEM SOLVING

USER-FRIENDLY FORMAT  
APPLICATIONS • LEARNING OBJECTIVES •  
PROCEDURES FOR INTRODUCING,  
CONDUCTING & DEBRIEFING  
SUMMARIES • VARIATIONS

**FREE SAMPLE!**

\$ 79.95  
POSTAGE PAID  
SATISFACTION GUARANTEED

Rex Games, Inc.  
1642 Bush Street  
San Francisco, CA 94109  
Tel 800 542 6375 Fax 415 931-8282

Circle No. 113 on Reader Service Card  
Visit us at ASTD Booth #1340

## Managing Chaos



### Center for the 21st Century

A global training resource center  
offering solutions to critical  
workplace issues.

Your organization  
**will benefit**  
from cutting-edge  
programs, products  
and services.

#### Center for the 21st Century

3001 LBJ Freeway, # 105  
Dallas, TX 75234  
800/788-3199

Contact: Liz Stelchek

Circle No. 140 on Reader Service Card  
Visit us at ASTD Booth #1516



### LET US HELP YOU HELP YOURSELF



Overcome your challenges and improve your **confidence, results, evaluations and bottom line** by learning to plan, design and implement more effective training in your organization.

**Neuro-Linguistic Programming(NLP)** has come of age in the business world as a means of providing effective, systemic training.

Utilize the power of NLP to learn strategies to implement the models of people such as Peter Senge, Stephen Covey, and others into your organization. Begin by attending Module 1: the **Basics of NLP in Business Training** of Phase I of the **Mastery of NLP in Business Training** series.

#### What you will learn:

- Self Mastery • Advance Communication Technology
- Triple Description of the Communication Loop • and other Nifty Processes

**Your Trainers:** Susan Grace Branch, of Susan Grace Branch & Associates and Bill Hoosty, of WRH Consulting provide a dynamic, experienced team approach to using NLP in business training. Both Susan and Bill have a wide variety of background training in business, industry, government and education.

**Dates for Module 1: May 24, 25, 26 and June 14, 15, 16, 1994.**

Registration: \$2500 before 4/1/94, \$3,000 after 4/1/94. Group discounts are available. Pre-registration is required. Details of accommodation and location will be sent upon registration or request.

**Conveniently located in Rochester, New York. Call (716) 586-6773**

Circle No. 127 on Reader Service Card

still may find the distinction useful when you are selecting a system.

Authoring languages are computer-programming languages (akin to such languages as BASIC and FORTRAN) that are used to create computer-based training. The four key features of authoring systems are embedded in a system's authoring language.

A language-based interface gives you the flexibility to create any kind of lesson using any kind of strategy you want, but you must understand and remember a lot about the language and the software. Don't consider a language-based system unless you plan to spend more than half your work time using the system.

Menu-based systems display options and prompts that walk you step-by-step through the authoring process and automatically build your lesson. For instance, a menu-based system would ask you such questions as these:

- ▶ Do you want to present information or ask a question?
- ▶ Do you want a multiple-choice,

matching, or true-or-false question?

▶ Where do you want to branch after this question?

With a menu-based system, you don't have to know anything about programming, it won't take you long to get started, and you won't have to review much if you use the system infrequently. On the other hand, your options in designing your lesson are limited to the system's menus of choices.

To choose an appropriate interface, think about how often you will use the system, the complexity of the lessons you expect to design, and the amount of time you can invest in learning and using the system.

### Take it for a test drive

Once you've compiled a short list of products based on these criteria, take the products for a test drive. Have each supplier create sample screens so that you can compare different systems. (*The ASTD Handbook of Instructional Technology* contains sample screens and strategies that

you can use. It costs \$58 for ASTD members and \$60 for nonmembers; to order, call 703/683-8100.)

Some suppliers prefer to do canned demonstrations that show off their systems' best features. But you should insist that suppliers create a demonstration based on your needs. For instance, if you will use the system for technical training, ask the supplier to create a screen with technical drawings similar to what you might use in a lesson.

Don't take suppliers up on offers to take your material with them, create the screens, and show you the results. You need to watch as your sample screens are created so that you can decide if you could do it yourself. As you watch, keep the following questions in mind:

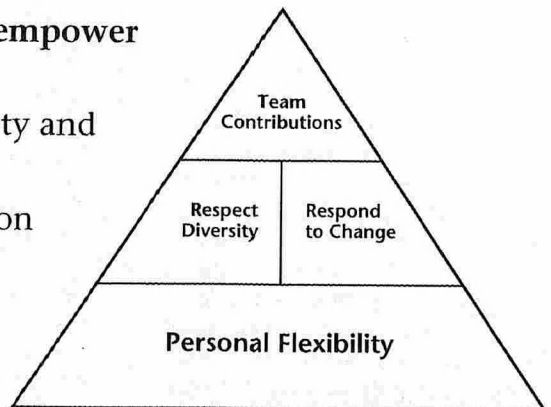
- ▶ How many actions are needed to create a simple screen? Can you remember them?
- ▶ Do you have to be a programmer to use the system? Good authoring systems make it easy for non-programmers to create CBT lessons.

## Increase Personal Flexibility & Team Productivity with the Personal Style Inventory (PSI)

### *A Rational/Intuitive Assessment Package*

This evolved workshop tool was designed to empower individuals by:

- Increasing their respect for individual diversity and responsiveness to change in the workplace
- Enhancing the left-brain/right-brain impact on personal flexibility and effectiveness
- Increasing personal style options for more effective team efforts



Call 1-800-331-TEST to order your copy of the PSI Learning Kit today  
or to receive your FREE copy of the PSI Demonstration Booklet.

**PAR** Psychological Assessment Resources, Inc.

Circle No. 182 on Reader Service Card

Don't hesitate to tell suppliers when their systems are too complicated.

▶ Does the supplier use special tricks to make a strategy work? Some authoring systems allow you to add a BASIC program to do a special function, such as animation. That's fine for someone who knows BASIC, but will you be able to do it?

▶ How long does it take for the system to shift from its testing mode to its editing mode? Ask your supplier to demonstrate by changing a word while testing a lesson. Good authoring systems can switch between testing and editing within five seconds.

▶ Consider how well you like the supplier. Most people rely on their suppliers for training and help during the first few months of using a system, so you'll need a comfortable working relationship. Have your supplier spell out the customer support you'll receive.

### Designing CBT

Suppliers frequently claim that their systems help you design lessons. Usually, this means the system provides templates for lessons. Templates can help you format your lesson and can remind you to include all the necessary information, but you still have to design the lesson.

The design process for a computer-based training lesson is the same as for other media. You start by identifying training needs and specifying objectives. You must decide what content to include, how to arrange the material, what type of examples to use, which questions to ask and when to ask them, and what type of feedback and reinforcement to provide.

Once you have your objectives and content, write scripts (also called storyboards) for your lesson and design your screen displays. Expect to spend two to three workweeks preparing a script for a typical one-hour CBT lesson.

A script is a planning tool that enables you to revise your work easily before you enter it into an authoring system. Scripts also make it easy for others to review your work and make suggestions.

Create your scripts by hand or use a wordprocessor. Include all the text that will appear on a screen and either sketch the graphics that will

# The Hottest Video in Town Can't be Found at Your Local Video Store.



**R** request our free video, and you'll get a thorough briefing on the benefits of Team Learning. Gone are the high costs and productivity losses normally associated with traditional seminars. With Team Learning, small groups participate in regular, self-directed training sessions *at the workplace.*

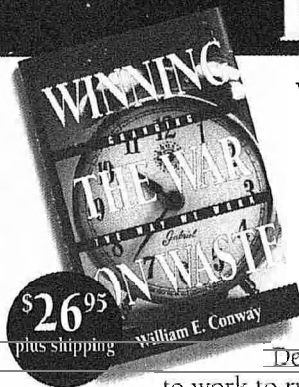
For your video and information kit on our nine-module Team Learning series, fax (416) 539-9604 or, call MRCC: 1 800 263-TEAM



**M.R. Communications Consultants Inc.**  
Soundview Executive Centre, 72 Cummings Point Road,  
Stamford, CT 06902, USA.  
In Canada: 221 Dufferin Street, Toronto, Ontario M6K 1Y9, Canada

Circle No. 185 on Reader Service Card

# CREATE YOUR OWN REVOLUTION

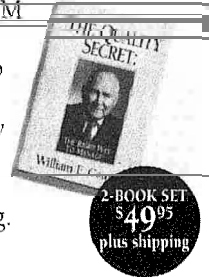


with the new, step-by-step guide  
**"Winning The War  
On Waste"**  
by William E. Conway

New from the first CEO of a Fortune 500 company to work directly with Dr. W. Edwards

Deming to put the principles of TQM

to work to run an entire organization! This sequel to the best-seller "The Quality Secret" takes you step by step with case histories, clear analysis & a proven practical methodology to the system of continuous quality improvement and the elimination of waste FOREVER! Hardback, 230 pages. \$26<sup>95</sup> plus shipping. "The Quality Secret" now in its 4<sup>th</sup> printing available. \$42<sup>95</sup> plus shipping.



2-BOOK SET  
\$49<sup>95</sup>  
plus shipping

**Call 1-800-359-0099**

**CONWAY QUALITY, INC.**

**The Right Way To Manage®**

15 Trafalgar Square, Nashua, NH 03063-1968 USA (603) 889-1130 • FAX (603) 889-0033

Circle No. 171 on Reader Service Card

appear on the screen or describe them in words. Aim to make the graphics and screen layout as attractive as possible; in CBT, visuals carry as much weight as text. Also include in your scripts all questions, answers, feedback, and branching.

You will need to anticipate the possible ways in which students might type answers to questions. If

the correct answer is "dog," students might type "dogs," "Dog," "DOG," or "dawg." You have to specify which versions are acceptable.

Along with entering correct answers, you can instruct the system to guide students who answer incorrectly to the right answer by displaying your feedback. You can build lists of possible incorrect answers

into your lesson and arrange for the computer to respond with different feedback to each one. You also can instruct the computer to respond with feedback if students make more than a certain number of mistakes.

Once your script is finished, expect to spend about two weeks entering the text into the system and creating the graphics for each screen. A few authoring systems trim the time needed for this stage by allowing you to import your script from a wordprocessing file. You also can save time by using clip art instead of drawing graphics yourself or having a graphic artist draw them.

Some suppliers contend that you can skip the design and script-writing stages. They advocate composing CBT lessons directly in their authoring systems.

You might be able to compose this way, but most people can't. It's difficult to organize your content and create your screen format at the same time. Also, once you enter text, graphics, questions, and branches into an authoring system, it is difficult to change them. Adding a new sentence can alter the entire layout of a screen that took hours to create. Because editing is so difficult, you may find yourself reluctant to make revisions that would have been easy to make while the lesson was still at the script stage.

If you compose directly on an authoring system, you may have to fight the tendency to waste time on unnecessary flourishes—for example, on animations that have no instructional value. Otherwise, you could wind up with a poorly designed lesson that took longer than expected to develop.

A few newer authoring systems have a rapid prototyping feature, a tool that makes it easier to plan your lesson and make revisions. Using this tool, you can create what amounts to a rough draft of your lesson. Prototypes let you quickly sketch and modify your lesson's design; once you are settled on the design, you can work on the content.

Once you have written, designed, and entered your lesson, you will spend about a week testing and revising it. At this stage, you'll proof the lesson as you would printed

WRITING  
COURSES  
COME  
AND GO...

ONE STAYS.

## Put It In Writing

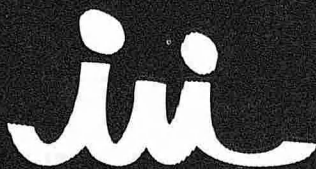
We began teaching writing to corporate America 25 years ago, and since then this remarkable training program has become the most widely used writing course in the English-speaking world. It works because it teaches the communications principles business men and women really need to know:

- How to use clear, understandable English
- How to organize for the busy reader's needs

Happy *Put It In Writing* users include: AT&T, Boeing Aircraft Co., General Motors, Travelers Insurance, and the City of New York.

Available in classroom, self-study, and one-day workshop editions.

Also available: *Executive Guide to Grammar*, the ideal supplement to any writing course.



INTERNATIONAL  
WRITING  
INSTITUTE, INC.

415 Hanna Building  
Cleveland, Ohio 44115  
Writing Course questions?  
CALL (216) 696-8100

# Leatherman Leadership Questionnaire

- Valid
- Reliable
- Comprehensive
- Knowledge-Based

If you want the most effective tool available today for *needs assessment, career development, selection, and performance management*, you should take a look at the LLQ today! And ask about the new "Select" group of LLQ instruments for specific needs and shorter time investment!

- LLQ Front Line Select—
- LLQ Executive Select—
- LLQ Sales Select—
- LLQ Custom Select—

**INTERNATIONAL**   
TRAINING CONSULTANTS, INC.  
(800) 998-8764

Circle No. 188 on Reader Service Card  
Visit us at ASTD Booth #1302



## Excellence Through Diversity: Diversity and Sexual Harassment "Best Practices" Training and Consulting

*"Recognized for our treatment of these issues in a spirit of camaraderie, absent of guilt and blame, with the focus on professional behavior, productivity and quality organizational change."*

Specialists in  
Reducing Resistance to and  
Increasing "Buy-In" of Diversity  
by Managers and Employees

Because it's the **right** thing to do  
Because it's the  
**necessary** business thing to do

**Tulin DiversiTeam Associates**  
5 Curtis Park Drive, Philadelphia/Wyncote, PA 19095  
215-884-7325 Fax: 215-886-5515

Circle No. 131 on Reader Service Card

## Resources on Instructional Design, Development, and Selection

Need more information on the design, development, and selection of instructional media and systems? Try the following articles that have appeared recently in *Training & Development*.

▶ "Developing Self-Directed Learning," by George M. Piskurich. March 1994.

▶ "How To Develop a Training Simulation," by Bruce Lierman. February 1994.

▶ "Training by Design," by William L. King. January 1994.

▶ "The Challenges of Electronic Learning," by Robert C. Albright and Paul E. Post. August 1993.

▶ "Shopping Smart in the High-Tech Marketplace," by Nina Adams. August 1993.

▶ "The Art, Science, and Business of Program Development," by Stephen L. Cohen. May 1993.

To purchase reprints of these articles, please contact ASTD Customer Service at 703/683-8100. Single-article photocopies are \$6 each; the package is \$15. Phone for prices on bulk orders (50 or more) of custom reprints. Call to order by credit card, or send your order to ASTD Customer Service, Box 1443, Alexandria, VA 22313-2043.

materials for misspellings and similar errors. You'll also have to work out bugs typical of CBT programs, such as screen displays that do not erase properly, text that overwrites other text or graphics on the screen, feedback that doesn't fit on one screen, and unintended branches.

## What's next in authoring systems?

Two trends will shape the nature of authoring systems in the future.

One trend is software integration. Until recently, you were limited to the design tools included in your CBT authoring system. For instance, you couldn't merge 3-D animation created with special graphics software into a CBT lesson because the two packages were not compatible. Newer CBT authoring systems

enable you to integrate different software packages into one lesson. As this technology evolves, expect to see more specialized software. For instance, in the future you might use presentation software to create displays, special interaction software to create questions and feedback, and a CBT authoring system to integrate all the screens into one lesson.

You're likely to see specialized packages for creating tutorials, simulation strategies, drills and practices, or testing, as well as authoring systems that enable you to mix and match screens.

When specialized authoring tools become common, prices are likely to drop because the products will have wider applicability. In the future, you might buy 10 specialized tools for the amount you'd pay for one authoring system today.

Future authoring systems also are likely to incorporate expert-system technology, which will enable them to help users design instruction. Eventually, this technology might automatically generate a CBT lesson from knowledge entered by a subject matter expert.

Expert systems are still in the early stages of development. The most advanced expert systems available today can figure out how to solve difficult problems for which the range of possible answers are limited. But they are not as useful for solving simple problems with a broader range of appropriate responses.

You don't have to wait for the next wave of products to make investing in a CBT authoring system worthwhile. Many currently available systems enable you to create customized computer-based training right now, and the demand for specialists with expertise in creating CBT will evolve along with the technology. ■

**Bob Yeager** is founder and president of InterCom, 3 Grogan's Park, Suite 200, Woodlands, TX 77380.

To purchase reprints of this article, please send your order to ASTD Customer Service, 1640 King Street, Box 1443, Alexandria, VA 22313-2043. Single photocopies, at \$6 each, must be prepaid. Bulk orders (50 or more) of custom reprints may be billed. Phone 703/683-8100 for price information.