Best of The eLearning Guild's

learning solutions

TOP ARTICLES FROM THE eMAGAZINE'S FIRST FIVE YEARS

Bill Brandon (editor)

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eLearning Guild's Learning Solutions

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First Five Years

Edited by
William R. Brandon
The eLearning Guild

About This Book

Why is this topic important?

e-Learning—the use of technology to assist learning—has already become a standard delivery method in education at all levels and for training employees in many organizations. The technology itself is becoming easier to use, so that more people are now producing e-learning applications. This includes subject-matter experts, human resources professionals, and others who have no formal background in teaching or in the production of instructional materials. Yet the challenge of creating e-learning that works is great, requiring specific knowledge about the psychology of learning, about design principles that adapt technology to people rather than the other way around, and about the new technologies that appear constantly and that can greatly improve results. To create effective e-learning applications, we need guidance on the best use of technology. Whether you are a manager, a specialist in the design and production of e-learning, a teacher, or a subject-matter expert, in this book you will find the specifics you need, provided by practitioners who have already solved many of the problems you face.

What can you achieve with this book?

The Best of The eLearning Guild's Learning Solutions delivers the top articles that thousands of Guild members worldwide have found indispensable for guiding their development efforts. In it you will find guidelines, checklists, and instructions for creating great e-learning that will help you:

- Devise a learning strategy for your organization

- Manage e-learning implementation

- Measure the results of e-learning and identify the return on investment (ROI)

- Integrate e-learning and knowledge management

- Choose a learning management system (LMS)

- Create planning documents and developers' guides that will facilitate project management and improve the quality of e-learning

- Create and use learning objects

- Understand XML-based e-learning development

- Create effective, engaging, live online learning events

- Rapidly produce video for e-learning

- Use simulations and games to promote deeper learning

- Motivate employees and students to complete e-learning assignments

- Use social software (weblogs, podcasts, and wikis) to bridge the gap between formal and informal learning

If you are involved in the planning, design, production, or delivery of online instruction, this book will help you create solutions that result in real learning and improved performance by employees and students.

How is this book organized?

This book contains twenty-two chapters, organized into three sections. The first section addresses e-learning strategy and management. The second section offers detailed instruction and guidance on capturing skill and knowledge in your e-learning programs. The third section shows you how to facilitate transfer of that skill and knowledge. Each chapter provides a list of links to online resources and a complete set of references. Please note that the first paragraph of every chapter contains an introductory statement from the book's editor, Bill Brandon. This introduction is identifiable by the gray shaded background.

About Pfeiffer

Pfeiffer serves the professional development and hands-on resource needs of training and human resource practitioners and gives them products to do their jobs better. We deliver proven ideas and solutions from experts in HR development and HR management, and we offer effective and customizable tools to improve workplace performance. From novice to seasoned professional, Pfeiffer is the source you can trust to make yourself and your organization more successful.

Essential Knowledge   Pfeiffer produces insightful, practical, and comprehensive materials on topics that matter the most to training and HR professionals. Our Essential Knowledge resources translate the expertise of seasoned professionals into practical, how-to guidance on critical workplace issues and problems. These resources are supported by case studies, worksheets, and job aids and are frequently supplemented with CD-ROMs, websites, and other means of making the content easier to read, understand, and use.

Essential Tools   Pfeiffer's Essential Tools resources save time and expense by offering proven, ready-to-use materials—including exercises, activities, games, instruments, and assessments—for use during a training or team-learning event. These resources are frequently offered in looseleaf or CD-ROM format to facilitate copying and customization of the material.

Pfeiffer also recognizes the remarkable power of new technologies in expanding the reach and effectiveness of training. While e-hype has often created whizbang solutions in search of a problem, we are dedicated to bringing convenience and enhancements to proven training solutions. All our e-tools comply with rigorous functionality standards. The most appropriate technology wrapped around essential content yields the perfect solution for today's on-the-go trainers and human resource professionals.

Pfeiffer
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Essential resources for training and HR professionals

Best of The

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CONTENTS

THE eLEARNING GUILD is a global community of practice, and our goal is to be an industry-leading facilitator of the exchange of information about e-learning from the people who have that information to those who need it. *Learning Solutions e-Magazine* is just one of the vehicles we use to accomplish this goal. Every article we publish is written by members . . . for the benefit of other members. Our role is merely to aid in the communication of ideas by providing editorial, design, and project management services and the online infrastructure to support delivery.

The eLearning Guild has been publishing weekly issues of *Learning Solutions e-Magazine* (formerly called *The e-Learning Developers' Journal*) for six years now. During this time we have published more than 250 issues. But the number of issues is not the important achievement. What's really important is that we have been able to aggregate an enormous collection of excellent ideas, case studies, best practices, and reflective thinking from an incredible

group of industry practitioners—nearly two hundred of them. I am amazed by the collective knowledge and experience that all these contributors have so freely shared.

Every issue of *Learning Solutions* has, in my opinion, been a candidate for this "best of" book. Unfortunately, we simply can't select them all. In fact, we couldn't even select 10 percent of them. What a challenge it was to narrow it down to just the twenty-two articles included in this book. We think that these articles collectively will provide readers with a well-rounded view of the fundamentals and of the state of the art of e-Learning. Individually, each article provides specific tools, checklists, best practices, or step-by-step instructions on how you can make your efforts more successful.

You will find articles here from a number of our industry's most notable and widely recognized thought leaders. People such as Lance Dublin, Ruth Clark, Margaret Martinez, Ellen Wagner, Allison Rossett, Patti Shank, Clive Shepherd, and Karen Hyder have contributed their work. But this book also includes articles from focused industry practitioners who are working every day in organizations just like yours, and who are solving common problems just like yours. These authors include Jeffrey Berk, Desiree Tryloff, Victoria Bowen, Monique Donahue, Mike Dickinson, Cynthia Holmes-Radner, Kendrick Abell, Stephanie Sanford, Laura Levey, Joyce Seitzinger, and Marc Gamble. They might not be as well-known today, but the contributions they've made are no less significant. Without these practitioners taking the time to document their thinking, knowledge, and experiences, the Guild's *Learning Solutions e-Magazine*—and this book—simply wouldn't be what they are.

These chapters provide a snapshot of some of the best thinking in our industry at this moment in time. They represent the views (sometimes opposing views, I might add) of twenty-four e-learning professionals . . . and that's why this book is so important. It captures the essence of current professional practice as showcased in *Learning Solutions e-Magazine* in one nice volume.

Whether you are new to e-learning or you are an old hand, you will find value in these pages. We specifically selected articles that address a range of topics, from managing e-learning attrition to measuring your success, from using XML for development to integrating knowledge management, from developing design documents and guides to rapid storyboarding, from learning object

design to simulations and games for learning, from principles for effective e-learning to Blogs, Wikis, and Podcasts—this book covers it all. So whether you are a designer, a developer, or a management professional, read it.

For management professionals working to establish or refine their strategies, this book will help you examine the myths surrounding e-learning and find new ways to understand e-learning. It will help you to explore the mismatch between learning orientation and e-learning design and to use these ideas to develop your own attrition management plan. You will find advice on how to identify effective measurements and a system for applying them in a way that does not break the bank. One chapter offers ideas on how to incorporate knowledge management into your e-learning and gives you an excellent look at the planning and coordination that delivered outstanding results.

Once you've established your strategies, you'll have to put it all into practice. This book will be instrumental because it lays out the guidelines for instructional design and for project management that shaped one organization's e-Learning Development and Style Guide, and offers suggestions on how to adjust your own guide to match the culture of your organization. It also will show you how expert designers and developers can work together to automate and standardize storyboard production and how to conquer the steep learning curve associated with using today's synchronous e-learning technologies.

For e-learning instructional design professionals, this book offers ideas on how you can work with XML and be successful by gaining (or regaining) control of your development process. You'll discover the attributes of great training, along with a number of examples and references. You'll also discover how learning objects have significant potential for creating highly personalized learning programs, easily updated courses, and performance support tools. This book will also help you to identify and deal with the challenges you will face as you link formal and informal learning, and put new technologies like Blogs, Wikis, and Podcasts into the mix.

As you move from the design process to the development process, this book will give you six principles that have emerged from controlled experiments in how to best use multimedia to optimize learning, a summary of the basics for improving your assessments and the quality of your results,

and how you can speed your efforts with software development tools like templates, "skinning," and future-proofing.

It will also show you how techniques from radio broadcasting can transform your virtual presentations into engaging, compelling, highly effective instruction, offer you guidelines that will make your first e-learning video a resounding success, and share the insights and lessons learned that one solo developer acquired during her first year in our field. Finally, you will also learn how to put together a planning document that will help you identify and manage all the critical items.

I hope you find this book to be a useful addition to your library. I believe you will. But as you go forward reading this book, remember that your profession is constantly evolving—adjusting to the ebb and flow of new technologies and ideas. To stay on top of it all, you need to be proactive about how you gather information and learn. We hope that you consider The eLearning Guild to be a primary source of that information. We will continue to publish weekly issues of *Learning Solutions e-Magazine* long into the future . . . and who knows . . . one day you might have an article included in a future edition of this book.

<div align="right">

David Holcombe
Co-Founder, President, and CEO
The eLearning Guild

</div>

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Great thanks to David Holcombe and Heidi Fisk, whose vision in the fall of 2001 led to The eLearning Guild, to over 30,000 members world-wide, to *Learning Solutions e-Magazine*, and ultimately to this book.

All of us owe a debt of gratitude to the editors and production support staff at Pfeiffer, including Lisa Shannon, Marisa Kelley, Kathleen Dolan Davies, Michael Kay, and Rebecca Taff.

As the editor, I offer my thanks to my patient and long-suffering wife, for putting up with all the nights and weekends when I was more engaged in editing the articles and this book than I was in doing the household chores and honey-do list.

GETTING THE MOST FROM THIS BOOK

Bill Brandon, Editor

WHAT EVERY E-LEARNING designer, developer, and manager wants, at least once in a while, is information and ideas that were useful to others. How did other people solve particular problems in the creation, distribution, and tracking of software applications that teach? How did others figure out ways to pin down and assess what employees and students actually learned? What learning did they actually put to use on the job? This book provides some answers to those questions and to a number of others as well.

Even though e-learning applications have been around now for almost half a century, that information and those useful ideas have been hard for the average e-learning practitioner to find. Some of it is buried in academic journals. Some is in books that are out of print. Typical articles on e-learning in some professional magazines are too short and do not provide enough information. While the critical topics are often addressed at conferences, there are too many conferences to attend them all. It can be expensive and time-consuming to track down the answers, and the practitioner nearly always needs the answers right now.

The Mission of This Book: Making Critical Knowledge Easily Available

Since 2002 The eLearning Guild has recorded, in the archives of *The eLearning Developers' Journal* and *Learning Solutions e-Magazine*, answers to these questions and to many others in the form of hundreds of in-depth articles. The articles are not "solutions" from vendors, and they are not untested theories. Instead, they provide guidelines, tips, and wisdom from practitioners who were already well along on the journey that others are only beginning. These articles are online, indexed, and easy to find—for members of The Guild.

This book intends to make a significant part of this storehouse of knowledge available to the rest of the world. We have chosen twenty-two articles from among the 199 published by The Guild between March 2002 and November 2006. These articles were chosen on the basis of the number of times Guild members downloaded them, the general importance and quality of the information in the articles, and the relative stability of the content. We present them here as the chapters of this book. These chapters provide answers to some of the most persistent, enduring questions that e-learning designers, developers, and managers ask every day. Readers, no matter which of the categories they fall into, will find themselves coming to this book repeatedly for vendor-neutral ideas that are already proven. Furthermore, in most cases, the authors have provided their contact information, so that readers can ask them for clarification or expansion of the ideas in the text.

Overview of the Chapters

As it turned out, the articles we chose address three main issues: (1) e-learning strategy and management, (2) how to capture skill and knowledge during the design process, and (3) ways to facilitate the transfer of skill and knowledge. These became the themes of the three sections in the book. Some of the chapters take a high-level, big-picture view. Some offer a very personal view of the struggle that is sometimes involved in executing an organization's learning strategy. Others provide tactical level details to guide the practitioner "on the ground" who must do the job.

The chapters are evenly divided between providing specific guidelines (tactics) and giving a more strategic focus. However, all of them share a highly practical orientation, with no "pie in the sky."

Summary of Chapter Contents

To help you find the information that may be most relevant to your immediate needs, Table I.1 provides previews of all the chapters. In the next section of this Introduction, you will find some additional information about ways to use the book.

Table I.1. Chapter Previews

Chapter	Includes
1. If You Only Look Under the Street Lamps . . . or Nine e-Learning Myths (Lance Dublin)	Discussion of what e-learning is and is not; Various definitions of the term; and What it takes to create successful e-learning
2. High Attrition Rates in e-Learning: Challenges, Predictors, and Solutions (Margaret Martinez)	Why learners drop out of e-learning; What corporate learning designers can learn from higher ed about attrition; How to use learning orientation to increase learner motivation; Designing an attrition management plan
3. Learning Measurement: It's Not How Much You Train, But How Well (Jeffrey Berk)	What to measure and how; How to streamline measurement; Using ROI measures, including the Balanced Scorecard
4. The XML Learning Revolution: Is Your Production Model Holding You Back? (Doug Wallace and Anthony Levinson)	Understanding the difference between HTML-based and XML-based e-learning development; Understanding the XML schema; Two brief examples
5. Integration of e-Learning and Knowledge Management (Desiree Tryloff and Victoria Bowen)	Case study: U.S. Air Force Knowledge Now Network; Creating online repositories; Tracking and reporting results

(Continued)

Table I.1. (Continued).

Chapter	Includes
6. The Design Document: Your Blueprint for e-Learning Standards and Consistency (Monique Donahue)	Creating a planning document that helps identify and manage all critical e-learning elements; Identifying interactivity guidelines; Creating specifications for media; Setting out the testing and evaluation strategy
7. Steps to Creating a Content Strategy for Your Organization (Ellen Wagner)	Explaining the evolving role of content; Defining metadata and its value; Defining the content object reference model; Defining content strategy; Evaluating LMS needs and features
8. Back to the Basics: Revisiting Great Training on Behalf of Great e-Learning (Allison Rossett)	What are the attributes of great training?; How to create great e-learning with the same attributes
9. Evolution of an e-Learning Developers Guide: Documenting Decisions and Intentions (Mike Dickinson)	How to design an e-learning style guide for your organization; Layout and format of e-learning; Instructional design and strategy
10. Evolution of an e-Learning Developers Guide: Instructional Design and Project Management (Mike Dickinson)	How to design an e-learning style guide for your organization; Instructional design; Project management
11. Using Microsoft Word for Rapid Storyboard Development: Efficient Production of Professional e-Learning Storyboards (Cynthia Holmes-Radner)	Comparing products used to create storyboards; Storyboard template design; A template for rapid development
12. The New Frontier of Learning Object Design (Ellen Wagner)	What are learning objects?; Why are learning objects important?; Learning object design; Barriers to adoption

Table I.1. (Continued).

Chapter	Includes
13. Avoiding Assessment Mistakes That Compromise Competence and Quality (Patti Shank)	Learning assessment as part of evaluation; Five common mistakes in assessment design and how to avoid them
14. Templates, Reusability, Future-Proofing, and the Technology Side of Rapid e-Learning (Kendrick Abell)	Lessons from software engineering for e-learning designers; Template types; "Skinning" and reusability; Ensuring reusability ten years later
15. A Team of One: Rapid e-Learning Environment at Break-Neck Speed (Stephanie R. Sanford)	Insights and lessons learned about rapid e-learning development; Surviving as a one-person department
16. Six Principles of Effective e-Learning: What Works and Why (Ruth Clark)	Research-based principles and guidelines: Multimedia; Text with graphics; Graphics with audio; Graphics with audio and redundant text; Effects of gratuitous media; Personalization
17. Bridging the Formal-Informal Gap: Blended Learning Evolves (Clive Shepherd)	What is blended learning?; Objections to blended learning; The four faces of e-learning; Handling resistance; Example of use
18. Behind the Screens: A Look at The eLearning Guild's Online Forum Series (Karen Hyder)	Synchronous e-learning production and technology; Presenter preparation tips; Instructional design for synchronous e-learning; Participant preparation; Checklist for the moderator
19. Fast Track Your e-Learning Video Development: Targeting Production Needs Analysis (Laura Levy)	Making decisions about streaming; Dealing with video file formats; Writing a video storyboard; Shooting the video; Editing the video; Testing the video; Worksheets for planning

(Continued)

Table I.1. (Continued).

Chapter	Includes
20. Simulations and Games: Revisiting Their Strategic Value (Allison Rossett)	Sweet spots for investing in simulations and games; Examples of good programs
21. Be Constructive: Blogs, Podcasts, and Wikis as Constructivist Learning Tools (Joyce Seitzinger)	Constructivism; Constructivist learning elements; Social software; Details of how to create and use weblogs, podcasts, and wikis in constructivist learning designs
22. Using Radio Production Techniques to Improve Synchronous Communication (Marc Gamble)	Differences between the classroom and synchronous communication; The importance of audio in synchronous events; Radio broadcast techniques

Because these articles were chosen primarily on the basis of how many times Guild members downloaded them, this book does not promote any particular view or model of "how to develop e-learning." You will find that the authors work from pedagogical models that may be behaviorist, cognitivist, or constructivist. But what they all have in common is a focus on what "works." And my belief is that this accounts for the popularity of the articles, which have been downloaded hundreds or even thousands of times since they were originally posted by e-learning professionals looking for exactly that.

How to Use This Book

It is not necessary to read through the book in chapter order. In fact, I would not recommend that. Instead, I suggest using the book as a reference and a resource to help establish your organization's learning strategy, design and development process, and your project management methods.

There are at least two other ways to get the most out of this book, by focus (tactical or strategic), as shown in Tables I.2 and I.3:

Table I.2. Chapters Corresponding to a Particular Tactical Focus

Tactical Focus				*Chapter*							
	4	6	9	10	11	13	16	18	19	22	Also
Resource or Reference			×	×			×	×	×	×	
Adapt Model		×	×	×	×			×			3, 5
Use Best Practices	×	×					×		×	×	

Table I.3. Chapters Corresponding to Particular Strategic Focus

Strategic Focus					*Chapter*							
	1	2	3	5	7	8	12	14	15	17	20	Also
Get Started	×						×	×	×		×	6, 21
Guide		×			×							6, 11, 13
Case Study									×			

Or you could approach the book according to your situation:

- If you are new to managing e-learning, I recommend starting with Chapters 1, 3, 6, 7, 8, 9, 10, 15, 16, 17, and 20.

- If you are new to developing or designing e-learning, start with Chapters 2, 4, 6, 8, 9, 10, 11, 13, 15, 16, 18, 19, and 22.

- To develop a sense of "where e-learning is going," start with Chapters 4, 5, 12, 14, 17, 20, 21.

About the References and Links in the Chapters

The authors have provided very complete references at the end of their chapters. We have checked these, and all of the print references should still be available to readers.

The links to articles and other resources on the World Wide Web may be a different matter. At the time of this writing (early September 2007), most of the links in the articles are still working. In a few cases, I have noted that the material is available through the Internet Archive (http://archive.org)). Should you find a "dead" URL in the book, I recommend that you use the Internet Archive (sometimes referred to as the Way Back Machine) to retrieve the information cited in the article.

PUBLICATION DATES

Chapter 1: Originally published June 16, 2003, in *The eLearning Developers' Journal* as "If You Only Look Under the Street Lamps . . . or Nine e-Learning Myths."

Chapter 2: Originally published July 14, 2003, in *The eLearning Developers' Journal* as "High Attrition Rates in e-Learning: Challenges, Predictors, and Solutions."

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Chapter 5: Originally published February 6, 2006, in *Learning Solutions e-Magazine* as "Integration of e-Learning and Knowledge Management."

Chapter 6: Originally published December 5, 2005, in *Learning Solutions e-Magazine* as "The Design Document: Your Blueprint for e-Learning Standards and Consistency."

Chapter 7: Originally published October 29, 2002, in *The eLearning Developers' Journal* as "Steps to Creating a Content Strategy for Your Organization."

Chapter 8: Originally published June 9, 2003, in *The e-Learning Developers' Journal* as "Back to the Basics: Revisiting Great Training on Behalf of Great e-Learning."

Chapter 9: Originally published September 25, 2006, in *Learning Solutions e-Magazine* as "Evolution of an e-Learning Developers Guide."

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Chapter 11: Originally published June 13, 2005, in *The e-Learning Developers' Journal* as "Using Microsoft Word for Rapid Storyboard Development: Efficient Production of Professional e-Learning Storyboards."

Chapter 12: Originally published June 18, 2002, in *The e-Learning Developers' Journal* as "The New Frontier of Learning Object Design."

Chapter 13: Originally published December 19, 2005, in *Learning Solutions e-Magazine* as "Avoiding Assessment Mistakes That Compromise Competence and Quality."

Chapter 14: Originally published January 23, 2006, in *Learning Solutions e-Magazine* as "Templates, Reusability, Future-Proofing, and the Technology Side of Rapid e-Learning."

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Chapter 16: Originally published September 10, 2002, in *The e-Learning Developers' Journal* as "Six Principles of Effective e-Learning: What Works and Why."

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Chapter 18: Originally published July 12, 2004, in *The e-Learning Developers' Journal* as "Behind the Screens: A Look at The eLearning Guild's Online Forum Series."

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Chapter 20: Originally published October 4, 2004, in *The e-Learning Developers' Journal* as "Simulations and Games: Revisiting Their Strategic Value."

Chapter 21: Originally published July 31, 2006, in *Learning Solutions e-Magazine* as "Be Constructive: Blogs, Podcasts, and Wikis as Constructivist Learning Tools."

Chapter 22: Originally published November 27, 2006, in *Learning Solutions e-Magazine* as "Using Radio Production Techniques to Improve Synchronous Communication."

e-Learning Strategy and Management

1

If You Only Look Under the Street Lamps . . . Or Nine e-Learning Myths

Lance Dublin

The E-learning Industry is obsessed with finding the answers to the question, "Why hasn't e-learning been more successful?" Perhaps we have been looking in the obvious—but wrong—places because our mythology of e-learning is misleading us. Follow along as a consummate changemeister examines the myths and suggests new ways to understand e-learning.

YOU KNOW THE STORY. A man (of course) has lost his keys. After searching diligently for them, he returns to his house, empty-handed. When asked by his family why he didn't find them, he replies, "I looked under each street lamp and they just weren't there!"

It seems to me the e-learning industry is a good example of that man. We keep looking for answers to why our e-learning isn't "successful." We keep talking about the technology, instructional design, and content, when the

real issue is getting people to use what's developed, and getting organizations to truly integrate e-learning into everyday life and operations.

The e-learning industry has had its chance. We've been in the spotlight for the last few years. Most organizations have deployed some form of e-learning. Learning management systems (LMSs) are now standard tools. Thousands of people have come to conferences. The term e-learning is in common use (without a common definition I hasten to add, but that's another issue). Large investments of time, money, and resources have been made. And yet, there still exists a high degree of skepticism at all organizational levels about e-learning. It's safe to say the honeymoon, however short-lived, is over. We are beyond "proof of concept" and "pilots"; results are now expected—and often mandatory.

We all know the hackneyed (and often misquoted) line from Kevin Costner and his movie, *Field of Dreams:* "If you build it, they will come." ASTD and others have modified that phrase to ask, "If we build it, will they come?" Any way you phrase it, the answer is, "Only in Hollywood!" (See Sidebar 1.1, Field of e-Learning Dreams.)

The simple truth is that designing and building the very best e-learning program does not guarantee that learners will use it and that organizations will support it.

But the simple truth may not be all that "simple." There still exist many myths about what you can and should do to ensure your success with e-learning. Let's explore nine of those myths and what you can do to make sure your e-learning implementation is based on fact and not on fantasy.

SIDEBAR 1.1. FIELD OF E-LEARNING DREAMS

ASTD: *The Learning Technology Acceptance Study* (2001) asked, "If We Build It, Will They Come?"

- 31 percent of learners fail to register for compulsory e-learning

- 68 percent of learners fail to register for voluntary e-learning

- Dropout rates of 50 to 80 percent are not uncommon

Myth 1: Everyone Knows What You Mean When You Talk About e-Learning

The truth is that the term e-learning means different things to different people. When the phrase was first popularized in 2000, it most often referred to computer-based training delivered over intranets and the Internet. "e-learning" replaced "web-based training" which, during the high-flying dot-com days, was just not sexy enough. It was a time when we were putting an "e" in front of everything, "e"-letters, "e"-toys, "e"-commerce, "e"-banking, "e"-pets—the "e"-list goes on and on. But the constant was a reference to delivering courses online.

Then in 2001, ASTD published a report that offered an expanded definition of e-learning. They wrote that e-learning is, "instructional content or learning experiences delivered or enabled by electronic technology . . . that is designed to increase workers' knowledge and skills so they can be more productive, find and keep high-quality jobs, advance in their careers, and have a positive impact on the success of their employees, their families, and their communities" (ASTD, 2001). Now *that's* a mouthful! And one that you don't often hear repeated.

At the same time, reflecting the buzz and enthusiasm of the dot-com world, Gene Ziegler, former chief learning officer (CLO) of Corpedia Education, suggested: "What is different is the ability of the Internet to build all this [rich learning] on the fly, on demand, and almost independent of time and place. Unlike the written word, the experience is only as linear as we want it to be. We can allow our whimsical personalities to drive us to any place in the world of knowledge that our imaginations desire. And we do so using both halves of our brain, firing on both cylinders, learning at unprecedented speeds" (Ziegler, 2001).

This certainly reflects my experiences using the world's most powerful e-learning tool, Google (www.google.com)! Somehow, no matter what I start to search, I end up spending hours exploring—and learning about—related and unrelated topics I'm led to both consciously and unconsciously.

By the end of 2002, many of the industry's experts were offering a definition of e-learning along the lines of, "The use of technologies to create, distribute, and deliver valuable data, information, learning, and knowledge to improve on-the-job and organizational performance, and individual development."

(This is my paraphrase of a great many different versions.) The number of e-learning vendors and resources and tools was now vast. Everything from LMSs to authoring tools to content management systems (CMSs) to virtual classrooms to enhanced Microsoft® PowerPoint™ presentations to courses online to portals to performance support systems. The list goes on and on.

At the same time, there was a constant debate about what the "e" actually stood for. Responses I heard included, "everywhere," "extending," "enhancing," and "enabling," as well as the obvious "electronic."

So it is no wonder that learners, managers, and executives are confused about what we do mean when we talk so confidently of e-learning.

Myth 2: e-Learning Is Really No Big Deal

The truth is quite the opposite. e-Learning *is* a big deal because it represents a change that ripples through an organization. And change is always a big deal to adults, with most of us reacting to it based on what seems to be only 30 percent logic and 70 percent emotion.

Organizations are complex systems that balance culture with technology, management, competencies, and business processes. Visualize a diamond with these at the points and at the center. (See Figure 1.1.)

Figure 1.1. Any Change to Any Element of the Organizational System Immediately Affects the Other Four
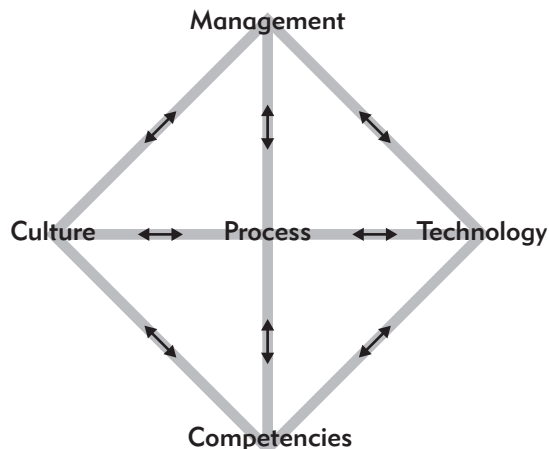
Which ones are at the points and which one is at the center may change with time and point of view. The important thing is this: if you connect the points, it becomes clear that any change in one will have an immediate and direct impact on every other point.

With e-learning we seem to be changing the *process* of learning in an organization. And, by definition, the technologies, management systems and structures, competencies and culture will be changed, along with business processes. Our choice then is whether to try to manage these changes, or to ignore them and just let them happen.

Myth 3: The "Hard-Stuff"—The Technology—Is What's Really Difficult

There exists more than ample evidence that, in fact, it is the "soft stuff"—the human issues—that are really the most difficult. After all, technology itself has no emotions to respond to or feelings to be hurt. It's a world of ones and zeros, whereas we humans are one complicated species!

Much has already been written about the change process and how humans move through their own personal change journeys, so I won't go through that again here. (Jay Cross and I also addressed the change process in our book, *Implementing e-Learning.)* But I do highly recommend that every e-learning professional learn about these models and theories. Whether we like it or not, we are in the change business.

Once you understand change, you can then make a plan to manage your implementation. My colleagues and I at Dublin Group developed, over many years, the "Ready-Willing-Able" model for implementing large-scale change. This model works well to ensure that your e-learning is accepted and used by the learners, and for it to be embraced and supported by the organization as a whole.

Ready refers to the fundamental systems and structures that must be in place and working. For e-learning this means that the technology itself must work, and help desks and support systems must be in place in case it doesn't. It also means the learners have the means to access and use the e-learning (that is, properly equipped PCs, correct passwords, and so on) and the organization has the systems to support it (that is, manager approval, registration, tracking, and so on).

Able refers to the education, training, and job aids required to make sure the learners know how to access and use the e-learning you develop and distribute. Although your e-learning adheres to standard conventions, you must make sure learners know how to log on, how to use all of your program's features and functions to optimize their learning experience, and how to get help (such as when to call the training department, the IT department, or the vendor).

Finally, *willing* refers to the change management systems and internal marketing activities necessary to ensure learner acceptance and organizational integration. This entails winning the hearts and minds of your stakeholders. Although it's hard, by having the necessary sponsorship and leadership, change communications and education, and linkage with ongoing organizational processes (for example, performance management), it can be done.

Myth 4: It's the Learners Who Really Count

Yes, learners do count—but so do many other people within the organization. A wide range of organizational stakeholders includes the "C"-level types (CEO, CIO, CFO, EVPs), middle and line managers, the human resources training staff (including trainers, instructional designers, and training managers) and anyone else with a vested interest. Add all these people together and you will realize that this is a large number.

The good news is that you don't have to get all of them on-board and embracing your e-learning at the same time. Through the work of Everett Rogers (*The Diffusion of Innovations)* we have learned that people adapt to new innovations (and change) along a bell curve. Some percentage of each stakeholder group are innovators," while those on the other end of the bell curve are "diehards." In between are the "early adopters," the "early majority," the "late majority," and the "late adopters."

The fact is that if only 5 percent of each stakeholder group embraces your e-learning, it will eventually become embedded in the organization. Once you get 20 percent of each stakeholder group supporting your e-learning efforts, the integration picks up tremendous momentum and becomes unstoppable!

Myth 5: Learners Know What to Expect from e-Learning

Actually, learners typically don't.

One of the root causes for this is that there isn't one accepted definition for e-learning, and therefore we don't have a common understanding to begin with. Another factor is the poor job we do of marketing our e-learning to all our stakeholders, especially to the learners.

The purpose of marketing today is to maintain profitable long-term relationships with customers or, in our case, stakeholders. As Spencer Johnson and Larry Wilson said in *The One-Minute Salesperson,* "People love to buy but hate to be sold." Therefore, critical elements of an effective marketing strategy and approach are branding and positioning.

Walter Landor, the renowned marketing guru, is often quoted as saying, "Simply put, a brand is a promise. By identifying and authenticating a product or service it delivers a pledge of satisfaction and quality." Think about the implied promise of brands like Coca Cola, BMW, Nordstrom, McDonald's, Lexus, IBM, Apple, and Revlon. What does each of these brand names promise the user? What mental images do these names and logos evoke?

What's interesting about brands is that there are really two views to consider: (1) the company's desire or hope concerning how the buyers and users will feel about it and (2) the buyers' or users' perceptions. When both of these views are aligned, strong brands develop. When they don't, you end up with an Edsel or Pet Rocks.

Are your hopes aligned with your stakeholders' perceptions? Try answering this question: If your e-learning were an automobile, what brand or make would it be, and why? What brand or make would your stakeholders perceive it to be, and why? Does your perception match theirs?

In other words, how have you positioned your e-learning? Is your e-learning to be used for professional development? Or for on-the-job support? Is it infotainment? Or is it entertraining? Unless you have a clear position defined *and communicated,* your learners and the organization will not know what to expect or why.

Myth 6: Communication Enables Us to Tell Our Stories

The American Heritage Dictionary defines communication as "the exchange of thoughts, messages, or information." The key word in this definition is "exchange." Exchange implies a two-way process, not a one-way flood. All too often, organizations develop "communication plans" that, in reality, are simply marketing communication plans. Their purpose is to tell a story in a convincing way, rather than to foster true two-way exchange.

To effectively implement e-learning, you need both a change communications plan and a marketing communications plan.

A marketing communications plan must tell all of your stakeholders about the vision and mission for your e-learning initiative. It has to present a memorable tag line, a 60-second "elevator" pitch, and accompanying project identity (such items as logo, font and colors, "look and feel"). You might create and distribute brochures and posters, tent cards and door hangers, mass emails and voice mails, mailings, and giveaways (for example, mouse pads, mugs, pens, t-shirts). The purpose is to make sure the message you want your stakeholders to hear is broadcast loud and clear.

A change communications plan is necessary to support your change management efforts. Its purpose is to support the learners and the organization as a whole as they move through the three phases of change adoption: awareness, engagement, and involvement. For each of these phases, the plan must present specific activities, messages, and timing for each key stakeholder group.

Myth 7: Success Is Getting It to Work

Getting your e-learning to work—completing the installation—is really only the first stage in being successful. And it is the easiest. It's the next two stages, implementation and integration, that are the really difficult ones.

You know you've succeeded at installation when your e-learning runs error-free, the sound can be heard, the video images played, and the LMS tracks whatever it is you decide you want to track, and then some. Your focus during installation is on the technology.

You know you've succeeded at implementation when your targeted audiences are accessing what you've developed. It's at this stage that there is a lot of conversation about the e-learning and the ROI (return on investment) anticipated and delivered. Your focus during implementation is on ensuring that your e-learning is used in the way you intended it.

Getting through the next stage, integration, is the hardest. You know you've succeeded at this stage when your e-learning is invisible. You are no longer absorbed with the technology or even talking about e-learning. Your focus is on your organization, and e-learning is just another part of any business process. Your e-learning has been absorbed into the fabric of your organization.

Myth 8: Once Is Enough

Oh, how we all wish this could be true! To be successful, you have to be in continual and overlapping cycles of preparing, launching, and sustaining. Within each of these cycles you must be in the process of learning → planning → developing → implementing → supporting → learning.

Almost as soon as you have done the preparation and launched Version 1.0, you should begin the preparation for Version 2.0. And, in parallel, you should be working within the organization to sustain the initial momentum. This is then repeated with Version 2.5 or 3.0 and on and on.

Think of e-learning as if it is organizational software that is in a continual process of improvement and refinement. Plan regular reviews and conduct what I've come to call "tune-ups." In these tune-ups, you might decide to look at some or all of the following: learning/e-learning strategy; business case (including ROI, if established); e-learning architecture, components, and delivery mix; content and instructional design; tools, technologies, and infrastructure; marketing; change management; evaluation and metrics; supporting organization and processes; sponsorship and governance; and roles and responsibilities.

Myth 9: It's Magic

Clearly, being successful with e-learning is not magic. There is no one model or formula to follow that will guarantee your success.

e-Learning enables you to change your current learning processes to be more efficient and more effective. If done right, e-learning becomes a critical force to improve the performance of your workforce and your organization as a whole. This is not the same as "converting" an instructor-led course. This is big stuff, and therefore requires the best thinking from the best people inside and outside your organization.

One-Minute Summary

In order to ensure your e-learning is used by your learners and embraced by your organization, remember:

1. It's about business and providing a business solution, providing a "Return on Expectation" not just a Return on Investment.

2. It's about enabling learning and driving performance, not training.

3. It's about people, not technology.

4. Marketing and change management are critical, not optional!

Good luck with all of your e-learning endeavors!

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Lance is now an independent management consultant, international speaker, and author based in San Francisco, California, and serving clients world-wide. He specializes in strategy development, program design, and implementation for corporate learning programs, and organizational change management. He brings to his work more than thirty years' experience in adult education and training, communication, change management, and organizational design and development.

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2

High Attrition Rates in e-Learning

CHALLENGES, PREDICTORS, AND SOLUTIONS

Margaret Martinez

> We know that learners frequently do not complete online courses. Reasons offered range from "e-learning is e-boring" to "they got what they needed and quit." This chapter explores another possible reason, a mismatch between learning orientation and e-learning design. Use these ideas to develop your own attrition management plan!

YOU'VE PROBABLY HEARD that people drop out of e-learning at very high rates and that nobody knows what to do about it. But the last part of that statement isn't really true. Some organizations and some researchers *do* know what to do about it, and we can all benefit from their experience. Let me give you an example.

The University of Phoenix has built its commercial success, in part, by understanding important learner considerations, especially social issues.

Here's what William Symonds had to say about Phoenix Online, in a *BusinessWeek* article published in June 2003:

> "Phoenix Online realized that interaction with humans—the professor and other learners in the class—was far more important to success than interaction with the digital content. Thus, Phoenix Online keeps its classes small, averaging just eleven learners. And to combat the Achilles heel of distance education—a high dropout rate—it offers its learners plenty of hand-holding, including round-the-clock tech support. The result: 65 percent of its learners go on to graduate." (Symonds, 2003)

Clearly, it is important to anticipate issues that cause learners to quit e-learning without completing the objectives, and to deal with those issues effectively. Successfully reducing the dropout rate allows better allocation of delivery resources as well as providing improved return on investment.

Learner attrition and retention (the two halves of the dropout problem) are not new challenges. Most colleges and universities routinely face them, especially with first-year students who are often unprepared for self-directed learning. It may be a surprise to learn that half of all freshmen today drop out before completing their programs. Now, outside the world of academia, trainers are finding that requiring a higher degree of self-motivation or self-direction in e-learning is also associated with higher attrition and lower retention. People drop out, and we wonder, "Why?"

We can learn much from the retention research conducted for universities and colleges. In these institutions, researchers have been able to identify common predictors that correlate completion with learner characteristics, experiences, and settings. Many universities and colleges have developed attrition management plans in order to better understand and address the dropout problem. Solutions found in higher education have improved retention through analysis and placement of students, collaboration between administrative departments, learner advice and management, and curriculum integration.

Any organization can create an attrition management plan to incorporate such solutions, tailored as necessary to government or private enterprise

situations. Such a plan will coordinate strategies for implementation, delivery, and progress measurement across entire learner populations. But plans adapted from higher education can now be made better.

e-Learning designs that accommodate individual learner profiles through "personalization" principles further reduce online dropouts. Recent neuroscience advances support the notion of these profiles. Personalization complements and extends more traditional approaches, including attrition management plans. Cost-effective technologies exist to identify and support key success attributes that are important to a learning audience, and to tap into self-motivation and self-direction. Through these technologies, it is possible to identify at-risk learners, improve the quality of the learning experience for every student, get the right message and the right tools to each person at the right time, and encourage learner achievement and continuing performance improvement.

This chapter provides the background information needed to apply these personalization principles and to develop an attrition management plan for e-learning in your organization.

Introduction

Keeping online learners engaged and enrolled is a tough challenge. The reality is that many learners who function well in classrooms are not ready for online learning. Typical learners have developed a classroom learning ability over time. They know how to interact with teachers and with other students, and they know how to take tests.

Online, learners require an expanded set of skills to be successful. In the same vein, trainers need a different kind of design and teaching perspective for the online world, in contrast to the classroom. These are two sides of the same coin.

Until the advent of online learning, it was enough to design primarily cognitive-based solutions, driven by the ways in which people process information, and to rely on the instructor to provide the personal touch during delivery. Something similar to that personal touch is even more important online. Research suggests that e-learning outcomes, including completion

rates, improve when the instructional presentation adapts to the learner's aptitude, expectations, and personality.

Good classroom trainers intuitively pay attention to key human factors, and adjust content, presentation, and other factors as needed to promote learning. Trainers receive important cues from learner emotions and from expressions of learner intent. Learner persistence is something that has to be inspired and nurtured throughout the learning and teaching experience. Online, of course, the usual cues to learner emotions are not available to an instructor or to an e-learning application.

Definitions

Definitions are important in this discussion, so here are three terms that you will see throughout the next few pages.

Attrition refers to a decrease in the number of learners or students engaged in some course of study. This course of study might be a degree plan, or it might simply be a standalone online course.

Attrition takes place when a learner leaves the course of study, for any reason. Institutions of higher learning often differentiate between the "dropout," who never returns and never completes the course of study, the "stopout," who leaves but comes back later to finish, and the "attainer," who leaves before completion but who has nonetheless achieved some personal goal—a specific skill, for example. In other settings (business or government), these distinctions may be made less often. Understanding the differences, and identifying examples of each kind of attrition, could be useful information in many organizations in guiding improvement efforts.

Retention refers to the number of learners or students who progress from one part of an educational program to the next. In higher education, this is normally measured as enrollment from academic year to academic year. In other settings, retention may simply be the inverse of the attrition rate. It may be defined as the number of learners who progress from one module to the next, or from one certification to the next.

Persistence relates to the act of continuing toward an educational goal. In higher education, a "persister" is simply one who achieves a degree or certificate and graduates "on time." In other institutions, persistence may not be

the term of choice, and instead the issue is simply the number of individuals who complete the required course, modules, or criterion tests.

Learning Design and Attrition Issues

Successful e-learning designers, instructors, and trainers know that online instruction can encourage persistence and reduce attrition, to the extent that the design and implementation recognize and tap into how individuals may want to learn. Unfortunately, many of today's e-learning designs lack appropriate personalized support that will help individuals manage their online experience, stay motivated to finish the course, and learn satisfactorily.

Personality issues must be considered from the very beginning of the e-learning design process, during planning and analysis. An analysis is inadequate if it does not determine the key personality attributes and sources for learning differences in the learner population. The ongoing analysis of the audience must go so far as to determine why some of the learners are less persistent, successful, self-directed, or motivated than others.

Designers must also understand how to apply the specific strategies, derived from new research, that support and foster greater persistence and self-motivation. This approach will help to identify "at risk" learners and provide the solutions, interactions, and environments that will eliminate or minimize the demotivating elements. If the design is causing attrition because it frustrates or drains interest, analysis will make this obvious.

Attrition Management in Higher Education

Traditional theories addressing learner attrition at institutions of higher learning consider various issues, characteristics, and settings. These usually include demographics, ethnicity, family, economics, experiences, background, and related variables. Additionally, studies often cite personal reasons such as family problems, finances, child care, distractions, and job needs and demands as the cause of withdrawal.

There is, as yet, no consistent view among educators of the key factors. However, over time, various attrition models have been proposed. One of these is more often used than the others, comes close to being a working

standard, and forms the basis (or at least the point of departure) for many attrition management efforts.

Tinto's Model

Vincent Tinto's model is commonly referenced in the learner retention/ dropout literature. The model's concept is that of "integration" of multiple influences on attrition. The model claims that whether a learner persists is strongly predicted by that learner's degree of academic and social integration (Draper, 2003; Tinto, 1993).

Attrition Management Examples

There are a number of guidelines and examples of attrition management plans and strategies available on the web. Several are included in the References at the end of this chapter. These are:

- *An Examination of the Retention Literature and Application in Learner Success* (Harvey-Smith, 2002)
- *Community College Survey of Learner Engagement* (CCSSE, 2003)
- *Retention Revisited: College and University* (Seidman, 1996)
- *Strategic Plan* (MSU-Bottineau Administrative Council, 2003)
- *Strategic Retention Planning* (University of Memphis, 2002)

Attrition Management Framework

An attrition management plan should deal with retention issues based on a coherent framework combined with a more effective method for measuring progress. An overview of the framework should provide a reliable definition of retention. The framework should link business or academic strategy and priority to a strategy for learning, development, and evaluation, and then to a learning blueprint. Aspects of the framework should include the following elements:

- Business or academic strategy and change vision
- Organization principles, needs, resources, and priorities
- Individual and team needs

- Stakeholders' goals, priorities, and needs

- Key processes, interactions, and activities

- Key programs, facilities, and resources

- Measures and accountability

Where Do Current Attrition Management Plans Fall Short?

The literature to date does not provide strong proof or good tests of retention and attrition theory. Additional consideration and integration of important neurobiological characteristics, such as locus of control or goal orientation, is needed.

Note that most of the examples available on the web do not consider individual learning differences; they assume that "one size fits all." This type of untargeted approach wastes resources. What is needed is an integration of conventional models offering a more evolved understanding of individual learning differences based on neurobiological foundations. Research is suggesting that locus of control, measured by Julian Rotter's Locus of Control scale (Rotter, 1966), is a significant predictor of academic persistence. In my opinion, leaving the differing aspects of learner control out of the discussion is an important omission.

Learning Orientations

Neuroscientists are helping us identify individual differences in learning, memory, and brain development that govern specific aspects of learning success. Emotion and intention to learn are powerful forces—on these two depend how well individuals purposefully manage information, plan, and set and accomplish goals. These are consistent findings in the research. Ultimately, these are the factors that influence learner persistence, attrition, and retention.

Whole-Brain Perspectives

Recent research highlights the strong influence of three additional factors on persistence and performance, namely an individual's independence, goal

orientation, and locus of control. These characteristics also affect factors commonly associated with learner retention and attrition, including engagement, expectations, motivation, self-direction, and attitude. Studies are beginning to show that these three factors can be used to distinguish learners who complete courses from those who do not.

The neurobiology of learning and memory is the source of learning differences, including differences in persistence. Emotions (such as fear, frustration, passion, motivation, and happiness) and intentions (for example, will, striving, and commitment) greatly shape personality characteristics—including locus of control as well as how learners persist to meet goals, learn and perform tasks, and succeed.

An Important Concept: Locus of Control

Some researchers describe locus of control as a concept that considers how some people feel that they have high control of managing their lives (an internal locus of control), while other people feel that they must rely on forces outside of themselves (an external locus of control).

People with a strong internal locus of control tend to be highly motivated and believe that they can make a difference in the outcome of a situation. Those with a strong external locus of control see their lives as being directed by luck and forces outside of their control. They may believe that change brings risk and fear of the unknown; they may blame others for the outcomes of their behavior. While most people fall in a range between the two, several researchers have found that dropouts scored higher in external locus of control, that is, they felt they were more controlled by external events.

Learning Orientation Model

Learning orientation theory (summarized at www.trainingplace.com/source/research/overview.htm) represents human learning variability from a whole-brain perspective. Learning orientations represent a comprehensive set of psychological factors (conative, affective, cognitive, and social) that influence how individuals approach learning. This perspective is more robust than the primarily cognitive explanations of learning differences (for example, learning styles) because it highlights the dominant developing, guiding,

and managing influences of emotions and intentions on cognitive and social processes. Personalization without including a whole-person neurological foundation is unsatisfactory and incomplete.

The learning orientation model (summarized at www.trainingplace.com/source/research/lomatrix.htm) presents profiles for four dominant learning orientations: *Transforming, Performing, Conforming,* and *Resistant.* These orientations describe the range of learning approaches (for example, differing locus of control) within any learner population. They are summarized in Table 2.1.

These profiles show the degree to which learners, following beliefs, values, emotions, and intentions to learn, generally commit effort and self-manage the learning process to attain goals, monitor or assess learning progress, and use reflection to improve future learning opportunities. Depending on the

Table 2.1. Learning Orientations

Transforming learners	Transforming learners deliberately use personal strengths, deep desires, strong emotions, persistent and assertive effort, and sophisticated, abstract, or holistic thinking ability and strategies to self-manage learning successfully. www.trainingplace.com/loq/pop_trans1.htm
Performing learners	Performing learners are lower-risk, semi-skilled to skilled learners who rationally, systematically, and capably use psychological processes, strategies, preferences, and self-regulated learning skills to achieve learning objectives and tasks. In contrast to transforming learners, performing learners are more selective about how hard they work on learning goals. They prefer focusing on the process and steps toward attaining worthwhile, to them, goals. www.trainingplace.com/loq/pop_perf1.htm
Conforming learners	Compared to transforming or performing learners, conforming learners are complying learners who prefer to more passively accept knowledge, store it, and reproduce it to conform, follow simple steps to complete assigned tasks, and please others. www.trainingplace.com/loq/pop_conf1.htm

(*continued*)

Table 2.1. Learning Orientations (*continued*)

Resistant learners	In contrast to the other three learning orientations, resistant learners lack a fundamental belief that (1) achieving learning objectives set by others is of any value or worth the effort, (2) they can learn and enjoy achieving goals set by others, or (3) academic learning and achievement can help them achieve personal goals or initiate desired changes. A resistant learner's personal goals strongly conflict with learning goals set by others. www.trainingplace.com/loq/pop_resist1.htm You can find more learning orientations research information at www.trainingplace.com/source/research/index.html

specific learning circumstances and the individual's ability, a learner may cover a range of tasks with a single learning orientation or they may move downwards or upwards on the table of orientations in response to negative or positive responses, conditions, resources, results, expectations, and experiences.

Extending the Attrition Management Model

What additional considerations are there when implementing an attrition management plan? With the long-term goal to reduce attrition, such a plan should also improve learner motivation, independence, persistence, satisfaction, and accomplishment. It is important to find the right balance between maximizing individualized learning opportunities and accomplishment of business, educational, and performance goals.

It is not enough to simply talk about attrition and persistence problems! These problems should be managed with a formalized attrition management plan offering targeted strategies for implementation, management, and measured progress. When developing models for today's more personalized online learning, there are two steps to take. The first is to explore, understand, and use some of the new information about extraordinary whole-brain activity, learning processes, and social interactions. This is to be done in the context of instructional goals, learner purpose, motivation, independence, persistence, and self-directed learning.

The next step is to use the "brain research" foundations to develop an attrition management plan. In other words, consider those "personalization characteristics" that particularly impact attrition and persistence. This plan should provide a framework within which one can analyze and differentiate audiences, identify key success attributes, predictors, and retention issues, track attrition rates, and provide and evaluate solutions that support retention and minimize attrition.

What to Cover in an Attrition Management Plan for e-Learning

The plan should cover key points, including strategies to:

- Consider the effect of emotions and intentions on learning, persistence, and self-motivation to learn

- Identify causes for non-completion

- Determine predictors that correlate learner settings, situations, and characteristics (such as independence, self-direction, and self-motivation) with learner retention, accomplishment, and completion of courses and academic programs. (For example, frequency and quality of contact with faculty, staff, and peers has repeatedly been shown to be a good predictor of learner persistence for learners with low locus of control or conforming learners.)

- Implement and manage the transition from instructor-led to online learning

- Predict and track potential and actual persistence with some accuracy

- Apply results to improve policy making, budgets, and resource allocation

- Improve and direct curriculum and learner support programs (for example, transition programs, counseling, and support for special populations) toward improved quality, increased enrollment, and learner retention

A good attrition management plan should:

- Be flexible enough to change as the needs change

- Ensure that the plan's substance and foundation is the learner

- Ensure positive workplace, learning, and social settings—in which learners and learning are valued

- Measure and report to management, learners, and stakeholders

- Represent core values and expected outcomes

Summary and Recommendations

e-Learning requires a higher degree of self-motivation, self-directed learning, and greater persistence and commitment from the learner. These requirements can create the serious problem of high attrition rates and costs if not recognized and managed strategically. Too many learners lack adequate preparation for the rigors of e-learning and are less likely to complete programs or courses. A better understanding of "at risk" learners is critical.

Over the years, many models of persistence have evolved to address attrition and retention issues, particularly focusing on learners' reasons for dropping out. These models, primarily university- and college-based, examine which factors relate to persistence. Identified as predictors, these factors are the typical reasons learners give for dropping out, including ability, academic and family matters, instructors, finances, full-time jobs, dissatisfaction, and lack of direction or reasons to complete.

Today, non-traditional attrition studies are considering the impact of psychological factors (such as locus of control and goal orientation) on persistence (that is, goal-directed behavior). In the new models, the traditional factors associated with retention and attrition may become secondary or contributing factors (albeit still important factors).

The whole-person factors are being studied as a primary or dominant influence on persistence. For example, highly goal-oriented learners persist and seek education as a means to accomplish specific objectives and accomplishments. In contrast, "at risk" learners have lower levels of persistence

toward completion. With the growing recognition about the need for targeted learner support or remedies for more personalized learning needs, many educational institutions have upgraded the level of student-support services and developed attrition management programs to identify and support "at risk" learners. As a result, they can encourage learners, as needed, to stay, be satisfied, and persist toward completion. An attrition management plan is the first thing that can be done to apply relevant interventions to improve attrition rates and support better learning, achievement, performance, and career development.

Finally, collecting data about persistence associated with e-learning and course completion has the potential benefit of guiding management decision making with respect to planning, policy making, and providing future services aimed at learner support and improved return on investment.

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3

Learning Measurement

It's Not How Much You Train, But How Well

Jeffrey Berk

A key consideration in designing e-learning measures is to decide what to measure and report. Measurement can be expensive and time-consuming. This has strategic implications for budgeting as well as for continuous improvement of e-learning. This chapter identifies not only the measures, but also a system for applying them in a way that does not break the bank!

A **FEW WEEKS AGO** I was talking to a colleague, Toni Hodges, a consultant specializing in learning measurement for organizations. We were discussing the difference between what I referred to as "activity measures" and "performance measures." Toni aptly recast my terms into "how much you train versus how well you train." The terminology stuck with me. Let's explore this very critical issue: How can we focus training measurement on how well instead of how much?

Quality and impact matter more in today's world than quantity and "butts in seats." Astute users of metrics will be the first to understand the

difference, so those who produce the metrics should be making sure the right things are being measured.

Activity Measures Versus Performance Measures

It seems sensible to start with the difference between activity measures and performance measures. Activity measures tell you how much you have trained.

Examples of activity measures include average number of students per class or facility utilization. A more comprehensive list of activity measures is included in Sidebar 3.1.

SIDEBAR 3.1. ACTIVITY MEASURES

- Fill rates by class, course, program, curriculum, location, or learning methodology

- Student cancellation rates by class, course, program, curriculum, location, or learning methodology

- Min, Max, Average participants enrollments in class, course, program, curriculum, location, or learning methodology

- Enrolled versus attended ratio by class, course, program, curriculum, location, or learning methodology

- Student activity per class, course, program, curriculum, location, or learning methodology (percent of students attended, students no-show, students cancelled)

- Class cancellation rates (percent cancelled)

- Completion rates by learning methodology (percent of e-learning offered versus completed, percent of instructor-led training (ILT) offered versus completed)

- Instructor utilization rates (available versus used ratio)

- Location utilization rates (available versus used ratio)

- Courseware utilization rates (available versus used ratio)

- Courseware Aging Report (percent of courseware that is less than one year old, one to two years old, etc.)

- Student profile by class, course, program, curriculum, or location (percent senior executives, managers, staff)

- Response rates to evaluations (post-event, follow-up, manager, by course, class, location, program, curriculum, or learning methodology)

- Financial summary (cost-per-course, cost-per-student, cost/benefit ratio)

Performance measures tell you how well you have trained. "How well" is reflected by such things as time to job impact, change in strategic results isolated to the training, or instructor performance. Some other common performance measures are shown in Sidebar 3.2.

SIDEBAR 3.2. PERFORMANCE MEASURES

- Instructor performance

- Courseware quality

- Facility's conduciveness to learning

- Training vendor's customer service ratings

- Quality of online delivery

- Effectiveness of on-the-job support tools

- Effectiveness of learning (knowledge gain)

- Percent of training applied to job

- Time required for training to impact job

- Barriers/enablers of training use on the job

- Percent of time training skills are used on the job

- Criticality of training to the job

- Estimated change in business performance isolated to training

- Training's value as an investment in time and money

- Return on training investment

Activity measures tend to be easier to collect than performance measures. Most learning management systems can gather such data, although it is debatable how well they perform at reporting the data for useful analysis. Activity measures are primarily data components of the training registration process. Because training needs to be coordinated and scheduled, the information is readily available for "data mining." Most organizations do a fairly decent job of reporting some activity measures that are easy to obtain, such as number of classes run, or number of people trained.

Performance measures are more challenging to obtain. Some feel that certain performance measures are nearly impossible to obtain. Satisfaction-type measures such as instructor performance or courseware quality can be obtained through end-of-class evaluations, often referred to as "smile sheets." Knowledge transfer measures can be obtained through pre- and post-test scores, but the testing exercise can be a significant drain on a company's resources, often making testing impractical to use for training across the board.

Furthermore, measuring the impact of training on the job and on specific business results baffles many managers. The question is not only how to measure it, but how to measure it without spending more on the measurement exercise than on the training itself. Finally, even though return on investment (ROI) is often thought of as the Holy Grail of training measures, for many training groups this is nothing more than a distant dream.

Nonetheless, performance measures are critical. If you don't know which programs had the greatest impact on the job and the company's business objectives, then your measurement system has some significant shortcomings.

Call to Action: Performance Metrics Needed

The new millennium brought a completely different workplace—almost overnight. In the late 1990s, the economy was booming, the money was flowing, and it seemed that training had a blank checkbook to experiment with all kinds of new programs. It was an exciting time; e-learning bloomed during this period and perception of its value grew.

Everyone knows what happened next. The bubble burst. The dot-com heyday and exuberance ended. The economy dried up and senior management adopted a "back to basics" attitude about doing business. In many companies, massive layoffs became the order of the day, and departments were asked to do more with less. Finally, all budgets came under much closer scrutiny. As a result, just as in previous economic downturns, training departments could no longer use activity measures to justify expenditures or as the basis for budgets. The wonder is that, even three years into the downturn, many groups continued to struggle with the issue of what to do instead.

Let's take an extreme and overly simplistic example. The CEO of a company is trying to control spending and costs. She asks the chief learning officer (CLO) for a training budget. That budget is prepared and submitted. The CEO wants some evidence to justify not cutting the budget this year. Reasonable business decisions dictate that tools that help the business perform better and improve the bottom line are good investments. The CLO tells the CEO that 80 percent of the workforce received training in the prior year, that nearly three hundred classes were taught, and that anecdotal evidence (smile sheets) suggest people really liked the training. Unfortunately, these are not sufficient reasons to support continued expenditures.

Why was the CEO not compelled to approve the budget by the metrics the CLO gathered? The facts offered are quantitative, they can be graphed, and they can be subjected to statistical analysis. The problem is that they do not relate to the business objectives of the company. Did the training help increase revenues? Did it help decrease costs? What kind of impact did it have on the average employee's job performance relative to the salary paid to the employee? None of that data was collected, measured, or presented.

What do you do?

Choose Offense Rather Than Defense

Being on the defensive is the worst situation to be in. The way to avoid this situation is to showcase the value of training as a strategic tool for improving job performance. Through scaleable, replicable, and practical measurement solutions, show how e-learning improves the human capital of the organization.

Rather than continuing to provide the same activity metrics from years past that don't work in today's business world, the best-practice CLO will search for a proactive solution rather than a reactive one. Key ingredients of this solution include taxonomy, process, methodology, and technology. All of these ingredients are absolutely critical to putting in place a cost-effective and compelling learning measurement solution.

Finding the Right Model

The first step in the process is to research learning measurement taxonomies and models. After all, why start with a blank sheet of paper when others have solved this problem before you were faced with it? In doing your research you are likely to run into many models with strong advocates. However, in my opinion, the one approach that has best stood the test of time is the Learning Levels model by Dr. Donald Kirkpatrick. Widely adopted since its creation in the 1950s, and supported by professional groups such as the American Society for Training and Development (ASTD), many organizations today base their learning metrics on the Kirkpatrick model.

Many readers may already be familiar with Kirkpatrick's Four Levels of Learning Evaluation. However, let's review them briefly for those who have not seen them before.

> **Level One: Reaction.** This answers the question, "Did they like it?" If done right, Level One can include a set of performance measures for all the pieces that comprise the satisfaction component of a learning program.

> **Level Two: Learning.** This answers the question, "Did they learn?" Since e-learning is in the business of transferring knowledge and skills to individuals, it is only fitting to measure performance in this area. Just because someone had a satisfying experience does not mean he or she learned new skills or knowledge.

Level Three: Behavior. This answers the question, "Did they use it?" A learner could have learned significant new knowledge or skills, without ever applying them on the job. This is a key performance metric.

Level Four: Results. This answers the question, "Did it impact the bottom line?" This is probably the most important measure since it looks at the real business results delivered as a result of e-learning.

The Kirkpatrick model is nice, but without a process to measure these levels it might not be practical. Enter Dr. Jack Phillips. Phillips is another individual you'll run across when doing research for your measurement solution. He has made two major contributions to the field of learning measurement that will help you in your learning measurement solution. First, he built a process to measure Kirkpatrick's four levels. Second, he added a fifth level—return on investment (ROI). The Phillips ROI Methodology is used around the world as a tool to help learning organizations measure Kirkpatrick's four levels, and Phillips' fifth. You can see a brief overview of the Phillips ROI Methodology in Figure 3.1. (*Editor's Note:* Dr. Kirkpatrick and Dr. Phillips are the Advisory Board for Knowledge Advisors, the author's company.)

Figure 3.1. The Phillips ROI Methodology
Copyright © 2005 ROI Institute, Inc. All rights reserved. Used with permission.
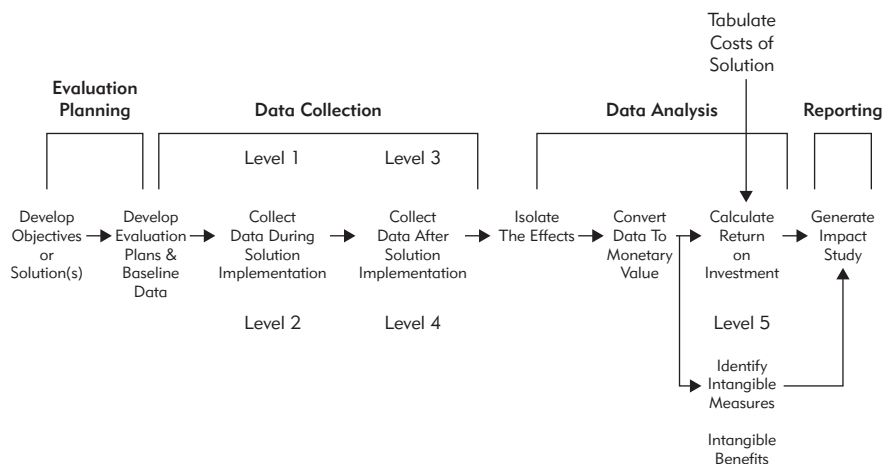
But you're not out of the woods yet, not by a long shot. If you read the books by Doctors Kirkpatrick and Phillips or attend certifications on the ROI process endorsed by ASTD, you'll quickly conclude that using ROI as a measure is a lot of work. It seems that nothing worth doing is easy. The learning levels have been embraced by so many because they cover the range of performance metrics from satisfaction to linkage to business results. The ROI Methodology has been accepted because it is rigorous, conservative, and solid. So putting what is right into practice is the next step, but if it takes a significant investment of financial, physical, and human resources, it is not something you can easily sell to management. Asking for more money to measure training than the cost of training itself would not be prudent. So what can be done?

Enter technology. The new millennium, if nothing else, has taught us how to leverage technology so we can do more with less. The next section will discuss how to use technology as a practical enabler to implement industry-accepted measurement models.

Technology Wrapped Around Methodology

Any measurement process aims at collecting data, storing it, processing it, and reporting it. That is what needs to happen to measure Kirkpatrick's Four Levels, Phillips' Fifth Level and to work your way through the Phillips ROI Methodology. With this in mind, why not leverage technology to streamline the steps so you don't have to make significant outlays of resources for your measurement solution? Let's start with data collection. There are a host of inexpensive web-based data collection tools. These tools are easy to use and allow you to collect data from learners, instructors, managers, or any other stakeholder at any point in time. Leveraging the Internet to collect data saves the costs of paper processing. It is worth investigating and leveraging, where practical and feasible. Even if paper is necessary, scanning technologies can easily move quantitative and qualitative data into databases for centralized data storage and processing.

In former times, "data storage" meant a metal file cabinet in a basement closet where so many end-of-class evaluations went as their final resting place. As a step up, simple tools like spreadsheet applications are inexpensive

and powerful technologies to collect online data for efficient processing and analysis. More sophisticated solutions include using more powerful local relational databases such as Access, or using enterprise relational databases such as SQL or Oracle.

Queries. Analysis and interpretation of the collected information is the most critical piece in all of measurement. The key to success is to have flexible tools that support building queries that can then be automated or standardized. On-Line Analytical Processing (OLAP) tools such as various ones from Cognos® or Microsoft™ Analysis Services are very powerful for querying large amounts of data. Do not, however, throw technology into the hands of functional users who are untrained on learning measurement. Allowing a line-of-business person to write his or her own OLAP query that compares learning data to business data can be counter-productive—if not downright dangerous—if the person does not know what he or she is doing.

Here is an example of the problem. I recently read an article about a sales department that reported an ROI on training of over 10,000 percent! At first glance that is phenomenal. However, a deeper look revealed that there was no attempt to isolate the revenue increase from training. It just so happened that revenues increased at the same time sales training occurred. The data showed this correlation, and the writer of the article attributed the sales rise to the training. What about the economy, the competition, technology, people, process, and a host of other factors that could have accounted for the sales increase? This was a classic result of an unsophisticated query and a naïve interpretation.

If you have skilled people writing appropriate queries that a novice user can then run reports against, you can leverage OLAP tools appropriately. The resulting reports will be targeted at the right level of person for the analysis.

Reports. This leads to reporting. In most organizations there is a need for four primary types of reports. Your measurement solution has to be able to provide reports for each. These reports include tactical, aggregate, executive, and value analysis.

Let's start with tactical reports. These are for the staff personnel in the training department who need to manage learning investments on a day-to-day basis. Examples of tactical reports include class evaluation summaries,

verbatim respondent comments, and the actual evaluations themselves. These are used to spot problems before they grow any bigger.

Next are the aggregate reports. Middle managers in a learning group use these reports. They aggregate tactical data for monitoring and quality control. For example, the person responsible for managing the sales curriculum must quickly view all the course titles and determine which are most effective. The person managing the e-learning content has to easily see how effective it is compared to traditional instructor-led training. These managers must see tactical data rolled up, and they must be able to filter it down too.

Then executives in the learning group require reports. They need to see comparisons internally and externally. For example, how did employees in each line-of-business that funds the training see the training impact their jobs? How did the key indicators of training compare to external benchmarks? And what exceptions occur on a day-to-day basis? Executives need summary, exception-based data that is comparable internally and externally.

Finally, there is value analysis. This packages it all together. It is your balanced scorecard that you can present to management when the budget is up for renewal or when you need to fund a new program. It's the measures you review with the CEO on a quarterly basis. It shows e-learning versus instructor-led training (ILT) so that the CEO can see how that e-learning investment is doing. Value analysis sums it all up. It presents all the measures in an easy-to-generate and easy-to-interpret scorecard. Value analysis allows a CLO to sit down with a C-level person or a line-of-business manager to cover how training impacted the job, how human capital was improved through training, and, yes, the financial return on training in hard and soft dollars. Metrics such as benefit-to-cost ratio, payback period, and ROI percentage are in the value analysis.
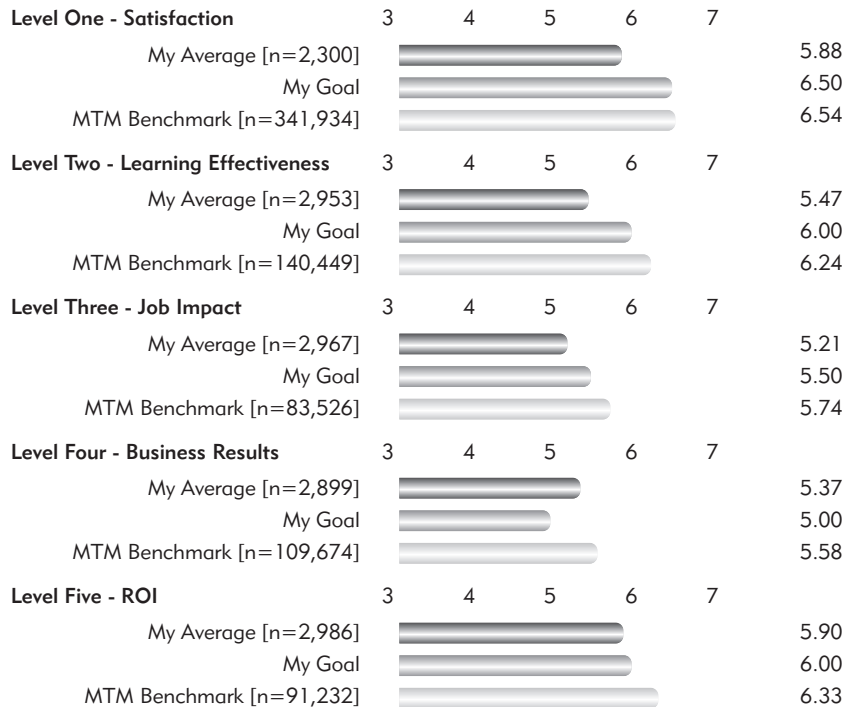
Examples of some of the reports mentioned above are shown in Figure 3.2 and in Figure 3.3.

Figure 3.2 shows how actual data can be compared to performance goals and external benchmarks for each level of learning for continuous monitoring of the learning levels. Figure 3.3 shows the balanced scorecard that can be presented to management to showcase value in learning investments.

Figure 3.2. Learning Levels Scorecard

summary of learning performance by learning measurement levels for all forms

Time Period for Reporting: January 1 2003 to May 28 2003

Level One - Satisfaction	3	4	5	6	7	
My Average [n=2,300]						5.88
My Goal						6.50
MTM Benchmark [n=341,934]						6.54

Level Two - Learning Effectiveness	3	4	5	6	7	
My Average [n=2,953]						5.47
My Goal						6.00
MTM Benchmark [n=140,449]						6.24

Level Three - Job Impact	3	4	5	6	7	
My Average [n=2,967]						5.21
My Goal						5.50
MTM Benchmark [n=83,526]						5.74

Level Four - Business Results	3	4	5	6	7	
My Average [n=2,899]						5.37
My Goal						5.00
MTM Benchmark [n=109,674]						5.58

Level Five - ROI	3	4	5	6	7	
My Average [n=2,986]						5.90
My Goal						6.00
MTM Benchmark [n=91,232]						6.33

A Solution to Work 100 Percent of the Time

We've talked about how to take the Kirkpatrick and Phillips models and wrap technology around them for your measurement solution. But you still must ensure that your solution has flexibility. Most of the time you can get by with reasonably accurate indicators to manage your business. These don't have to be in-depth and dead-on accurate, but they must provide enough detail to allow people to make intelligent decisions. Designing the right data collection instruments targeted at the right stakeholders at the right time is important when building a model that is easy to use and that provides reasonable outputs. Recognize, though, that you might want to go deeper when the program is strategic or if it costs a lot. Your solution should then allow for more in-depth measurement to occur.

Figure 3.3. Human Capital ROI Scorecard

Business Result Score Card summary training measurement results of levels 1 to 4 as reported by respondents			
Based on 7 point scale			
Level 1 Satisfaction	**Post Event**	**Follow Up**	**Manager**
Instructor performance	7.00	-	-
Environment conducive to learning	5.00	-	-
Courseware quality	5.50	-	-
Online delivery	5.50	-	-
Average of level 1 indicators	5.00	-	-
Level 2 Learning Effectiveness	**Post Event**	**Follow Up**	**Manager**
New knowledge and skills learned	6.00	5.00	5.00
Improvement in skill and/or knowledge	45.00%		40.00%
Level 3 Job Impact	**Post Event**	**Follow Up**	**Manager**
Application of knowledge/skills to the job	7.00	7.00	7.00
Percent of work time requiring knowledge/skills	50.00%	50.00%	10.00%
Criticality of training to job	65.00%	65.00%	20.00%
Percent of training actually applied to the job	65.00%	65.00%	30.00%
Time to Job Impact	**Post Event**	**Follow Up**	**Manager**
1 week	-	30.00%	-
2–4 weeks	-	20.00%	-
5–6 weeks	-	40.00%	-
I haven't applied what I learned yet, but I plan to in the future	-	5.00%	-
I don't expect to use the knowledge/skills gained	-	5.00%	-
Barriers to Use	**Post Event**	**Follow Up**	**Manager**
Content not practical	-	10.00%	-
Prevented or discouraged from using	-	35.00%	-
No opportunity	-	10.00%	-
Other high priorities	-	7.00%	-
Other	-	2.00%	-
Post Event Support	**Post Event**	**Follow Up**	**Manager**
Participant materials useful on the job	-	6.00	-
Set expectations with manager prior to training	-	5.00	5.00
Determined use of training after the training	-	6.00	6.00
Provided adequate resources to apply training on job	-	7.00	7.00
Level 4 Business Results	**Post Event**	**Follow Up**	**Manager**
Training estimated impact on improved performance/productivity	6.00	7.00	7.00
Training had a Significant Impact on:	**Post Event**	**Follow Up**	**Manager**
Increasing quality	70.00%	50.00%	50.00%
Decreasing costs	25.00%	25.00%	25.00%
Decreasing cycle time	30.00%	40.00%	40.00%
Increasing productivity	80.00%	70.00%	70.00%
Increasing sales	10.00%	5.00%	5.00%
Increasing customer satisfaction	70.00%	50.00%	50.00%
Increasing employee satisfaction	40.00%	50.00%	50.00%
Business Result: Increasing Productivity	**Post Event**	**Follow Up**	**Manager**
Total percent improvement in productivity, including training	64.00%	50.00%	40.00%
Training's contribution to improved productivity	50.00%	20.00%	20.00%
Percent improvement due to training	32.00%	10.00%	8.00%
Adjustment factor for confidence in estimations	65.00%	65.00%	65.00%
Adjusted percent improvement due to training	20.80%	6.50%	5.20%
Business Result: Decreasing Costs	**Post Event**	**Follow Up**	**Manager**
Total percent improvement in reduced costs, including training	25.00%	20.00%	20.00%
Training's contribution to reduced costs	80.00%	50.00%	30.00%
Percent improvement due to training	20.00%	10.00%	6.00%
Adjustment factor for confidence in estimations	65.00%	65.00%	65.00%
Adjusted percent improvement due to training	13.00%	6.50%	3.90%

Because of this need for flexibility, I suggest a set of three models that can help provide measurement solutions with 100 percent coverage. These models are the learner-based, manager-based, and analyst-based solutions. You get good *breadth* in measuring all five levels of learning in each of these models. But the *depth* increases as you move from learner-based to manager-based to analyst-based. The cost and complexity of the measurement solutions increase with depth too, so be careful of that.

Learner-Based

This measurement model captures data from training participants at two distinct points during the learning process. The first point is directly after the learning intervention (post-event) where the main measurement focus is on Kirkpatrick's Levels One and Two in order to gauge satisfaction and learning effectiveness. Because there is a high response rate to these data instruments, it is also critical to capture indicators for the advanced Levels Three through Five. These indicators are, in effect, forecasting or predicting the future impact the training will have on the participant and n the organization.

A second data collection point is a follow-up survey conducted a period of time after the participant has been back on the job. This survey is meant to improve the accuracy of the forecast and predictive indicators of Levels Three through Five by gathering more realistic estimates after the participant is back on the job.

The approach is low-cost if one leverages standard data collection instruments and if one utilizes technology and automation to capture, process, and report the collected data. Thus this model can be used for all of your training, whether classroom-delivered ILT or e-learning, to yield continuous measurements.

Manager-Based

This model has the same data collection points as the learner-based solution but adds a manager-based dimension. The learner's manager is another important data point. Managers can be sent an evaluation instrument timed to coincide with the participant receiving the follow-up survey. The manager survey focuses on Levels Three through Five of the Kirkpatrick and Phillips

models. This provides estimates of job impact, business results, and ROI from the manager's perspective. The manager survey also asks "support" type questions to understand the on-the-job environment in which the participant applied the training.

Due to the increased effort it takes to conduct and analyze manager surveys, the cost and time to measure at this level is higher than the learner-based model. With automation and technology to facilitate the dissemination, collection, processing, and reporting of the data, the cost and time can be minimized, and this model could be used on a continuous basis for every training event a participant attends. More realistically, it will be used on a periodic basis for more strategic programs for which manager data is more relevant.

Analyst-Based

This model uses significantly more comprehensive post-event follow-up and manager surveys. It also uses other analytical tactics that go beyond surveying. For example, to analytically measure Level Two, a detailed test is designed and administered to participants. Due to the time commitment of conducting a significantly detailed data collection and analytical exercise, the analyst-based approach might only be used for about 5 percent of all training programs in an organization. Typically, these programs would be the more strategic or visible, and one would have the budget to afford a more costly and time-consuming measurement exercise.

See Figure 3.4 for a view of how the learner-, manager-, and analyst-based models relate to one another.

Concluding Thoughts

Activity measures are necessary to manage learning activities and will tell you how much you trained. But the workplace has changed and the demand for more comprehensive measurement tools heightens the need for better use of performance metrics that tell you how well you trained.

Through appropriate methodology that is made scaleable, practical, and replicable by leveraging technology, organizations can provide performance metrics in a cost-effective manner. Organizations should always keep in mind

Figure 3.4. Learning Measurement Methodology
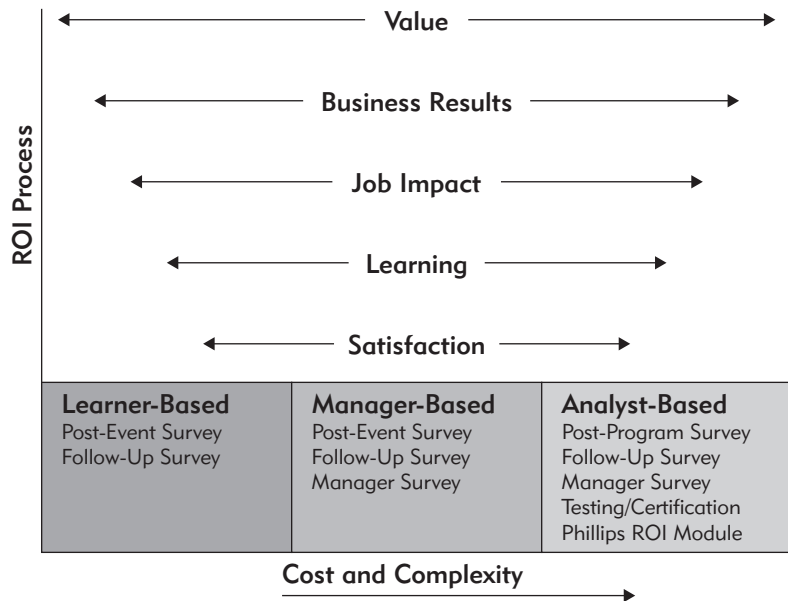
that the most perfectly accurate quantitative metrics are not required in order for performance measurement to be worthwhile. In fact, a study published in *Harvard Business Review* found that senior managers make decisions based on instinctive factors, not on the highly accurate and very costly data from highly paid number-crunchers (Bonabeau, 2003).Use reasonable data based on indicators that are meant to predict and estimate your key performance metrics. This will save you significant cost and significant time, and it will accomplish the objective of providing the right performance measures to management for their decision making.

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Berk has been quoted and published in periodicals such as *Learning Circuits, Workforce Management Magazine, Fortune, IndustryWeek, T&D Magazine, CLO Magazine,* and *The CPA Journal.* A CPA, Berk began his professional career as an auditor. He has an MBA from the University of Chicago and degrees in business and accounting from the University of Kansas.

4

The XML e-Learning Revolution

IS YOUR PRODUCTION MODEL HOLDING YOU BACK?

Doug Wallace and Anthony Levinson

e-Learning development since 1997 has mostly been an HTML-based process. However, this works against easy re-use of content and single-source authoring for presentation in multiple formats. The alternative is the XML-based production model, which has suffered from a lack of familiar tools and from a lack of support from organizations in spite of its inherent advantages. In this chapter, two e-learning innovators show you what it takes to succeed, where to find the tools, and how to use XML to regain control of your development process. It's time to start!

SINCE ITS SPREAD TO THE WEB in the late 20th century, e-learning has grown from a largely experimental educational model into a full-fledged industry. By using existing web technologies, e-learning practitioners have been able to disseminate educational content to larger and more distant audiences, more effectively and more efficiently than ever before. However, current production models for the creation and delivery of e-Learning content rely heavily on HyperText Markup Language, or HTML.

In this chapter, we will present the contrast between HTML-based and XML-based e-learning and explain the advantages of the latter. We will also provide an extensive example of the way to develop an XML schema that will enforce the instructional designer's pedagogical decisions uniformly across the development team, including the subject matter experts. Finally, we offer two testimonials, if you will, about XML-based e-learning development, one from higher education and one from the corporate world.

The HTML Approach to Development

HTML is a scripting language designed for creating documents for display in a web browser. HTML defines the visual layout of those documents and enables their connection to other documents by using hypertext links. Using a modest list of formatting options, HTML allows document authors to combine text, multimedia assets, and navigation links and to determine how the documents will appear in a web browser.

Although effective, HTML has its limitations. By locking the content and the rules for presenting that content together into a single document, HTML makes content reusability difficult. The content formatting in an HTML document provides one specific visual layout, and it works only in a web browser. Presenting that content in alternate visual layouts or delivery media involves re-authoring it for each new layout or medium.

Ideally, you would want to be able to change the visual layout of e-learning content or the medium via which it is delivered, such as print or personal digital assistant (PDA), without having to repeatedly revisit the authoring process. To accomplish this requires separating content from both its layout and from delivery media. Content then becomes highly reusable, and you can present it more readily in different delivery media to a variety of audiences.

This separation also facilitates the assignment of conditions for the presentation of content. In other words, a content management system can automatically identify learners in a given audience, using a certain kind of device, and deliver the content using the most appropriate presentation, via the most appropriate medium.

Unfortunately, because of its rigidity, HTML makes it impossible to effectively separate content from its presentation. If HTML is so limited, why is it so prevalent?

Successful e-learning production requires a combination of skills. A highly technical team of graphic designers, programmers, and audiovisual specialists could create a visually compelling, interactive web project, but there is more to e-learning. It also takes the expertise of subject-matter experts (SMEs) and instructional designers to deliver on the educational goals inherent in such an endeavor.

Because their strengths are in educational subject-matter knowledge and (perhaps) in copywriting, SMEs may not be highly proficient with the technical components required. As a result, WYSIWYG (What You See Is What You Get) HTML authoring tools have become popular. These tools promise that, given the requisite skills to create a PowerPoint presentation, an SME can produce an e-learning project. This allows SMEs to work without technical resources, and for many organizations eliminates the bottleneck created by a huge base of SMEs and a small technical team.

This is the main reason that HTML-based solutions are so entrenched in the e-learning community. The biggest question left unanswered by this approach is, "Where is the instructional designer?" Just as the invention of the word processor did not turn every Corel® WordPerfect® user into a great novelist, skill with Microsoft® PowerPoint® and Adobe® Dreamweaver® does not make someone an instructional designer. However, the apparent convenience of PowerPoint and the WYSIWYG HTML editors has encouraged many organizations simply to direct the SMEs to proceed without the technical team and without the instructional designers. This has resulted in a large amount of e-learning that is not visually compelling, interactive, pedagogically sound, or engaging for the learner.

Any solution that is going to raise the quality of e-learning must also enforce pedagogy—the strategies used to focus instruction and improve learner outcomes—and facilitate good user interface design. It must also include far more energizing content than a long sequence of text slides and bullet points. However, at the same time, the solution must not become a bottleneck to the work of the SMEs or greatly increase the costs

or timelines of e-learning projects. In fact, to be successful, the solution must reduce them.

So, if having SMEs going around the instructional designers and the technical team is one of the drawbacks to HTML-based solutions, what's the answer? One of the most important contributions that instructional designers make to an e-learning project is the development of a consistent pedagogy. There are many competing opinions and ideas as to what constitutes good pedagogy. As a result, different organizations will require different pedagogical approaches from their instructional designers.

Some HTML-based tools have tried to incorporate the enforcement of a standard pedagogy. However, the pedagogical requirements of e-learning projects—whether there will be remediation when a learner responds incorrectly, for example, or the number of quizzes and criterion tests, how to handle simulations and games, and so on—may differ from one organization to another or between instructional designers. As a result, none of the HTML-based tools can deliver a definitive, global, final word on the best pedagogical design.

Ideally, a tool should make it possible for each organization to determine its own pedagogical design and, at the same time, to apply that design consistently, without fail, across all work done by an organization's SMEs.

XML to the Rescue

XML is the eXtensible Markup Language. It allows semantic content markup. *Markup* is information added to a document that enhances the meaning of the document in certain ways. Unlike HTML, XML says nothing about what things *look like.* Instead, XML focuses all its efforts on the semantic content: declaring what things *are.* Furthermore, XML allows you, the developer, to define markup to describe things found in an XML document. A simple example of XML would look like this:

```
<book>
<title>Do Androids Dream of Electric Sheep?</title>
<author>Philip K. Dick</author>
```

```
<publisher>Del Rey</publisher>
<language>English</language>
<isbn>0345404475</isbn>
</book>
```

XML's structure appears similar to HTML because it is also a tagging language. XML is both machine-readable and human-readable and is immediately understandable because the tags give semantic meaning. XML says nothing about formatting.

There are many ways to format XML documents. One option is to format XML documents for use in a web browser, using the eXtensible Stylesheet Language or XSL. Alternately, you may pull an XML document into a Flash file and format it accordingly. If you want to send an XML document to PDF (Portable Document Format), you can determine the formatting with the eXtensible Stylesheet Language for Formatting Objects, or XSL-FO. In short, the possibilities to format for different visual layouts and delivery media are virtually unrestricted. (*Editor's Note*: Excellent free basic tutorials are available online at www.w3schools.com/default .asp on the subjects of XSL, XSL-FO, XSD, and other XML topics related to this chapter.)

Before creating an XML document, it is a best practice to create an XML Schema Definition, or XSD. An XSD defines the tags in an XML content document and the rules of use for those tags. You write the XSD itself in XML. The XSD defines and enforces the rules of use, so that SMEs only need to use the tags available, at any given time, to mark up the content they are authoring. SMEs don't need to know or care about the final layout or delivery medium.

This separation of content from its presentation is extremely powerful. It allows one set of rules to dictate the document's structure and any number of rules for how to format all content written using that structure. In addition, because XSL is a conditional language, you can display certain content in some media and not in others, rendering the same content differently to different audiences.

In the context of e-learning, an XSD lets an instructional designer define the pedagogical structure and forces all SMEs to follow that structure. For example, if an instructional designer has determined that all lessons are to start with a list of objectives, followed by a pre-test, examples, a practice exercise, and finally an exam, then the designer can define this structure in an XSD. Additionally, the designer would also define all the possible elements, or tags, for each of those objects (pre-test, example, exercise, and exam). As a result, all SMEs are able to author independently, without risk of deviating from the enforced structure. Creating an XSD is similar to database design. Create a set of elements, define their type value (string, integer, and so on), make them required or optional, and determine their relationship to other elements within a document.

Now, HTML also has a schema. It is loose and browsers do not enforce it, but it does exist. Consider this: there is a <table> element in the HTML schema. The <table> element has attributes, such as border, cellpadding, cellspacing, align, and others. The <table> also contains other elements: rows and columns, or <tr> and <td> respectively. The HTML schema says that a <table> element can contain x number of <tr> elements and a <tr> can contain x number of <td> elements. HTML is a markup language derived from the print industry, so it describes page layout and does not actually describe the content. But you can see how the schema describes what the page should contain and these sets of rules allow browsers to know what elements are on an HTML page. With an XML schema it is possible to develop an even more robust and definitive document to describe, enforce, or constrain any instructional style.

Choosing Page Types

Suppose that an instructional designer decides on a pedagogical structure limited to three kinds of displays that a learner will see. Think, for the sake of this discussion, of each of these displays as being a "page." A learner may, at any given time, be looking at a page of objectives, a page of instructional content, or a page with a test of some kind on it. We will call these, respectively, an objectives page, an info page, and an assessment page.

Making this decision about page types is one of the first steps in developing an XML schema for e-learning. Each page type becomes an element in the schema. This is usually the shortest list of elements and allows for concentration on a shorter list of specific elements included in each of those page types. Remember, the schema can evolve over time, so you haven't written your initial choices in stone.

For e-learning, the type of content is the key to the page type. Each page contains one type of content, such as objectives, or information, or assessment. Each page will contain various kinds of information relating to the page type. For example, an objective page will have an introduction, objective(s), and perhaps a summary. An information page might have text, audio, animation(s), or other instructional content on it.

Every schema must start with a root element. For the purposes of this example, we define this element as <sco> (Shareable Content Object). All other elements will be children of the <sco> element.

Here is the definition of the <sco> element:

```
<xs:element name="sco"/>
```

The next step is to define the page types. In this example, they are <objectives_page>, <info_page>, and <assessment_page>. Here are the definitions:

```
<xs:element name="objectives_page"/>
<xs:element name="info_page"/>
<xs:element name="assessment_page"/>
```

Add these elements to the root <sco> element. (See Figure 4.1.) By doing this, the <sco> element becomes a complex type, since it now contains other elements. This is where you start applying the rules for these elements, which in turn controls what the SMEs can do when they author lessons.

Complex types require indicators, which control the use of elements in documents. Some of the indicators for the child elements (the ones within the <sco>) in this example define the order of the elements. These are called, logically enough, order indicators, and there are three of them. They are <sequence>, <choice>, or <all>. The <sequence> indicator specifies that the child elements must appear in a specific order. The <choice> indicator

**Figure 4.1. sco Element with a Sequence of Objectives_Page, Info_Page
                  and Assessment_Page**
The legend here indicates the sequence from top to bottom. The diagram also shows that the
objectives and info pages are required, there may be an unlimited number of info pages, and
the assessment page is optional. Created in Altova XMLSpy®

specifies that either one child element or the other can occur (there can only
be two child elements, in other words). The <all> indicator means that the
child elements can appear in any order, and that each must occur only once.

There are other kinds of indicators, as well as different kinds of complex ele-
ments. We will explain these as they appear in the definitions later in this article.

For this example, a <sequence> indicator enforces that an <objectives_
page> comes before an <info_page> and an <info_page> comes before an
<assessment_page>. This is what the definition looks like:

```
<xs:element name="sco">

    <xs:complexType>

      <xs:sequence>

        <xs:element ref="objectives_page"/>

        <xs:element ref="info_page"/>

        <xs:element ref="assessment_page"/>

      </xs:sequence>

    </xs:complexType>

</xs:element>
```

Elements may also be optional or required (by default, within a
<sequence> they are required). You can control the number of allowable
elements by using an occurrence indicator. There are only two occurrence

indicators: <maxOccurs> (sets the maximum number of times an element can occur) and <minOccurs> (sets the minimum number of times an element must appear, with a default value of 1).

For example, the definition can make the <assessment> page optional. At the same time, you may want to allow the SME to add as many <info> pages as needed. Set the maximum occurrences to "unbounded" and the minimum occurrences to "0," respectively, to make this happen:

```
<xs:element ref="info_page"
maxOccurs="unbounded"/>

<xs:element ref="assessment_page"
minOccurs="0"/>
```

After defining the three page types, the next step is to decide what elements each page can contain. This is where you define the elements that make up each page and give them meaning. Thinking out of the box is very important for this step. This is not about colors, image placement, alignment, and so on. Now is the time to consider what each element contains and when it should appear within the document.

The Objectives Page

Broken down to its basic elements, an objectives page should contain the following:

- Some brief text describing the <sco> and any possible prerequisites or other knowledge that may be required

- A list of objectives or outcomes

- Perhaps a conclusion, or brief text, summarizing the objectives

These elements would commonly be described as <intro>, <objectives> and <summary>. The definitions would look like this:

```
<xs: element name="intro"/>

<xs: element name="objectives"/>

<xs: element name="summary"/>
```

Now that these elements have names, we need to describe what they are. Applying complex element types will accomplish this. There are four kinds

of complex elements: those that are empty, those that contain only other elements, those that contain only text, and those that contain both other elements and text. We specify the type of complex element by adding an attribute to the definition.

For example, <intro> and <summary> elements should be nothing more than text. The attribute to designate an element as "text only" is type="xs:string". The definitions now look like this:

```
<xs:element name="intro" type="xs:string"/>

<xs:element name="summary" type="xs:string"/>
```

However, there is more to think about and to take into account. The <objectives> element should contain more than just text. An <objectives> element could contain multiple <objective> elements (notice the difference in the name), each of which would contain only text.

```
<xs:element name="objectives">

    <xs:complexType>

      <xs:sequence>

        <xs:element name="objective" type="xs:string" />

      </xs:sequence>

    </xs:complexType>

</xs:element>
```

To be certain that each <sco> contains, for example, at least one, and up to as many as five objectives, add a maximum and minimum occurrence to this element. (See Figure 4.2 for a diagram.)

```
<xs:element name="objectives">

    <xs:complexType>

      <xs:sequence>

        <xs:element name="objective" type="xs:string"
        minOcc="1" maxOcc="5"/>
```

```
        </xs:sequence>

      </xs:complexType>

  </xs:element>
```

Figure 4.2. Objectives Page with Intro, Objectives, and Summary Elements

The objectives element may contain between one and five objectives.

Info Page

Info pages should be more complex than objectives pages. This is where the actual instruction takes place.

Some of the basic elements an info page may contain are:

- <text_block>
- <call_out>
- <animation>

This list could become very extensive. For the purposes of this article, these three elements will suffice.

Obviously a <text_block> will contain text, but it also may contain other elements, such as:

- <emphasis>—used to draw attention to a word or words
- <heading>—delineating the start of a major section of content
- <subheading>—delineating the start of a minor section of content
- <weblink>—text that will link to a Website

This means that the <text_block> is a mixed complex type and requires an appropriate attribute in the definition.

Figure 4.3. Info_Page with Text_Block, Animation, and Call Out

The <text_block> child elements would all be optional for the SMEs use. Here is the schema (see Figure 4.3 for the diagram):
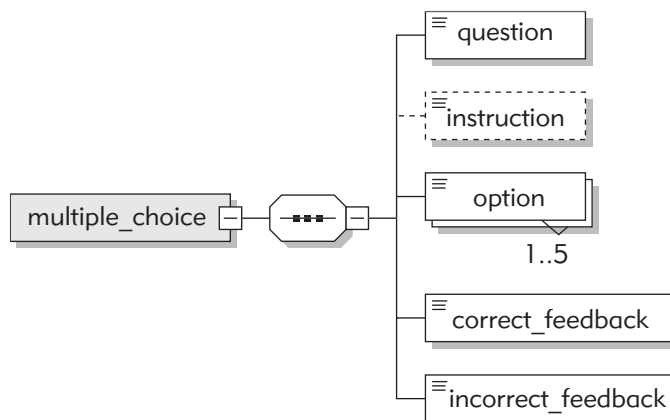
```
<xs:element name="info_page">
    <xs:complexType>
      <xs:choice maxOccurs="unbounded" minOccurs="1">
        <xs:element ref="text_block"/>
        <xs:element ref="call_out"/>
        <xs:element ref="animation"/>
      </xs:choice>
    </xs:complexType>
            </xs:element>
            <xs:element name="text_block">
    <xs:complexType mixed="true">
      <xs:choice maxOccurs="unbounded" minOccurs="0">
        <xs:element name="heading" type="xs:string"/>
        <xs:element name="subheading" type="xs:string"/>
        <xs:element name="emphasis" type="xs:string"/>
        <xs:element name="weblink" type="xs:string"/>
      </xs:choice>
    </xs:complexType>
</xs:element>
```

Figure 4.4.   Animation with Source Attribute and Caption Element

The next step is to add a "source" attribute and a <caption> element to the <animation> element. The "source" attribute will provide a URL or directory path to the animation file. The <caption> can be descriptive text for screen readers or it can be available for conversion to PDF output. This makes the <animation> element a mixed complex type. (See Figure 4.4.)

```
<xs:element name="animation">
    <xs:complexType mixed="true">
      <xs:attribute name="source" type="string"/>
      <xs:element name="caption" type="string"/>
    </xs:complexType>
</xs:element>
<xs:element name="call_out" type="xs:string"/>
```

Assessment Page

Many types of assessment questions could appear on this page. To keep things simple, we've used a multiple-choice question. Broken down to its basic form, a multiple-choice question would consist of the following elements:

- <question>
- <instruction>
- <option>
- <correct_feedback>
- <incorrect_feedback>

The schema representation would look like this (see Figure 4.5 for the diagram):

```
<xs:element name="multiple_choice">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="question" type="xs:string"/>
            <xs:element name="instruction" type="xs:string"
            minOccurs="0"/>
            <xs:element name="option" type="xs:string"
            maxOccurs="5"/>
            <xs:element name="correct_feedback" type="xs:string"/>
            <xs:element name="incorrect_feedback" type="xs:string"/>
        </xs:sequence>
    </xs:complexType>
</xs:element>
```

To provide a way to determine the correct option, add a "correct" attribute to the option element.

Figure 4.5. Multiple-Choice Element

This element is "boolean" (specifies true or false) and it is required.

```
<xs:element name="option" type="xs:string" maxOccurs="5">
    <xs:attribute name="correct" type="xs:boolean"
      use="required"/>
</xs:element>
```

A Completed Schema

This example has focused on page types. This is a common approach, but only one of the many ways of looking at the semantic structure of e-Learning. In the example in Figure 4.6 you see a very tightly defined model. (This example took only about twenty minutes to create, by the way.) Here each <sco> is a set of predefined steps with very few choices for the SME to make about the flow. Notice again that only the structure is defined, not the presentation.

The model calls for an introduction that may include a text area and an image. Next, the <sco> has a set of questions with a minimum of one question and a maximum of five. The SME author gets a choice between using multiple choice or true and false questions. Next, there is a lesson that has a textual element and then a case study. Following this is an activity where the user completes a scenario. Finally, the learner completes a post-lesson test that will deliver a mastery score.

Available Tools

In the examples in this chapter, you can see that the instructional designer determines how rigid or how open the structure is.

Knowledge of code is not necessary to create an XSD. Many tools are available that let you drag and drop elements into a flow chart to define your Schema. Two of the tools that many designers use are Altova XMLSpy® and Stylus Studio®.

Once you have defined a schema as an XSD there are many options available for delivering it to SMEs. SMEs can author XML content documents using XMLSpy, Authentic®, XMetaL®, <oXygen/>®, Microsoft® Word 2003 (with some caveats) and many other editors. There are even a

Figure 4.6. A Graphical Representation of an XSD Schema

few LCMSs, such as Thinking Cap®, that integrate XML authoring into the entire e-learning production process. Most of these editors simply require an author to right click and select (from a context-sensitive list) the element they wish to add to their document. What is important is that the schema is completely portable. It is not bound to any one of these systems.
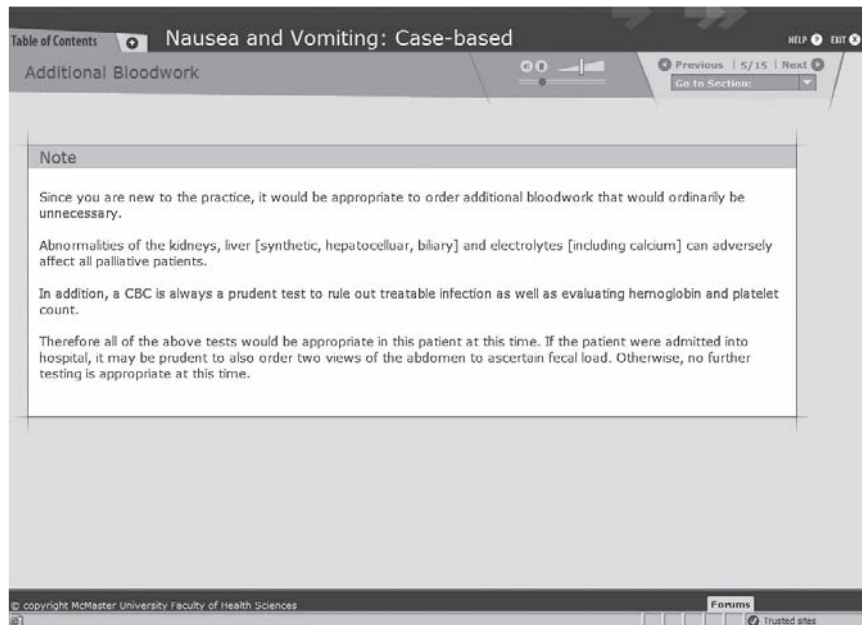
Structured Content In Practice

We would like to present two brief stories about using XML-based solutions to create e-learning. The longer of these stories is set in an academic institution—and we have one very brief corporate example to share. We hope that these help you understand the challenge and the promise inherent in converting your production model from HTML-based to XML.

McMaster University

McMaster University's medical school—famous for implementing problem-based learning in medical education—needed to expand its use of e-learning during a time of curriculum renewal. At first, the school delivered case studies to students with a combination of print and HTML-based web delivery. This method was administratively "clunky" and required editing and updating two separate files any time there was a change. Moreover, there were inconsistencies in the instructional design of the two sets of materials, due to the free-form nature of word processing and HTML formats.

The initial approach to implementing an XML-based solution was to analyze the existing content and e-learning goals with an eye to instructional design. In other words, designers asked how the pedagogical materials were structured and then began defining the content with XML schemas.

The XML-based approach that separates content from presentation layer has enabled single-source publishing of the same content to both print and web. By describing the content using a schema, and then creating the XSL-FO for print and the XSL for web, McMaster has been able to facilitate publishing to different media, to different audiences; with customized content for students and instructors, and for different levels of expertise. (See Figure 4.7, for an example of context-sensitive feedback based on the learner's expertise.)

Figure 4.7. McMaster e-Learning Course

The semantic focus of XML has also imposed a more consistent peda-gogy on e-learning case studies, where the XSD can define topic-specific elements such as "patient history," "laboratory investigations," and "diag-nosis." By pre-defining the sequence of page types, and constraining the different elements of a medical e-learning module, instructional designers have brought consistency to the pedagogy of problem-based e-learning for medical education. There is also the flexibility to define different schemas for different instructional contexts or content. For example, case studies may have a specific, consistent instructional design; whereas more directive e-learning content (regarding a specific disease), may have another well-defined schema and content architecture. This enables instructional design-ers and subject-matter experts to have both flexibility and consistency.

The constraints of the schema are also helpful to subject-matter experts, who are otherwise often overwhelmed by the phenomenon of "not know-ing where to start" when building e-learning content. The schema can

essentially guide the subject-matter expert with an instructional design template, helping to simplify and accelerate content development.

In addition to single source publishing, personalizing content to target audience, and templating of instructional design, XML's separation of content from presentation has had several advantages for e-learning implementation. McMaster enjoys a number of collaborative partnerships with other institutions. The ability to author in XML using an XML LCMS, with different XSL "presentation layer" templates, allows for a flexible "co-branding" of the e-learning delivery (each delivery under the branding and logo of the corresponding institutional partner) without changing authoring tools.

The standards-based use of XML for e-learning authoring—including the SCORM 2004 standard—has also made the content somewhat independent from proprietary LMS solutions. Content authored in XML is easier to export into different LMSs, extending the reusability of the content. This also reduces some of the panic of being "locked in" to a particular HTML-based LMS vendor, where the content is often tied to the platform. Although you can author e-learning in XML using Word Pad and other text editing tools, more sophisticated tools (as discussed in "Available Tools") facilitate schema authoring. Macromedia Flash's improved handling of XML has also made for a robust linkage between XML at the content end, and Flash at the presentation layer. Moreover, XML-based LCMSs, such as Thinking Cap® and Learn eXact, also help in the management of large-scale XML e-learning deployments by linking asset repositories, schemas, learning object content authoring, and XSL "delivery templates" with the other features of an LMS.

There are challenges in transitioning to an XML approach to e-learning. First, it involves a more conscious pedagogical approach to your content. Developing a schema requires analysis and thought about your instructional design choices. Authoring content in HTML—a formatting language—doesn't really require you to commit to semantic choices about your content. HTML gives you flexibility, but at a price: inconsistency between authors. Second, the use of XML requires the additional step of describing the "delivery templates" or formatting instructions in detail. Arguably, both XSL-FO (for PDF and print output) and XSL (for transforming XML to HTML)

are more complicated than HTML. In McMaster's implementation, XSL—the delivery templates for the e-learning schemas—has proven to be one of the biggest challenges. Once the XSL is in place, however, implementation is complete and subject-matter experts can continue to work on content authoring, without having to worry about formatting issues. An important step in the use of XML is therefore to sort out and simplify the schemas as much as possible. The clearer the XSD on page types and their elements, the easier it is to develop the XSL.

For larger-scale e-learning operations such as enterprise-wide solutions, the benefits of XML are easily realized in reusability of content, flexibility of single-source publishing, the ability to change the presentation layer, and the improved quality and consistency of instructional design at the level of the schemas used for content authoring. For smaller "one-off" projects, there may be less to gain by abandoning the WYSIWYG of HTML.

Corporate Use

While the use of schemas in higher education at institutions such as McMaster University, Queen's University, and the Association of Canadian Community Colleges is significant, it is equally relevant for corporate users such as CGI, Teranet, CAE, and Cellular One.

We asked Laura Micks, manager of training at Teranet Inc., to tell us about her company's experience with XML-based e-learning production. She provided us with this statement and a screen shot to illustrate one of the courses as delivered online from XML documents (see Figure 4.8).

Laura said, "We have a large base of subject-matter experts, a small team of trained instructional designers, and a smaller pool of technical resources that are available for the creation of new courses. Working from a defined schema lets us get the most out of all the core team and removes bottlenecks common in the development process. The final result is award-winning training materials, faster, and at significantly less cost than HTML."

Conclusion

Although heavily entrenched and widely used within the e-learning industry, HTML production models have a number of drawbacks. By locking content

Figure 4.8. Teraview e-Learning Course, Delivered from XML Documents

and presentation together in a single document, HTML limits content reusability, facilitates deviation from pedagogical structure, and restricts an organization's ability to use their resources to their full potential.

In contrast, by separating e-learning content from presentation, the XML production model provides opportunities and efficiencies in every area in which HTML presents obstacles. From its ability to streamline the production process to its emancipation of educational capital, the XML e-learning production model has the power to spark a revolution in e-learning.

This revolution must come from instructional designers. By embracing XSD as a means to communicate and enforce pedagogy, the opportunity to create great e-learning and to share and contrast differing pedagogical models is within the industry's grasp.

Doug Wallace is the president of Agile, the makers of Thinking Cap®, a suite of XML-based e-learning tools including Thinking Cap® Studio, an XML-based LCMS, and Thinking Cap® Campus, an XML-based, SCORM-Certified LMS.

Anthony Levinson, MD, FRCPC, is currently an assistant professor at McMaster University, holds the John R. Evans Chair in Health Sciences Educational Research and Instructional Development, and is director of e-learning innovation for the Michael G. DeGroote School of Medicine.

Dr. Levinson currently holds research funding and grants from several groups for the development and evaluation of e-learning. His primary areas of expertise include technology-enabled knowledge translation, and he is studying how best to capitalize on multi-media and new technologies to enhance health sciences education. Current areas of interest include knowledge management, information architectures, and instructional design and development, as well as rigorous methodologies for studying the efficacy and effectiveness of instructional interventions.

5

Integration of e-Learning and Knowledge Management

Desiree Tryloff and Victoria Bowen

Portals, communities of practice, mentoring, knowledge management, and e-learning architectures are among the hottest topics in online learning today. But how can you implement them so that they provide an integrated solution, rather than a hodgepodge collection of technologies? The U.S. Air Force devised an innovative answer that provides learning at the point of need, including aspects of informal learning and workflow learning. This chapter, by two of the architects of the Air Force Knowledge Now (AFKN) system, will give you an excellent look at the planning and coordination that delivered outstanding results.

IT SEEMS THAT THE NEED to move beyond training to learning, to move beyond knowledge and information to wisdom, and to do both quickly, is an all-consuming preoccupation with organizations and managers. Yet it is difficult to find real examples of success in these efforts. We would like to share with you the story of an Air Force knowledge management system that has

integrated e-learning to provide learning at the point of need, and in doing so has achieved all three of the goals named in our opening sentence.

The knowledge management system, Air Force Knowledge Now (AFKN), accelerates warfighter support by giving the Air Force Materiel Command (AFMC) workforce a mechanism for finding and accessing time-critical knowledge, training, and performance support resources. In this article, we describe how this system works, and we also discuss the rationale behind integration of the ELearning Architecture (ELA) within AFKN. Real-world applications that take advantage of the AFKN integrated ELA will illustrate the ELA features. These include the application of e-learning environments for AFMC Directorate of Personnel, AF Civil Engineer Support Agency, AF Performance-Based Services Acquisition, and Deficiency Reporting.

The AFMC workforce encompasses over 100,000 military, civilian, and contractor personnel. The Command is responsible for delivering war-winning technology, acquisition support, and sustainment of expeditionary capabilities to the warfighter. Since 2001, policy and processes have been evolving at a rapid pace to be more flexible and responsive to expanding warfighter requirements. The challenge is getting the new knowledge to the workforce responsible for implementing these new directives.

At the same time, because of technological advances, the way we access and share information has changed. To facilitate knowledge sharing and information access, many enterprises now have some kind of knowledge management or portal framework in place. As far back as 1995, AFMC recognized the opportunity offered by the Internet to deploy training and information to its widely dispersed workforce. AFMC designed the Virtual Schoolhouse to provide online training to the entire AFMC workforce simply, quickly, and economically. A few years later, three other knowledge dissemination programs joined the Virtual Schoolhouse program: the Help Center, a Lessons Learned database, and Deskbook, an online reference book of policies, instructions, points of contact, and other useful items. These four programs, in combination, formed the beginning of the AFMC Knowledge Management Program, which began to integrate and enhance each system to provide online performance support to the workforce. The evolution

Figure 5.1. Knowledge Now Site Banner

continues today with added powerful search and collaboration features. The resultant Knowledge Now (AFKN) environment is content-rich, intuitive to use, and extremely responsive to what is becoming AFMC's "connected" workforce (symbolized by the banner in Figure 5.1 above).

The development of an e-learning capability within AFKN provided an opportunity to realize learning beyond the reach of traditional training approaches, by addressing "how" people obtain the knowledge needed to accomplish their jobs and how Internet technologies could facilitate that process. Elliott Masie, a training futurist, attempted to address what the "e-" in e-learning might mean. He stated, "The easiest part of implementing e-learning is the technology. That is like picking a good video camera or receiver. The toughest part is to invent—to innovate—content to create new models of experiences for delivery with the technology" (Masie, 2000). So we threw away constraints to define an environment for e-learning that provides instruction and information for training needs as well as a toolbox of knowledge—"wealth" to be shared and integrated in an environment conducive to creativity and innovation.

Knowledge Now

AFKN, designed to support a community of practice (CoP) architecture, had over two thousand communities in early 2006 and is growing exponentially. This "community of communities" brings together people with like needs and provides the training and support they need to accomplish their jobs. The full operational range of each CoP involves a significant number of user-controlled functions, including Discussion Forums, Document Management, Hyperlink Maintenance, Community Calendars, Wisdom Exchange,

Frequently Asked Questions (FAQs), News Tickers, "Tell a Friend," and Alert Notifications. It also includes Metrics Tracking to measure the benefits of these features based on usage. In addition, each community provides hyperlinks to Tools, Training, and Education, Find a Mentor, MyLearning, Related Sites, Other Community Members, Policy and Direction, Other CoPs, and the Air Force Portal.

AFKN e-Learning Assessment

Once AFKN began to achieve its goals for a connected workforce, we also began to look closely at how people were using the site. Our goal was to identify and assess how AFKN might provide learning beyond traditional training approaches by addressing "how" the workforce was using AFKN to obtain the knowledge needed to accomplish the AFMC mission. To accomplish this goal, we first conducted a study to define the gap between the current, "as-is," environment and the desired, "to-be," environment. In the "to-be" environment, we wanted to support learning that is everywhere, all the time, and tied directly to the job. We wanted to support learning removed from the constraints of job definitions that limit the ability of the person, and that also limit the ability of the organization to fully leverage its human capital. We wanted to communicate leadership's vision, so that learning was present and the workforce could then act on that vision as one. The results of this assessment provided a foundation from which we could derive the "to-be" vision, policies, and processes to interject new behaviors into AFMC, creating a cultural shift toward meeting AFMC business needs.

Using a systems approach, we evaluated the degree to which technology, people, and process addressed the to-be environment. We considered how to enhance these three systems components to achieve AFMC's productivity and customer support objectives. In summary, the team's assessment determined that AFKN had proven technology with great potential to achieve a connected workforce. Technology was not a constraint. However, processes had to be better defined and people needed more personal support. In addressing these issues, we defined requirements for the creation of a fully integrated ELearning Architecture that would:

1. Create opportunities for dynamic learning, deepening the meaning and effectiveness of the learning experience as a process for personal, academic, and professional development.

2. Allow a small number of AFMC/DP ELearning Program staff to connect with an entire workforce through a structured process utilizing CoP Administrators and Knowledge Owners.

3. Facilitate the structured distribution and access of training.

4. Support the sharing of learning objects among numerous courses or curricula.

Online Repository: MyLearning

Currently, learning resources are scattered across numerous organizations and websites. The first step was to create a centralized repository of learning resources available to the AFMC workforce. Using AFKN, we established the MyLearning CoP and populated it with links to numerous learning organizations containing resources available to the AFMC workforce. This included access to formal training, online learning, and collaboration opportunities. In addition, we tied MyLearning into the AFMC Education and Training Management System (ETMS). Through MyLearning, the workforce can conduct a keyword search for available courses and create a customized "My Training Interests" page. They may locate a mentor through the Mentoring application. Scheduled discussions, debates, and group activities on new AFMC processes and changes allow the workforce to learn from each other. The goal is to ensure activities are purposeful and relevant and their presentation is timely, organized, and responsive to learner (workforce) interests. Users are beginning to form special interest MyLearning CoPs. The Science and Engineering (S&E) Learning Center is one example. This MyLearning center, by joining together members of the S&E workforce, can provide opportunities for dynamic learning.

Facilitated through the AFKN Wisdom Exchange feature (Figure 5.2), users can seek advice from more experienced members of the workforce. Experts register using the Provide Wisdom feature by indicating which knowledge areas they have experience in. AFKN users can seek answers by using the

Figure 5.2. The AFKN Wisdom Exchange

Find Advice feature and selecting a knowledge area. An email message sent
to all associated wisdom providers contains a hyperlink to a threaded discussion
area set up to collect all responses. Browse Wisdom allows the user to
see an inventory of prior questions and corresponding answers. In many
cases, several different people will answer a single question. This exchange of
ideas and opinions allows the user to better learn about and understand the
nuances of an issue under differing circumstances. It helps deepen the meaning
and effectiveness of the learning experience by connecting the learning
with the context in which it is applied, and it helps facilitate the creation of
new knowledge.

Support for Community Learning

Each community determines the content of its own workspace. For example,
the Air Force Civil Engineering Support Agency (AFCESA) has created several
CoPs for the AF Civil Engineering community to provide information
and expertise and links to training materials. Figure 5.3 illustrates the ACES
Real Property CoP. The civil engineering community includes real property
personnel, readiness personnel, military construction managers, fire department
personnel, and other specialty areas. AFCESA is responsible for providing
data management software and training for all of these specialty areas.
Under Document Management, members are able to find the most recent
AF real property policy and guidance. In addition, details regarding tricky
transactions or classifications, unique situations, and lessons learned can be

Figure 5.3. ACES Real Property Community of Practice

submitted to designated Knowledge Owners who approve their addition to the site. Real property government guiding organizations use the community as a means to inform the members and keep them updated on changes to the field.

Even more important, the discussion forums provide a place for members to ask questions and discuss topics related to their jobs. They capture input from many members in one location. These forums are a source of learning for all of the members, not just the ones who are new to the field. Remember the axiom that you learn well what you teach someone else? Having a mechanism for peers to share their knowledge is so important for professionals such as real property officers.

The community provides other resources as well. For example, the calendar feature is used to identify events at the community level such as a real property integrated product team meeting or an industry conference like the Society for Applied Learning Technology (SALT) conference. This information eliminates the "I didn't get the e-mail" syndrome and everyone has the same information. You can advertise highlighted items within the scrolling News Ticker, for example when new training is posted to the training website. In addition to the discussion forums, CoP members can contact other members through e-mail and mailing lists.

Last, but certainly not least, are the links to other communities. This mechanism for quickly accessing additional resources from the community is one more way the community serves its members.

Improve Training Distribution (Or, If We Build It, Will They Come?)

One of the biggest challenges facing AFMC is getting the over 100,000+ workforce to access and take continuing, non-mandated training. For many years, we built courses and made them accessible through road shows, and online through educational resources such as the Air Force Institute of Technology (AFIT). The challenge has been getting the workforce to seek out the training resources that were made available. Even with the availability of a centralized repository like MyLearning, we still needed a strategy to get people to come to the site.

The Answer: The Community Is the Core

Our ability to efficiently transform AFMC into a learning culture requires a people-to-people interface, something which is impossible to accomplish given lean staffs and resources. Figure 5.4 illustrates our strategy for addressing the training distribution issue. This strategy captures and supports the process and people components of the AFKN environment.

The CoP members who are at the core of this strategy represent the AFMC workforce. The AFKN CoP structure allows organizations responsible for the distribution of training to quickly contact and notify community knowledge owners and administrators about the developing new training that will affect their community members. The knowledge owners can then notify their members about the training. The knowledge owners of a community have an established trust relationship with the community members. Thus, their notification (and endorsement) of the training can motivate more members to complete the training than if an email had been distributed directly to the workforce from the training organization. In essence, the training organization pushes the training (leadership's vision, new polices and processes, etc.) to the knowledge owner who pulls the training into the CoP for the community members.

Figure 5.4. Training Distribution Strategy for AFKN

Example: Performance-Based Services Acquisition

This same process is usable across CoP. For example, HQ AFMC Contracting (AFMC/PK) developed Performance Based Services Acquisition (PBSA) training for the acquisition community that required contracting support. A Services Acquisition CoP was established to distribute the training. The CoP included additional resources, information, and point-of-contact names that supported the training effort in a couple of ways. First, AFMC/PK is available to provide in-depth training for new skill development along with regular information broadcasts, peer-to-peer support, and access to related tools and resources. Secondly, we removed the information that was subject to change from within the e-learning course and posted it on the CoP.

The course "taught" the learners to use the CoP for updates and on going support, thus minimizing the need for updating the more costly e-learning course. The AFKN ELA allowed AFMC/PK to help educate their customers and provide a customer service function.

Example: AFMC Sponsorship

Utilizing the ELA structure allowed us to address another issue—training content can change based on where a person is stationed or located. The AFMC/DP Sponsorship CoP illustrates how a single training program can accommodate this base-centric information. The AFMC Family Support Center (FSC) is responsible for the Sponsorship Program, which matches a sponsor with a newcomer to the base in order to help the newcomer and the newcomer's family get settled in their new "home." While there is a standard sponsorship process, specifics change depending on the base the newcomer is moving to. The Sponsorship CoP contains the base-specific resources such as maps, local stores and hospitals, license bureaus, etc., while the sponsorship e-learning course provides training on the sponsorship process and instructions on using the Sponsorship CoP to access these additional resources.

ELA Course/Unit/LO Structure

In addition to creating a learning repository, the ELearning Architecture design supports the deployment of learning objects in a structured, yet flexible, manner. Learning objects (LO) are small chunks of content that can stand alone, support a single learning objective, and can combine to form a module (unit), or an entire course. In addition, the ELA allows training and learning to tie to AFMC business objectives at organizational and individual levels. The ELA allows the instructional designer to enter information concerning each learning object, including Continuous Learning Points (CLPs), a measure of the hours of training provided by the LO. The syllabus is built using LO information entered here and the total CLPs for a course is calculated by adding the CLPs assigned at the LO level. Recording the Author's Name, and the Creation and Expiration Dates allows the system to email authors later, to ensure the content within the learning object is still current. We create Units (or modules) by joining together learning objectives, and

they may contain one or more Learning Objects. Finally, we create courses by joining together one or more units. We create the course syllabus at the course level and it provides access to assigned units and LOs.

The Deficiency Reporting Program is an example of how learning objects were "mixed and matched" to create customized curriculums using a fixed subset of learning objects.

Example: Deficiency Reporting

The AFMC Deficiency Reporting (DR) Program had not been achieving its objectives, and one of the reasons cited was lack of training. We developed a curriculum to address the training needs of the DR workforce. The workforce consisted of senior leadership, management, and key roles in the DR process (originating point, screening point, action point, and support point). Each group needed a different combination of learning objectives. The ELA allowed the e-learning team to customize the learning for each person (role). Table 5.1 identifies how we assigned the LOs to each role. The syllabus for the Screening Point would include DRIS and Air Superiority, DRIS 101, and Screening & Action Point Duties; but not Root Cause Analysis.

Table 5.1. Curriculum Requirements Matrix

Role/Course	DRIS and Air Superiority	DRIS 101	Originating Point Duties	Screen and Action Point Duties	Support Point Duties	Root Cause Analysis
Senior leadership	X	X				
Originating point	X	X	X			
Screening point	X	X		X		
Action point	X	X		X		X
Support point	X	X			X	X

ELA Tracking and Reporting

The ELA also accommodates tracking and reporting of distributed training at the AFMC/DP level as well as at the CoP level.

The Learner Progress Report is available at the CoP level to CoP administrators and others assigned with e-learning administration responsibilities. It lists all CoP members and displays the start and finish dates for a particular course. In addition, when the CoP member completes the course, we issue and e-mail a certificate to them. A unique certificate number is included in the Learner Progress Report for validation.

Because we can link an individual and a course to multiple CoPs, the ELA was designed to ensure an individual only needs to complete the course

Figure 5.5. Course Statistics Reports

Course Title: Initial Sponsorship				Data Range: N/A	
* Note the 'Total for Current Course' will not equal the 'Subtotal for Current Team' counts combined. Due to duplications.					
Team: eLearning and KM (ELKM) Team Room					
Base/Org	Members	Start	Complete	Usage	Completion
Not Specified	20	4	1	20%	25%
WRIGHT-PATTERSON AFB	2	2	2	100%	100%
Subtotal for Current Team:	22	6	3	27.27%	50%
Team: GDAIS AFMC eLearning Center					
Base/Org	Members	Start	Complete	Usage	Completion
Not Specified	52	11	1	21.15%	9.090%
WRIGHT-PATTERSON AFB	2	2	2	100%	100%
Subtotal for Current Team:	54	13	3	24.07%	23.07%
Team: GDAIS eLearning Access					
Base/Org	Members	Start	Complete	Usage	Completion
Not Specified	13	1	0	7.692%	0%
WRIGHT-PATTERSON AFB	2	2	2	100%	100%
Subtotal for Current Team:	15	3	2	20%	66.66%
Total for Current Course:	**72**	**13**	**3**	**18.05%**	**23.07%**

once. That individual's progress will be reflected in any CoP of which the individual is a member.

The Course Statistics Report provides metrics of course completion rates (see Figure 5.5). Each report will give the following information: number of CoP members, number of Starts, number of Completions, usage rate (in percentage), and a completion rate (in percentage). We can sort information by course, base, and CoP. The sort-by-CoP option allows the course administrator to see which CoPs have added the course into their CoP. As described above, an individual can be a member of multiple CoPs. The Course Statistics Report adjusts for multiple memberships when calculating totals.

Conclusion

The integration of ELearning Architecture within an active knowledge management system has allowed us to expand learning beyond training. In its simplest form, learning occurs by pulling together training products, needed supplemental information, and subject-matter experts within a structured environment. As training becomes more structured, the ELA allows communities to take responsibility for getting and monitoring training for the community members, In addition, the ELA allows learning to be accessible and customizable with virtually no effort, and can involve all stakeholders quickly and easily into the process. We consider each of these efforts to be a success, and plans are in place to grow and nurture these efforts for continuing workforce performance support.

Reference

Masie, E. (2000, January). *Learning Decisions Newsletter*, 1(1). Saratoga Springs, NY: The Masie Center.

Desiree Tryloff was project manager (PM) and lead designer of TASC's Virtual Schoolhouse, a first-of-its-kind Internet-based learning management system, and the Air Force Materiel Command's (AFMC's) Virtual Schoolhouse. She also led the effort to build an e-learning architecture within the

AF Knowledge Now (AFKN) system. She was awarded Vice President Al Gore's "Hammer" Award and ASTD Honorary Recognition for "Significant Contributions to Workplace Learning and Performance." She has had extensive hands-on experience working with customers and staff to help them make the shift to e-learning and knowledge management, including AFMC, from both a technical and organizational perspective.

Currently, Ms. Tryloff is employed by General Dynamics Advanced Information Systems and is manager of its e-Learning and Knowledge Management Initiatives Programs (desiree.tryloff@gd-ais.com). Ms. Tryloff received her MBA at Wright State University, Ohio, and has a BS/BA from Bowling Green State University, Ohio.

Victoria Bowen, Ed. D., is employed by General Dynamics C4 Systems in the Orlando Battle Management Systems Division, where she is chief engineer, Learning Solutions. She received her doctoral degree from the University of Georgia, where her research focused on cognition and multimedia in computer-based training. Dr. Bowen has twenty-four years of experience developing distributed learning products and managing production teams. She is a skilled programmer, human factors engineer, and facilitator. She currently leads a team developing distributed training for the Joint Force Support Component Command and other Joint Logistics organizations. She also leads the Future Combat Systems Level 1 Fusion Interactive Multimedia Instruction Development Team.

She previously headed the Air Force Civil Engineer Support Agency's (AFCESA) Automated Civil Engineer Systems (ACES) web training team. She was instrumental in establishing several of AFCESA's Communities of Practices and aided in establishing their knowledge management programs.

6

The Design Document

YOUR BLUEPRINT FOR E-LEARNING STANDARDS AND CONSISTENCY

Monique Donahue

In any project, it is normal to document the specifications and the scope of work. But in e-learning projects, designers must spell out a number of other elements, including the course features that will be standard across lessons and modules, the design strategy for critical elements, and media standards. These must be communicated consistently to the rest of the team, and in many cases must be signed off on by the client. Learn how to put together a planning document that will help you identify and manage all the critical items!

IF YOU ARE just getting started in e-learning—or even if you are a seasoned veteran—what tools are you using to plan and organize your approach to each course? Are you recording the design decisions your team makes along the way? What are you doing to ensure consistency of design across multiple courses or multiple developers? A well-written design document helps solve these problems by outlining the design specifications, standards,

and conventions specific to your e-learning development. The design document does just what its name implies—it formally documents the design decisions your team makes for a given project. It serves as an excellent reference tool and ensures that everyone on the team is speaking the same language and following the same rules, and it's a great way to bring new team members up to speed quickly. The design document also tells your clients, whether internal or external, exactly what features and functionality they can expect from the finished program.

What, then, goes into a design document? At the Educational Institute of the American Hotel & Lodging Association (EI), we consider the design document a living document that continues to evolve as our team refines its processes through feedback and experience. In its current incarnation, the structure of our design document template comprises six major sections: Project Specifications, Standard Course Features, Design Strategy, Technical Specifications, Media Standards, and Project Management. This article will help you create your own practical design document by walking through each section in detail and reviewing the information and best practices our organization has found helpful. Although the decisions you make and the information you choose to document may differ from ours, this should serve as a good place to start.

Project Specifications

Our first step in any e-learning project is to outline its most fundamental requirements—those attributes that define what we are building and for whom. The methodological and technical aspects of how we will conceptualize, build, and maintain the program come later in the design document.

Overview

We begin by specifying the basic parameters of the project: a brief description of the course and its learning objectives, the intended audience, targeted length, and any prerequisites. If there are specific audience characteristics that should be taken into consideration, such as the level of computer and/or job experience, language or literacy barriers, or secondary audiences who may

also participate in the training, those should be noted here. Also indicate the overall course length, as well as any standards for the maximum length of individual modules within the course. For example, we typically try to keep our modules to no more than twenty to thirty minutes in length to make it easier for users to complete the course in several short sessions.

Deliverables

We also define the exact materials or output that the team will submit for review and approval during various phases of course development. For EI, that most often include:

- *Detailed course plan*—a comprehensive outline of course content and structure

- *Draft storyboards*—a screen-by-screen breakdown of content, interactivities, media, and audio script

- *Supporting resources*—often a course glossary or external PDF files (worksheets, forms, job aids) that users can launch and print from within the course

- *Assessments*—draft questions for quizzes, exams, and course evaluations

- *Prototype module*—a sample module with media for clients to approve before proceeding with development of the full course

- *Completed, fully enabled program*—the completed program for full testing

Depending on your needs, you may choose to combine or eliminate some of the above deliverables, particularly if you are working in a rapid development or rapid prototyping environment.

Existing Content Resources

Finally, we document all the existing and available resources from which we will derive the course content. If we or our clients have subject-matter experts, existing training or documentation, or other materials to be used as a source of content, it is listed here as a reference for all team members.

Standard Course Features

The next step is to establish a high-level course framework. The decisions made at this stage will ensure consistency of presentation across all modules within a course, or across all related courses that are part of the project.

Course Components

Begin by deciding what elements will be included in your course. Some of the typical course components referenced in our design documents include:

- *Tutorial module*—generally provides instructions about using the program and navigating within the course. If plug-ins or third-party downloads are required, include links within the tutorial. Be detailed in the design document about what information your tutorial module will contain.

- *Overview module*—typically presents an introduction to the content to cover within the course, including course objectives and a brief description of the roles or responsibilities of the people you will be training.

- *Content modules*—state the intent to organize core content into one or more brief, logical modules. You will expand upon details about content modules in the Preliminary Course Plan section later in the design document.

- *Wrap-up module*—summarizes key information presented in the course and provides concluding thoughts. Often, the wrap-up module will include additional resources or an action plan.

- *Assessment or user evaluation*—assessment and evaluation details are spelled out later in the Testing and Evaluation Strategy section of the design document, but the inclusion of these pieces is introduced here as a course component.

Module Components

Because a course, especially a long one, is typically broken up into a series of modules, you'll want to document the items or screens that should be

standard across all modules. For example, your design standard might be that each module opens with an animated title screen or a synchronized musical introduction, or you may want to include a printable job aid or a summary of key points at the end of each module. Documenting such decisions ensures consistency and uniformity from one module to the next.

Interface and Navigation Controls

Other global course elements to consider include the interface and navigation controls that will appear on each screen of the program. Describe the informational sections the interface will incorporate, which may include course title, module title, progress indicator or location within the module, or a text prompt that provides instructions for what to do next.

If you plan to use submenus or other means to allow users to jump directly to specific topics or points within a module, provide a description of those here too. For example, you may choose to have a topic menu running down one side of the screen that is visible at all times and that links to subsections within the module. Alternatively, such a menu could be a pop-up from a button in the interface.

Describe the basic navigational controls that allow users to progress through the program in the design document as well. This typically includes Next, Back, Help, and Exit, along with any other features your design team chooses to add. For instance, you might want to include buttons that let the user replay a screen, toggle audio on and off, or launch a course glossary or other resources.

Design Strategy

The Design Strategy is the core of the project and typically the longest section of the design document. Here we document methods, strategies, and constraints for presenting content, engaging users, and evaluating their learning.

Treatment and/or Themes

If your program will consistently apply a themed treatment, identify it clearly and obtain any necessary approvals early in the design process. For example, you might have a character or "personality" who leads the user through the

content, a running theme that defines the graphical look, such as "space" or "high tech," or simply a style or color scheme to which the interface and all graphical elements must adhere. Although your team may not actually develop graphics until later in the process, you will want to identify the "look and feel" early so your designers can use appropriately themed language and examples when writing supporting content.

Figures 6.1 and 6.2 show examples from a course in which developers did not identify stylistic themes at the outset of development. Notice that the style of graphics is inconsistent with the interface, and even inconsistent with each other from one screen to the next. By contrast, notice that the graphics in Figures 6.3 and 6.4 cleanly integrate with the interface.

Instructional Methods

Most e-learning courses use a combination of instructional methods to provide information to the user. The design document should list the agreed-on

Figure 6.1. Course Screen with No Clear Graphic Theme

Figure 6.2. Style of Graphics Is Different from Figure 6.1, Even Though
            This Screen Is from the Same Course

methods for the current course. Common instructional methods and their
uses may include:

- *Presentation*—short chunks of material presented to the learner
  to read

- *Demonstrations and/or behavior modeling*—video and/or animations
  to demonstrate tasks and procedures

- *Case studies and/or problem-based learning*—detailed explanation of
  a situation or problem that users must analyze and offer findings,
  recommendations, or solutions

- *Graphical illustrations*—still or animated graphics, photos, charts, and
  diagrams to reinforce content or illustrate processes

- *Audio*—voiceover narration to reinforce onscreen text

Figure 6.3. Photos Integrate with the Interface in a Common Theme

- *Interactions*—integrated opportunities throughout the instruction that allow users to explore content, apply knowledge, and check understanding through questions, games, and activities

- *Simulations*—interactive environments that simulate real work experiences and conditions

- *Blended learning*—combination of the e-learning approach with more traditional teaching methods, including classroom instruction and on-the-job training

Interactivity

The best e-learning programs are rich in simulations and interactive experiences that engage learners and increase retention. However, as with many design decisions, there is a trade-off and compromises may be required. Your available resources, time, and budget must factor into any planning. You can develop meaningful interactivities with limited time and money, but be wise

Figure 6.4. Original Graphics Integrate with the Interface

about the activities you create. Focus on the content and on developing an instructionally sound program, not on creating flashy elements just because you can. Some questions to ask yourself include: What types of interactions are appropriate for the course? How and why will we use them? How frequently will we use them?

Table 6.1 shows an abbreviated version of typical guidelines for interactivity used in our course development. The table lists the team's and client's agreed-upon reasons for choosing to apply an interactive element, and strategies for making the interaction relevant to the content.

Testing and Evaluation Strategy

Among the most important components of any course are the measurements you put in place to assess the course's success. Your documented testing strategy should outline the following:

- The levels at which you will be evaluating course results (reaction, learning, transfer and application, and/or business results)

Table 6.1. **Interactivity Guidelines**

Reason for Interaction	*Strategy*
Explain and support concepts	Use to emphasize key concepts or highlight key points; Use to provide structure to detailed or complex content; Use to allow learner control over content/sequencing; Use to challenge learners prior to introducing new concepts
Practice and apply learning	Make practice opportunities meaningful and interesting; Use after presenting key concepts; Use when knowledge/skills need to be internalized; Use to help learners differentiate between good and poor performance
Check learner understanding to determine if course objectives are being met	Directly relate questions to at least one module objective; Provide positive reinforcement that the user is making progress; Provide positive intrinsic feedback that demonstrates the ineffectiveness or risks of poor responses and the value of good responses

- The format of the assessment(s), and how they will be administered
- The number of questions, if a traditional test
- The passing score
- The retake options for those who don't pass
- The remediation plan for incorrect performance or responses
- The proctoring requirements, if any

Constraints

Often, there are limiting factors to course development that are outside your ability to control. In some cases, you may have already identified these constraints, particularly technical considerations, in other parts of your design document. Whether constraints are scattered throughout your document in

the relevant locations or compiled in a single section of known issues, you should always document those things that are likely to require compromises or affect any aspect of design, development, or delivery of your course.

For example, in a recent development effort we repurposed content from a series of eight-hour workshops to a comparable series of online courses. Feedback from potential clients strongly discouraged online courses that exceed three hours, so we identified a constraint stating that we may scale back or de-emphasize extraneous or non-critical information, with input from subject-matter experts, in order to meet the targeted course length. Similarly, because the program was a precursor to certification, we had to take care not to eliminate information that is tested on the certification exam.

Preliminary Course Plan

The course plan is where we begin to structure the format, sequence, and presentation of specific content. It is essentially a high-level outline that breaks course objectives and content into modules, makes preliminary recommendations for interactivities to support various content points, and estimates the length for each module. The course plan may also include a flow chart to visualize complex interactions or branching, if needed. Depending on the needs of the project or client, a more detailed course plan may follow the preliminary or sample course plan included here, as a separate deliverable, after approval of the design document.

Technical Specifications

Before you can begin development, you will need to define the technical specifications to which you are developing. Here, especially, we learned from our previous experiences of building e-learning sans a formal design plan.

Development Tools

Have you ever storyboarded an e-learning course without knowing which tools you would be using to build the final product? We have. We were eager to move forward in the next phase of our e-learning presence, and ended up a little too far ahead of ourselves. We were lucky that our final tool selection

did not result in a major redesign, though some modifications were required to fit the template-based system we chose. More disappointing was that, with the new development tool, we suddenly had access to many new templates we had not previously anticipated. Had we selected the tool first, our design could have been so much richer. The moral of the story? Don't let your tools restrict your creativity, but do at least know what they are so you can design to their strengths and find workarounds for their limitations.

The actual tools you select will depend on factors specific to your organization and your budget. There are many good authoring packages out there, some of which require more programming skill than others. After some trial and error, we are currently using a template-based system that allows our instructional designers to build the courses themselves with no programming knowledge required. The tradeoff is that, while we can develop courses faster and cheaper, we are more limited in some of our development options. In more recent courses, we have been able to get around this to some degree through creatively designed Flash elements in place of some static graphics, although that has caused our development time and cost to creep back up. These considerations should factor into your design plan.

File Naming Conventions

Once you begin designing your course and creating related documents and media, what do you name the files? Always establish file naming conventions up-front so all team members can easily create, find, and retrieve the various course and media elements. There is no universal standard for naming and storing files—just make sure your naming scheme makes sense to your team members and within your organization, and that it is easy to remember.

Course Identifiers At EI, we begin with a unique course identifier that becomes a prefix for all media elements related to that course. For example, we have a course for restaurant servers currently in development. The course identifier we use is LLFB01. Decoded, the LL indicates the course is for a line-level position, the FB indicates the position is within the Food and Beverage department of a hotel, and the 01 indicates that this is the first in a planned series of line-level food and beverage courses.

Frame Numbers Next, we express conventions for referencing individual screens within a course. Our usual standard is a four-digit frame ID that identifies the module number and frame number, sequenced in increments of ten to allow for inserting additional frames, or screens, later without disrupting the naming scheme. Thus, we might number frames for the first module of a course 1000, 1010, 1020, etc., with the second module beginning at frame number 2000 and the third module beginning at frame number 3000. We might assign the number 1015 to a new frame, added later between frames 1010 and 1020.

Media and Other Files We then use a combination of the course identifier, frame number, and media type to name media elements and link them to specific screens within the course. We might therefore name an animated graphic for screen 1010: LLFB01_gfx_1010.swf. Finally, we also detail comparable conventions for naming work product and resources such as storyboards, the course glossary, and help files.

Delivery Hardware and Software

Many design decisions will be constrained by the technology of the end user. It is therefore crucial to identify the target delivery platform. Are there limitations of operating system, screen resolution, web browsers, plug-ins, or other software that you must contend with? Will users be on a dial-up or broadband connection? What are the hardware specifications of the end user?

Once you have answered these questions, ask what the design implications are. Systems without speakers or headphones will affect your ability to use audio for presenting content. If most users are on dial-up connections, you may have to avoid high-bandwidth media such as high-resolution video. If users are on a corporate network that locks down systems and prevents installation of software, you'll need to limit your media to the plug-ins and versions that are already available.

Data Tracking and Interoperability

One lesson EI learned regarding technical standards of interoperability is that if you have any intention of deploying your course on more than one

learning management system (LMS), or if there is the possibility of migrating your course to a new LMS down the road, think early and often about how you will get a program that runs fine on LMS "A" to do the same on LMS "B." This means building your course to standards such as AICC (Aviation Industry CBT Committee) or SCORM (Shareable Content Object Reference Model) from the start, and recording decisions about which technical specifications you are adopting in your design document.

By way of example, I offer our first effort at building an interactive online course.

When we developed the course, we weren't thinking ahead to the possibility of licensing our online content to clients for use on their own systems, or the fact that we might not always be so enamored with the LMS we were using at the time. Both of those scenarios came to pass, and we found ourselves rebuilding the original course to allow it to communicate with a client's SCORM-conformant LMS. The good news is that the rebuilt course later transferred very nicely when we made our own switch to a new internal LMS.

Related to standards are issues of accessibility and tracking. Accessibility is increasingly becoming a buzzword in e-learning design, and Section 508 accessibility guidelines should be a factor in your design if you are developing programs for federal agencies, in particular. Even without a Section 508 requirement, it's prudent to document any accommodations (if any) you plan to build into your course for users with visual, hearing, mobility, or other impairments that may affect how they use the program.

Finally, we document the data we intend to track for each user. For our courses, this usually consists of time spent in each module, bookmarked locations, quiz and test scores, and module completion status. Conforming to the appropriate SCORM or other technical specifications allows you to pass this data easily back and forth between the course and the LMS.

Media Standards

Media elements play a large role in any online course. As such, we devote a section of our design document to detailing conventions for the various types of media to be included in the project.

Text

With text standards, we lay out a few basic style guidelines such as: write concisely and in the active voice, use short sentences and/or bullets, and "chunk" content to avoid the appearance of dense screens. Writing style is one of the hardest areas to achieve consistency in across a multi-designer team. This section of the design document does not substitute for a good style guide (and you may want to list the specific style references you want your team to use, such as *The Chicago Manual of Style* or *The Gregg Reference Manual),* but it does offer a few helpful hints for instructional designers and technical writers and lets internal or external clients know what to expect in the presentation of text content.

We also specify what reading level we are targeting with onscreen text (e.g., eighth-grade reading level for a supervisory level course) and define any standards for how to word text prompts. For example, the instructional text prompt on the last screen of a module in our courses always reads, "You have completed this module. Click Exit to close the window and return to the menu." By specifying these standards early, all of our instructional designers are working consistently. This allows us to focus later quality assurance reviews on content and design, rather than details of uniformity.

Audio

Here, we spell out standards for voiceover, music, and sound effects. For voiceover, we indicate where we will use it and whether or not all onscreen text will be narrated word for word. Some of these decisions will tie into the capabilities of the end user's delivery platform (loudspeakers, bandwidth, etc.) and whether or not you have opted to create a course that is Section 508 compliant or that otherwise addresses accessibility concerns. We also specify where we will use music and sound effects to achieve a consistent effect across the course or product line. For example, we often choose to use music on the opening screen of each module.

Visuals

We frequently use visual images essential to online course development to provide an example for, or otherwise support and reinforce, the content

onscreen. Our goal is to provide instructionally meaningful visuals, as stated in our design documents.

Graphics Static, animated, and interactive visual images in e-learning courses may come from a variety of sources. They could be original images created by an artist, existing graphics or photos from an internal or stock library, or custom photos taken specifically for the project at hand. There is a cost tradeoff for original graphic design or custom photography versus limitations or suitability of "generic" images from a stock library; these considerations should factor into your planning.

List other graphic standards here too. For example, standards we have documented in the past include graphically calling out key points or fun facts in a stylized text box and including an animated opening title sequence at the start of each module.

Video Like audio, the use of video will depend on the delivery hardware. If users are on dial-up connections, consider using shorter video clips and higher compression settings. Higher compression results in smaller video windows and lower resolution, so you will want to test settings on a dial-up connection to achieve the desired balance between video quality and download speed.

Typically, for an e-learning course we also specify the source of video footage—either from existing assets or new video production. Obviously, new video production will impact your project's timeline and budget. When we choose to use clips from existing videos to present new information, or to reinforce or demonstrate concepts presented in the course, we provide guidelines in the design document for what is acceptable. This usually means that existing video content must be current, accurate, and relevant, and footage should not appear "dated" (clothing, hairstyles, etc.). Finally, we define screen location standards for the consistent placement of video on each screen that uses it.

Project Management

Although not essential to the actual design of the course, you may want to conclude your design document by including project management details that might be helpful for future reference. Such details would include:

- *Team members*—a list of project team members, along with their roles and responsibilities. Team members may include the project manager, instructional designers, programmers, graphic artists, audio and video producers, quality assurance reviewers, customer and/or client contacts, and subject-matter experts.

- *Key dates*—a development timeline with milestone dates for key tasks and deliverables.

- *Quality assurance and pilot testing*—are there quality assurance reviews or a pilot-testing phase before full launch of the course? If so, who will be involved and how will you collect and process feedback?

- *Approvals*—who gives final approval and signoff that the project is complete?

- *Archiving and maintenance*—how and where will you archive or back up files? How will you maintain or update the program in the future? Is there an anticipated revision cycle?

Conclusion

There is a lot to think about, and a lot of work involved, in writing a well-crafted design document, which means that it is a step often omitted from the development process. The good news is that, when you have a detailed design plan in place, it becomes your standard for development, and the course practically writes itself. If you have never written a design document before, the hardest part is writing the first one. The truth is that after you've written it once, you have a template for all future e-learning programs. (See Sidebar 6.1 for an at-a-glance design document outline.) Much of the information will be fairly static and won't change dramatically from one course to the next. Just remember that it is a living document. If it is not perfect or complete at first, you can continue to refine it as your team learns and your needs evolve.

SIDE BAR 6.1: DESIGN DOCUMENT OUTLINE

I.   Project Specifications

    A. Course overview, description, and objectives

    B. Audience

    C. Length

    D. Deliverables

    E. Existing content resources

II. Standard Course Features

    A. Course components

    B. Module components

    C. Interface and navigation controls

III. Design Strategy

    A. Treatment and themes

    B. Instructional methods

    C. Interactivity

    D. Testing and evaluation strategy

    E. Constraints

    F. Course Plan

IV. Technical Specifications

    A. Development tools

    B. File-naming conventions

    C. Delivery hardware and software

    D. Data tracking and interoperability

V.   Media Standards

    A. Text

    B. Audio

C. Graphics

D. Animation

E. Video

VI. Project Management

A. Project team

B. Development timeline

C. Quality assurance and pilot testing

D. Approvals and signoff

E. Archiving and maintenance

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7

Steps to Creating a Content Strategy for Your Organization

Ellen Wagner

Content always plays a critical role in supporting the learning function in organizations. It has now evolved to become a key resource fueling organizational innovation. To leverage intellectual property in support of this role across the enterprise, the first step is to develop a content strategy. In this chapter, allow the experts to show you how to take your learning to the next level.

DIGITAL CONTENT—especially content that has been constructed using a learning-object-oriented approach to its design and development—makes it possible to create personalized learning programs and performance support tools. This chapter describes how enterprises are reassessing the strategic value of their content as they look for ways to better leverage intellectual property in support of improved learning and performance across the entire organization.

One of the first steps is to develop an organizational content strategy. A content strategy has many components, but at the heart of every strategy will be found a content model. This model structures, organizes, and differentiates all the elements within the enterprise content universe.

The Evolving Significance of Content

We live in a world in which we can send email on our mobile phones, take snapshots with our handheld computers, and literally converse with colleagues online. As our colleague Wayne Hodgins of Autodesk suggests, consider the possibilities in an enterprise-wide learning strategy that leverages the power of all of its digital content creation and distribution capacity to deliver:

- Just the right content, to
- Just the right person, at
- Just the right time, on
- Just the right device, in
- Just the right context, in
- Just the right way.

Digital content promises to take learning to the next level of personalization and relevancy because it offers a way to construct, assemble, and reassemble learning and performance support assets based on the needs, interests, and requirements of learners. Imagine logging onto your company's knowledge base to pick out some learning modules to load on your portable computer—and then copying some practice objects from those modules to your personal digital assistant (PDA) so you can practice on that long flight later in the week. Imagine e-mailing practice results using your mobile phone and receiving a voicemail with feedback on your submission. All of a sudden, "anytime, anywhere" learning may really mean what it says.

Content has always played a critical role in the learning and performance support function in organizations. However, over the past ten years, the form and function of content itself has evolved, offering organizations new opportunities for realizing new value. What has changed to elevate

the status of content to that of a strategic resource fueling organizational innovation?

A number of significant developments have occurred to change the role and function of digital content, not the least of which was the growth and evolution of the Internet itself. It was not so long ago, in 1993 to be precise, that federal legislation first allowed the National Science Foundation to open the NSFNET Internet backbone to commercial users, resulting in the first appearance of suffixes designating one's organizational type, including the now infamous ".com". Also in 1993, the University of Illinois announced the release of Mosaic, a new type of computer program known as a browser. Mosaic incorporated a set of access protocols and display standards originally developed at the European Organization for Nuclear Research (CERN) by Tim Berners-Lee for a new Internet application called the World Wide Web (WWW).

In 1995, a report by the Department of Commerce Information Infrastructure Working Group on Intellectual Property, Rights, and Information noted the emergence of the National Information Infrastructure (NII) and predicted that the NII—colloquially called the Internet—would result in an explosion of digital content. The report observed that an information infrastructure had been in existence in the United States for some time, but also noted that it had never before been integrated into a single entity:

> Telephones, televisions, radios, computer and fax machines are used every day to receive, store, process, perform, display and transmit data, text, voice, sound and images in homes and businesses throughout the country. Fiber optics, wires, cables, switchers, routers, microwave networks, satellites and other communication technologies currently connect telephones, computers and fax machines. The National Information Infrastructure of tomorrow, however, will be much more than these separate communications networks. It will integrate them into an advanced, high-speed, interactive, broadband, digital communications system. Computers, telephones, televisions, radios, fax machines, and more will be linked by the NII and users will be able to communicate and interact with other computers, telephones, televisions, radios, fax machines, and more—all in digital form.

Now, fast-forward a mere thirteen years. *(It's only been thirteen years!)* The Internet is ubiquitous. It has already spawned one of the greatest economic boom-and-bust cycles ever. Conventional publishing, production, and distribution have been radically altered by powerful and relatively inexpensive software and hardware tools. The learning press reports that software applications such as Microsoft® Word, Microsoft PowerPoint® and Adobe Flash® are the most popular online content development tools, which puts the capacity for professional quality digital content creation and distribution in the hands of mere mortals.

Today, digital content surrounds us in multiple forms and file types that can be copied, modified, and shared on an unlimited scale. Knowledge management methodologies and tools help make the tacit explicit, capturing knowledge about processes and procedures that, in the past, had walked out the door every time an employee moved from job to job or from company to company. Every memo, email, and collateral marketing piece is a candidate for inclusion in the enterprise knowledge base.

Furthermore, new means of creating shared content continue to emerge.

Web logs, or blogs (for example, http://www.blogger.com) serve as the core of communities of interest organized around self-publishing and group publishing. Wiki (http://c2.com/cgi/wiki) represents a new medium for collaborative meaning-making. Wiki enables users to freely create and edit web page content using any web browser. It allows the organization of contributions to be edited in addition to the content itself. The WikiWiki Web (the first Wiki) defines wiki as "a composition system; it's a discussion medium; it's a repository; it's a mail system; it's a tool for collaboration. Really, we don't know quite what it is, but it's a fun way of communicating asynchronously across the network." (See http://c2.com/cgi/wiki?FrontPage.)

The deluge of new information long ago became a flood. Today's challenges revolve as much around not drowning in a sea of content as they do about ensuring that a sufficient quantity of quality content is available, and ensuring that each individual content asset can be easily located, used, adapted, and stored again for future use.

Why Metadata Matters

No content strategy will be complete without responding to this most fundamental question: How will we find the content we want for any given device, when and where we need it?

One of the most active areas in today's learning and technology standards world relates directly and specifically to metadata. Metadata gives developers the power to specify the attributes of the desired instructional content. Metadata makes searching more efficient and, since digital content is easy to describe and locate, it is feasible to reuse objects in different courses and performance support applications and to distribute them using a variety of devices.

Simply stated, metadata is information that describes the attributes of data so that users can find it after it has been stored. In general, metadata describes attributes associated with individual data files. There are two types of metadata.

Objective metadata, most of which can be generated automatically, describes characteristics such as file type and size, date, author, operational requirements, costs, identification numbers, and ownership. You've probably already experienced how Microsoft Office applications assign objective metadata to your files—for example, that little window that pops up every so often to identify the author of a document. Have you seen that little dialog box asking whether or not you want to merge the previous version of your document with the current version? That's objective metadata, too.

Subjective metadata are more varied and often describe the most useful information about a content object because they capture what may be otherwise undocumented knowledge, context, perspectives, and opinions. Subjective metadata can be provided by anyone, and as a result there may be a lot of it, and it will not necessarily reflect any consensus. Typical subjective metadata might include notes on the type of granularity of an object, a description of the pedagogical purpose of the object, or assessments and learning objectives associated with the object.

Another critical characteristic of metadata is the ability to have an unlimited number of metadata records for any single piece of information. This

is particularly obvious in subjective metadata, as they capture opinions, any number of which are available for a single object. In short, metadata provides the solution to the problem of finding content assets once they have been captured and stored in a database.

Imagine the challenge of using the same five words to describe yourself on any given day over a period of several days. Now imagine what five close friends might say: Would they use the same words to describe you that you did? What about five co-workers—would they use any of the same words? A consistent naming convention is an obvious requirement for a common naming framework—and that is in fact the role that learning object metadata standards play.

Common standards for metadata are essential for the success of object-oriented learning designs. Generally speaking, learning object standards are either learning- or technology-focused.

Learning-focused standards tend to address issues related to content, metadata, and the establishment of a learning management system data model. *Technology-focused standards* typically address issues associated with the interoperability of HTML, HTTP, XML, Java, and JavaScript.

Fortunately, much work to create metadata standards for learning objects and related content objects is underway all around the world by groups such as IEEE Learning Technology Standards Committee (IEEE LTSC), the Instructional Management Systems Project (IMS), the World Wide Web Consortium (W3C), and the Alliance of Remote Instructional Authoring and Distribution Networks for Europe (ARIADNE) Project.

The Value of a Content Object Reference Model

Defining and understanding learning objects has been a challenge because they need to be viewed within the context of an overall conceptual model that is based on a hierarchy of granularity. By showing the relative relationships of different content constructions, it is easier to conceptualize how small content elements can be assembled, disassembled, and reassembled as needed. This results in an almost infinite flexibility that allows users to create logical assemblies from smaller learning objects to meet individual needs.

Figure 7.1. The Learnativity Content Model

Revised, Wagner, Learnativity, 2003

L e a r n i n g   C o n t e n t   E c o s y s t e m

Learning Environment	Learning Content Aggregations*	Learning Object	Information Object	Content Asset
Web Services — Communities Components Collaboration Databases Communications	Chapter Lesson Unit Course	Objective Practice Assess	Fact Concept Principle Process Procedure	.doc .wav .swf .fla .jpeg .mpeg

Context ←

→ *Reusability*

A Reference Model for Learning Content

The Learnativity Content Model shown in Figure 7.1 was designed to help visualize how content can be organized for e-learning and knowledge management applications. It illustrates the relationships among varying kinds and sizes of data files likely to be a part of any e-learning or knowledge management solution.

As shown in this model, the most granular of the files are the *Content Assets.* Content Assets include raw media such as photographs, illustrations, diagrams, audio and video files, animations, and applets, to name a few examples.

Information Objects comprise the next level in this model. An Information Object is classified as a Concept, a Fact, a Process, a Principle, a Command Reference, an Exercise, or a Procedure.

Individual Information Objects can be combined to form a more conceptually complete data structure called a *Learning Object.* Learning Objects are formed by assembling a collection of relevant reusable information objects to teach a common job task on a single (enabling) learning objective. While

learning object definitions vary from organization to organization, many current definitions include practice and assessment elements.

Learning objects may be sequenced and bundled to form larger *Learning Content Aggregations,* such as "Lessons" and "Courses." When these Aggregations are wrapped with additional functionality such as communication tools, peer-to-peer computing and other community-of-practice-specific support, and modular web services learning components built upon learning objects, this enables the design and creation of *Learning Environments.*

The strength of a content model such as the one shown in Figure 7.1 is that it forms the basis for organization-specific plans that extend the architecture for content. In some cases that may mean adding a layer to describe instructional and learning design features, while in others it might involve a whole new architecture for learning, or for performance support.

This content model also helps to visualize the relationship between granularity and reusability: The more granular the content, the more likely it is that content will be reused. The more content is contextualized in learning objects, components, and environments, the less likely it is that it will be reused without modification.

Other Content Strategy Considerations

Defining a content strategy demands that an enterprise determine what its content assets are, and then determine what additional value can be derived from leveraging those content assets in the service of its mission, purpose, and principles. Successful implementation of an enterprise content strategy then depends on identifying organizational e-learning and knowledge management needs. It also means responding to those needs with creative, flexible, innovative solutions for content creation, design, development, distribution, and management.

Here are a number of steps to consider as you navigate your way through the maze of content-asset enabled learning and knowledge management opportunities:

Conduct a Content Audit to evaluate your current content assets already captured by courses, performance support tools, print resources, assessments, support services, and access to subject-matter experts. This process of assessing

and evaluating content resources includes such diverse activities as identifying self-contained content modules within the existing course (to begin the process of defining the conceptual parameters of a content object) and creating a relational content map of curricula and programs to see where topics and themes overlap. When you conduct your Content Audit, don't forget to include organizational knowledge assets such as internal reports, business plans, presentations, reference manuals, style guides, product descriptions, policies and procedures, and more.

Determine which legacy content (for example, printed learning materials) should be converted to digital content. This may involve a multi-staged process that includes such activities as identifying self-contained learning content modules and creating content and concept maps for each curriculum and program. It will be important to evaluate the relative ease or difficulty of converting content to digital resources tagged for storage and retrieval in an object-base. Constraints (such as budget, timeline, production value, bandwidth, database requirements, or hosting requirements) must be articulated so that the impacts of such constraints on an implementation are understood.

Determine the storage requirements for an object-base for digitized content assets. What other options exist for ensuring greatest access to content assets for those who need them? The diversity of content formats and topics likely to be contained in a learning object-base may create the need to standardize a set of content guidelines.

Determine the network infrastructure, server, and database requirements for hosting and for efficiently distributing content in meaningful arrays (that is, courses, objects, competency models, performance support tools, and so on). The technical specifications for e-learning implementation will have to accommodate both the essential and the desirable feature sets. For example, if an e-learning site is primarily to be used as a content distribution system, it may not require the same level of learning management system or collaboration system functionality that would be needed in a more "full-service" e-learning provider model. Bandwidth requirements must be considered, as will the need for video or multimedia servers, collaboration services, file sharing, groupware, and so on.

Determine how object interoperability and reusability are likely to affect your e-learning strategy. This will determine the necessity for adhering to commonly

used metadata schemas for tagging content. It means understanding the implications of SCORM and of the Learning Object Metadata standard recently approved by the IEEE.

Consider staffing and resource requirements needed to implement and maintain your enterprise learning initiative. Generate a budget to get a sense of real costs likely to be associated with such an effort.

Develop a plan that ensures the greatest "reusability" of content by:

- Creating a content map for each course in your curriculum. This is an essential first step in determining the degree to which content is currently being used and "reused."

- Determining which courses will offer the greatest likelihood of reusability success. Be sure to factor in localization/translation requirements across all courses.

- Comparing the content map with the enterprise learning map to determine organizational priorities for creating learning objects.

Finally, don't forget to select the best tools for conceptualizing, creating, and maintaining e-learning content, and determine the best development and distribution environment for distributing and managing e-learning content.

Knowledge management best practices wisdom suggests that different kinds of content will call for different content management strategies. These strategies are dependent on the assignment of objective and subjective metadata that identify and describe each individual content asset. Factors that differentiate the various kinds of content and content management strategies include:

- Some content is stable, while other content is dynamic and subject to change.

- Some knowledge declares facts or concepts, while other knowledge is procedural or rule-based. Validity, reliability, and currency of information require overt management.

- Some content is about other information, or is related in particular ways to other content.

- Some content is descriptive, illustrative, or demonstrative. It presents problem sets, scenarios, directions, or applications.

Linking Your Content Strategy to e-Learning

For many organizations, the logical application for a content strategy is to serve as the foundation for enterprise-wide learning using an object-oriented, e-learning architecture. The probability of implementing a successful e-learning initiative greatly increases when an organization determines which of its enterprise learning needs will be effectively served by using e-learning strategies, methods, tactics, and tools, thus creating an over-arching learning and performance improvement environment.

When people across an enterprise talk about e-learning, the only thing that may be common among them is that the web is involved somehow, somewhere, sometimes. To some, e-learning may simply designate the involvement of the World Wide Web to support personalized professional development and performance improvement. Conversely, to others, it may represent the implementation of a tightly defined learning experience with explicitly stated performance outcomes, offered to a fixed number of people during a fixed period of time. Or, to yet others, it may represent some variation of online help, or of a content search and retrieval capability.

First and foremost, organizations will find it useful to identify the key success metrics that e-learning will be expected to achieve in that organization: More learners served? More tests passed? More employees retained over time? Fewer customer complaints? Faster turnaround on orders? It will then be important to prioritize which of those measures of success are most important.

Secondly, it is useful to consider the wide variety of learning, performance support, and professional development activities required to enable an enterprise e-learning strategy. An organization should consider the following key questions when assessing its e-learning readiness:

- Will the needs of individual learners be addressed through personalization of learning programs?

- Will learners "march" through a fairly specific curriculum, or will they move toward a problem-based learning strategy that builds problem-solving skills. Or will they be called on to do both of those and everything in between?

- Will content be available in formats smaller than complete courses?

- Will individual learners have to take responsibility for managing their own professional development?

- Will learning results be tied to the organization's measures of business success? If so, which ones are most likely to be linked?

- Is technology currently used to support distributed learning? Are sites currently networked?

- What kind of bandwidth capacity is available?

- What technology platform standards currently exist?

- Is there interest in decentralizing the training operations to give a greater sense of "just-in-time" performance support?

- What performance improvement problems must be resolved? How are these needs prioritized?

- What kinds of resources are accessible for getting the job done?

- How are the organization's content assets going to be leveraged within its enterprise e-learning strategy?

The Critical Role of Learning and Content Management

A critical component of any content strategy will involve the selection of a system to store, manage, maintain, and track the modifications made to content resources. Selecting a learning management infrastructure is one of the most strategic e-learning decisions that companies will make. Today's choices involve both learning management systems (LMS) and learning content management systems (LCMS). An organization must determine the kinds of things that must be managed in order to ensure the smooth delivery of learning content resources and support. By first determining what needs to be managed, it's much easier to find a system that responds to those needs.

Learning management systems (LMSs) are suites of tools that deliver the right course to the right students, at the right time, in the right format. LMSs help address an organization's need for:

- Online courseware available for individuals anytime, anywhere

- Capacity for assessing individual and organization learning and then relating improvements in these to business goals and performance

- Tools to manage organization knowledge and competency, and to close skill gaps throughout the organization by matching learning needs with online courses

In the past several years, LMS providers have added system functionality that addresses content management. Learning content management systems (LCMSs) are more directly concerned with storing content files, managing revisions and modifications, and ensuring that content is tagged for easy retrieval and reuse. Systems that are intended to manage learning content are less concerned with student-content interactions and more concerned with issues of content storage, modification, assembly, and retrieval. However, because content management in these systems is intended for learning applications, learning content management systems will often include feature sets found in conventional LMSs. A brief summary of the major differences between learning management and content management systems is shown in Table 7.1.

Table 7.1. Comparison of Learning and Content Management Systems

Learning Management Systems	Content Management Systems
Offers improved delivery and tracking of content	Offers improved creation and management of content
Used by learners and administrators	Used by content developers
Typically offers courses	Assembles learning objects
Key Features:Learner records database; Event schedules; Course catalogues and registration; Assessment services; Competence management; User-profile management; Integration with learning-content management systems	Key Features:Learning Object Repository, Meta-tagging for search capabilities; Collaborative authoring and editing; Content conversion and assembly; Personalized adaptive delivery; Integration with learning management systems

The Future of Learning Content

Even though significant advancements regarding the role and function of content as an organizational asset have been achieved, so many questions are as yet unanswered:

- Can content teach?

- Do standards for learning and content matter?

- Does content design differ from instructional design?

- Does learning design using content objects call for different skills for instructional design?

- What makes "learning" content different from "regular" content?

- What is it going to take to establish an object economy?

- What is the value proposition for learning content?

- Is the business case for learning content for learning, e-learning, and performance support sustainable, scalable, and transferable within an organization, an enterprise, an industry?

- What metrics best make the case for determining the value of e-learning content in an organization?

- Is there a significant increase in the effectiveness of learning that will be derived from new models for learning and content?

The next generation of personalized learning and performance support will depend on better understandings of the relationships among content, learning management, and knowledge management. Answers to these and other related questions will be required to shape the future of organizational responsive enterprise learning.

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Capturing Skill and Knowledge

8

Back to the Basics

REVISITING GREAT TRAINING ON BEHALF OF GREAT E-LEARNING

Allison Rossett

e-Learning must support a "big tent" view of knowledge, performance, and support—but training is still the deliverable. What makes great training? Here, one of the masters of instruction and design lays out the nine attributes of great training, along with examples and references. Whether you are new to e-learning or an old hand, this chapter is one you'll keep referring to on future projects.

I'D LIKE TO TALK about what I see as the heart of great training. Of course, it is perfectly reasonable to question why I want to focus on training. Some might argue that the focus should be on performance, not on training, whether that performance is replenishment, customer service, parent education, or equipment repair. Others might argue from another angle. They would say that training isn't the point; *learning* is, especially in an era so dependent on knowledge workers. And still others might urge us to move from e-learning to *knowledge management*. Their view is that learning and lessons

represent only a portion of the possibilities, as we deploy technology to create rich environments that provide just-in-time content and community.

I have no argument with any of that. I edited *The ASTD e-Learning Handbook: Best Practices, Strategies, and Case Studies for an Emerging Field,* which reflects those views with articles from sixty-two experts, including Marc Rosenberg, William Horton, Gloria Gery, and Sivasailam Thiagarajan. e-Learning must contribute to performance, honor learning and capacity, and reflect a "big tent" view, encompassing online knowledge bases, communities, modules, decision support, assessment, and tracking.

There are, however, many reasons to revisit the attributes associated with great training:

- *It's what clients want.* "We need a curriculum for the buyers" or "We want a series of classes, maybe even a certificate program, about customer service" or "Can we shift that product class to online training?"

- *It's what employees want.* While for many reasons most still prefer classroom training, there is no doubt that they want and expect development experiences. According to surveys, professional training programs are the most effective way to retain employees, about equal to the effectiveness of bonuses. In fact, professional training programs and bonuses have more impact on retention than promotions do, according to a survey done in 2003 for *The New York Times Job Market.*

- *Development is what people need*, especially in a world chock full of new diseases, technologies, products, partnerships, and customers.

- *The use of technology shifts control to individuals.* They make choices to be involved with online learning, communities, and content— or to pass by those resources. Employees will make those affirmative choices when online resources demonstrate immediate value and opportunity.

- *Many organizations are large and global.* They want training to be consistent, standard, distributed, and top-notch. Ask any executive. That's what they want. Not objects, not learner choices, not even authenticity. They want training.

- In the rush of excitement about Flash^TM, knowledge management, and learning content management systems, *it's easy to forget what pays the bills*. Right or wrong, at the beginning of this century, training is what customers agree to pay for; thus, training remains what we deliver. Can we do more? Yes. Should we do more? Yes again. But let's also do a bang-up job on the basics—on training.

Many who are building e-learning are relatively new to training and development, attracted perhaps by the technology first and foremost. Here's a primer for them, as well as a reminder for those somewhat longer in the tooth.

What Is Great Training?

When Kendra Sheldon and I wrote *Beyond the Podium: Delivering Training and Performance to a Digital World*, we included a chapter titled, "What Is Great Training?" I assumed the chapter would stimulate debate because there is, of course, no one way to answer that question about training. Let the debate continue now, here, as I bring some thoughts about the attributes of great training from *Beyond the Podium* to The eLearning Guild.

Great Training Is Purposeful

Great training is about something, but not about everything. The online student who comes to a site and wonders why she's there or what this site is about will depart in a New York minute. The purpose or purposes must be both evident and resonant to the student.

Great training should say something or allow the user to discover something about a topic, whatever the topic, something that participants want to ponder and use. It is driven by purpose. In *Beyond the Podium* we identified several considerations regarding purposeful training:

- Are the purposes of the training clear, obvious?

- Are the purposes of obvious value to both the individual and the organization?

- Do we communicate the purposes to the individuals and their managers?

- Do we define a role for the manager, and make it easy and expected for him or her to do something relevant?

- If we are using a more constructivist approach, one that encourages participants to find meaning individually or in groups, is there meaning there for them to find?

- Do we use purposes in all possible ways: to rivet participants' attention; to set objectives; to define strategies and assessments; and to enable self-assessment?

- Do we write the purposes in a way that will interest their intended audience?

- Do our purposes include the development of independent learning and reference skills and resources?

Great Training Is Active

e-Learners, all learners, in fact, should enjoy programs that encourage them to be active. Lisa Schafer and I highlighted five kinds of activities in the June 2003 issue of *Training and Development*: seek, try, decide, compare, and commune.

Seek. Inquiry-oriented activities, such as WebQuests, engage learners by encouraging them to seek answers to questions by conducting research on the Internet. You can imagine how that would make sense for training about business intelligence, for example. Who is the customer? How can you learn about them online? What are the implications of what you've found? Who are our competitors? What can you learn online? What more do you need to find out? (See http://webquest.org/index.php for the WebQuest model.)

Try. The essence of action is nudging the learner to do something. What better activity than practice of the task at hand? Technology training uses the **try** action. ElementK, for example, required e-Learners to use the feather option in a Photoshop course; Cardean.edu uses realistic scenarios to teach business skills. They created a case and then asked online participants to try their hand at authentic business tasks associated with the situation.

Want to learn to sail? It makes sense to give it a try, even if your efforts get you turned around and headed back to the starting line, as mine did.

Figure 8.1 is an active online sailing program that you can try at www.mac-gregor.net/sailing/.

Decide. Should I recommend investing in that bond or this equity for this investor? Should I give this employee another chance or set him loose? What would constitute ethical action in this circumstance? Great training, online or otherwise, makes people engage, think, and decide.

DigitalThink offered a sample course with just such a situation. A man is interviewing a woman for a job. He says to the woman, who seems to be Japanese or Korean in heritage, "So Noriko, your last name is 'Smith.' How did you get such an American sounding name?" Did the interviewer handle this well? If he wants to know whether she has had other names so he can do a complete reference check, how might he have handled it? How should his supervisor advise him?

Compare. A critical element in successful learning is the ability to figure out what you know and what you don't know. How did I do on this? What

Figure 8.1. Learning Sailing by Doing It

was on target? What was not? How would peers handle this? How would an expert? On the First Things Fast website, training professionals can compose responses to objections by people who aren't as keen on performance analysis as they are. Then they may compare their approach with a model effort. (See www.josseybass.com/legacy/rossett/rossett/respond/index.htm.) Figure 8.2 presents a situation, in this case confrontation with a doubting subject-matter expert. Figure 8.3 allows the online student to compare his or her response to the author's.

Commune. We know that memorable instructor-led classes are chock full of conversation, examples, debates, and group effort. That should be true for online learning too.

In their contribution to the *Handbook of Research for Educational Communications Technology,* Thomas Duffy and Donald Cunningham reminded us of distinctions between cognitive constructivism and social constructivism.

Figure 8.2. A Resistant Subject-Matter Expert Isn't Keen on Talking to a Non-Expert

Figure 8.3. The Author Tackles the Objection and Explains Why She Handled It That Way

Cognitive constructivists influence much recent training, typically by creating opportunities for learners to: examine a realistic situation; seek and use relevant tools and resources; construct approaches based on research and analysis; and then assess results and efforts through comparisons to experts and peers, and reference to rubrics. (Rubrics are explained at http:// edweb. sdsu.edu/triton/july/rubrics/Rubric_Template.html.)

Social constructivists, on the other hand, incline us toward the convivial. They are keen on affiliation, conversation, teaming, mentoring, lunching, and collaboration. Great online training, in their view, would include e-mentoring, asynchronous discussion, virtual classrooms, electronic brownbag lunches, threaded discussions, listservs, and instant messaging.

I invited my introductory educational technology students online to prepare for a final exam. I delivered the course in a regular classroom, with no online students, so the online strategy was intended to enhance our practice

and generate a useful archive for use later as the date of the test came closer. This was an extra, voluntary, session, scheduled for a time I thought might be convenient.

Students and faculty used the Virtual Classroom function of Blackboard to share screens with practice test questions. Then, synchronously, through an online discussion, we tackled each item. The interaction was lively, based on content that riveted their attention, and energized by a semester's worth of relationships started in class and carried forward online. Approximately one-third of the students came online for the test preparation, which I considered to be a successful level of participation; more accessed the archive later.

Great Training Touches Hearts as Well as Minds

As we emphasized in *Beyond the Podium*, there is more to great training than cognitive outcomes—I've even learned to meditate online (www.do-not-zzz.com/).

Remember the math learned in high school and college and later avoided? Consider the time management class that made not a dent in any habits. After the online asynchronous module about customer service, will the representative take time to explain why and how, and to seek concerns as customers examine their bills?

What good is training, in a room or online, if the impact is shrugged away afterward? Here are some strategies known to influence attitudes toward the topic at hand:

- Early on, enable learners to experience success and see the usefulness of the experience.

- Reveal the sources—the people whose ideas or experiences influenced the program; detail why they are credible and how they resemble the participants.

- Use two-sided arguments to make points. In most cases, approaches that admit multiple perspectives on the topic are more convincing than a one-sided litany.

- Inoculate learners regarding the reactions and barriers to come, by detailing ways to handle impediments.

- Use role modeling and role playing, and include lively conversations.

- Use "war stories" to engage the learners in what happened to people.

- Practice on vivid problems and cases; ask for active participation, such as seeking, finding, deciding, comparing, and teaming.

- Encourage reflection about the usefulness and meaning of what their learning.

- Provide continuous and repeated exposure to the message and attitude, on the lips of supervisors and in takeaway materials and online programs and tools.

- Use extrinsic rewards for boring and repetitive tasks.

Great Training Has Shape

Instructional systems design (ISD) was born during World War II to increase the consistency and effectiveness of military training. Devoted to taking advantage of what educational psychologists knew about learning, the effort had obvious benefits for both developers and students, because each was able to move forward with more certainty and speed.

Many have recently raised questions about the value of instructional design today (refer to the References for the articles by Gordon and Zemke and by Zemke and Rossett; as well as my own article in *ISD Revisited*). They worry that instructional design adds time to the development process (see Thiagi's article at www.thiagi.com/article-rid.html), is too general or too specific, focuses on the wrong things, doesn't necessarily yield an improved product, and isn't particularly useful for new media development. Even in the midst of legitimate concerns, Marc Rosenberg responded, "I like the old definition of democracy. It's the worst form of government—except for all the other kinds. ISD is the best we have, if we use it correctly." Ruth Clark would agree with Marc, I think. She highlighted four architectures that offer shape to training: receptive, behavioral, guided discovery, and exploratory. A problem, of course, is when designers see one or the other of these as the "default" approach and apply it to everything. I'm also concerned about managers who think of one or the other of these as valid "training," to the

exclusion of the other three. Actually, each one has its particular strengths and appropriate uses.

Receptive. This is a traditional and familiar mode for training. We make it; they take it, or refer to it. If you are keen on this architecture, perhaps you have used Saba, Elluminate, or Microsoft Office Live Meeting to create a source for placing content online. Or you have been streaming an audio example or producing an online performance support tool—perhaps to help individuals contemplate their retirement benefits. (See www.ssa.gov/OACT/ ANYPIA/compute.html for an example.)

Behavioral. This expository architecture presents knowledge in small and hierarchical morsels through typically short lessons that demand action and provide feedback. Based on student performance, the program controls progress and direction. Robert Mager's famous little book on preparing behavioral objectives is a familiar example. Ruth Clark noted that early computer-based training programs conformed to this model, with small chunks of content and branching based on learner choices.

Guided discovery. This architecture is predicated on the belief that learners will seek, find, and make sense of learning assets, with proper guidance, background, and rich options. Clark's view is that the instructor or program should provide rich resources and experiences that promote individual construction of knowledge. While behavioral approaches teach to a specific set of objectives, guided discovery is predicated more on the individual figuring things out for herself. Scenarios and cases dominate. Tasks are set and communicated. Efforts are compared to rubrics and examples of effective practice.

Exploratory. e-Learning portals provide rich opportunities for the exploratory architecture. Interested in learning more about poodles? See www.akc.org/breeds/recbreeds/poodle.cfm. Were you worried about SARS? You could read up on it at www.cdc.gov/ncidod/sars/. Eager for your children to become young money managers? Steer them to www.practicalmoneyskills .com/. Want to provide resources to support the global sales staff? A well-stocked website can provide lessons, coaching, reusable content, and communities targeted to several product lines and geographies.

The hitch, of course, is increasing dependence on a curious, motivated, and independent employee. He has to know what he wants and needs, and then has to marshal the will and skill to go get it, often repeatedly, over time.

Figure 8.4. Exploratory Website on Intersection Between Training and KM

Figure 8.4 provides an example of an exploratory resource, this one devoted to the possibilities represented by the juncture between training and knowledge management. (*Editor's Note*: Although the project that created this site has closed, you can still see some of the resource online at http://defcon.sdsu.edu/1/objects/km/voicemail/index.htm. The "flashing red light" no longer works, so simply click on "Next.") Developed by the San Diego Sandbox, the site provides opportunities for professionals to get smart about knowledge management (KM) and think about it in light of their goals and tasks.

Great Training Adapts to the Individual

Maggie Martinez described how important it is to personalize learning, noting the "dominant power of emotions and intentions on learning" and highlighting the value of tailoring online programs to unique human

realities. In Chapter 2 of this book, Martinez presented four dominant learning types:

- *Transforming* learners who innovate, explore, and independently and purposely drive their own future growth and development;

- *Performing* learners who focus on getting the job done today as they systematically and capably accomplish tasks;

- *Conforming* learners who prefer fewer risks and structured opportunities to accomplish simple steps, assigned tasks, and well-defined goals; and

- *Resistant* learners who have personal goals that strongly conflict with learning goals set by others.

The four types derive from her research, including development of an assessment tool to get a handle on your learners. While I hesitate to pigeon hole, Martinez' categories strike me as useful for the design of online programs that teach. Here's a quick review of what Martinez said in her chapter about how these types guide the presentation of instruction for mass customized environments:

- *Transforming* learners: Make it quick and provide the big picture first. Minimize details, making them available as needed. Provide opportunities to explore and decide when, how, and about what this learner will want to use online. Clark's exploratory architecture is on point here.

- *Performing* learners: Make it quick and provide details and hands-on procedures that allow for moving forward on strategies and tasks. Provide semi-structured coaching, and active opportunities to advance progress. Guided discovery programs would be well suited.

- *Conforming* learners: Make it step-by-step with explicit instruction, constructive feedback, and repetitive tasks. Minimize risk taking and problem solving. Provide extensive guidance. Behavioral and receptive programs have been used with this population. Some guided discovery programs, with an emphasis on clarification and guidance, might be effective.

- *Resistant* learners: Attempt to find something that taps into their beliefs and values and matches their reasons for paying attention. What moves them? What concerns them? How does this content relate to their priorities and desired benefits?

Great Training Is Measured

Measurement, practice, testing, and feedback are very much a part of great training. My niece, Ellie, provided a vivid example. Ellie was learning to drive. She called to proclaim victory on her driving test. She crowed, "Once I'd gotten the parallel parking done on the first try, from there on I was fine. I knew I could do it." Ellie was much more excited about success on the road test than on the written exam. Why? It was the last step. She would now get that treasured license. But there was another reason too. The written test interested her about as much as most of her high school coursework. She perceived those assessments as distant and unreal, far removed from what mattered to her. Taking the car out for a drive—well, that looked and tasted just like what she wanted in her life.

The best assessments are much like the real world for which the training is preparing students. That was true of Ellie's driving test and of all the little practices that contributed to her eventual success.

Recently I reviewed an online program about customer service. It had a steady stream of pages about letting customers vent and the importance of open and closed questions. What it lacked was any meaningful opportunity to try out the material and to obtain feedback on efforts. That feedback could be computer-generated or it could be based on comparing your efforts to those of others, a strategy used earlier, in Figure 8.3. How would an employee sharpen these skills? How would this individual know whether she had "gotten" it? How would the manager know whether his employees were able to perform?

Great Training Never Forgets People

Great training must be about people and their goals and challenges. That's true in the classroom, of course, and remains true as we move programs online.

I admire online learning resources that tell stories, develop characters, and include authentic contexts, where, for example, a doctor is coping with a family in crisis. The wife is seventy-five years old and distraught. The husband is seventy-five too, in a coma, and, in the opinion of the doctor, has no hope of recovery. Months before, the husband made clear that he did not wish to have extraordinary measures used to prolong his life. He signed a document to that effect. Now the wife, not surprisingly, wants the doctor to save her husband. She pleads for the physician to find a miracle. This program, I'm sure, would rivet doctors. They recognize the situation. They've met this woman.

You can only build such a powerful e-learning program by attending to the needs of the people expected to learn from it—those needs must be front and center.

But that doesn't always happen. I've seen programs hijacked by subject-matter experts. Others dazzle with production value, but lose by making pandas dance gratuitously.

What to do? I'm intrigued with the use of personas, because they assure that attention is riveted to the people for whom the programs are intended. Personas, as described by Maish Nichani (see his article at www.elearning post.com/features/archives/001585.asp) and also by Elan Freydenson (www .boxesandarrows.com/archives/002343.php), are vivid descriptions of user archetypes. (*Editor's Note:* Freydenson's article is now only available through the Internet Archive. Enter the URL given here in the search box at http://archive.org. The later versions of the article contain additional very useful information.)

Based on analysis of the population for whom the programs are intended, personas are used to engage and educate the customer and to bring team members to shared certainty about people and priorities. Written in a vivid way, with names, ages, jobs, opinions, and tasks, personas provide a way to consider and agree on the audience. Is the website primarily for sales leaders, sales people, or customers? How will the assets serve the primary audience? The secondary? The tertiary?

We must not forgo the value of what happens in the classroom through snorts, nods, winks, raised eyebrows, and a pat on the back. How do we shift such moments and meaning online? Charlotte Gunawardena and Frank

Zittle found that "social presence," how much a person is perceived as real in an online conversation, is a predictor of satisfaction with the computer-mediated communications. Katrina Meyer has recently suggested that successful online teaching will rely upon the vivid writing that establishes relationships and guides success. (See www.thejournal.com/magazine/vault/A4401c.cfm for her article.)

Great Training Is More Than a Moment in Time or Space

Marc Rosenberg made the point in his book, *e-Learning: Strategies for Delivering Knowledge in the Digital Age*. We also emphasized it in *Beyond the Podium*. Training must be more than time served, space occupied.

IBM does this with Basic Blue. Managers develop over time and in many locations as they go about their work. To provide a cost-effective, engaging development experience for more than 30,000 managers worldwide, Basic Blue creates an online program for novice managers. Basic Blue combines self-assessments with self-paced e-learning modules, online simulations of business scenarios, face-to-face workshops, synchronous and asynchronous virtual collaboration tools including email, phone calls, instant messaging, online whiteboards, and experienced managers as e-Mentors. The company reports that by the end of 2000, more than five thousand managers had completed the training and received it enthusiastically, saving the company $16 million for that year alone. According to Robert MacGregor of IBM management development worldwide, "From a bottom-line perspective, Basic Blue lets us cover significantly more information at a fraction of the cost." In the old days, IBM was famous for good classes that lasted days and weeks. Now Basic Blue provides a pervasive development experience that stretches over the ups and downs experienced by the novice manager.

Eyes on the Prize

Too often, I've heard e-learning professionals lament culture and complain that the implementation was funky.

"It's the sponsors. They aren't supporting the program." "It's the supervisors. They aren't supporting the program." "It's the platform. It doesn't support our videos." "It's their organization. They aren't a learning organization."

There is no question but that the impact of great training depends on great systems. Still, there is no excuse for so much training that disappoints. It's something we can do something about. Shouldn't we?

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Dr. Allison Rossett, long-time professor of educational technology at San Diego State University, works most often on workplace learning and technology-based learning and support. Allison received ASTD's prestigious award for her lifelong contributions to workplace learning and performance. She is also a member of the *Training* magazine HRD Hall of Fame, the CLO Advisory Board, and recipient of the International Society for Performance Improvement's highest honor, Member-for-Life.

Allison's latest book is *Job Aids and Performance Support: Moving from Knowledge in the Classroom to Knowledge Everywhere*. Her book and website *Beyond the Podium: Delivering Training and Performance to a Digital World* won the ISPI Instructional Communications award for 2001. Rossett also authored the award-winning book and website: *First Things Fast: A Handbook for Performance Analysis*, www.jbp.com/rossett.html

Evolution of an e-Learning Developers Guide

DOCUMENTING DECISIONS AND INTENTIONS

Mike Dickinson

One tool that can make an e-learning director or manager's life much simpler is a set of standards that guides the designers, developers, and SMEs to create consistent product. While it is easy to find "style guides" for Web page development, it seems that there are few examples of similar documents for e-learning creation. This chapter's author has had considerable success and luck with the guide he and his team created, and he shares the basics with you to help you design your own e-Learning Developers Guide!

OUR E-LEARNING DEVELOPMENT "SHOP" started operating a couple of years ago. We're small: two full-time course developers and one part-time SME/developer. I had prior e-learning development training and experience, but the other two had none. We develop courses for internal use, that is, for our organization's 1,200 employees. We license some third-party courses, but for proprietary systems and processes, especially when it is important to convey our corporate culture, we develop courses internally.

This includes compliance-type courses, in which we want to portray situations in our vernacular and environment. I have found over the years, and recent research corroborates this impression, that adult learners just do not see the relevance very readily if they can't picture themselves in the setting.

Soon after we were underway, I felt we needed an e-learning developers guide to preserve some of the decisions we were making. The guide would also serve as a job aid for our inexperienced team members, and perhaps would be a central repository for solutions to authoring challenges as we encountered them. (I'll refer to it as simply the "guide" from here on.)

This story is as much about the development of a new e-learning shop as it is about the guide itself, since the guide merely documents the decisions or intentions we adopted. We treat it as just that: a guide. We want to experiment and learn, so we don't treat individual elements as rigid standards. Where do you start with a brand new shop, new authoring system, and inexperienced team? I've been down this road twice before, in pre-HTML days. Now with all the latitude offered by hypertext and video, not to mention numerous operating systems and display options, it can be very challenging to develop courseware that is instructionally sound and runs reliably.

The guide continues to evolve as our operation matures. I hope this chapter and the one that follows will help others select guidelines and make decisions that are germane to their environments.

Our guide is like a lagging indicator on Wall Street: We try something such as a screen layout or a particular way to let the user access reference material, and if we decide it's a "keeper," we document it. One caveat as you read this chapter: we don't claim these guidelines are necessarily correct for your situation, but at least they provide more of a starting point than a blank sheet of paper!

First Steps

The HIPAA training requirement hit about the same time we were planning our entry into online learning. (*Editor's note:* HIPAA is the Health Insurance Portability and Accountability Act, a U.S. law governing health industry privacy and security regulatory issues and compliance.) We were fortunate

enough to find a snappy and concise off-the-shelf course that was both inexpensive to use and easily customizable. This, combined with our CEO's gracious form of positive reinforcement (company currency at the company store), led to a very positive user satisfaction rating from employees.

Next, we faced a requirement to deliver several compliance-type courses to our entire employee population. We chose an authoring system, did some panic learning, and . . . realized we had many questions. After all, there's nothing more frightening to a writer or course developer than a blank screen. Where do you start? We had questions such as:

- Where do you put the course title? The screen title?

- Where do you put the navigation buttons? Which navigation buttons do you need?

- How do you convey the size and mental model of the course "package" to the learner? Unlike a book, learners can't pick it up and thumb through it.

It got harder . . .

- What is a reasonable course length in terms of student contact time and file size?

- How does a development team standardize some of these things while allowing room for innovation and experimentation?

- How do we make the authoring system do the things you need it to?

. . . and harder still:

- How do we bring the project in on time?

- How do we meet the business owner's expectations? What are his or her expectations?

As with other start-ups I've been involved in, we began with rather simple course formats: present information using text and simple graphics, and test knowledge with true/false and multiple-choice questions. But, unlike previous efforts where the development teams never fully exploited the power of the authoring system, nor even moved very far up Bloom's taxonomy,

I wanted this team to produce really effective training. So I adapted the guide to serve three purposes:

1. Layout and format

2. Instructional design and strategy

3. Project management methodology

This chapter will primarily address the first of those three purposes; the next chapter will address the other two.

One of our first goals was to settle on some initial screen and course layout formats. Our team wanted room to experiment, since we're still relatively new at this, so we agreed to follow a building block approach by which we documented certain guidelines as we settled on them. We follow those guidelines unless a project seems to require a different approach.

One of the first things we wrestled with was overall course structure. We settled on the following guidelines. (Again, remember that our guide is a work in progress.)

Overall Course Structure

We have a standard course layout. This layout uses the following screen structure with each course and, if applicable, with each module:

- Title screen

- Introduction or welcome screen. We begin each course with something compelling (for example, a startling statistic, a powerful quote, or a compelling story) that will create a tension for learning. This screen provides the learner with the "What's in it for me?"

- Overview screen. This gives the learner a "picture" of the course, including the estimated completion time, the main characteristics of the way the module works, and any unique navigation or resource features. We repeat this screen for any individual modules that differ from the overall course structure if the changes are not self-evident.

- Specific learning objectives or outcomes. These are stated in behavioral terms: What will the learner *know* or *be able to do* at the end of this module?

- Content/presentation

  - Use second person, active sentences (you . . . do . . . this)

  - Use a friendly, conversational tone

  - Keep the learner oriented with introductory statements, clear transitions, and summary statements as needed

  - Limit each page to one concept, procedure, or item of instruction, and try to do it in the space of one screen (that is, without scrolling)

  - Use consistent navigation features throughout

- Course wrap-up. Summarize the content and tie it back to the terminal learning objective.

Notice that the above screen sequence is totally independent of individual screen design, media, or type of interactivity. It serves as our "author contract" with our employees so they know what to expect when commencing a course. We expect to vary it some over time, for variety, but for now, it serves as a standard course structure.

Navigation

An obvious concern when designing courses is navigation. The learner has to stay oriented and know what is available in the lesson, how to get to it, what the preferred path through the lesson is, and so on. Here are some excerpts from our guidelines pertaining to navigation:

- What should the first screens say to introduce the lesson?

- Should screen titles state course, lesson, module . . . what?

- Where should the navigation buttons go?

- How should we situate a multiple-choice question stem, the choices, and the feedback on the screen?

- What size font should we use?

- How do we simulate a software interaction?

- What shall we use for a background?

- How should we highlight a word on the screen?

  - With color, bold font, italics, underline?

Learners should spend time mastering the course objectives, not the course navigation. Navigation must be learner-friendly and must comply with the following guidelines:

- Provide learners with the ability to control all navigational activities.

- Provide clear instructions or cues for all required learner activities.

- Use the term "click" for mouse responses and "press" for specific key responses.

- Navigational elements should be formatted as buttons and should include the following functions:

  - Forward (or Next)

  - Back (or Previous)

  - First (or something like "Go to Start")

  - Exit

  - Menu

  - Glossary (when applicable)

  - Tools (when applicable)

  - Help (when applicable)

Note: Other navigational buttons may be added as appropriate.

Generally, we place navigational buttons across the bottom of the screen or at the right edge. The only exception is simulations in which we may be simulating the actual software. In any case, we are consistent with placement of the navigation buttons throughout a course. Specifically:

- The navigational buttons should be consistent within each course; all buttons and icons should have a consistent and unique appearance.

- Visual cues such as mouse cursor changes and rollover highlights used on all buttons should be consistent.

- All buttons should be labeled with text, or have rollover text that clearly and succinctly describes what the learner needs to do.

- Buttons should "gray out" or disappear when they are inactive.

- All non-button graphics should have design properties distinct from that of buttons.

- Navigation buttons should be displayed in *exactly* the same position every time they appear in a course or module (down to the precise pixel size and placement).

Finally, we are consistent about access to ancillary content, bookmarks, and menus.

- Learners should have one-click access to Help, Glossary, Resources, Exit.

- Learners should be able to bookmark their progress in a session.

- There should be three or fewer levels of menus (that is, module, lesson, and topic).

- Menu items should be in sequential or logical order.

Interactivity

The next thing we addressed was one of the most important elements of online learning: interactivity. Sidebar 9.1 summarizes our definitions of the various levels of interactivity.

SIDE BAR 9.1: LEVELS OF INTERACTIVITY

We agree with the sponsor on the level of interactivity in the courseware and document the agreement in the work plan. We further describe the level in the analysis/design documents. Here is what we mean by levels of interactivity:

- **Level I**—Passive. The learner acts solely as a receiver of information. The learner progresses linearly through the course reading text from the screen, viewing video, or listening to audio. **This level is highly discouraged.**

- **Level II**—Limited Interaction. The learner makes simple responses to instructional cues. Examples include multiple-choice or true/false

questions. If this level is used, as a rule of thumb the learner should have an interaction every four to six screens.

- **Level III**—Moderate Participation. The learner makes a variety of responses using varied techniques in response to instructional cues. Examples include assembling a model or diagram from available parts, drag-and-drop, or answering multiple-choice questions about realistic scenarios. This is our preferred level of interactivity because it optimizes the tradeoff between active learning and time to develop.

- **Level IV**—Real-Time Participation. The learner is directly involved in a lifelike set of complex cues and responses. Examples include simulation of software interactions or role play of interpersonal situations.

Note: It may be appropriate to design modules within the same course for different levels of interactivity (for example, one module may focus on foundational principles and another module may use complex, branched case studies for application of those principles; the foundational module might be developed at Level I, whereas the application module might be developed at Level IV).

Interactivity at a Macro Level

For modules with a test at the end, these guidelines apply:

- Require some kind of learner interaction, non-scored, but with feedback, about every four screens.

- Learners should have two chances to answer each question correctly, and then move on after receiving remedial feedback. (The ToolBook "how to" is our guide for specific coding instructions.)

- Put a transition page before end-of-course score tests that gives the learner the option of reviewing any or all of the material before attempting the test.

- Use a Module Test Summary page to display test results.

- For modules with embedded questions that the learner must answer correctly to proceed, we include an appropriate number of questions at the end of each main point or objective.

The above guidelines are independent of the kind of interaction that is used. Initially we used true/false and multiple-choice questions, but tried to make the experience elegant by not merely repeating rote content, but by using scenario-based design that acknowledged some of the real-world "gray area." Even without fancy graphics or video, learners have given most of our courses a satisfaction rating of 94 percent "agree" or "strongly agree" that the learning was relevant, enjoyable, and a good choice for online delivery.

Next, we drilled down to describe more specific aspects of the interaction.

Interactivity at a Micro Level

We provide opportunities for un-scored practice after teaching each concept or skill. We also ensure that practice opportunities are directly linked to learning outcomes (that is, we pay attention to the verbs and conditions in terminal and enabling objectives).

Here is how we address question construction in our guide.

These guidelines apply to multiple-choice questions:

- Use three to five answer choices.

- Avoid giving cues to the correct answer based on structure of the question itself, for example:

- The choice with conditions is often the correct answer.

- The longest choice is often the correct answer.

- Use radio buttons when the learner can make only one selection.

- Use check boxes when the learner can make multiple selections.

- For matching items, use a list with one or two more choices than there are answer spaces.

When we scoured the Internet for sample courses upon which to base our own approach, we found a plethora of ways to deliver feedback. Not all of them were instructionally sound, or even very respectful of the learner, in my opinion. So I opted for a pattern that was built into my first authoring system, TICCIT, which was developed by the Mitre Corporation in the 1970s. (Okay, so I'm dating myself.) Our guide describes it this way:

- **Important:** Here is the preferred sequence and content of feedback for embedded practice items (that is, not part of the learner's final course score). The idea is to give the learners ample practice, along with instructional feedback if they don't understand.

- For correct answer feedback:
  - Use "Correct" or a conversational equivalent when the learner answers correctly, followed by a brief paraphrase of the correct answer and explanation why it's correct. The idea is to reinforce the correct choice and the rationale. Example: "Right on! The whippersnapple goes on first, then the hummersnoogle."
  - If the correct choice involved a subtle or crucial point, point out the factors that make this the correct choice.

- For incorrect answer feedback:
  - First attempt: Feedback on incorrect answers should briefly explain why that choice is incorrect, if feasible. The idea is to instruct gently, even on wrong answer choices without giving away the correct answer. Example: "No, something else goes on first before the hummersnoogle. Please try again."
  - Second attempt: Same as above. Then usually finish with "Let's go on," and then explain what the correct answer is and why.

Feedback is an area of e-learning in which art meets science. Good feedback is instructionally sound, it conveys an empathetic tone to the learner, it reinforces correct knowledge or behavior without making the incorrect way more memorable, and, when really well designed, it can be an efficient way to deliver content.

Learner Feedback/Remediation

We recommend these additional guidelines to feedback for embedded practice exercises:

- The tone of feedback should be supportive and instructive. Check it carefully to avoid any hint of condescension. If you use humor in feedback, use it prudently, and test it with members of the target audience if possible.

- Consider providing the learner with a "hint" if he or she answers incorrectly on the first try.

- Encourage the learner to try again. (Again, we use the ToolBook "how to" for programming instructions.)

- Avoid using pointed phrases such as "You are incorrect," "That's wrong," or "Of course not." Even if you think a wrong answer is obvious, be careful not to degrade a learner for choosing it. Here are some gentler ways to say it:

  - Incorrect

  - No, that's not it

  - Nope

  - We disagree

- We encourage visual cues (such as a green "X" for correct and a red "X" for incorrect.

Now let's move from instructional design to the manifestation of courses on screen.

Media Guidelines

This section defines the standard "look and feel" for computer- and web-based courseware. These guidelines maintain style consistency within the following areas:

- Screen design
- Text

- Graphics

- Animation

- Audio

- Video

Note: Make decisions involving media—especially the use of graphics, video, and sound—for instructional design reasons and not just to be flashy (no pun intended). We will strive to learn what it takes instructionally, and what does not work, based on learner evaluations and the literature. This is not to say we will disregard uses of media that grab and hold the learner's attention—this is a necessary element of effective instruction.

Screen Design

We use the following guidelines for general page design:

- Design for a screen resolution of 800 X 600 pixels. This will prevent any user in the TSS (The Scooter Store) network from having to scroll to see a full screen display.

- Establish a specific location for the presentation of instructions and prompts.

- Provide recurring information in consistent locations.

- Provide generous white space to separate blocks of text.

- Avoid scrolling, to the extent feasible. (*Note:* Research seems mixed on whether users and learners prefer to scroll down a screen in order to save clicks, or if they would rather have the display "chunked" into only what one screen will display without scrolling. We're taking the non-scroll approach for now, subject to change as we learn more about our audience's preferences.)

Text

Use the following guidelines for text layout:

- Present instructional information in a top down, left to right format.

- Limit the amount of text on each page; use a PDF format, or link to an external document to display long text segments.
- Use short lines of forty to sixty characters (maximum of sixty characters) per line.
- Design text layout in short segments or phrases.
- Use bullets, numbered lists, tables, and charts to break up lengthy sentences.
- If bulleted text wraps to a second line, left-align both lines on the text (not the bullet). In ToolBook this is best done using the Bullet Text Level objects in the Action Objects catalog.
- Do not indent paragraphs.
- Left justify text. Do not right justify.

Use the following guidelines for text appearance:

- Use consistent color for text and graphics throughout a course and its modules.
- Generally use Arial or Verdana font. (Although I personally like Comic Sans.)
- Use 14-point for the course title. (A given point-size font is not the same size in our authoring language as it is in, say, a Word document.)
- Use 10-point bold for subheadings (page titles).
- Use between 10- and 14-point font for instructional text.
- Use Verdana 8-point for instructions within the instructional area of the screen.
- Use Verdana 8-point for learner prompt text at bottom of screen.
- Break up blocks of text to make it easier for the learner to scan the content.
- Underline hyperlinks only; glossary words should be hyperlinks.
- Use **bold** font to emphasize a word or phrase.
- AVOID USING ALL CAPITAL LETTERS or underlining to emphasize words or phrases (reserve underlining for hyperlinks).

- Use standard web conventions for hyperlinks (not yet selected, currently being selected, already been accessed).

- Do not use blinking text or repetitive animation.

Graphics

Use the following standards for illustrations and photographs:

- Use the standard color palette prescribed by IT.

- Use colors that accommodate color-blind learners.

- Aside from portraying objects or scenes realistically, *use color judiciously* for two purposes:

  - To give the course a certain overall "look and feel"

  - To highlight or draw attention

- Establish and maintain a convention for the use of color(s) to denote meaning.

- Maintain a constant perspective in a series of visuals, that is, if showing an overall view of an object prior to zooming in on a particular component, shoot both shots from the same angle.

- Avoid graphics that are trendy, or that may become outdated in a short time.

- All text within the graphic must be readable. If you need to scale down the graphic, then there should be a "click to enlarge" feature.

- Be consistent with all graphics (with the use of borders, effects, and quality).

Animation

We do not use animation in our courses just because we're not there yet. However, when we do, here are some initial guidelines we intend to follow.

- Allow the user to control the start of the animation.

- Avoid timed effects. (If one or more events are to launch on a page, the learner should trigger the event. Do not time events to launch.)

- Do not use blinking graphics or text.

- Use special effects only when required for emphasis or transition.

- Do not use any special effects that detract from learning.

- Use animation when you need motion to help convey concepts that would otherwise be difficult to describe in words alone.

Audio

We use these guidelines:

- MP3 file format is preferred (optimizes file size and audio quality).

- Use audio judiciously (for example, to demonstrate interpersonal skills, to demonstrate sounds heard on the job, to engage the learner—such as providing a talking coach).

- Aside from verbatim text intended to correspond with audio for accessibility reasons, text that supplements audio narrative should normally appear as bulleted highlights. Bulleted items may include slight paraphrasing as long as key words are included to help the learner stay oriented.

- Ensure that audio volume levels are consistent throughout the course.

- Provide an audio "Replay" button as a minimum, with a full control panel preferred.

- Use only one voice talent throughout the course. Exception: If needed for role playing, multiple voice talents may be used, but roles must be consistent.

Video

These are our video selection guidelines for courseware:

- Use video to reinforce, clarify, or emphasize a specific behavior or performance objective that you cannot effectively teach using graphics, stills, photographs, or animation. Also use video to add personal interest, for example, to put emotion into soft-skill or compliance scenarios.

- Do not use continuous video clips (clips more than fifteen to twenty seconds in length) because of file size.

- Give the learner some control by offering at least a "Replay" button; consider providing a full control panel.

- Because buffering problems tend to hinder streaming media performance, minimize traditional techniques such as zooming, panning, transitional wipes, dissolves, and fast motion subjects.

Next Chapter

In the next chapter, I'll take more of a "big picture" view by showing how our guide addressed our instructional design and project management methodologies. As a bonus, I'll describe the instructional design behind the development of the style guide itself—after all, it *is* a job aid!

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10

Evolution of an e-Learning Developers Guide

INSTRUCTIONAL DESIGN AND PROJECT MANAGEMENT

Mike Dickinson

In Chapter 9, the author shared the basics of creating an effective e-Learning Developers Guide, a set of standards that guides the designers, developers, and SMEs to create consistent product. This chapter lays out the high-level issues—guidelines for instructional design and for project management that shaped the entire Guide. Read this chapter to learn how to adjust your own Guide to match the culture of your organization.

I**N THE LAST CHAPTER,** I focused on detailed developer's guidelines for course and screen design. In this chapter, I will back up to a more macro view and explain some instructional design and project management guidelines as they pertain to the development of e-learning. Recall that the focus of these two chapters is internal-courseware developers, that is, those who develop courses for the organization's own employees. There may be some differences in approach, rigor, and consequences between those developing internal courses and those developing them on contract.

Instructional Design Guidelines

The vision for our online learning program is to be our company's website-of-choice for current and relevant online training and performance support tools, created in a style that fits our corporate culture and that is easy to use. As a means to that vision, we intend to follow certain principles.

First, we intend to provide valuable and timely knowledge- and skill-building activities that help employees enhance their job skills and self-confidence. Second, we strive to choose topics for online learning based on the need for interactivity and/or advantages of online delivery. Finally—and this is a big element of our corporate culture—we strive to put fun and a spirit of adventure into our online and blended learning products.

Development Phases and Process

We develop our e-learning courseware by using the instructional systems design (ISD) process, specifically the ADDIE model: Analyze, Design, Develop, Implement, and Evaluate. (If ADDIE is not familiar to you, see the article by A.W. Strickland listed in the References at the end of this chapter.) One could choose other instructional design models, including rapid proto-typing. We like ADDIE because it is intuitive and rather universal. We often have to adapt the ADDIE process because of short notice or incomplete requests prompted by changing business needs. All developers deal with this reality, each in his or her own way. We use ADDIE as the underlying frame of reference, using as much rigor as the conditions of each project permit.

Our department has also created a "Toolkit" for course development in all media. We use elements of the Toolkit for e-learning projects when they're applicable.

Development Team

Our guide mentions the multiple disciplines that our small team must cover. Although not many people outside our department read our guide, we wanted to set the stage for future growth by documenting the breadth of skills needed for this segment of training. Looking ahead, this could set the stage for recruiting future hires as well as for staff development. At the same time, we must be careful not to intimidate key sponsors by making it sound overly

complex and thus, costly. Some of the skills we mention are subject-matter expertise (via SMEs—more on this in a minute), instructional design, graphic arts, web development, audio and video production, and quality assurance.

Adult Learning Principles

Certain principles of adult learning and performance guide our instructional design, regardless of which methodology we use; therefore, we state them at the beginning of our guide. In a way, these principles represent the "what," and the detailed guidelines and standards represent the "how."

Our training is designed for adult learners—*working* adult learners. Thus, as described by adult learning pioneer Malcolm Knowles, the training must accommodate the needs that characterize adult learners.

Adults are self-directed and expect to take responsibility for decisions. They need to know how the material is relevant to their jobs—why should they learn it. The learning should occur within the context of tasks that learners will perform on the job, not just rote memorization.

Adult learners may have a wide range of backgrounds and experience with the subject at hand; the learning should appeal to learners across this spectrum.

Instruction should allow learners to discover things for themselves, with help and other aids to provide direction and explanation and recovery from mistakes. Although this is what the literature frequently says, my own experience does not completely corroborate it.

I find that time-pressed adult workers often just want someone to tell them what to do. They have neither the time nor inclination to explore. They want to know one reliable way to do a task, and that's it. Sure, they want help at the moment of need, and they want it under their control, but that's not to say they prefer "discovering things for themselves." The art comes in balancing what adult learners know they don't know with what they don't yet know they don't know.

General Instructional Strategy

Our Developers Guide helps us put the adult learning principles above into practical application by describing certain general guidelines before going

into the specifics that we covered in the previous chapter. For example, we try to maximize *meaningful* interactivity to hold learners' interest. We don't want to just keep them busy—we want to keep them engaged in job-relevant decisions and applications.

By using realistic situations and acknowledging real-world dilemmas along with pros and cons of each choice in the feedback, we feel we address some of the "gray area" that a traditional "right or wrong" approach can't do. This combination of job context and real-world feedback enables us to reach Bloom's levels 2 and 3 (comprehension and application) with multiple-choice and drag-and-drop questions—keeping development cost modest.

We try a variety of instructional approaches. Recall that our shop is relatively young. Our company is among America's favorite companies to work for and we have been among the one hundred fastest-growing private companies. Things change quickly, and we have fun—our courses need to reflect this dynamic environment. Therefore we identify guidelines and not rigid standards so that we can capture best practices while still allowing ourselves room to experiment.

We try to design screens that look crisp and inviting, and we stick to one concept or idea per screen. (*Note:* The research is mixed as to whether it is more effective to reduce page turning by having learners scroll down longer pages, or to limit the content on each screen so no scrolling is necessary. We will leave the option open until we know what our learners prefer. A whole body of usability research exists, from which you can draw your own conclusions about overall screen design. Here is one helpful source for such information: http://psychology.wichita.edu/surl/. We design courses that are no more than thirty minutes in duration, with twenty minutes preferred. This equates to about thirty to forty screens in an interactivity Level II lesson (see our definitions of interactivity levels in Sidebar 9.1 of the previous chapter).

A very important guideline involves establishing the mindset in which we attempt to place the learner. Each course must have a theme or paradigm. Modules within a given course will be consistent with the overall course theme. *We try to place the learner as close as feasible to the role of action agent or decision-maker in the context of the job or task.*

We start by considering themes such as lecture (yawn); game; scenario, job-realistic or imaginary (one, not both); boss; or explorer (encouraged to discover information rather than merely repeating the correct rote answer). Sometimes we gather colleagues to brainstorm other ideas. For example, we learned from one colleague that a company up the highway in Austin, Texas, hires fledgling scriptwriters to brainstorm scenarios.

An interesting example of the learner's role was the course we developed last year for sexual harassment prevention training. The main character in the lesson was a weekly columnist preparing her answers to several letters in her in-box. The learners played the role of "assisting" the columnist to prepare her answers. This manifested by having the learner answer the same three questions in each scenario:

1. What is making the person feel uncomfortable? (We took a behavioral approach versus one of legal interpretation.)

2. What should the person do now?

3. What can the person expect to happen next? (That is, what is the other individual's obligation or the company's obligation, now that that particular issue was raised?)

Decisions on the degree of interactivity in any e-learning product rest on relative importance of the content, budget, time line, shelf life, and audience size. Translation: time and money tend to be directly proportional to the level and quality of interactivity, so be prudent about that investment. This leads to the next topic, project management.

Project Management

e-Learning can be expensive and time-consuming to develop, and thus risky. It has many parallels to software development. The impact of mistakes and rework increases the further along they occur in the project life cycle.

Like software, the courseware development process can become more productive and efficient with certain methodologies and tools. I assume anyone developing online courseware has the main tool, an authoring system, so I will focus here on the methodology.

Similar to software development, one proven way to develop online training, as with any training, is with a "waterfall" methodology such as ADDIE. The idea, of course, is to identify the target audience, requirements (objectives in our lingo), context, and opportunities and obstacles up-front.

After that, design before we develop (it's less costly to make changes on paper or prototype screens than to make changes after the program is coded), pilot test before we implement, evaluate the degree to which the objectives were met, and capture our lessons learned. As an alternative to ADDIE or ADDIE-like models, some developers prefer rapid prototyping in both the software and courseware worlds.

In her chapter in this book, Monique Donahue did a marvelous job of describing how the design document can be used to ensure that the development team adheres to the chosen methodology and thereby reduces risk. (See Chapter 6.) Table 10.1 shows a variation on that theme that we try to follow. This is our course development process in a nutshell, augmented by our Prelaunch and Launch and Support checklists in Sidebar 10.1 nearer the end of this chapter. Note the deliverables identified for each of the ADDIE stages. As I said in Chapter 9, and as Ms. Donahue says in Chapter 6, these are living processes and documents that we continue to adapt over time. Ours is a condensed version; refer to her chapter for a more detailed description.

The deliverables in Table 10.1 should be discussed with sponsors and agreement made as to which ones will be used on each project. As a minimum, the e-learning director should review those in bold prior to proceeding with the subsequent phase.

Notice the phrase "try to follow" in a preceding paragraph. As I have composed these chapters, I have been struggling with how best to describe the way I would like things to be, and the way they are. (Such is life, eh?) The truth is, we don't always get the advance notice that we would like, or the forethought, or a clear picture of expected performance outcomes, nor convenient access to SMEs. I suspect this may sometimes hold true for external courseware developers as well as for those of us doing it for internal audiences. This goes back to that other word I used earlier: "adapt."

Then I remembered something from the software development community that migrated to the project management world: the capabilities

Table 10.1. Project Deliverables by Phase

Phase	*Deliverable(s)*
Planning	**Project charter** and/or work plan (end goal, scope, major learning/performance objectives, resources, desired start/end dates, dependencies)
Analysis	**Needs analysis** results
Design	**High-level design plan** (Final objectives and how they will be evaluated; instructional strategy); Template or prototype (course look and feel); Detailed design plan
Development	Storyboards and audio scripts
All media	**Beta courseware**
Implementation	Beta courseware and source files
Evaluation	Test items as submitted in storyboards, beta, and final courseware Level I and, if used, Levels II and III evaluation data

maturity model, or CMM. First pioneered by the Software Engineering Institute at Carnegie-Mellon University, then adapted by the Project Management Institute and its membership, a CMM provides a way to categorize the *environment* in which projects are managed. In fact, it is sometimes referred to as an *Organizational* Maturity Model, or OMM, with respect to the particular discipline.

Maturity models describe ways for organizations to assess their current states, their desired states, and ways to get there. They examine the way the organization performs certain processes such as planning, chartering projects, managing project portfolios among competing priorities, the capabilities of individual project managers, and continuous process improvement (toward the desired state).

Having been a manager of internal courseware development in three quite different organizations, I think the same thing applies to online

courseware development. We thus have to manage upward, diplomatically and gently, educating those who sponsor courseware projects in the process, risks, and implications of certain decisions, etc.

Tools such as a design document or Table 10.1 are to help this process. We need to explain why the input and decisions we're asking for are important at this time. Even then, the people we're asking may not recognize the implications until they have been experienced once or twice. As internal developers, especially in small shops, we may have a bit more latitude to exceed planned development effort or delay course launch dates than those operating in a system of billable hours do, but that should not be a license for sloppiness.

So we "try to follow" the checklists in Sidebar 10.1. Admittedly, we don't always follow the process as rigorously as we should. But we are learning, and we help our internal business partners learn, too.

SIDEBAR 10.1: DEVELOPMENT CHECKLISTS

Pre-Launch Checklist

1. Course ready?

    a. Final checks of spelling, interaction, media

2. Sponsor ready?

    a. Validated content?

    b. Have vetoers checked course?

    • Go over any sensitive content in person

    c. Launch and deadline dates agreed to?

    d. Report sequence agreed to? (see Launch and Support Checklist below)

    e. Any special communications needed?

3. Support ready?

    a. IT Help Desk notified?

    b. Special Course Summary Report requested from IT, and ready?

4. Launch strategy:

   a. Whole company or phased?

   b. Use latter if there's risk of changes

5. Publish course into Aspen

   a. Ensure properties page is complete

   b. Ensure course works okay

   c. Assign an evaluation to the course

      • Trigger upon completion

      • (Non-mandatory courses may trigger on something else, like registration)

      • No offset; due within three days

Launch and Support Checklist (for Mandatory Compliance Courses)

1. Day before release: Sponsor emails announcement to all managers

   a. Announce deadline

   b. Bonus affected?

   c. Remind them of online Course Status Summary report

2. Day of release: TRAINING registers learners

   a. Need QRC: best way to register if:

      • Whole company

      • Phased

3. Weekly in DR: TRAINING publishes company-wide stats, reminder of online report

4. Any way to pique interest among employees, such as, "Did you know . . . ? " or "Here's how _____ changed."

5. One week before deadline:

   a. Deadline still good?

   b. Sponsor reminds managers of deadline, includes overall percentage complete (or by department with help from TRAINING)

   c. Report sorted by EVP, to EVPs?

6. Day after deadline: TRAINING gives course summary report to sponsor sorted by EVP

Conclusion: Instructional Design of the Developers Guide Itself

What about the design of your Developers Guide itself? It's a training or job aid, so let's apply the ADDIE model to our own performance support tool. "Physician, heal thyself."

Analyze. What is the problem we're trying to solve with a Developers Guide? For some, it may be to convey standards to third-party courseware developers, whether internal or external, so the final product conforms to a certain look and feel. For others, it may be to serve as a "coach" for various parts of the development process.

Who is the target audience? Courseware developers, obviously. But consider other stakeholders, too, even if just a part of the guide pertains to them. It may behoove you to involve them in the Guide's creation. Here again, some of this can be done case by case with the Design Document. But if you want to establish underlying guidelines, put them in the Developers Guide.

For example, what documentation will each phase produce, and who must approve it? With what IT standards must you comply? We found the guide improved communication with our IT department. We found that a QA person had a suite to test compatibility with all end-users' systems across the company. That saves us many hours of pilot testing with individuals in various locations. IT also helped us store videos outside the courses with smaller file sizes and better response time.

Design. I looked at several developers guides on the Internet, and then chose one that seemed closest to our needs and obtained permission to adapt and use it.

Develop. Our guide is a continual work in progress.

Implement. Although our guide has been "published," it is admittedly easier in a small shop to just talk and remind ourselves of past decisions or solutions than it is to maintain and refer to a document.

This is especially true for solutions to technical issues. We're usually resolving them under time pressure and don't take the time to document them. In this regard, we share the bane of software developers: we know we should document, but it's the least favorite thing to do. The Developers Guide itself could be a repository for such lessons learned, especially in a shared online folder that would be both convenient and accessible.

One rather painless way, albeit perhaps not the purest from a software standpoint, is to use the second screen of each course to document any special features and logic, and then make this screen invisible to the learner. This way the documentation stays with the course, and it's rather easy to jot a note about special features or code at the moment it is created. Since we're still trying one or two new things with each new course, this helps preserve any unique coding or features for future course maintenance. All documentation though, takes energy to make it happen.

Evaluate. Recently I asked my two teammates whether our Developers Guide is valuable. One of them feels she really doesn't need it. The other appreciates having it all written down for easy reference. I think the value of such a guide may increase with the size and complexity of the courseware development operation. Yet, even in our small shop, I find situations when rework is needed because someone—me included—either forgot to follow a certain guideline and the instruction or navigation isn't clear, or a situation occurs that should have been addressed in our guide but wasn't—yet. As I said earlier, it's a living document.

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11

Using Microsoft® Word for Rapid Storyboard Development

EFFICIENT PRODUCTION OF PROFESSIONAL E-LEARNING STORYBOARDS

Cynthia Holmes-Radner

Storyboards are a critical element in the design and development of e-learning applications. In organizations that develop many such applications, the challenge of creating an effective storyboard compounds when developers individually create their own storyboard templates. In this chapter, learn how expert designers and developers worked together to automate and standardize storyboard production, using an available tool familiar to clients and development teams alike.

HAVE YOU EVER FOUND yourself writing a standard course introduction for what seems like the hundredth time? Instead of reinventing the wheel, gather your best writing, combine it with your best instructional strategies, and make it easily available for all of your instructional designers to use every day. With Microsoft Word, and some of our easy-to-follow steps, you can develop a storyboard template based on your own best practices that will provide professional results every time.

How Our Journey Began

RWD Technologies, Inc., a Maryland-based company involved in training and end-user performance support since 1988, made a natural segue into the web-based e-learning field in 1996. During several ensuing years of varied client engagements in the banking, pharmaceutical, automotive, telecommunications, manufacturing, information technology, and services industries, our e-Learning and Performance Support Group became more efficient and comfortable working together as a collaborative creative team. Each of our project teams typically included instructional designers, graphic artists, multimedia developers, programmers, testers, and project managers. Many of us had been working in the online learning field for more than ten years. Team members worked from several different office locations inside and outside of the United States, and often juggled more than one project at a time. Our project teams formed and reformed as different client engagements began and ended.

Survey Says . . .

One of our guiding principles at RWD is to learn continuously. To this end, we distributed an internal process-improvement survey to all the members of our e-Learning Development Team. Our goal was to use our considerable collective experience to enhance our work processes. This survey helped us to identify the changes that team members would find most valuable. Among other areas of improvement, the responses we received pointed out that we urgently needed to standardize our storyboard tool.

As evidenced by our survey responses, our geographically dispersed teams and our fluid organization often resulted in different projects using different storyboard formats. One survey response read, "Currently, the team seems to use a new storyboard format with almost each new project. This unnecessarily adds ramp-up time to the process for all team members."

It turned out that each of our instructional designers had been using his or her own favorite storyboard tool to write courses. These tools had been created using various applications such as FileMaker® Pro, Microsoft® PowerPoint®, and Microsoft Word®, and each tool had its own unique layout and format. When following a completed storyboard to create a new

course (or courses), our developers and testers found it both time-consuming and frustrating to switch between the various storyboard tools and formats. For those people who were working on multiple projects simultaneously, it could be extremely disconcerting to work with several different tools. We clearly needed a more efficient approach, so we set out to develop a standard, consistent storyboard tool.

Defining the Requirements

To create a standard storyboard tool, we realized that there were several important criteria we had to meet. Our standard storyboard tool had to meet the following seven criteria:

1. Be Quick and Easy for All Team Members to Use We wanted to eliminate—as much as possible—any learning curve for using the tool to write or review storyboards. When development is on a tight schedule, this helps eliminate ramp-up time for new personnel assigned to the project. To collect team member comments on a storyboard's content, it was important to use a software package that everyone could easily share and use. We wanted to take advantage of this application's automation capabilities while keeping the tool user friendly.

2. Be Quick and Easy for Clients to Use We also wanted to eliminate or minimize any learning curve for clients. With busy clients it is often difficult to get a thorough review of storyboards in any form. We did not want to further encroach on their time by having them use an unfamiliar tool. Many clients have "locked down" configurations, in which adding even a simple plug-in becomes a logistical nightmare, so we also wanted to avoid using a tool that would require them to install any software on their computers. To collect client comments on the storyboard, we had to use a software package that was both readily available on a client's desktop, and easy to use.

3. Clearly Communicate Ideas from the Instructional Designer When it comes to storyboards for e-learning, we don't simply deliver a storyboard to developers or clients without any other interaction (known as the "throw it over the wall" method), but even when following best

practices of having regular client contact and production hand-off meetings, the communication is never perfect.

Based on our years of experience, we knew that if a client or developer misunderstood how a screen described in a storyboard was actually supposed to look or function, it could cause agonizing rework later in the development process. Since correcting errors becomes more and more expensive the further we progress in the development process, it was critical for our standard tool to result in a storyboard that was as WYSIWYG (what you see is what you get) as possible. This would help ensure that all stakeholders could easily understand it.

4. Be Flexible Enough to Accommodate Different Design Approaches Different subjects and different clients require a variety of instructional strategies and formats. Although many of our e-learning products are menu-driven, we also needed to allow for non-linear branching. We needed a tool that could easily include a broad assortment of strategies and navigation schemes.

5. Efficiently Collect Team Comments Collecting comments from our team for a storyboard is a critical part of our review cycle. Before releasing any storyboard to the client, at a minimum we conduct editorial and instructional design reviews. We may also conduct a programming review, a project management review, or both. The instructional designer who wrote the storyboard then addresses and incorporates any comments before releasing the storyboard to the client for review.

6. Efficiently Collect Client Comments Once we have released the storyboard to the client, it is likely that more than one member of the client's team will have comments to make, and some can be rather lengthy. Since we ask clients to provide us with a set of consolidated comments, this often means that the client's lead reviewer must read and collate multiple sets of comments before returning the storyboard to us. We coach clients to be as specific as possible at this stage and to give us any requested wording changes verbatim.

7. Allow for Quick Incorporation of Changes Anyone who has had to respond to either handwritten comments from a client or to comments provided

in a document separate from the storyboard will understand why this is a requirement! Both of these approaches tend to slow down the workflow and adversely affect the accurate incorporation of changes and comments. Once the client has supplied comments, it is critical to correctly reflect the requested changes in the storyboard so that production can commence. Comments embedded within a storyboard allow us to quickly see and respond to any requested changes.

Deciding On a Software Application

To decide on a software package to use to create our storyboard tool, we mulled over both what we currently used and our alternatives. FileMaker® Pro, although a powerful tool with some distinct advantages, was not a software package widely used by all of our clients. Microsoft® PowerPoint® allowed for very WYSIWYG storyboards, but did not provide a native feature for adding comments or tracking changes. Microsoft Word was widely available, commonly used in our office and in our clients' offices, and provided both a comment feature and automatically tracked changes. We decided not to look at other products, since purchasing a new tool was not in the budget at that time. A list of some of the typical products used across the industry for creating storyboards is shown in Table 11.1.

Choosing a Format

Like the software tool choice, selecting a standard format was the cause of much discussion and some heated debate. Some team members favored a tabular format because all pertinent information about a screen appeared in one row (see Figure 11.1). Others preferred a narrative format to be more in keeping with the WYSIWYG requirement (see Figure 11.2). Since there is no one "right" solution, we ultimately followed an executive directive to choose the approach that would work best for our clients and for our team.

We decided that, for our standard format, each page of the storyboard would include a narrative area at the top to convey the WYSIWYG look and feel of a screen with the information necessary to describe and create it located underneath.

Table 11.1. Typical Products Used for Creating e-Learning Storyboards

Software/ Method	Company	Output Formats Include:	Ease of Use
Dreamweaver®	Adobe	HTML, GIF, JPEG	Moderate
FileMaker®Pro	FileMaker, Inc.	PDF, HTML, XML	Moderate
Flash™	Adobe	FLA, SWF	Difficult
FrontPage®	Microsoft Corporation	HTML, GIF, JPEG	Moderate
InDesign®	Adobe	PDF, PDFX, HTML, JPG, EPS, GIF, TIFF, AI, EPS	Moderate to Difficult
Pencil and paper	Your paper provider	Paper	Easy
PowerPoint®	Microsoft Corporation	PPT, HTML, Design Template (MPP)	Easy
QuarkXpress®	Quark, Inc.	PDF, HTML, XML	Moderate to Difficult
Sculptoris eLearning Authoring and Design Tool	Imaira Digital Media & Learning	HTML or SCORM HTML	Moderate to Difficult

Creating Our Storyboard Template

We decided on the widely used Microsoft Word software package to develop a standard storyboard template file (.DOT) for all of our instructional designers to use when creating storyboard documents. This template would serve as our standard, but also was modifiable as needed for a specific client or project. The plan for this template was to develop a toolbar that would provide access to all of our available best-practice strategies and content. The instructional designer could then create a document based on this template and,

Figure 11.1. A Tabular Storyboard Format Places All Pertinent Information About a Screen in a Single Row

Figure 11.2. A Narrative Storyboard Format Is More in Keeping with the WYSIWYG Requirement

while writing, could easily pick and choose from the toolbar the appropriate elements required to build a storyboard.

As Microsoft Word Help explains, "AutoText offers a way to store and quickly insert text, graphics, fields, tables, bookmarks, and other items that you use frequently." (*Editor's Note:* The author originally referred to Word 2000. Wording in the Help file may have changed since the article appeared.) We took advantage of this robust AutoText tool along with Microsoft Word's Custom Toolbar feature to create a toolbar with standard story boarding elements such as audio and video scripts, screen layouts, frameworks for interactions, and notes.

After many years of creating e-learning, we had a wide variety of elements to include on the toolbar. We made an effort to unify all of our elements from various courses before adding them to the template. One of the strategies we used was to create an individual style that we applied to each unique element. For example, storyboard numbers that appear at the top of each storyboard page are always a specific color, font, size, etc., and have the custom style "storyboard number" applied to them whenever using them in an element. This means that no matter which elements the instructional designer chooses from the toolbar to include in the storyboard, the end result is smooth and professional looking.

How It Works

Each element on our storyboard toolbar is a separate custom AutoText entry (see Figure 11.3). By adding, removing, or modifying AutoText entries on the toolbar, we can easily customize a new template for our new client. Our instructional designers then use this template as the basis for creating storyboard documents for that client. The final product is a professional, well-formatted document easily understood by the client and the team.

When an instructional designer launches our template, a new .doc file based on that template automatically opens and the storyboard toolbar is available.

With one click of a button on this toolbar, a designer can paste any element into a storyboard document. Standard text, instructions, and writing suggestions are included with many elements as performance support for the instructional designers. This helps our newer designers to learn from

Figure 11.3. Each Element on This Toolbar Is an AutoText Entry

Storyboard
Cover page
Table of contents
Course splash screen
About this course screen
Unit splash screen
About this unit
Lesson introduction
Standard page (text)
Bullet list
Popup link (rollover text)
Popup text entry
Directions - general
Directions - rollover
Directions - click
Directions - audio
Directions - animation
Animation screen
Graphic placeholder
More information box
FAQ box
Note to graphic artist
Note to integrator
Note to client/SME
Note for ID
Audio script entry
Scavenger hunt activity
Mult choice question
Mult choice mult ans ques
Drag and drop activity
Simulation launch screen

the template as they work, and reinforces our internal standards. For example, clicking "Lesson Introduction" on our toolbar created everything shown in Figure 11.4. It includes, from top to bottom: placeholders for the storyboard number; the screen title; suggested text; a placeholder for a graphic; directions; a graphic representation of a hotspot; and the notes and pop-up text required to support the screen. All are properly formatted and placed on the page. Once this element is pasted into the storyboard, the designer can quickly tailor the page to support the course content.

Managing On-Screen Text

Using the Word Count tool in Microsoft Word, and the text length guidelines dictated by the user interface, we can ensure that we do not include too much text on a screen.

Figure 11.4. We Created This Storyboard with a Single Mouse Click

RWD *Technologies®*

Storyboard #: xx_ktm0x_ktt0xp01

\<Insert Lesson title\>

\<Insert introductory statement for lesson. For example "As an employee, it is your responsibility to know and follow the business controls related to your area of responsibility."\>

In this lesson, we will examine:

- \<Insert terminal objective(s)\>
-

Estimated time to complete this lesson: **xx minutes**

Directions: Using your mouse, roll the cursor over WHAT'S IN IT FOR ME? to view the lesson objectives.

| WHAT'S IN IT FOR ME? |

\<Insert graphic\>

Graphic Description	Mouse icon
	What's in it for me? button
	Use standard lesson intro graphic
Integrator Notes	Learners roll over the WHAT'S IN IT FOR ME? button and pop-up text appears.

Pop-up text:

WHAT'S IN IT FOR ME?	After completing this lesson, you will be able to:
	• \<Insert enabling objective\>
	• \<Insert enabling objective\>
	• \<Insert enabling objective\>
	• Etc.

| Documentname | 2/17/2005 | Page 1 of 1 |

Managing Comments and Changes

If you do not manage the workflow well, the review cycle can easily become a bottleneck. We follow a rigorous internal document revision cycle (our own RWD InfoVision®) to maintain control of all document versions. In addition, we can manage changes and comments within each version:

- Using the Track Changes tool in Microsoft Word, team members and clients can easily make changes to the storyboard. Instructional designers can use this feature to review and collate the additions, deletions, and changes made by others.

- Using the Comments feature in Microsoft Word, specific storyboard discussion can take place with questions asked and answered in context and all discussion archived with each version of the storyboard.

The Fruits of Our Labor

We found that including standard text and formats in the toolbar helps to speed up both the writing and the review processes. This proved critical when RWD began a large client engagement in early 2004. This project presented very challenging deadlines, a great deal of content to tackle, and some pretty stringent client requirements. As the project progressed, we knew we would have multiple project teams working in tandem with external contractors to develop multiple courses. All the courses would be part of one curriculum, and so had to be consistent in style and presentation.

By setting up the storyboard tool with the standard screens and on-screen elements that would be used across courses before writing commenced, we were able to better control the quality and consistency of the end product. We did have to add new elements to the toolbar as new design requirements came to light over the course of the project, but the main elements stayed the same. These additions were easy to make to the template. Once they were made (and reviewed by an editor), we simply redistributed the updated storyboard tool to the team.

When Time Is Short: The Rapid Development Template

At RWD we also have a separate tool we call the "Rapid Development Template," or RDT. Our RDT is a combination of a standard set of e-learning

presentation templates, approved in advance by the client, and a storyboard format that mirrors those templates. We use the RDT in tandem with an already-developed user interface for client engagements when a challenging schedule and strict limits on content are of utmost importance.

The storyboard tool used with the RDT follows a more rigid format that intentionally corresponds to the standard presentation templates. In this tool an image of the user interface and Microsoft Word 2000 text boxes (shown as selected in Figure 11.5) help ensure that the content and text written for a screen will match the space available in the standard presentation templates.

Figure 11.5. The Rapid Development Template Interface Ensures Compatibility Among Content, Text, and Space Available

We also make the RDT available to clients who want to do their own instructional design work but turn to us for creating their user interface as well as developing and testing their e-learning product. In this case, clients use our RDT storyboard tool. This provides them with an organized structure to follow, and in return provides us with a coherent and standardized storyboard to use for development.

Creating a Template for Your Team

The process for creating a storyboard template with a custom toolbar is fairly simple. The main steps are to:

- Gather best-practice course elements and unify their style/format.
- Create a template document.
- Create a custom toolbar and associate it to the template.
- Create an AutoText entry for each element and attach it to the template.
- Populate the custom toolbar with the AutoText entries.

Save the template. To avoid possible performance problems, we recommend developing the template and storyboards using the same version of Microsoft Word for all.

Creating the template and toolbar is a relatively straightforward process. The real work comes in defining the standards and perfecting the formats for the state-of-the-art storyboard. The best elements to put on the toolbar will be applicable across courses, rather than be content-specific. To allow for easy tailoring to specific content, they should be as flexible and generic as possible, especially if serving a wide variety of clients and industries, as RWD does. As you create new courses, you will naturally develop new elements and the toolbar can be modified to include them. However, this means that you should designate someone on the e-learning staff to update the standard storyboard template, maintain version control, and be responsible for ensuring that new versions are available to all members of the design team.

What's Next for Us?

Our next initiative is an obvious step forward. The wish list from our team includes automating the transition from our finished and client-approved storyboard to a first draft of the actual online product. To that end, each of the types of information included in our storyboard template has an individually named Microsoft Word custom style. We intend to use these styles to automatically transform the finished storyboards to XML to free the integration team from "cut-and-paste" activities. When completed, this will mean our very talented designers and developers can spend their energy on more rewarding endeavors such as imagining and creating the next generation of engaging e-learning experiences.

Cynthia Holmes-Radner is a senior instructional designer with RWD Technologies, Inc. (www.rwd.com) in Baltimore, Maryland. Cynthia has been working in the field of online instruction since 1986, when she joined Ford Aerospace & Communications Corporation. As a video specialist there, she designed, wrote, and produced interactive video and managed computer-based training projects for the U.S. Department of Defense. She also supervised Ford's graphics department for two years. Upon moving to Autometric, Inc., she helped build the online learning practice for satellite modeling software products.

Cynthia has designed and written many e-learning courses on a wide variety of subjects for a client base of Fortune 100 telecommunications, pharmaceutical, manufacturing, and information technology companies. Cynthia loves the design and writing aspects of her work. Brainstorming with her colleagues at RWD and learning something new with every project energizes her. She did her undergraduate and post-graduate work in communications at Ithaca College. You can contact Cynthia at cholmes@rwd.com.

12

The New Frontier of Learning Object Design

Ellen Wagner

Learning objects appear to have significant potential for creating highly personalized learning programs, easily updated courses, and performance support tools. However, as e-learning has become heavily dependent on technologists, producers, and funders, learning designers have lost their voice and often seem to drop out of the conversation. Learning designers must think about better ways to conceptualize and create resources and programs. Here are some promising leads.

THE LEARNING OBJECTS MODEL for creating e-learning products and services offers real promise for creating learner-centered solutions and tools. Objects—stand-alone data elements holding "content," "learning," and "knowledge"—promise to take e-learning to the next level of personalization and relevancy. Yet for all the buzz, learning designers and decision-makers continue to wonder how to realize those promises.

Clearly, a viable learning object strategy involves much more than a shared content object resource model and metadata tags. This chapter takes a look at the current status of learning objects. It also explores some critical issues likely to affect the speed and degree to which the learning object model is adopted.

Learning Objects: Changing the Face of e-Learning

e-Learning's most successful commercial niche is online courseware for corporate training. Its adoption is generally the result of expectations for faster times-to-performance or lower costs. Improved documentation and records and information management functionality are also important payoffs.

Even so, e-learning vendors are more aware than ever that customers want more out of their e-learning investments. Buyers want to use their own content to customize e-learning offerings. The final product may or may not look like conventional courseware. Customers also want to develop their own content, and they want it to play in their chosen learning content management system (LCMS).

Content owners and organizations of all sizes and kinds want assurances that their content will be available to users even if distribution platforms change. This means the content must be in a format that can be reused and moved. These objects may be repurposed for many uses, not limited to training and education.

The education and training community is hungry to know more about learning objects. During the past decade, interest in learning objects has grown slowly but steadily, until they have come to represent a "new frontier." Practitioners now expect them to leverage existing information, produce new knowledge, and create new meaning.

Along the way, learning objects have evolved from a computer programming strategy to a metaphor of interoperable content elements. Ideally, these elements can be repeatedly assembled and reassembled, creating an unlimited number of forms.

Learning object standards have evolved dramatically in the past several years. There is special interest in accelerating large-scale development of dynamic and cost-effective learning software. The hope is to find a way to build such software with these reusable objects.

The emergence of the Advanced Distributed Learning Initiative's Sharable Content Object Reference Model (SCORM) has already altered the face of e-learning as we've known it. With SCORM and the standards dominating many of today's e-learning and knowledge management conversations, it looks like objects really are here to stay.

However, in the midst of all the exciting standards developments, more than a few people are feeling confused and left behind in a steady stream of "object technobabble." How do we make sure to keep the "learning" in "learning object?"

A Quick Learning Objects Review

Learning objects are commonly viewed as the smallest element of stand-alone information required for an individual to achieve an enabling performance objective or outcome. Learning object uses include, but are not limited to, online instruction or performance support.

Grounded in the object-oriented paradigm from computer science, learning objects are central to instructional theories offered by such authorities as Dr. M. David Merrill (professor of instructional technology, Utah State University), Dr. Charles Reigeluth (professor of education, Indiana University at Bloomington), and others. These theories support breaking down content to constituent parts, then reassembling that content to meet specific learning goals. Many leading practitioners believe that learning objects are a core concept to creating, maintaining, and managing learning content. (See Figure 12.1.)

Many writers credit Wayne Hodgins, director, Worldwide Learning Strategies, Autodesk Inc., for coining the term "learning object." The story goes that in 1992, while watching one of his children playing with Lego™ building blocks, Hodgins realized that his learning design efforts might benefit from plug-and-play interoperable pieces of learning content that could be assembled and reassembled as needed. The rest, as they say, is history.

Figure 12.1. Objects Ensure That Complex Content Can Be Broken Down into Smaller, More Meaningful Chunks That Can Be Assembled and Reassembled to Meet Individual Learner Requirements

Molecular Content Model

Corporate Content Model

Application Specific Profiles

Content Items	Reusable Information Objects (RIO)	Reusable Application Objects (Learning, Support, Reference, Marketing)	Aggregate Assemblies (Lessons, Support, Solutions, etc)	Collections "Stories"
Text, Audio, Illustration, Animation, Simulation	Procedure, Principle, Concept, Process, Fact, Overview, Summary	Process, Procedure, Principle, Objective, Summary, Overview, Fact, Concept	Objective	Objective
		Enabling Objective	Terminal Objective	

Peder Jacobsen, co-founder and chief learning officer, LogicBay, describes the period from 1992 to 1998 as a time of significant activity in the learning object arena. The Learning Object Metadata Group from the National Institute of Science and Technology and the Computer Education Management Association (CEDMA) began to address learning object issues such as modularity, database centricity, and metadata. The Aviation Industry Computer-Based Training Committee (AICC), the International Electrical and Electronics Engineers (IEEE) Learning Technology Standards Committee (LTSC), the Instructional Management Systems (IMS) Global Consortium, and the Alliance of Remote Instructional Authoring and Distribution Networks for Europe (ARIADNE) started their work in the learning object arena, paying particular attention to the development of standards.

Around this same time, Oracle introduced the Oracle Learning Architecture (OLA), an early attempt at an authoring environment using learning objects. Although the OLA never came to fruition at Oracle, Tom Kelly and Chuck Barritts continued their learning object efforts at Cisco Systems. Their efforts culminated with the release of Cisco's white paper on Reusable Learning Objects in 1998.

A number of learning object definitions had been offered by these groups and by individuals. For example, the IEEE LTSC described learning objects as any entity, digital or non-digital, that can be used, re-used, or referenced during technology-supported learning. David Wiley, an influential thinker involved in exploring innovative applications, has defined learning objects as any digital resource that can be reused to support learning. (Wiley, 2000, p. 6, at http://reusability.org/read).

For vendors of e-learning products and services, these definitions may be too broad to be functionally useful. e-Learning content and distribution vendors have tended to craft learning object definitions that support the kinds of content development and distribution applications offered by their companies. For example, Asymetrix, Inc. (now SumTotal Systems), once defined learning objects as pre-scripted elements that simplify programming. The Educational Objects Economy (a National Science Foundation funded project) simplified the definition even further, equating learning objects with Java applets. Macromedia's (now Adobe's) interest in supporting robust interoperable content

creation was reflected in its definition at about the same time, which described a learning object as instructionally sound content, combined with opportunities for practice, simulation, collaborative interaction, and assessment that directly relate to a learning objective or outcome.

Some developers suggest that a typical course should contain a specific number of objects, or that objects should be of a certain time duration, or that each learning object must contain a certain number of specific kinds of elements. Those suggestions tend to reflect object requirements for use in specific settings. Wayne Hodgins suggests that there is no set absolute size to a learning object, since the size of the object will be relative to the needs of learners and the requirements of given learning tasks.

While it is likely that definitional debates and discussions will continue, the prevailing views suggest that learning objects have the following attributes:

- They are the smallest element of stand-alone information required for an individual to achieve an enabling performance objective or outcome.

- They are stored and accessed using metadata attributes and tags.

- They are assembled and contextualized using metafiles that situate meaning and application and facilitate meaningful assembly.

Figure 12.2 provides a graphic representation of an object in e-learning.

Why Learning Objects?

e-Learning expert Warren Longmire suggests that learning objects can satisfy both immediate learning needs—such as a knowledge-based or skills-based course—and current and future learning needs that are not course-based. (See www.learnativity.com/download/LwoL3.pdf.) Longmire proposes that other possible benefits of using learning objects are:

- **Increased value of content.** The value of content is increased every time it is reused. This is reflected in cost savings by avoiding new design and production efforts. Selling content objects or providing them to partners may offer additional revenue generation opportunities.

Figure 12.2. A Learning Object Is a Simple Device Conceptually, But Opinions Differ with Regard to Implementation

Tanya Heins and Frances Himes. Creating Learning Objects with Macromedia Flash MX. San Francisco, CA: Macromedia, Inc. A Macromedia white paper. www.macromedia.com/learning. Released April 2002. Used with permission.

- **Improved content flexibility.** When content is captured in an object format, it can be reused much more easily than material that has to be rewritten for each new context or application.

- **Improved updating, searching, and content management.** Metadata tags describing various attributes of a learning object help organize, identify, and locate relevant content. This improves searching, facilitates management and maintenance, and helps filter and select the relevant content for a given purpose.

- **Content customization.** The learning object approach enables a just-in-time approach to customization by allowing designers to select, assemble, and rearrange content according to stakeholder needs.

Not surprisingly, these benefits for using learning objects relate most directly to concerns for content and its modification, utility, value, and

management. Content is the most tangible asset in an e-learning design. Improved methods for managing content may, in fact, relate directly to improved learning outcomes for individuals and organizations.

But learning content, no matter how robust, is not the same thing as learning. What are the benefits of using learning objects for learning or performance improvement? In many learning object models, relatively little attention is paid to increasing an individual's personal capacity to absorb information and create new knowledge. These days most discussions about learning objects concentrate on standards, metadata, and SCORM. While the work involved in creating a shared content object model is important, it is only a part of the total picture.

What's Happening on the Object Front?

The broad acceptance of SCORM as a de facto standard for content creation and distribution has resulted in a greater awareness of the importance of metadata and object models. But just how broadly accepted is SCORM in the e-learning marketplace? The March 2002 eLearning Guild (www.eLearning Guild.com) SCORM Standards Awareness Survey noted several important points. First, awareness of SCORM standards is much higher in the e-learning vendor community than in the practitioner community. (See Figure 12.3.)

Given this difference in awareness, it follows that vendors are more likely to be providing SCORM conformant applications. (See Figure 12.4.)

Figure 12.3. Fewer Than Four Out of Every Ten Practitioners Were Aware That the SCORM v1.2 Update Had Been Released

Figure 12.4. In 2002, Most Vendors Were Developing or Deploying SCORM-Conformant e-Learning Applications, While Most Practitioners Had Not Started Any Development of Such Systems

Developing or Deploying SCORM Conformant e-Learning Applications

The primary reason practitioners offered for not doing more with learning object designs is that they lacked the technical knowledge to interpret and apply the technical guidelines in a practice setting. The second-most-offered reason was that people are still waiting for useful, widely accepted standards definitions.

Keeping the Learning in Learning Objects Design

What many people don't yet recognize is that a working learning object strategy involves much more than SCORM and metadata tags. Realizing the value of an object strategy will demand a change in the way we value content. Even more important, this change calls for giving learning designers a voice and getting them back in the conversation.

e-Learning has become completely dependent on technology (for example, learning content management systems, content creation and authoring tools, XML, metadata, SCORM). As a result, the loudest voices at the e-learning table are those belonging to the technologists, the producers, and the funders. Learning designers, master teachers, and subject-matter experts all need to have a greater say in how e-learning products and services evolve.

In order to do that, learning designers are going to need to think about better ways to conceptualize and design learning-object-based resources and

programs. In most learning settings, instructional design activities tend to focus on the arrangement of contingencies to elicit specific responses. (See Figure 12.5.) Developing object-oriented learning designs involves a significant shift from behavioral to cognitive perspectives and from objectivist to constructivist perspectives.

The seemingly algorithmic nature of the process of design ("First you state your goal, then you define your objectives") almost suggests a stimulus/response relationship ("and your student will perform certain tasks with 80 percent accuracy, 90 percent of the time"). Even in cases in which designs are developed for cognitive tasks such as knowing, remembering, thinking creatively, and solving problems, designs tend to reflect an objectivist rather than a constructivist orientation. According to an objectivist:

- The world is completely and correctly structured in terms of entities, properties, and relationships.

- Meaning exists in the world outside the realm of human experience.

- While people have different understandings of meaning based on their different experiences, these are still only partial understandings.

Figure 12.5. Most Instructional Design Activities Tend to Promote a Behaviorist Perspective

Instructional Design Flow

Evaluation:
- Did learners learn what they needed to learn?
- Can they perform as they are supposed to perform?
- Was the course developed on time and on budget?

Assessment:
- Discovery Processes (who, what, how, when, where)
- Findings Summary

Development:
- Creative design
- Interaction and interface design
- Subject matter expertise
- Content creation: text, graphics, other media
- HTML coding
- Quality assurance and testing
- Project management

Design:
- Objectives and Outcomes
- Instructional Strategies
- Interaction
- Content Selection, Treatment and Presentation
- Development Capabilities and Limitations
- Technologies
- Interaction

- The goal of complete and correct understanding is to get people to know the entities, attributes, and relations that exist, unbiased by their prior experience.

Constructivism provides designers with an alternative basis for thinking about instructional experiences. In such a view, there are many ways in which to structure the world. This further suggests that there are many meanings or perspectives for an event or concept.

As a result, there may not be just one correct meaning or understanding for which learners must strive. In this setting, learning is a process of making meaning, rather than a response to a stimulus or a transmission from teacher to student. Human beings interact with other people and with the world. They attempt to make sense of those interactions all of the time.

In their book, *Theoretical Foundations of Learning Environments*, David Jonassen and Susan Land reiterate that learning itself is a dialog, a process of internal and social negotiation. Communities of practice provide a real-world context for negotiating, evaluating, and creating shared meaning. These communities have become the ideal learning environments for the current era.

This differs from the traditional behavioral-cognitive view of learning. The traditional view positions the individual as a medium of learning who processes, stores, retrieves, and applies information. Behavioral principles continue to form the basis for many large-scale training initiatives.

For example, a key behavioral principle holds that a response followed by a reinforcer is strengthened and is therefore more likely to reoccur. This is the basis for much drill-and-practice activity. Cognitive approaches to learning tend to present learners with an objective "right answer" defined by others and presented as true. Each individual compares his or her interpretation of meaning against that statement.

In fact, all three approaches to learning and to instructional design—behavioral, cognitive, or constructivist—offer solutions for helping learners achieve specific kinds of learning outcomes. It's just important for designers to keep in mind that constructivist learning outcomes such as shared meaning-making will not be particularly well-served by a behavioral instructional design.

While a constructivist perspective makes perfect sense in theory, the notion of "self-determined correct answers" can easily strike fear in the heart

of a learning designer. In such an approach, how is one to demonstrate that learners are achieving "world class standards," or that they have achieved specific performance-based outcomes?

To counter such concerns, constructivists emphasize situating new (cognitive) experiences within the context of authentic (learning) activities. Learners draw on their own experiences, interpretations, and priorities to fit their instruction to their situations. This is a very different approach than the prevailing approach in which learners receive a plan of action, and success is simply a matter of following that plan.

This suggests that the constructivist way may be well-suited to learning object design. It also suggests that e-learning designs built using behavioral or cognitive models are not likely to work as well when the intent of learning involves meaning-making, activity, and social negotiation.

Other Barriers to Adoption

There are a number of other common barriers to learning object adoption. The idea of constructing a personalized learning program is still relatively new. It is also a complex job. The designer must select and assemble learning objects to match learning interests, performance gaps, learning style, and presentation preferences.

Courses still represent the most familiar way to offer learning content to students, whether the course is a classroom-based, instructor-led course or a web-based, instructor-led course from a virtual institution. This familiarity goes a long way in establishing the trust between the learner and the e-learning solutions provider that is necessary for building brand loyalty. Nevertheless, "comfort with the familiar in an unfamiliar virtual space" will increasingly find itself balanced against "improved productivity and competitiveness enabled by leveraging organizational knowledge and personalizing e-learning programs."

Another challenge to early adoption by most organizations has to do with the way that learning content is valued in organizations. While learning and content management system vendors have begun to embrace the SCORM data model, content providers have not yet created broad libraries of digital content objects for commercial distribution.

Until such objects are more readily available, the ability to construct "open source" e-learning resources may be compromised. Furthermore, until reusable learning objects are readily available, online learning designs will continue to emphasize presenting content in the ready-to-use, familiar form of the course. It will take the combined efforts of internal development groups, commercial content publishers, and content aggregators to overcome this obstacle.

Another possible barrier to learning objects has to do with using assessment to profile learner needs and interests. This is of particular importance if learner profiles are going to be matched to content objects. This is the only way in which the learner is going to directly improve knowledge and skills and demonstrate his or her cognitive gain on a valid, reliable test.

What variety of assessment experiences (such as objective tests versus reflective tests, multiple-choice versus "point-and-click" graphical response items) are the best measures of the learning gained? Can an objective test be used to quantify learning outcomes that are derived from a learning experience based on shared meaning-making?

If the selection of learning resources is to be based on individual learner profile criteria, then the validity, reliability, and predictability of the profiling instruments must be empirically supported. Knowledge-based and competency-based assessment "instruments" may take a variety of forms. They may range from objective multiple-choice items to online case-based simulation, to skill demonstrations, to the preparation of a professional portfolio, depending on the learning to be assessed.

Whatever the format of the assessment exercises, the importance of employing methodological rigor when designing these instruments cannot be overstated. This is especially critical when constructing resources used for assessing integrated, situated problem-based abilities in (simulated) applied settings.

Poorly designed assessments may only scratch the surface of the essential knowledge, skills, and abilities needed to function as a highly competent practitioner. In fact, poorly designed assessments can obscure the existing competencies held by the individual being assessed. Learning prescriptions based on inaccurate diagnoses may themselves be inaccurate. This would invalidate the goal of building a personalized learning plan for each individual.

Conclusion

Learning objects appear to have significant potential for creating highly personalized learning programs, easily updated courses, and performance support tools. But this may only be true if we can figure out how to bring them to life without completely automating the process of content creation, instructional design, and assessment. The current directions of learning design include exciting new ideas such as socially shared cognition, situated learning, problem-based-learning, case-based reasoning, distributed cognition, and activity theory, to name just a few.

The successful adoption of learning objects will require conversations, debates, and discussions that bring together all parties. Engineers, programmers, and producers, psychologists, researchers, teachers, and subject-matter experts, learners themselves, and senior IT, business development, and marketing experts all have a share in the process. Learning content, no matter how robust, is not equivalent to learning. Learning designers, master teachers, and subject-matter experts all must have a greater say in how e-learning products and services evolve.

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13

Avoiding Assessment Mistakes That Compromise Competence and Quality

Patti Shank

Assessment of learning is one of those elements of design that many practitioners talk about but find difficult to do well (or to do at all). Yet there are ethical and even legal reasons why doing assessment properly is critically important. Fortunately, designing good assessments is simple, given some basic principles. In this chapter an expert designer walks you through these basics and shows you how to improve your assessments and the quality of your results.

YOUR CAR HAS BEEN STALLING and you take it to a mechanic who completes the work at the time specified for the estimated amount. That's great news, but are these facts enough to determine whether the mechanic is competent? Well, of course not. You also need to know whether your car is actually fixed.

One of the hallmarks of competence in *any* field is the ability to produce needed results. In other words, does the result "work"? How does an observer determine this? By measuring the actual results against the needed results.

For example, a competent carpenter making custom built-in bookshelves determines whether the product fits, and does what is needed to assure that it does. A competent grant writer determines whether her efforts are succeeding, and adjusts her efforts to make good results more likely. Likewise, if your car mechanic is competent, he checks to make sure the fix works and doesn't call you to pick up the car until it does.

We build instruction so that "works" means that people learn. Adequate learning assessments tell us whether what we build "works" and provides data to help us adjust our efforts.

How do people who build instruction most commonly measure the results of their efforts? For many, the most common measure is project completion. Others determine whether they delivered the project on time and within budget, or whether the person requesting the project is satisfied with the results. Some determine whether the learner "likes" the instruction. All of these results have merit, but they aren't enough. Too often the most critical result is missing.

One of the most (if not *the* most) critical results is whether what we build actually helps people achieve the learning objectives. Finished projects and satisfied stakeholders may be necessary results, but they are insufficient. Just as someone building an office building can't be considered competent simply because the project is finished (even if on time and within budget) and the building owner is satisfied, we instructional designers cannot be considered competent if we can't show that what we built helps learners learn.

Unfortunately, many trainers, instructors, instructional designers, and multimedia developers don't know that they should design adequate learning assessments to accompany classroom, online, or blended instruction. In fact, many do not know how to design such assessments. Inadequate assessments fall short of measuring what's needed, and can even cause significant problems for designers, learners, instructors, and organizations. In some cases, inadequate assessments can result in legal or other problems.

Let's consider this scenario so we can refer to it throughout this discussion of assessment mistakes. An online *Introduction to Workplace Safety* course has the following learning objectives:

Learners will be able to:

1. Identify the benefits of workplace safety to the company and staff

2. Interpret applicable federal and state laws and company policies related to workplace safety

3. Analyze and prevent common safety problems

    3.1.   Analyze and prevent ergonomics problems

    3.2.   Analyze and prevent accidents

    3.3.   Analyze and prevent electrical hazards

    3.4.   Analyze and prevent hazardous materials problems

4. Work effectively as part of a departmental safety team

Learners complete the two-hour course and then utilize a Jeopardy-type game to assess their skills. So far so good? We'll see. . . .

Learning Assessments in the Scheme of Evaluation

Instruction is the process of directing learners through the content, activities, and practice, and then monitoring toward specific outcomes. Building instruction is the creation of learning experiences toward this end. Assessment helps us determine whether we achieved the desired end.

According to Benjamin Bloom (of Bloom's Taxonomy fame), we *expect* well-designed instruction to help most or all learners achieve the desired results. We design good instruction specifically to provide the instruction, practice, feedback, and remediation needed for those results to occur, and if they don't, that's an indication that the instruction is lacking.

Evaluation is the whole set of practices used to determine whether our efforts are efficient and effective and Donald Kirkpatrick's four levels are a common way of discussing evaluation types. (See Table 13.1.)

Assessment is a *subset* of evaluation, and specifically asks if the instruction helped learners achieve the desired objectives, both during instruction (level 2), and hopefully in the real world (level 3, the true goal of instruction). (*Note:* We are assuming that the objectives are well considered and written, which

Table 13.1. Donald Kirkpatrick's Four Levels of Evaluation

Level	Measure	Question to be answered
1	Reaction	How do learners feel about the instruction?
2	Learning	Did learners achieve the learning objectives?
3	Transfer	Can learners apply the knowledge and skills to the job?
4	Results	What is the impact on the organization?

is a huge assumption because many aren't, but this is a related rant for another time.)

Serious Mistakes

In my experience with the myriad folks with whom we work, people who build instruction, when designing learning assessments, often make some serious mistakes that compromise their competence and the quality of instruction they build. That's a situation in serious need of remedying, in my opinion. In the rest of this article, I'll describe some typical mistakes in more detail. They include assessments that are too often:

1. Given only cursory attention
2. Not integrated properly into the instructional design process
3. The wrong type
4. Not valid (enough)
5. Poorly written

Given Only Cursory Attention

This mistake is widespread. People who build instruction often don't realize that designing adequate learning assessments is critical to designing and

developing instruction. They don't give designing learning assessments enough time or effort. And many who build instruction don't have the depth of foundational skills (performing task analysis and writing learning objectives) needed to write adequate learning objectives, making the job that much harder.

People who work on a design team may think that they *personally* don't need to understand this process, but they do need to make sure it is well done, which necessitates more than a cursory level of skill.

Consider the *Introduction to Workplace Safety* course. The team that developed this course expended a fair amount of effort developing a fun "Jeopardy-type" game as the final assessment for this course. Does the fact that they had a Flash programmer build this game and incorporate amusing sound effects rather than using a more typical multiple-choice quiz mean that the assessment received adequate attention? Actually, it doesn't, and their efforts may have been misguided. The next few mistakes should explain why.

Not Integrated Properly into the Instructional Design Process

Designing assessments should happen early, right after identifying learning objectives. Below is a typical sequence of tasks for building technology-based learning. Notice how early in the process you should design assessments.

- Analyze tasks
- Identify learning objectives
- Design assessments
- Select instructional strategies
- Select media and delivery options
- Design content and activities
- Conduct formative evaluations
- Develop
- Conduct formative and summative evaluations
- Revise
- And so on . . .

We want to develop assessments right after identifying learning objectives because assessments need to measure whether the learners met the objectives. The ideal time to make sure objectives and assessments line up properly is immediately after identifying the learning objectives. Waiting until later to develop assessments (a common oversight), causes other parts of the design process to likely influence the assessments. This should not be the case. Rather, the assessments should influence the other parts of the design. Assessments are far more likely to be less meaningful or even to be inappropriate (as in the Jeopardy-type quiz example), if designed as an afterthought. Writing objectives and assessments go hand in hand.

Given the objectives for the *Introduction to Workplace Safety* course, does a Jeopardy-type game as a final assessment make sense? It might be a fun knowledge assessment to include in the course if resources permit, but it cannot measure the objectives as written. That's because there isn't a good match between the objectives and the type of assessment.

The Wrong Type

There are two primary assessment formats: performance assessments and "test" assessments. The former involves assessing performance in a more realistic way (*in situ)* and the second involves paper- or computer-based forms with multiple-choice, matching, fill-in-the-blank, and short- and long-answer (that is, essay) type questions. Test assessments are by their nature a less authentic way of assessing learning, even though they are very practical.

The optimal assessment type depends primarily on whether the objective is declarative (facts: name, list, state, match, describe, explain, etc.) or procedural (task: calculate, formulate, build, drive, assemble, determine, etc.). Research shows that there is a big difference between these two types—the difference between knowing *about* and knowing *how* (practical application to real-world tasks).

A copier technician may need to know the names of a copier's parts (declarative knowledge) in order to find applicable information in the troubleshooting manual. But knowing part names only goes so far. Knowing how to troubleshoot the copier (procedural knowledge) involves far deeper skills.

So asking copier technicians to name parts, or even to list the troubleshooting steps, is an inadequate assessment of troubleshooting skills. The bottom line is whether they can, in fact, troubleshoot—and that requires a performance assessment. When it comes to designing adequate assessments, it's inadequate to only determine whether learners know *about* something if it's important to determine whether they can actually perform in the real world.

The type of assessment should match the type of objective. Declarative objectives require right or wrong answers you can easily measure with test questions. If we want to know whether a person can actually perform (not just name facts), we need to design more complex types of tests (scenario questions, for example), or utilize simulations or real-life performance assessments. Table 13.2 shows how types of objectives match to their purpose and assessment type.

Is the Jeopardy-type game in the *Introduction to Workplace Safety* course likely to measure performance of the listed objectives? No. Assessing whether a person can analyze and prevent common safety problems, for example, requires, at a minimum, scenarios to which the person can respond. Simulations, or real-life performance assessments (such as a checklist of observable

Table 13.2. Types of Objectives Versus Purpose and Assessment Type

Type of Objective	Purpose	Assessment Type
Declarative	Right answer	Test
Procedural		
Less complex	Right answer	Test or performance assessment
Procedural		
More complex	Overall measure of performance	Performance assessment

behaviors), would provide even more assurance that the learner has met the objective.

Not Valid (Enough)

It's easy to design less-than-optimal assessments, and we see examples of these all around us. These assessments tend to measure the wrong things, and their value is dubious or even harmful. At worst, they can damage learners and organizations.

The gold standard for assessment quality is validity. A valid assessment *measures what it claims to measure.* For example, a copier troubleshooting assessment should measure the skills of the person doing actual or simulated troubleshooting. It's easier than you might think to design assessments that measure something other than what you intended to measure. Let's say you wrote the copier troubleshooting assessment at too high a reading level. What is it measuring? For one thing, reading skills. Is that what the assessment designer wants to measure? Probably not. And think of the implications!

Valid assessments provide evidence that permit appropriate conclusions about whether the learner has achieved the objectives. The extent to which an assessment does this is the extent to which that information is *valid for the intended purpose.* For training assessments, establishing validity generally requires careful matching of job tasks, objectives, and assessment items.

Why should we care about having valid assessments? A major motivation is ethical concerns. If the instruction is important, and there are consequences for assessment results, it's unethical to have assessments that don't map to achievement of desired objectives. Adequate assessments help learners gain mastery, but inadequate assessments don't. That's simply unfair, and a waste of time and effort on everyone's part. Plus it's frustrating (or worse) to ask learners to show achievement in ways that don't matter. Moreover, if one uses assessments to make decisions about promotion, training, or other opportunities, invalid assessments are not only unethical but potentially illegal.

The higher the potential consequences, the more thought and effort are needed to assure assessment validity. If passing the assessment for the *Introduction to Workplace Safety* is a prerequisite to taking more advanced safety

courses, and completion of the *Safety Series* is part of each person's performance review, the validity of the assessment becomes very important indeed.

Poorly Written

Many assessments, even if they are the right kind, are poorly written. Two of the most common mistakes are confusing or ambiguous language, and implausible distractors (wrong alternatives from which the learner selects the correct answer(s)). A poorly written multiple-choice question automatically lowers the validity of the assessment.

Writing good performance assessments and test questions is a skill that takes training, time, and feedback. Consider the following multiple-choice question from an ethics course:

A vendor offers you two tickets to the World Series. Based on the rules listed in the Vendor Gift Policy, you cannot accept them:

A. Unless the tickets have no street value

B. If the vendor is expecting "quid pro quo"

C. If the gift is worth more than $25 or is considered to be an inducement

D. Unless the vendor is also a friend

E. None of the above

See any problems? Here are just a few: The language requires understanding of "quid pro quo" and "inducement" and includes confusing negatives. Distractor C has two answers in one distractor; D is obviously non-plausible; and E, "None of the above," is not recommended as a distractor choice. Overall, this is a very poorly written question. One of the things I commonly do before presenting assessment workshops is to review assessments used in that organization. In my experience, a great number of the multiple-choice questions I review are written poorly and at too low a level.

A Few Conclusions and Some Words of Advice

Designing adequate assessments is one the most critical tasks we do. Inadequate learning assessments are at best silly and frustrating. At worst, they

can damage people and organizations. Adequate learning assessments are one of the hallmarks of competence for building good instruction, and organizations sorely need competence. Adequate assessments markedly improve the quality of the instruction we build. The resources I've listed under "How to Get Started" can help you improve the quality of your assessments very quickly.

One of the reasons many people who design instruction do not have these skills is that many graduate-level programs don't include in-depth training on designing them. Train-the-trainer and instructional design courses often talk "about" assessments (declarative knowledge), but don't train people how to adequately design them (procedural knowledge). In addition, many people who design instruction assume that it doesn't require much effort, and this common-but-wrong thinking passes down from one person to another. In other words, this thinking suffers from many of the same flaws that many of our training designs do.

The final assessment for the *Introduction to Workplace Safety* course suffered from all of the mistakes listed, even though the design team was well intentioned and the rest of the course contained good content and activities. The team designed the assessment as an afterthought, determining what would be "fun," rather than what was needed to show that learners had achieved the objectives. Most of the listed (procedural) objectives mapped better to scenario-based multiple-choice or performance assessments, not simple (declarative) test assessments. Because the assessment did not map to critical objectives, it wasn't valid for the intended purposes, thus creating potentially unfavorable consequences for learners and the organization.

It's easy to make mistakes when designing learning assessments, but designing adequate learning assessments is a skill well worth learning. Consider what you need to improve your competence, including courses and books and tons of practice, until you can train others (they'll need it, and you'll benefit as well). It's critical to quality, and to the stakeholders of what we produce.

How to Get Started

e-Learning Centre. Library of resources for testing and assessment online, located at www.e-learningcentre.co.uk/eclipse/Resources/testing.htm

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Templates, Reusability, Future-Proofing, and the Technology Side of Rapid e-Learning

Kendrick Abell

Are you building today's e-learning with yesterday's approach to development? In an era when business demands speedy response, every e-learning producer must ask that question. Many of the best answers come from our colleagues in software development, and we would do well to adopt some of those methods. In this chapter, a seasoned developer discusses templates, "skinning," and future-proofing in terms of what they offer e-learning designers and developers.

IT COST A LOT of money to build CBT ten years ago, when I started in what was to become the e-learning industry. $50,000 an hour was the standard metric, and from there you would modify the cost based on factors such as the amount of video, quality of video, flexibility of navigation, tracking requirements, and number and complexity of interactions. Today, the standard cost is under $25,000, and that includes in-depth instructional design, complex interactions, non-linear navigation, and lots of high-quality media.

Ten years from now it will probably be closer to $10,000 for the same course, with better-quality media and more complex interactions, navigation, and tracking.

So what has changed in ten years?

Hardware has changed. I'm sure we could chalk technology advancements up for a large chunk of the cost savings. At the front end, thanks to better quality equipment at lower prices, everything a cash-strapped multimedia shop or department needs is easily within their reach.

During production, tasks that used to take days now take hours. I remember three people spending half a day running a full lab of computers non-stop to process the audio files for an hour-long course. Today, that same task takes a high school co-op student an hour on a single PC. One can now do, over lunch, 3D animations that used to render overnight, and compiling that thirty-second video clip is something you do while you get a cup of coffee.

Of course, the time savings don't stop there. Because the client has access to better hardware, we don't have to worry as much about using higher bit depths or complex compression algorithms. We can also design for 800×600 or 1024×768 resolutions, and know our audience won't need the latest technology (or a magnifying glass) to use our courseware.

Software has changed too. Better hardware has contributed to putting more powerful development tools into our hands. Ten years ago we could send text, pictures, and audio over a phone line. Now you say you want a 3D multi-user environment delivered in a browser? Hey, no problem. The hardware limitations no longer hold the software back.

Another major driver of progress has been a convergence of custom tools and modern programming languages and methodologies. It used to be that custom scripting languages were designed around a limited feature set the designers thought was important. While that is still somewhat true, they base the majority of products today on standardized scripting languages such as ECMAScript (JavaScript), which allow greater flexibility and portability, due to their more generic nature, as well as an easier transition for traditional programmers.

We—the producers—have changed. Yes, we too have evolved along with the software and hardware. As an industry we are more interested in defining

standards, re-using content, and generally being efficient in our work. We've also taken the advancements in our tools and leveraged them to create more with less. Some of this leverage has come from applying principles of software engineering and design to our courses and the engines that drive them.

Software Engineering and e-Learning

"Software Engineering and e-Learning" could have been the title of this chapter, but it lacked the buzzword appeal. It could also have deflected the attention of anyone who isn't a software engineer. Rest assured software engineers are not the target audience.

Now that I've allayed your fears, let's talk about software engineering. Take almost any application out there and you can divide it into three components. There is the interface, which is the toolbars you see above the application and the window that contains it. There is the data, which is the content itself, text, graphics, hyperlinks, and so on. And there is the logic: the component responsible for intelligently sharing data between the two.

If you were to open a software engineering textbook, you might find a diagram that looks like the one in Figure 14.1.

Now, let's talk about your static HTML e-learning course. Are all of those three-tier components identifiable? Sure they are. We still have navigation buttons, content, and communication between the two. The problem is that all of the layers are in the same place. (See Figure 14.2.)

Figure 14.1. Three-Tier Architecture

Figure 14.2. Three Tiers in One

The Basic Course

Assuming the most basic HTML course, we have:

- Statically linked pages. (Each individual page holds information pointing to next and previous pages.)
- Replicated interface. (A copy of the code for the global navigation and graphical layout is included on every page.)
- Static layout. (One must place every element on the page manually, including text, graphics, interactions, and navigation elements.)
- Duplication of content. (The content in the storyboard does not tie, in an automated way, to the contents of the course.)

This course is not easy to create. We must copy every page from the storyboard. The programmer must make layout decisions, screen by screen. We must update the navigation links on every page and thoroughly test each one when the course is finished. We must create interactions from scratch or copy them from existing code and then customize them.

This course is not easy for the subject-matter expert or instructional designer to update. Both the storyboard and the course require updates. Alternatively, we may throw the storyboard out once we have created the course, and it is then more difficult for reviewers to provide feedback on the course contents.

This course is not easy to update for the programmer. Adding or moving a page means updating the links on the next and previous pages as well. Changing global controls or adding new features requires, at best, a complicated search-and-replace operation, and at worst it requires manually editing each page.

This content is not reusable. If someone were building a different course and wanted to reuse a module, he or she would have to replace all of the hard-coded navigation and modify the layout in every page to match the look and feel of the new course. If the layout in the new course is different, and the content needs to be rearranged, then you basically must create each page from scratch.

Beyond the Basics

There is a lot one needs to do to turn this course into a full three-tier application, probably more than the average developer has time to even think about. Luckily, we can build up the final application over a number of courses by working in stages. This approach costs more in terms of overall work, since you don't have the easy development environment up-front, and you will probably also want to go back to early courses and update them once your engine is complete. On the positive side, time-to-market is better; because you don't have to wait to build the engine, you can keep the whole team busy, and you can spread the engine development cost over multiple courses.

Templates

A template is the separation of content and design elements. A cookie cutter is an example of a template. The cutter is the design element, and the cookie dough is the content. With regard to an e-learning course, a template can mean many different things, and you can apply it on many different levels.

Background and Positioning Templates

When moving from a static course, the first step, and probably the biggest up-front timesaver, is the "background and positioning" template. This means taking everything around your content and making sure there is a single copy of it. The simplest way to do this in an HTML course is to take a page, cut everything above the content, and paste it into a separate header file; then do the same with everything below the content for the footer. Now your content is in a file all to itself, and it can reference the header and footer files. Changes made to the header and footer files affect the course globally. This is now a two-tier application, since you have separated the data (content) from the interface and logic. (See Figure 14.3.)

Figure 14.3. HTML Course with Top and Bottom Visibly Partitioned

Data as Data

This is all fine, but there is still a significant amount of hard-coded information, dictating how the data should be displayed, stored in the page. The simple solution is to use styles with your content. This way, you can change the styles if you need to change layout, size, or color in the course. Unfortunately, this still doesn't give you full control, and it really only works well in HTML anyway.

The ideal solution is to completely abstract your data from all layout information. This is probably best and easiest to do in XML, but any data structure will work. The important thing is that you present the data as unbiased data. Metadata then provides context, which the engine interprets to decide where the text, images, and video go. Now if a particular client wants the picture at the top left of the page, video at the top right, and rubber duckies for bullet points, you can say, "OK, but it's going to take me at least fifteen minutes to reformat all of our courses!"

You can find a simple example of this in PowerPoint. You can change the background as well as the look and feel of the content by applying a new design template to your presentation. PowerPoint doesn't store, "Here is a block of 'Green 16-point Arial' text that says 'Hello World.'" PowerPoint stores "text 'Hello World' with 'heading 1 format'" and separately stores "style 'heading 1' is 'Green 16 point Arial'."

Interaction Templates

Another useful place to use templates is in interactions. One of the features introduced in Authorware 3 was the concept of models. A model allowed you to pre-build a component and then place it wherever and whenever you liked. Of course, this was basically copy-and-paste without the effort of finding and copying your example component, but it quickly brought to light the power of a template approach. You put in effort up-front to create a **perfect** working example of an interaction, and then you didn't have to build it every time you needed it. The emphasis on "perfect" is because, although I could create an interaction from scratch in not much more time than it took to customize the pasted version, oddly enough, the interactions customized from the

"model" rarely had errors or omissions. Interactions built from scratch were much more likely to come back to me for rework.

A few years later, Authorware added a much more powerful feature called "knowledge objects." These allowed you to not only paste a model, but to control the contents of the model through a step-by-step wizard interface. Now standard interactions were error-free **all** the time, and course creators never even saw the code behind them. The drawback was that creating the knowledge object was much more complicated than creating and manually editing the model.

There is another drawback to both approaches. The logic, interface, and data are all stored in the interaction. When the requirement came in for all multiple-choice questions to respond to keyboard shortcuts, you had to program in that functionality manually for each interaction. To avoid such problems, we again turn to the two-tier approach. Abstract the generation of the interaction to a global function, and not only can you modify the way every interaction in the course works with a single change, but you don't have to do more than cut and paste the interaction content to create it in the first place.

Communication Templates (APIs)

Another obvious "template" in the e-learning world would be the SCORM or AICC APIs. This is a communication template between course content and an LMS. Communication templates are what enable a three-tier approach.

I mentioned SCORM. It is hard not to at least bring it up these days when the subject is e-learning. My advice, contrary to popular opinion, would be to ignore it. Instead, I recommend being flexible.

Now I'm coming at this from the perspective of a custom content and off-the-shelf e-learning developer, so being flexible in terms of interoperability is very important for me. Why don't I use SCORM? Because none of my clients do! Of all the government, educational, and business clients, from small business to huge multi-nationals, I've only run into two who could actually accept SCORM content, and they both wanted hosted content instead, so they didn't have to deal with the process required to get a course into their centralized LMS.

In the multi-cultural world of today's LMS market, one system requires posting data to a hidden frame, the next uses a parameterized image load, and a third uses one of the AICC methods or some form of SCORM. In order to be flexible, you can't build the communication into your pages; it has to be a global function. The particular data your pages communicate has to go through your own API into your engine, which then knows how to deal with the particular environment it is running in. In my Flash delivery engine, a configuration XML file is included with the engine files. Changing one setting in this file is all that is required to get a new course running in an existing client's LMS or delivery environment. Yes, that comes in handy.

Now that's not to say that the work done by the AICC and the ADL initiative in building their standards should go to waste just because your client doesn't use their standards. There is nothing wrong with the data models and communication methods used. Using those same data models in your own engine will make adding SCORM and AICC support down the road that much easier.

"Cookie Cutter" Courseware

I am sure some of you didn't care for my cookie cutter analogy. We are building engaging learning material, something that challenges people and makes them think. A cookie cutter is the last thing we want to compare our courseware to. In order to avoid the repetitious feeling of the cookie cutter course, you don't need to make every screen different, you just have to be able to mix things up and stay open to new ideas. Solution: Use multiple background and layout templates. I generally use a layout or two for video, a few for pictures and animations, one for un-scored questions and interactions, and maybe one for scored questions if they are mixed into the course. Your particular requirements are likely different, but the best approach I've found is to start with the few obvious requirements, then look for opportunities to create new layout templates as you encounter different types of content or an excess of similar content that needs to be broken up visually.

The other important aspect, which I consider a must, is to allow static content. There are some things you just don't template, like subject-specific games or extremely complicated interactions. One of the early courses

I worked on had a "Click on the next joint to solder" interaction. There was no specific order, simply a rule that you didn't solder two adjacent joints and risk excessive heat buildup. If the last two joints were side-by-side, you had to wait two seconds before soldering the second one. I've never come across a similar interaction. If I were using my template system and I didn't allow static content, then that interaction, which to this day is one of my favorites, would have been written off and a multiple-choice question would have taken its place. One of your options should always be to include a file instead of building a page. The extra hassle when converting your course or moving platforms is worth providing creative freedom for your instructional designers.

Another Tier?

All this talk about software engineering and three-tier applications and I've only talked about splitting the content out. The next step, splitting the interface and business logic, is actually fairly easy at this point. Move the logic. Right now in our two-tier courseware, when you click on the forward arrow it knows where to go and takes you there. To make this a three-tier application, make the forward arrow ask the engine to move forward. Want to know whether you need to disable the forward arrow because we are at the last page? Get the engine to tell the forward arrow when it should be enabled.

Separating this functionality out creates a number of opportunities for us as developers. For starters, we have no longer specifically tied the development of the engine to the interface. We can send the interface to the graphics department for updates without worrying about them breaking something, and we can continue to work on the engine while modifying the interface.

The astute among you may have noticed a conundrum with separating interface and logic in interactions. Generating an interaction on the page is half look-and-feel and half logic. So where does the code go? Well, you do have the option of trying to separate the logic half from the display half, but this may be more effort than it is worth. In Flash, I put the generation on the display side, since different displays will use different font sizes, and so on. In an HTML environment, I would put the generation on the engine side and use CSS to control the layout from the design side.

The tradeoff is up-front complexity versus time saved down the road, and this isn't the only place you'll find this kind of issue. The solution is to make an educated guess as to which is more overall effort. If you aren't sure, implement it the easy way and decide later whether it would be better to put in the extra time. Another alternative is modularizing your components further. For instance, you can make the interaction generator a modular part of your interface. This way you would only update it when a particular interface was wildly different from another, and you could simply drop upgrades into existing courses, instead of upgrading every interface separately.

Reusability

We know the benefits of templates in terms of development effort and down-the-road updates, but reusability is where the real, but sometimes less obvious, benefits are to be seen.

"Skinning"

Everyone loves the personal touch. Jill's Big Digging Machines Ltd. wants a course on soil types, and you already have one you wrote for Joe's Flower Hut. Fantastic! This is how you make money! The problem is, Joe wanted a flowery look. Jill, on the other hand, probably doesn't. The advantage of having your logic separate from your interface means that they can both get what they want, and you have to make only one course, maintain one engine, and build them each their own interface, or "skin." If you upgrade the engine later on, you can pass that upgrade on without having to worry about redoing each interface.

The concept of skinning has wide reach. In many entertainment applications "skins," applied on a user-by-user basis, can make the interface more appealing to the individual. There's no reason one can't do this in e-learning, and although I haven't implemented it myself yet, I've certainly heard it requested.

Interoperability

One of the mandates of the ADL initiative is interoperability. Vast repositories of content are being created from which one can simply "pluck" a learning object (LO) here and a LO there and create a finished course. Of course,

in reality, it doesn't really work that way. Each learning object has its own color scheme, keyboard shortcuts, levels of accessibility, optimal screen size, fonts, point sizes, and so on. Put a bunch of objects from different vendors together and it is definitely a learning "experience."

Our three-tier content abstraction helps immensely in this area. If a client has your collection of learning objects and wants to use them in their course, they first edit your interface component to match their existing course. After that, the engine instantly formats any object they pull in the way they want. Think about it: that's pretty cool!

Future-Proofing

Future-proofing and reusability are basically the same thing. It's great when you can reuse stuff next week, but when you can use it ten years from now, it's even better.

Accessibility

This is a current issue for lots of us, but it could also be a future issue for a course for which you did not think it would be required. My company had to turn down a contract years ago because our course on visual inspection of solder joints wasn't fully accessible to the blind—you just never know. Even if your content is accessible now, standards evolve. With abstracted data, you have full control over the accessible components of your course. A single change to bring all of your courses up to the latest standards is a powerful thing.

The Future Is "M"

m-Learning is the next big thing, or at least that's what I've heard. I'm not ready to buy that line quite yet, because I despise low-resolution displays and am rarely five meters from my computer anyway. Then again, I'm probably not the target market. The point is that m-learning could be in your courseware's future. If you separate the engine and interface from your course content, then your entire library of courses could be available on a PDA near you with a lot less work than you might think.

Expert Systems and Intelligent Tutors

What I consider to be the future of e-learning, and this may just be the geek in me, is not the delivery platform, but the underlying method that provides the right information at the right time. Expert systems and intelligent tutoring systems do just that, but they are complicated pieces of technology and require a lot of invested time and information before they are able to function properly. What they need is data, and at some point one source of that data could be existing courseware. Having the data separated from the content makes it much easier for the system to extract it. Having contextual information with the data may make it easier for the system to understand it. This also brings to light the importance of metadata. Think about what you might want to know about the content if you were peering at it from a distance or trying to place it in a larger hierarchy of knowledge. This will immediately help people with content reuse in a repository environment, but may also eventually help computers to understand your content as well. This is once again an excellent place to look to the SCORM for inspiration.

Return on Investment and Rapid e-Learning

Thus far, I've said nothing about doing things fast; it has all been about consuming time before course development even begins in order to eventually save time after the course is finished. The biggest business driver is what generates the most money right now.

Return on Investment

Everything I've described in this chapter should take your average programmer about one to one-and-a-half months after all of the feature creep, de-bugging, and so on, is finished. That's probably a week of design, two weeks of programming, and one to three weeks of working out the bugs and adding features. That's effort, not elapsed time. Figure out what that costs you.

Now figure that it takes almost zero programming time to create every standard course you develop from now on.

How long until you save money?

Now that's a rather quick and exaggerated example, but the point is that you have to consider the aggregate cost savings and benefits. Not only are you spending less time creating a course, but your experienced developers are now free to concentrate their efforts on more elaborate interactions or more complicated and lucrative contracts. The process of putting the course together can now be delegated to junior developers or, if you can find good ones, trained monkeys.

If you want to skip the course creation altogether, you can work in a system that exports to a viable XML format and simply drop that in the directory and call it a course. This is what Doug Wallace and Anthony Levinson were talking about in Chapter 4.

Rapid e-Learning

Scripting a course, putting some media with it, and sending it off to the client: that is my definition of rapid e-learning. No programming, no extensive QA, nothing else required. Everything that PowerPoint can offer you in terms of speed, and most of what custom development can offer you in terms of creative flexibility and interactivity—all of this directly in the hands of the instructional designer, who knows that when time is of the essence he is limited only by what he has done before.

Fast, cheap, and good—on the technology side, we can deliver!

Existing Tools

I am not aware of a single integrated tool that does all I just described, but collectively at least 85 percent of it is implemented and available for purchase as a number of separate components. I have run into at least one e-learning IDE (Integrated Development Environment) that exports XML as well as providing e-learning-specific workflow tools, course previews, and issue tracking capabilities. Couple that with a delivery environment that runs off XML, for which I know about at least one available and inexpensive option, and you are off and running. The tradeoff of third-party tools is complexity versus required features and future customizability, but they generally get you up and running cheaper and cost less to maintain than a homegrown solution.

Drawbacks

Yes, there are drawbacks to this approach; however I wouldn't be writing this chapter if I didn't think the benefits outweighed them.

LMS Compatibility

Your courses will work in everyone's LMS, but they will not always work as well as you would like.

One of the original requirements of our off-the-shelf courses was for trainees to interact with the course when hidden content was available through the interaction. This means you must disable the forward arrow until they have completed the activity. This is not a standard function in every LMS, and in some implementations it isn't possible to meet this requirement because the LMS provides the navigation and you don't have the option to change that.

Another issue, this one with an LCMS, was that because the LCMS provided the navigation, you had to provide a separate entry point for each page of your content. Passing a different page variable to the same main file was not an option because the LCMS wanted you to browse for the HTML, Flash, or document file. To make matters worse, the LCMS stored every LO in a separate folder, no matter how you wanted your course structured. This meant you had to replicate the engine and content for every objective in the course. This worked, but now if you wanted to change the look of the course you still had to copy the interface for every single LO. This was actually partially a limitation imposed because the SCORM didn't allow for a shared file dependency between LOs, or at least didn't require implementation of it.

As a general rule, your content will work best in your own delivery engine and will lose some functionality on other engines. Portability of client-side technologies like JavaScript and Flash will also generally be easier than server-side technologies like .NET. For this reason I built my main delivery engine entirely in Flash, but you may have constraints that force you to take a non-plug-in route.

Complexity and True Abstraction

I mentioned the difficulty of building your interaction generator, since it has components of both logic and display. Unfortunately, the more you add to

your engine, the more complex it becomes, the more issues you run into, and the more compromises you have to make. That is life in the software development world, but for a pure multimedia shop, it may become more complex than your developers can easily deal with. Two viable options for solving this, if you don't have the expertise in-house, are outsourcing development or using off-the-shelf tools. Adherence to object-oriented (OO) principles and a formalized event model are a must for complex intercommunications.

Cost

Money is an issue. Time is an issue. Implementing a template-based delivery engine will cost you both, whether you develop it in-house or use third-party tools. Slowly working toward this goal may be more attainable than building it all in one pass, and it will allow you to put the time savings from the first steps toward taking the next ones.

Conclusion

An industrial designer once told me that the job of the engineer was to always document your job function so you will be easy to replace, and continually automate and simplify your job function until you are no longer necessary. The automation and simplification of standard page-based e-learning almost completely removes the need for programming support during course development. This frees your programming resources for more useful tasks, such as porting your courses to a mobile platform, building more advanced tools, or creating workflow enhancements to support your processes in other areas.

I have only covered one part of the development process here. Ten years ago programming was probably only a third of our development cost, and that ratio has steadily decreased as the developers became more proficient and we built up a number of pre-programmed components. One could certainly argue that the week it takes to turn a storyboard into a course (without the fancy delivery engine) is insignificant compared to the three weeks or more it takes to research, consult, design, and review the storyboard or, depending on the course, the many weeks it may take to create the graphical elements. While the technical side is certainly the easy part of the average course, it is also the low hanging

fruit. We can probably gain in other areas as well, and I hope that others who read this chapter will tackle these difficult subjects.

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Since 1995, Kendrick has been the driving force behind several CBT/ e-learning initiatives for companies such as Sentient Media, Newbridge Networks, Learnsoft, Rovell, ABC e-Learning, and Automated Learning. As the architect and programming manager behind several successful programs, he has considerable knowledge of the tools and methodologies used in the creation of interactive learning content and learning engine and database design. Driven to create groundbreaking programs that excite and engage learners, he is not only a software engineer fluent in multiple programming languages, but also a multimedia specialist who enjoys working with audio, graphics, and 3D models.

An avid gamer, he also spends his free time rock climbing and teaching ballroom dance. You can contact Kendrick at kabell@automatedlearning.com

15

A Team of One

RAPID e-LEARNING ENVIRONMENT AT BREAK-NECK SPEED

Stephanie R. Sanford

Producing e-learning is a challenge, even with a complete team of writers, artists, developers, and instructional designers. But what if one person has to fill all those roles—and more? Many professionals have found themselves in this situation and wondered whether they were doing the job right, and whether there might be a better way. In this chapter the author shares the insights and lessons learned that one solo developer acquired during her first year in our field. Read this gold mine of ideas about rapid e-learning development under the most trying of circumstances!

WAS SO EXCITED! I had just arrived at my first conference with America's Second Harvest—The Nation's Food Bank Network. I had not officially started working there. However, my manager thought it would be a good experience for me to attend the conference anyway, and of course it would only help. The session had already started as I was taking my seat. They were discussing online courses, their availability through the Internet, and what a wonderful means of e-learning this would turn out to be. It was

a new venture, and you could feel the excitement about the technology the company was about to launch.

The speaker kept referring to the online learning specialist, the OLL, the person who would be heading up the project and all that was involved. I couldn't help but feel sorry for this poor guy. He had his work cut out for him. The list of duties just snowballed. All I could think was, "Whoa! This is huge. Where do you begin? What do you need to do?" The list was endless, and the tasks ahead were daunting. I just shook my head.

Again and again I kept hearing that the new OLL specialist will have to do this and have to do that, and so on and so on. I must have sat there looking hopelessly naïve. A few minutes later the manager of technology sat next to me and said rather matter-of-factly, "You know they're talking about you, right?"

I smiled one of those smiles that started with, "Oh, really," and ended up with, "God help me now." A daunting task indeed since I now knew that I would be the project manager, writer, business analyst, liaison between vendor and users, and whatever else might fall into the numerous hats I would be wearing, I was the e-learning team—a team of one.

The good news—they had already purchased the software that I would need. The bad news—I had no experience with any of it. However, I had used similar software before and managed to create something relatively decent. So, not to worry, I had a whopping two months to learn RoboDemo (for screen captures and movies—RoboDemo is now Adobe® Captivate®; see www.adobe.com.), ReadyGo® (www.readygo.com) (authoring), and Isoph™ (www.isoph.com) (the learning management system, or LMS). Oh, did I say I had two months to learn the software? Correction—I had two months to learn the software, edit the courses in ReadyGo, create the screen captures and a video in RoboDemo, and upload the updated courses to the Isoph server.

You Need a Plan, Stan

The plan was quite simple—just do it! Anyway, it was not as if they hadn't mentioned this during the interview process. I distinctly remember my response, "No, I haven't used that software before, but anything can be learned." So, it was me and tech support. Tech support and me. Thank God for the kindness of strangers, and also that I didn't have to see the faces they would make when

I asked my stupid questions. But I was cool. I pretended that it didn't matter, and to be perfectly frank with you, it really didn't. There were far greater things I had to do than be caught up in feelings. (It took a Myers-Briggs test to reveal that I didn't actually have any feelings. But that's another story.)

Rapid e-Learning

Now, after dealing with all that, I'm realizing I don't have a lot of time to sit around and contemplate the future of electronic learning. But I have to kick it up a notch and make it rapid e-learning. According to Jennifer DeVries, the following criteria define rapid e-learning:

- Courseware can be developed in less than three weeks.
- Subject-matter experts (SMEs) act as the primary development resource.
- A well-known tool (such as, PowerPoint) or user-friendly templates form the starting point for courseware.
- Simple assessment, feedback, and tracking are usually provided.
- Media elements that enhance learning but do not create technology barriers may be included (such as, voice).
- Learning modules can be taken in one hour or less, often in less than thirty minutes.
- Synchronous (scheduled or live) and asynchronous (self-paced) models may be used.

My circumstances most definitely met all of the above criteria. I would even venture to add a few more, but since I am relatively new to the game, what DeVries stated raps golden to me.

Isoph First I decided to focus on the learning management system—Isoph. This is where everything ends up. I thought I should at least get a feel for creating the pages, setting up the links, pulling in the graphics, and uploading the files. I needed some trial-and-error time. Fortunately, my manager and the technology manager had worked diligently to choose the LMS that would be best for our situation. We are a non-profit organization, and it is best to spend our monies on our mission, which is to feed the nation's food insecure—those whose

access to enough food is limited by a lack of money and other resources. Our contract with Isoph included training, one-on-one, phone-to-phone. This actually worked well because I did not hesitate to pick up the phone when I needed additional assistance. That's a major point: Persistence must be part of your makeup. (See Sidebar 15.1.)

SIDEBAR 15.1: ISOPH TIP

While you are in Isoph save early and save often. The system times you out if it perceives you as being idle. This can be very ugly. It was only at these times that moments of genius would occur.

If you are new to technical or instructional writing, here's an important concept: ask early and ask often—meaning as often as it takes for you to get it. Feel foolish? Tough. Get over it. You have a deadline, and your precious ego has to take a back seat.

After spending more than fifteen years in the technical writing field, I still recall leaving my feelings in a project manager's office. There was so much red ink on my draft, I thought he was bleeding. To top it off, he told me I did a great job. Of course, this was while I was looking on the floor of his office for my feelings.

No, Not Ready or Not, Ready Go I muddled through Isoph and had a clue. That's all the luxury I had at this point, and then it was time to tackle the authoring software, ReadyGo. The blessing was that it was there for the using. Again, tech support is your friend. Remember there are no stupid questions, only stupid people who forgot when they were on the learning end of something totally new and foreign. Fortunately, the tech support staffs for both Isoph and ReadyGo were very responsive, even when I had to ask the same question at least three times.

I recall when I was working for a global software company and I was trying to learn about a system for which I was creating online help. English was a second language for the developer and he had not been in this country

very long—not to mention that I just was not getting it. After having to go back for a third explanation for a specific piece, my approach was to take full responsibility for the breakdown in the teaching/learning process. He knew what he was doing and he had almost finished it. I had to get that information and convey it to others. Remember, I had lost my feelings in another office some years before. I went over to him with the biggest, widest grin I could muster and said, "Hey, I am just stupid. I am not getting this, and I'm going to have to keep coming over here until I get it right in my head." He appreciated my candor, and the fourth time was more fluid for both of us.

One of the reasons they chose ReadyGo for the authoring software was because the author doesn't have to know HTML to use it. My knowledge of HTML is to Google it for the thing I am trying to do and simply copy the code. If that sounds crazy, there I am. I learned that ReadyGo was pretty easy to use. It took a while for me to figure this out. (See Sidebar 15.2.)

After working on about twenty courses, it has come to me now. I was feeling very pleased with myself, as I had tackled two of the three pieces of software and managed to keep my job during this time. But smugness is always short-lived in my brain, and for good reason.

Rolling the Video with RoboDemo I had figured out enough about Isoph to get a few pages up and running, and managed to get the links right too. ReadyGo became easier to work with as I trudged through the courses. But my deadline was pending and I needed screen shots and a movie for my courses. My logic for tackling RoboDemo last was quite basic.

What do I need to do to get the courses up and running? First, Isoph. I had to have a command of the LMS, because that's where the user goes

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SIDEBAR 15.2: READYGO TIP

ReadyGo has a simple way for you to insert web links. However, you may want your e-learners to click a word in the body of the text and open a web page in a separate browser. To do this, you need to insert Page Name

first. Once that was accomplished I tackled ReadyGo to make sure I knew how to create and edit the courses to be uploaded to Isoph. The final tool to tackle had to be RoboDemo. And the reason was that, if push came to shove, everything would be in place. It would merely lack the bells and whistles. Never mind that these were some pretty significant bells and whistles. Nonetheless, I had something to show the Powers-That-Be in a pinch.

However, this is where impressions are most lasting. The Powers-That-Be are usually impressed with the bells and whistles the most because they are what really catches their eye in the presentation of what you have accomplished thus far. You can have web page upon web page and course on top of course. If it ain't pretty, if it doesn't reach out and grab—BAM! You're done, son.

Therefore, RoboDemo was necessary. So I spent quite a bit of time creating and destroying videos. It wasn't that the software intimidated me, I had used a similar product before. Nonetheless, the final phase of pulling it all together before D-Day, which was fast approaching, probably dropped my learning curve down a notch or two.

I remember that the start was quite tedious as I tried to create a smoother transition from screen to screen. And as luck would have it, this did not get any simpler for me the second time around. You have to play around with the features too: figuring the right position for the screen captures, positioning the callouts, and making sure they display at the right time. Also, you have to consider what would be the best display setting for all your users. As I mentioned, a diverse group of people all over the nation will access these courses, and some may have limited technology. After all, we are in the not-for-profit business. Plain and simple, "You gotta work with what you got." So it's important that one of the first things your users see is what the system requirements are. And even if you post it front and center, there may still be questions about it.

Whether It's SNAFU or SNIFU

There are always bugs and glitches, whether it's the software, the hardware, or you just trying to get there. The SNAFU (Situation Normal All Fouled Up)

is a given. Don't panic. These things happen. The main thing is that once you realize there is a problem, whether it's the software, the hardware, or your ware, address it right away. Inform all concerned, because you do not want to miss a deadline that still may be attainable (in which case the situation becomes SNIFU: Situation Normal **I** Fouled Up). And, if it isn't attainable, make sure you covered everything you needed to cover and presented this information to whomever it is you report to. If you have to take one on the chin, so be it. Rub it and move on.

To Beta or Not to Beta

Okay, we have the site up and running and a few courses under our wings. Now take it to the beta testers. Yes, you need to let someone go in there and find everything that needs fixing, and believe me when I tell you there will be some fixing going on—more than you care to imagine. And this does not just cover what you as the writer or project manager overlooked, but there will also be glitches in how your software flows from one tool to the next. It's best that you encounter and address these issues with a select few rather than with ten or twenty people coming at you with the same problem. It would be most helpful to beta test to a diverse group with various modes of learning ability.

Also, include your SMEs in the beta testing. Make sure they like the way you've presented their material because it flows differently than it does on paper. They may have additional changes based on the format of the online course. The transition from page to page within a course gives them a different perspective, and changes *will* be forthcoming. Your relationship with your SMEs is crucial. They know what they want to say and how they want to say it. There's no need to go edit crazy. Those of us with technical writing experience were trained to do things by the book, but sometimes you just have to close the book and have an open mind. Remember, customer satisfaction may often take precedence.

One course that we used from the LMS I thought was great. The graphics and sound were far superior to what I was able to present. However, one of the users found it too overwhelming. She said it was just too busy for her taste.

Mind you, there is no pleasing everyone. But you need to consider a core group of users with different learning styles. This may not be easy to achieve if you are part of a small group with only limited access to your users. I have been there and know what that's like. Remember the famous line, "You guys start coding and I'll go and find out what the customer wants." If at all possible, try to poll the users in advance to see what would best fit their needs. They may not always know, but at least find out what they do know.

The key is to have another set of eyes look at what you produced to minimize any problems that you can correct up-front. They can be anything from typos, misconceptions, or links not working properly to text not flowing—and the list may be endless. You want to tweak it before the masses get hold of it.

When you come up with your core group of testers, supply them with the means to test. Don't let them comment willy-nilly. Well, you won't be able to stop that, but provide them with focus points as well as access, navigation, and any general tips that will be helpful. At least include the following:

- How to access the courses
- How to navigate through the courses
- What to look for in the courses:
    - Typos/Usage—Misspelled words, words used incorrectly, sentence structure, and so on
    - Content—The subject matter and how it is conveyed
    - Flow—How the course flows from the beginning through the course summary
    - Graphics—Do the graphics reflect the content? Are there enough graphics? Too many?
    - Tests—Do they cover the content? Should they be easier or more difficult?
    - Homework assignments (if applicable)—Does the course provide the appropriate amount of material to complete the assignment?

Do not dismiss any of your beta testers' suggestions. There were some suggestions that did not immediately strike my fancy. However, after

some thought, and a great deal of persistence on their part, I succumbed and could see the benefit.

That was in September of 2004. One year later, with the site up and running, there were twenty-six courses available, twenty-two additional courses available through a link to another site, and more on the burners. With awesome help from some very determined users, I was able to create three levels of courses that garner certification. The first level of courses is the prerequisite for the second level, and of course, the second level is the prerequisite for the third level. At this point, you are at the master level, which will become visible to the industry through additional efforts by way of certificates and awards.

This Little Piggy Went to Market

So, I'm feeling kind of proud of myself, thinking I was able to pretty much meet my deadlines, having learned three new types of software, and having quite a few courses completed. But as I took a sigh of relief, counting my blessings, my manager says, "How do you plan to market ACORN (America's Second Harvest Online Resource for the Network)?"

And there was this low echo that said, "How do I plan to market ACORN?" Now there's a goal I had not considered. After all, I deal with the written word. I am a writer. I produce courses. I work with software. I do tech support. I don't do marketing. There's no marketing in e-learning—or so I thought. "Waaaaaah!!!!!" Another new hat for my head. BAM! Congratulations! You are now at the next level.

Just because you build it, does not mean they will come. After getting the site up and running, I am in the process of trying to get the users to beat a path to the website to take those courses. So now I am a salesperson. I created flyers; I hawked my product at conferences and workshops. I baked ACORN cookies. Yes, I kid you not. I bought ACORN cookie cutters to make cookies with. They were a hit, but baking is not my forte. And America's Second Harvest—The Nation's Food Bank Network has over two hundred food banks and many, many agencies and programs included in that network. Now, that's a whole lot of cookies!

It's time to broaden the plan. Talk to the folks who've been where you've been and who have excelled. That was the message from my manager—and it was very sound indeed. I talked to one of our resident sales people whose program is doing quite well. Some basic rules to assist you in your course development, delivery, and marketing strategy are:

1. You must make your product visible.

2. Make plenty of calls and then follow up with more calls.

3. Know who your target audience is (those who stand to benefit the most from your courses) and market, market, market.

4. Market your product in every feasible way that you can. (Be tasteful because it can be overdone. You don't want them to hate to see you coming.)

5. Find ways to drive people to your site (for example,, put a link wherever possible in such places as newsletters, intranet sites, and return email closings).

6. I haven't tried this one yet, but I plan to do webinars on navigating to the site and addressing any concerns and/or difficulties users may have.

7. Add other viable resources to the site so that users will get in the habit of going there (such as documents and templates users may need, which will always be the most current).

8. Contact human resources and other departments within your organization to see how your site can benefit them.

9. (I'm adding this one even though it may seem like common sense.) Broaden your shoulders. You may not appreciate all of the criticisms and questions as you provide support and market your product. However, you must deal with it. This is where you truly learn. You want to hear everything that people are saying because that will only help you to make your courses better.

Summary

Having said all that, I will endeavor to turn ACORN into a mighty OAAK (Optimum Access to A2H Knowledge). Sometimes, as we set out to accomplish a task, we forget where we are because we are too caught up in what we are doing. Therefore, you need to plant some little seeds so you not only know where you've been, but so you can see where you need to grow.

Reference

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Stephanie R. Sanford is an online learning specialist for America's Second Harvest—The Nation's Food Bank Network. She also has a background in technical writing, training, and instructional design. She is currently pursuing an online teaching certificate.

Stephanie decided to write the original article on which her chapter is based to reflect on her first year as she struggled to develop her organization's online learning project. The project was new and so was she. Considering the challenges she faced and the vast intricacies of playing many instruments in a one-woman band, she wanted to share her experience with others to provide encouragement and humor in a fast-moving, far-reaching industry.

Stephanie has also published a novel, *Hope.* She is married and has three sons and four grandchildren. Her spare time is filled with fitness (spiritual, physical, and emotional), reading, writing, and puzzles. She resides in a suburb of Chicago.

Facilitating Skill and Knowledge Transfer

16

Six Principles of Effective e-Learning

WHAT WORKS AND WHY

Ruth Clark

> To readily identify effective e-learning, we need fewer end-user and expert opinions and more data. Decisions about e-learning courseware must begin with an understanding of how the mind works during learning and of what research tells us about the factors that lead to learning. Here are the six principles that have emerged from controlled experiments in how to best use multimedia to optimize learning.

TAKE ANY E-LESSON—show it to five people and ask them what they think. My bet is you will hear five different opinions about the quality of the courseware. But wait! What if the five reviewers are educational "experts"—specialists with advanced degrees in training and education? Now you might expect a greater consensus. Based on my experience over the past three years reviewing courses with experts, I predict a little more agreement; but it's not likely to be anything close to a consensus.

Unlike classroom training, e-learning is very visible. While much of the classroom experience is packaged in the instructor, and in fact varies

from class to class, you can easily see and hear all elements of e-learning. Everything from screen color to content accuracy to the types of practices is readily available for scrutiny. I believe that this high visibility will prove to be a good thing. With this much more accessible instructional environment, we will be able to more readily identify effective and ineffective training. But to do so, we have to move beyond a reliance on end-user (or even expert) opinions. After a year of work on a commission tasked to identify the qualities of effective e-learning, and hearing a great deal of (often contradictory) views, I decided I needed fewer opinions and more data.

Decisions about e-learning courseware must begin with an understanding of how the mind works during learning and of what research data tell us about what factors lead to learning. This is where decisions must begin. Naturally, factors other than psychological effectiveness come into play in your multi-media learning decisions. For example, instructional strategies will be shaped by parameters of the technology, such as bandwidth and hardware, and by environmental factors such as budget, time, and organizational culture.

What Is e-Learning?

Since we use the term e-learning inconsistently, let's start with a basic definition. For the purposes of this discussion, e-learning is content and instructional methods delivered on a computer (whether on CD-ROM, the Internet, or an intranet), and designed to build knowledge and skills related to individual or organizational goals. This definition addresses:

- **The what:** training delivered in digital form,

- **The how:** content and instructional methods to help learn the content, and

- **The why:** to improve organizational performance by building job-relevant knowledge and skills in workers.

In this chapter, I draw the main focus and examples from business self-study courseware that may include synchronous or asynchronous communication options. For example, the screen in Figure 16.1 is part of a web-delivered course designed to teach the use of software called

Figure 16.1. Practice Exercise from an e-Lesson on Dreamweaver

With permission from Element K

Dreamweaver to create web pages. The main content is the steps needed to perform this particular task with Dreamweaver. The instructional methods include a demonstration of how to perform the steps along with an opportunity to practice and obtain feedback on your accuracy.

There is a distinction among three important elements of an e-lesson: the instructional methods, the instructional media, and media elements. In spite of optimistic projections of the positive impact of technology on learning, the reality has not lived up to expectations. From film to the Internet, each new wave of technology has stimulated prospects of revolutions in learning. But research comparing learning from one medium such as the classroom with another medium such as the Internet generally fails to demonstrate significant advantages for any particular technology. These repeated failures lead us to abandon a technology-centered approach to learning in favor of a learner-centered approach. Having participated in many poor training sessions in the classroom and on the computer, we recognize that it's not the

medium that causes learning. Rather it is the design of the lesson itself and the best use of instructional methods that make the difference. A learner-centered approach suggests that we design lessons that accommodate human learning processes, regardless of the media involved.

Instructional methods are the techniques used to help learners process new information in ways that lead to learning. Instructional methods include the use of techniques such as examples, practice exercises, simulations, and analogies.

Instructional media are the delivery agents that contain the content and the instructional methods, including computers, workbooks, and even instructors. Not all media can carry all instructional methods with equal effectiveness. For each new technology that appears on the scene, we typically start by treating it like older media with which we are familiar. For example, much early web-based training looked a lot like books—mostly using text on a screen to communicate content. As the technology behind a given medium matures, we become better at exploiting the features unique to that medium for learning.

A third component of multimedia learning is the *media elements*. The media elements refer to the text, graphics, and audio used to present content and instructional methods. For example, in the Dreamweaver screen shown in Figure 16.1, the content is the steps needed to perform the particular task that is the focus of this lesson. The instructional methods include a demonstration and simulation practice with feedback. The media elements include a graphic of the screen and (during the demonstration) audio narration that explains the steps seen in the animation.

For the past ten years, Richard Mayer and his colleagues at the University of California at Santa Barbara have conducted a series of controlled experiments on how to best use audio, text, and graphics to optimize learning in multimedia. We can define six media element principles based on Mayer's work. What follows is a summary of these principles, along with supporting examples, psychological rationale, and research. Use this information as guidelines regarding the benefits of graphics, the placement of text and graphics on the screen, and the best way to present words that describe graphics, among others.

The Multimedia Principle: Adding Graphics to Words Can Improve Learning

By graphics we refer to a variety of illustrations, including still graphics such as line drawings, charts, and photographs and motion graphics such as animation and video. Research has shown that graphics can improve learning. The trick is to use illustrations that are congruent with the instructional message. Images added for entertainment or dramatic values not only don't improve learning but they can actually *depress* learning (see the coherence principle below).

The Research

Mayer compared learning about various mechanical and scientific processes, including how a bicycle pump works and how lightning forms, from lessons that used words alone or used words and pictures (including still graphics and animations). In most cases he found much improved understanding when pictures were included. In fact, he found an average gain of 89 percent on transfer tests from learners who studied lessons with text and graphics, compared with learners whose lessons were limited to text alone. Therefore, we have empirical support that should discourage the use of screens and screens of text as an effective learning environment. However, not all pictures are equally effective. We will need more principles to see how to best make use of visuals to promote learning.

The Psychology

Learning occurs by the encoding of new information in permanent memory called long-term memory. According to a theory called "dual encoding," content communicated with text and graphics sends two codes—a verbal code and a visual code. Learning increases by having two opportunities for encoding into long-term memory.

The Application

While graphics can boost learning, it will be important to select the kind of graphic that is congruent with the text and with the learning goal. As I'll

discuss below, graphics that are irrelevant or gratuitous actually depress learning. Consider selecting your graphics based on the type of content you are teaching. Table 16.1 summarizes some graphics that work well to illustrate five key content types: facts, concepts, processes, procedures, and principles. You can effectively illustrate processes, for example, by animations or by still graphics that show change through arrows. Figure 16.2 shows an effective illustration of a process in e-learning.

The Contiguity Principle: Placing Text Near Graphics Improves Learning

Contiguity refers to the alignment of graphics and text on the screen. Often in e-learning when a scrolling screen is used, we place the words at the top and the illustration under the words so that when you see the text you can't see the graphic and vice versa. This is a common violation of the contiguity

Table 16.1. Graphics to Support Content Types

Content Type	Graphics Support	Example
Fact	Realistic illustrations of specific forms, screens, equipment	Illustration of software screen
Concept	Realistic illustrations of multiple examples of the concept	Pictures of good web pages to illustrate concept of what is a good web page
Process	Animated diagrams illustrating stages of process	Activities in a computer network
Procedure	Video or animated demonstrations of near-transfer task being performed	Animation of how to use a software application
Principle	Video or diagrams of far transfer tasks being performed	Video of effective sales closing techniques

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Figure 16.2. e-Learning Illustrating a Biological Process

principle, which states that we should place graphics and the text related to the graphics close to each other on the screen.

The Research

Mayer compared learning about the science topics described above in versions that placed text separate from the visuals with versions that integrated text on the screen near the visuals. The visuals and text were identical in both versions. He found that the integrated versions were more effective. In five out of five studies, learning from screens that integrated words near the visuals yielded an average improvement of 68 percent.

The Psychology

Learning occurs in humans by way of working memory, which is the active part of our memory system. You have probably heard of "seven plus or minus two." This refers to the severe limits placed on working memory. Working

memory is not very efficient, and can only hold seven (plus or minus two) facts or items at a time.

Since we need working memory capacity for learning to occur, when working memory becomes overloaded, learning is depressed. If words and the visuals they describe are separate from each other, the learner has to expend extra cognitive resources to integrate them. In contrast, materials in which the words and graphics are contiguous does the integration for the learner. Therefore the learner is free to spend those scarce cognitive resources on learning.

The Application

As mentioned above, scrolling screens sometimes violate the contiguity principle by separating text and related visuals. But it is not the scrolling screen itself that is to blame. One way to use scrolling screens effectively is to embed smaller graphics on the screen with related text close by. For example, Figure 16.3 shows a screen from my online design course. You can see that we reduced the visual in size and placed it on the screen near the text.

Figure 16.3. An Example of Application of the Contiguity Principle

The Modality Principle: Explaining Graphics with Audio Improves Learning

If you have the technical capabilities to use other modalities such as audio, it can substantially improve learning outcomes. This is especially true of audio narration of an animation or a complex visual in a topic that is relatively complex and unfamiliar to the learner.

The Research

Mayer compared learning from two e-learning versions that explained graphics with exactly the same words—only the modality was changed. Thus he compared learning from versions that explained animations with words in text with versions that explained animations with words in audio. In all comparisons, the narrated versions yielded better learning with an average improvement of 80 percent.

The Psychology

As described under the contiguity principle, working memory is a limited resource that we must preserve for learning purposes. Cognitive psychologists have learned that working memory has two sub-storage areas—one for visual information and one for phonetic information. One way to stretch the capacity of working memory is to utilize both of these storage areas. Figure 16.4 illustrates how the use of graphics, which enter visual memory, and audio, which enters phonetic memory, maximize working memory capacity.

Figure 16.4. Visual and Supporting Auditory Information Maximize Working Memory Resources

The Application

You should use audio in situations in which overload is likely. For example, if you are watching an animated demonstration of maybe five or six steps to use a software application, you should focus your visual resources on the animation. If you have to read text and at the same time watch the animation, overload is more likely than when you can hear the animation narrated.

This does not mean that you should never use text. For example, some information in e-learning, such as directions to an exercise, has to be available to the learner over a longer period of time. And present in text any words needed as reference. Also, when using audio to explain an animation, a replay option should be available for learners to hear the explanation again.

The Redundancy Principle: Explaining Graphics with Audio and Redundant Text Can Hurt Learning

Some e-lessons provide words in text and in audio that reads the text. This might seem like a good way to present information in several formats—and thus improve learning. Controlled research, however, indicates that learning is actually depressed when we use a combination of text and narration that reads the text to explain a graphic.

The Research

In studies conducted by Mayer and by others, researchers have found that better transfer learning is realized when graphics are explained by audio alone, rather than by audio and text. Mayer found similar results in two studies for an average gain of 79 percent.

There are exceptions to the redundancy principle, as recently reported by Moreno and Mayer. In a comparison of a scientific explanation presented with narration alone and with narration and text, learning was significantly better under conditions that included both narration and text.

The researchers conclude that, "An effective technique to promote broader learning with multimedia explanations is to use the auditory and visual modalities simultaneously for verbal information if no other visual material is

presented concurrently." Therefore, there will be limited situations in which narration of on-screen text could be helpful to learning, such as when there is no graphic on the screen or when readers lack good reading skills.

The Psychology

As illustrated in Figure 16.5, overload of the visual and auditory components of working memory occurs if both text (which enters the visual center) and narration explain an on-screen graphic. However, if there is no on-screen visual, then overload would not result, and because dual codes would be provided, learning would be increased.

The Application

In general, it's advisable to avoid narration of text when there is a demanding visual illustration on the screen. This is especially important when working memory is subject to overload, such as during an animation in which learners have limited control over the pacing, or during the presentation of complex new information. In contrast, when there is no graphic information on the screen, then research to date would suggest that presenting words in text and auditory format would benefit learning.

Figure 16.5. Presenting Words in Text and Audio Can Overload Working Memory in the Presence of Graphics

The Coherence Principle: Using Gratuitous Visuals, Text, and Sounds Can Hurt Learning

It's common knowledge that e-learning attrition can be a problem. In well-intended efforts to spice up e-learning, some designers use what I call a Las Vegas approach. By that I mean they add glitz and games to make the experience more engaging. The glitz can take a variety of forms such as dramatic vignettes (in video or text) inserted to add interest, background music to add appeal, or popular movie characters or themes to add entertainment value.

As an example, consider a storyboard for a course on using statistical quality control techniques to improve quality, shown in Figure 16.6. To add interest, the authors added several stories about the costs of product recalls. But how do these additions affect learning?

Figure 16.6. A Seductive Detail from a Quality Lesson

From Clark and Mayer, 2007

The Research

In the 1980s, research on details presented in text that related to a lesson explanation but were extraneous in nature were found to depress learning. They called such additions "seductive details." In more recent research, Mayer has found similar negative effects from seductive details presented either via text or video. For example, in the lesson on lightning formation, they added short descriptions of the vulnerability of golfers to lightning strikes and the effect of lightning strikes on airplanes to the lesson.

In six of six experiments, learners who studied from the base lesson showed much greater learning than those who studied from the enhanced versions. The average gain was 105 percent. They saw similar effects in a comparison of lessons that included background music and environmental sounds with base lessons that did not add extra auditory material.

Finally, a third series of experiments compared an expanded explanation that used five hundred words and several captioned illustrations with a lesson that used only the illustrations and their captions. Students who received the summary version—just the visuals and their captions—actually achieved 69 percent more learning.

The Psychology

Mayer did several studies together with S.F. Harp to determine why seductive details depress learning. In these experiments, they evaluated the hypotheses that these added materials did their damage by:

1. Distracting learners from key instructional points,

2. Disrupting the learner's organization of information into a coherent mental model, or

3. Activating irrelevant prior knowledge.

They created three versions of lessons that included seductive details, but that also added instructional methods that should compensate for their damaging effects. Only one of their compensatory treatments reduced the negative effects of the seductive details. Seductive details placed at the beginning of a lesson were more damaging than the same information placed at the end of the lesson.

Therefore, they concluded that these details activate inappropriate prior knowledge. Since learning takes place by the integration of new information into existing knowledge in long-term memory, stimulating inappropriate prior knowledge would have a damaging effect.

The Application

The coherence principle essentially tells us that "less is more" when learning is the primary goal. It suggests that you avoid visuals or text that is not essential to the instructional explanation. It suggests that you not add music to instructional segments. It also suggests that lean text that gets to the point is better than lengthy, elaborated text.

As designers we need to make a distinction between entertainment and learning. This is not to say that an effective e-learning course is not interesting. Mayer reminds us of prior distinctions between cognitive interest and emotional interest. Cognitive interest stems from materials that promote understanding of the content presented—in other words from materials that optimize learning. Emotional interest comes from the addition of extraneous materials that have been shown to depress learning. Our goal should be to promote cognitive interest and avoid emotional interest in situations that require cognitive learning processes.

The Personalization Principle: Use Conversational Tone and Pedagogical Agents to Increase Learning

A series of interesting experiments summarized by Byron Reeves and Clifford Nass in their book, *The Media Equation*, showed that people responded to computers following social conventions that apply when responding to other people. For example, Reeves and Nass found that, when evaluating a computer program on the same computer that presented the program, the ratings were higher than if they made the evaluation on a different computer. People were unconsciously avoiding giving negative evaluations directly to the source.

Of course, individuals know that the computer is not a person. However, deeply ingrained conventions of social interaction tend to exert themselves unconsciously in human-computer interactions. These findings prompted

a series of experiments that show that learning is better when the learner is socially engaged in a lesson either via conversational language or by an informal learning agent.

The Research

Based on the work of Reeves and Nass, Mayer and others have established that learning programs that engage the learner directly by using first- and second-person language yield better learning than the same programs that use more formal language. Likewise, a number of studies have shown that adding a learning agent—a character who offers instructional advice—can also improve learning.

While some computer scientists are working to make agents very realistic, a series of studies using Herman the Bug (see Figure 16.7) as an agent found that:

1. The appearance of the agent made little difference—a cartoon or human worked just as well.

Figure 16.7. Herman the Bug Is a Pedagogical Agent
From Clark and Mayer, 2007

2. Learning was better when presenting the agent's words in audio rather than in text, and in a conversational style rather than in a formal style—congruent with the modality and personalization principles.

3. The agent did not even have to be visible on the screen—the voice alone was sufficient to promote better learning.

The Psychology

Learning is based on an engagement of the learner with the content of the instruction. Even though learners know that computers are inanimate, the use of conversational language, either directly in the program or via an agent, seems to stimulate very ingrained unconscious social conventions that lead to deeper learning.

When you are in a conversation with someone, he or she expects you to listen and respond in a meaningful way. This requires you to invest attention in what the person is saying, to process it, and to generate a meaningful response. A similar model seems to apply when learners see the e-learning as an engagement with a social partner—even an inanimate one.

The Application

When you write the script for your e-lessons, use first- and second-person constructions—but don't overdo it. For example, dialog such as, "Hi Dude. Are you ready for some exciting information on quality control tools?" is incongruent and more distracting than helpful. The research on pedagogical agents is quite new, so applications are still a bit tentative.

First, it seems that you don't need to invest a lot of effort in the physical representation of the agent. Second, you need to consider the role of the agent. To be useful, the agent has to serve an instructionally valid role—not just appear as an on-screen character.

You can see one example I liked in Figure 16.8. This program, designed to teach reading comprehension at a fourth-to-sixth-grade level, introduces the agent, Jim, who appears throughout the program to show readers comprehension strategies that have worked for him.

Figure 16.8. Jim Serves as a Pedagogical Agent

Conclusion

So there you have it. These six media element principles should give you the basics, since all e-learning programs must rely on some combination of graphics, text, and audio to deliver their content. Perhaps now that you better understand the research that has been done and the psychological foundations of why the principles work, and have seen some examples of how the principles are applied, you will feel more confident in using them yourself.

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17

Bridging the Formal-Informal Gap

BLENDED LEARNING EVOLVES

Clive Shepherd

Many e-learning designers have come to think of blended learning as a strategy only for situations in which some of the skills or the practices require a physical classroom or in-person facilitation. But with the advent of computer support for informal learning, blending is coming to imply a much broader range of possibilities. In this chapter, learn how to identify and deal with the challenges you will face as you link formal and informal learning.

BLENDED LEARNING is the thing—training's big talking point for the mid-noughties. Like sensitivity training, action learning, interactive video, accelerated learning, coaching and mentoring, and e-learning before it, it has become a bit of a bandwagon.

Yet blended learning is more than just a fad. It's a recognition that other approaches to training are simply not strong enough to work for all audiences, all of the time. Sometimes only a combination of learning media will do the job.

I'd like to suggest that blended learning is evolving into a new role, as our understanding of learning itself—and the applications of technology to learning—is also evolving. For in addition to previous uses of computers for learning, we now have informal learning. e-Learning producers (designers, developers, managers) may regard informal learning as a threat, but that would be a mistake, as I hope to show. One of the keys to understanding how informal learning changes our work is the realization that blended learning, whatever practitioners may have thought of it in the past, is actually a bridge between formal learning and informal learning.

Bridging that gap is not easy, and requires several steps and adjustments. It is up to e-learning producers to take these steps. In this chapter, I will give you my thoughts on four challenges that confront us, and ways to meet them:

- Dealing with the various existing objections to blended learning;
- Incorporating non-formal learning into blended learning, as a transitional step;
- Coming to terms with informal learning; and
- Handling resistance issues.

Objections to Blended Learning

Because blended learning has become such a commonly used term, some who think of themselves as training cognoscenti regard it with scorn and cynicism. They may speak of it as another panacea to delude the masses, and one that is bound to fade into the background when we eventually realize it doesn't work. This sounds harsh, and perhaps you doubt that anyone would hold such an opinion. Yet, I once went to a seminar during which the chairperson referred to blended learning as "the 'B' word," something not to be mentioned in polite company.

Since blending is a concept that can arouse such strong passions in some of our colleagues, I'd like to take some time to consider the particular objections that you may hear.

"It's Nothing New"

One of the most common objections to the razzamatazz about blended learning is that it's nothing new—blending is something we have always done. There is obviously some truth in this, because we can probably all think of some examples of training interventions that have successfully combined a variety of media. But to maintain that this has been in any way the norm is clearly wide of the mark. Most learning, of course, is informal—we don't even know that it is happening. When it is structured and formalized, it's most likely to be wholly on the job, if not wholly in the classroom, if not wholly online. Blending has been (and still is) very much the exception, not the rule. That's not surprising because blending is a hassle—it takes more planning and more coordination.

"It's Just Marketing"

Cynics may also claim that blended learning is just a rebranding exercise, carried out by e-learning vendors who have hit upon hard times after the bursting of the dot-com bubble. Again, there is something to say for this view. Most companies that claim to be in the blended learning business used to be—you guessed it—e-learning companies, not classroom trainers. They even tried to make the term blended learning their own, referring to it as a mix of "e-learning and traditional methods." This definition still dominates, even though it is unhelpfully restrictive, not to say condescending about the so-called "traditional" methods.

"It Keeps the Classroom Instructors Happy"

The e-learning community may retaliate by claiming that blended learning is in fact a sop to the classroom community, allowing them a piece of the action in a world of learning that is already dominated by the computer. (See Sidebar 17.1.) This view is hard to justify. Computers are playing an increasing role in learning, but have major limitations, as anyone can see. Even the most optimistic forecasts for e-learning don't see it replacing the classroom as a mechanism for delivering formal training.

SIDEBAR 17.1: E-LEARNING TAKES THE LEAD

The American Society for Training and Development's *State of the Industry Report 2004* showed e-learning as 29 percent of all formal training (up from 8 percent five years earlier) and the classroom at 63 percent (down from 80 percent). Also, it has long been known, and proven by a number of major studies, that most of what people learn at work is not as a consequence of any formally planned interventions. A typical estimate is just 20 percent. (See Table 17.1.) The rest occurs quite naturally as we do our best to cope with the demands of our jobs by hunting down information, asking opinions, comparing alternative solutions, trying things out, and learning from what happens. I'm sure you'll agree.

Now, here's where we need to make a judgment call, because I'm not aware of any up-to-date research. What proportion of this communication would you think is online, through email, instant messaging, web conferencing, and forums; or through browsing the intranet and searching with Google? How much higher could this rise when blogging extends its reach into the world of work? I'd say a conservative 30 percent, perhaps even 50 percent. The remainder is likely to be a mix of face-to-face communication, print and telephone, or perhaps even TV and radio. None of this is going to be in a classroom.

So what does this jiggery pokery tell us? Perhaps it just confirms that there are "lies, damned lies, and statistics." More importantly, I believe, it emphasizes the contribution that networked computers are making to all aspects of our lives, and that includes how we learn. Even without the interventions made by trainers

Table 17.1. Contribution to Learning

	Formal	*Informal*	*Total*
e-Learning	4%	24%	28%
Classroom	14%	0%	14%
Other	2%	56%	58%
	20%	80%	100%

and e-learning suppliers, we have become empowered by the phenomenal improvements that have occurred in our access to information and expertise. We are becoming ever-more-independent learners, less and less reliant on the formal inventions of learning professionals. That's what all good teachers and trainers have always wanted, so I believe there's cause for a modest celebration.

"It's About Control"

Blended learning has also been harshly criticized, if not completely written off, by advocates of new, less formal approaches to learning (you know, those that take advantage of new technologies such as blogs, wikis, and podcasts) as just another attempt to impose highly structured and formalized instruction on employees who would prefer to be in much greater control of what they learn, and when and how. They see blended learning as being yet another repackaging of the same tired old ingredients, typically classroom instruction and what we used to call CBT (computer-based training, that is, interactive, self-study lessons).

Worse than that, perhaps, is the accusation that, where e-learning is used in the blend, it is restricted to covering the boring knowledge material that trainers hate training and learners hate learning. In his book *Lessons in Learning, e-Learning, and Training*, Roger Schank laments that, "The part that is assigned to e-learning is the rote learning part—the facts followed by the answers. That stuff doesn't stick, and for the most part trainees hate it. When you hear the word 'blended,' run."

This viewpoint of blended learning, while appealingly cynical and superficially fashionable, is off the mark in at least two respects. First, I believe that there remains a place for formalized instruction—and a very valuable one at that. Structure in learning is important when you don't know what you don't know, nor (once you realize what you don't know) do you know how to go about rectifying the situation. You are a dependent learner—dependent on an expert who has done all this before to guide you from ignorance to mastery. The more dependent you are, the more you appreciate the structure that goes with formalized instruction, whether that's in the classroom or online.

Structure is also helpful if you're an employer and you need to be absolutely sure what knowledge and skills your employees have been exposed to and what they have learned as a result. As valuable as informal learning may be (and at least 75 percent of all learning is informal, by all accounts), it doesn't show up as a pass or fail on your learning management system. That matters when you're responsible for training pilots, ensuring compliance to key legislation, or a thousand other critical training challenges.

Bridging the Gap

The criticism of blended learning by informal learning enthusiasts falls down in one other important respect—it assumes that blended learning cannot make use of new, relatively informal methods and media. Now strictly speaking, you can't accurately call any learning activity that is set up with an explicit learning objective "informal." However loosely it may be structured, however discretionary, however unsupervised—if the learning activity is deliberately included in a program to facilitate learning, then educators would like us to call it "non-formal." That's fine, this distinction can be conceded—blended learning can be as non-formal as you like. Here's for non-formality!

It's true that most blended learning is a combination of formal, you might say traditional, elements—a bit of classroom, a bit of CBT, perhaps some on-job instruction. But there is no reason whatsoever why this should always be the case. By including non-formal elements, blended learning not only becomes more relevant, more embedded in real-work behavior and therefore more powerful, but it also acts as *an important bridge from formal to informal learning*. (See Figure 17.1.) It demonstrates the potential for learning in everyday work activity. It encourages independent learning.

Coming to Terms with Informal Learning

e-Learning has been consolidating—which is what you do when you are worn out from too much change and need a breather. We've been honing our skills, listening to feedback, refining our strategies and making pacts with our enemies, if you will (a development also known as blended learning). I am writing this chapter in the midst of the World Cup, so I hope you will forgive me for using soccer as a metaphor. It seems to me that the

Figure 17.1. By Making Use of Non-Formal Methods and Media, Blended Learning Fills the Gap Between Formal Instruction and Informal Learning

e-learning industry, used to being on the defensive and doubled up trying to recover its breath, has completely taken its eye off the ball; it has failed to anticipate an attack from an unexpected direction and ended up deflecting the ball off its backside and into the net for a spectacular own goal.

Until recently, I was complacent in the view that there were three primary applications for computers in learning. The first, and the most dominant, is the use of computers to deliver interactive, self-study lessons (you know, CBT in a web browser). The second is the use of the Internet as a channel for the delivery of longer distance-learning courses incorporating a wide range of activities, supported by tutors and encouraging collaboration between learners. And the third is the delivery of short, live online events using virtual classroom software.

Well, it never pays to become too smug about a model because the real world pays models no respect. My complacency was rudely interrupted by

what appears already to be the most exciting new development of them all. This fourth big idea for e-learning has evolved as a natural function of improved tools for online collaboration and the increasing self-confidence of Internet users. You can effectively summarize it as learners doing it for themselves. (See Figure 17.2.)

I say "learners," but it's hard to identify them as such—they don't wear school uniforms or sit behind a desk. Learners in this context are just people wanting to get things done and using their initiative to overcome any obstacles in the way (like being short of information or not knowing how to go about doing something). They can do this because they are now empowered by software tools that are incredibly easy to use yet awe-inspiring in their potential.

Search Engines and Forums

First port of call is, of course, Google—not a new phenomenon, but one that plays an increasingly important role in everyday life. If you still have more questions than answers, then simply Ask Yahoo! or submit a query to one of the thousands of forums addressing every topic imaginable. You will buy books, watch TV documentaries, consult with experts, even go on training courses, but only if you can't find what you need online.

Figure 17.2. The Four Primary Applications of Computers to Learning

Interactive self-study lessons	Live online events
Collaborative distance learning	Learners doing it for themselves

Weblogs

But Google's not enough and Yahoo! is not enough, because with Google and Yahoo! you're still essentially a passive recipient. You are not in a position to challenge or debate. More importantly, you don't have the opportunity to publish your own thoughts and opinions, to become a provider as well as a recipient.

With the new tools, everyone's a publisher, everyone's a teacher. It's midway through 2006 and there are something like thirty million weblogs (online journals, more familiarly called "blogs"), with more than thirty thousand being discovered daily. Blogs allow people like you and me to publish our thoughts and experiences to whoever will take notice. They allow us to make contact with others who are facing similar challenges and who may be able to help us. They provide us with the broadest possible range of views and perspectives, often in stark contrast to the "official view" or the hysterical outpourings of the mass media.

Wikis

If you can't find the reference information that you're looking for online, why not publish your own? "Wikis" are websites created by their own users, in collaboration with each other. You want to add or edit an article, just go ahead and type it in. You want to challenge the accuracy or authenticity of a contribution, go right ahead and say so.

Wikis are succeeding where complex knowledge management systems have failed so spectacularly. Perhaps this is because volunteers drive them; perhaps because they're so easy to use; perhaps because, like so much of Internet culture, they have emerged as a solution that people have worked out for themselves, rather than one imposed on them by remote software "architects" and the experts from a head office.

For the finest example of how wikis allow learners to do it for themselves, visit the Wikipedia (www.wikipedia.org), where tens of thousands of "amateur" contributors are creating their own online encyclopedia. The English language version of the Wikipedia already contains more than a million articles, with a completeness and accuracy that matches the *Encyclopedia Britannica* (as evidenced by a recent study by *Nature* magazine (see www.nature.com/news/2005/051212/full/438900a.html).

Podcasts

Podcasts are another interesting option. In case you've been away for rather a long time, let me explain what podcasting is. (See Figure 17.3.) First, you need an iPod or some other form of MP3 player, and a computer with an Internet connection (actually a PC on its own is enough as long as it will play back audio, although this is nowhere near as cool). Then you subscribe to the podcasts that you're interested in. These are typically audio (although video podcasting, or vodcasting, is also a possibility) and composed primarily of speech rather than music. You could listen to your favorite radio programs as podcasts, or the daily ramblings of an audio blogger recorded on her laptop, or fascinating little learning nuggets prepared by your training department.

You'll need some special "podcatching" software, such as Apple's own iTunes, to regularly check to see whether new editions of the podcasts to which you have subscribed are available. Download them to your PC and

Figure 17.3. The Key Elements Required for Podcasting Are Simple

then transfer them to your portable player, and all you have to do is listen, on the train, walking to work, in the gym, at your desk, or wherever you like.

Now podcasts have a certain glamor, but let's not forget that they are just sound recordings. When it comes to learning, sound recordings have never before had much of a role to play, and they are not going to change the world this time round. There are obvious limitations, not least the fact that listening to a podcast is a passive experience—you can't ask it questions and it can't ask you any either. And recorded audio is not self-paced—it goes at the speed of the speaker, which may be much too slow or too fast for your taste. If you want to hunt down information, you'd be better off with a transcript. But listening to a podcast is not about hunting down anything; it's what marketing people call a "lean back" experience. It's reflective and low-stress. It's enjoyable. Most of us do plenty of "leaning forward" in front of our PCs during the working day. Listening to a podcast provides a welcome break from incessant messaging. Who knows, we might even learn something.

Learners on Their Own

This fourth big idea for e-learning represents the ultimate learner-centered approach: learners identify their own needs, work out how best to meet them, implement their own training plans, and then evaluate their own results. What they don't do is wait for teachers and trainers to do this for them. This approach is not completely learner-centered because teachers still play an important role—it's just that those teachers are more often than not other learners, trading their expertise for yours.

What we're seeing here is, of course, simply another manifestation of informal learning, the way that people have always achieved most learning. What's different is the scale of the operation: the pool of over a billion potential teachers and learners, the literally uncountable web pages, blog postings, and podcasts. If, as professional teachers and trainers, we feel under threat, then we are missing the point. We cannot hope to be everyone's teacher—there simply isn't the time. If we embrace the fourth big idea, we take a significant step in helping our organizations to establish a truly sustainable learning culture. And hasn't that always been a strategic goal of the learning and development department?

Taking the Plunge

So how can blended learning incorporate methods and media normally associated with informal learning? Well, perhaps the most obvious way is the use of weblogs by learners to maintain an ongoing learning journal, starting before the course (or whatever it is you call the formal bit) and extending on well after, if not indefinitely. Blogs encourage reflection, allow learners to communicate their successes and their frustrations, and provide an opportunity for tutors and fellow learners to offer encouragement and assistance. They help to build communities of learners that persist long after consigning a formal event to history.

Wikis provide a similar advantage. They allow learners to work together to build a body of knowledge from which they and all future learners can benefit. They remove the burden on trainers and subject experts to be the providers of all useful content. They encourage the notion that everybody's a teacher as well as a learner.

So what have podcasts got to do with informal learning? Well, not much, if they contain instructional material created by trainers and subject experts. But imagine this scenario: you send your students off on a "web quest" to hunt down information that's relevant to the course. Their task is to summarize their findings by creating their own podcast, which they then share with their fellow students. I have been using this technique for the past six months on a series of online courses. I anticipated all sorts of technical support problems and a requirement for a great deal of coaxing and cajoling on my part. My misgivings were completely misplaced, because the activity proved to be immensely popular, went without any sort of technical hitch, and made a great contribution to the learning of all concerned (including me).

Of course, the non-formal elements in a blended solution aren't constrained to online technologies with strange names. There's nothing to prevent you from providing opportunities for face-to-face collaboration, teleconferencing, maybe even reading. There are no rules for blended learning, other than the requirement to be effective and efficient. Using your imagination to incorporate a wide range of non-formal methods and media is optional, but highly desirable.

Handling Resistance

Unfortunately, integrating non-formal learning elements into your blended solutions is not going to be as easy as turning on a tap. First, this is not going to be what learners are expecting, and they may need more than a little encouragement to believe that what they are being asked to do is not just formal learning in disguise, perhaps a trendy new training game—or worse still, a new form of assessment. Second, there may well be a misalignment between the learner's goals for completing the program and your own aspirations.

There are probably three main reasons why a learner is taking part in a training event: (1) it is compulsory, such as most compliance training, (2) it leads to a valued qualification that will positively enhance their career prospects, or (3) he or she has chosen to do it because it as an opportunity to develop knowledge and skills. Let's take these in turn and see how they may impact on your chances of making a success of non-formal learning.

With a compulsory program, you may experience some resistance from participants to sharing their experiences and participating fully in collaborative activities. This may be because there is some resentment to having to do the training (perhaps they feel they don't really need it). It may be because they fail to see what's in it for them; it may also be that the experience is not of sufficient duration for participants to feel that the investment in establishing relationships with other learners is really worthwhile.

You have a number of choices if you want to persist with your strategy and make a success of the non-formal elements: you could make the activities themselves compulsory, which would ensure participation but may cause further resentment; alternatively, you could attempt to overcome the handicap that the training is compulsory by engaging learners fully. Do this by building on their past experiences, ensuring the content is relevant to their priorities and problems, and providing them with greater control over the learning process—in other words, treat them as adults.

You may experience a different kind of resistance to non-formal methods if you are responsible for a certificated course that leads to a valued qualification. Entry to the course may be voluntary, but more cynical (some may say pragmatic) participants may well have the goal to get into the program, get the

qualification, and get out as soon as possible. They are not interested in the learning content, just the piece of paper. Even if the participants on this course are young, technology-literate, and, outside work, engage in online communities such as MySpace, they may still be reluctant to go the extra mile and build collaborative relationships with their fellow students, particularly in a distance learning context.

Clearly, a great deal depends on the quality of the facilitation you provide. Again, you could make some participation mandatory, knowing that learners will be forced to comply if the qualification depends on it; but this compliance could be minimal and cursory, merely "going through the motions," when what you are trying to establish is a genuine sense of community. As before, your best chance is to engage your learners with the subject so completely that they will really want to take advantage of all opportunities to develop their interests further.

The third category is much less of a problem. Here learners are participating in the course because they want to—they are genuinely interested in the subject and will take advantage of any opportunities that you are able to provide for learning from each other. In this situation, the non-formal learning elements mirror the informal most completely—there is a clear and relevant need for information, and the learner is fully motivated to exploit all avenues to pursue it.

What Happens After We Cross the Bridge?

If blended learning is a bridge, then we should devote some attention to what lies on the other side and whether the crossing is going to be beneficial, both for the learning and development community and for those they seek to serve, the learners and the organizations for which they work. Well, in my opinion, the crossing is indeed worthwhile for all parties. Across the bridge lies a land where learning is truly informal and completely natural; what Jay Cross likes to call a *learnscape* (Natural Learning by Jay Cross at http://metatime.blogspot.com/2005/10/natural-learning.html):

> "Putting natural learning to work is more like landscape design
> and gardening than traditional instructional system design. All of

life is interconnected. Organisms cannot live independent of their ecosystems. Self-service learners connect to one another, to ongoing flows of information and work, to their teams and organizations, to their customers and markets, not to mention their families, friends, and friendship groups. We can improve their connections and nurture their growth but we cannot control them or force them to live."

In a learnscape, perhaps the one word that we would use rather rarely is learning. The process of learning—so integrated in day-to-day work that it would be almost indistinguishable from other activities—we would completely take for granted.

In this environment, all available communication media, including face-to-face interaction, print, the telephone, and text messaging, will facilitate learning. However, the primary catalyst for communication and collaboration will be online media, using the Internet and organizations' own intranets. The online media most commonly employed in organizations now—email, instant messaging, and simple, one-way web publishing—will continue to make an important contribution, but social networking tools not unlike those found in sites such as MySpace will play the key role.

These tools will replace the unwieldy and unworkable knowledge management systems that have failed so spectacularly to bring about the easy knowledge capture and exchange for which they are expensively designed; they will also marginalize those learning management systems that were designed only to plan, organize, and control the process of formal learning.

So what will these tools look like? Well, users will need to spend some time introducing themselves and explaining what they can contribute (in terms of their experience and expertise) and what they are seeking (in terms of their current and future work and career priorities). These user profiles will be vital because they will allow users to connect with others with similar interests and to form communities to serve their joint interests. We will not need to establish these communities from the top down; they will form naturally and spontaneously because members feel they will be valuable. They will close just as easily when their purpose is served.

There will be some familiar mechanisms within these tools. Users will be able to upload and share documents and other files that are of common

interest. They will maintain blogs in order to share their experiences and their opinions. They will use wikis as a way of capturing knowledge, which the community as a whole can utilize for reference into the future. They will often extend to include project management facilities such as task lists and schedules, so they become, in effect, shared workspaces. An interesting example of this sort of tool is EduSpaces (http://elgg.net), described on its website as a "learning landscape," although there are probably others that will do the job well, many of which are likely to be open source.

Many, mainly younger, users will find it completely natural to use these tools because they so closely resemble the web tools they use socially. They will take easily to knowledge sharing, because they have already learned that this is invariably of benefit to all parties. But older learners will discover the benefits as well. I've included a short story with this chapter (Sidebar 17.2: Barbara's Tennis Holiday) to illustrate how this might happen in a place not so far from you, at a time not so far in the future.

Those without these insights may continue to hold to the old dictum of knowledge equals power, unless they have, of course, crossed the bridge and learned how to learn through the non-formal collaborative activities they have experienced by participating in innovative blended learning solutions.

SIDEBAR 17.2: BARBARA'S TENNIS HOLIDAY: A TALE OF BLOGS, WIKIS, AND PODCASTS

Barbara had been a keen tennis player when she was younger and would have kept it up if it weren't for the all-consuming demands of family and career, particularly after the breakup of her marriage. With her children now in their teens and less dependent on her, at least in terms of her time, she resolved

to dedicate more of her energy to doing things that gave her pleasure—particularly if that involved meeting other people and making some new friends, perhaps even of the male variety.

Anyway, Barbara gathered up all her resolve, picked up the phone, and arranged to join her local tennis club on a low-cost "try it and see" three months' membership. As it turned out, this proved to be a rather more costly venture than she expected, because her daughter, Penny, refused to let her go to the club in the little white dress she last wore as a teenager, complete with frilly knickers, wooden racquet, and box of faded grey tennis balls.

Barbara enjoyed going to the club, although she found it harder than she expected to recover her old form. What she really needed was some coaching. In a break between matches, she sat down in the clubhouse with a drink and started to browse through an old copy of *Ace* magazine. She turned to the classified ads near the back and within minutes had discovered not only how she could obtain all the coaching she could ever need, but also have her first real holiday in years.

With Penny's help, Barbara booked the holiday online later that day. She decided to go to the Pat Elliott Tennis Centre in the Algarve—partly because she vaguely recalled Pat's name as one of the few Brits to

win more than one round at Wimbledon, and partly because the video on the website made it clear that she'd be doing as much sunbathing and sipping of cocktails as she would serving and sweating. Penny was also keen—she'd spotted that this particular tennis camp was up with technology and provided audio and video materials for use before and after the course. She was not slow to spot an opportunity.

A few weeks later, Barbara was unwrapping her new video iPod, with Penny looking on eagerly. Penny knew that, when her mother was not using it for her tennis stuff, which was most of the time, she could borrow it. Barbara also knew this, but felt guilty about going on holiday on her own and regarded the iPod as a form of compensation for Penny.

An hour or so later, Barbara had downloaded her first podcast, an audio introduction to the course by Pat Elliott himself. Barbara listened intently. She already felt she had to know Pat personally and was really looking forward to the course.

She was not disappointed. The course was very hard work, including four or five hours on-court every day, but that still left plenty of time for socializing and relaxing. One of Pat's innovations was that each person on the course had to maintain a journal both during the course and for three months after. This journal took the form of

a weblog, or "blog," which she completed by filling in a simple template on the tennis centre's website.

Barbara's Tennis Holiday
My week at the Pat Elliott Tennis Centre, Portugal. A learning journal

Monday, March 6, 2006
Just arrived

I've just arrived at the tennis centre. The weather's fantastic and so is this place. I've already learned something and that's what a blog is. Not only that but I've become a blogger myself. Now there's a thing.

Anyway, I'm going down to dinner now and that'll give me a chance to get to know the other players on the course. They seem really nice - I just hope they're not brilliant tennis players.

posted by Barbara Elphic @ 7.22 PM   0 comments

Each bedroom had its own computer, so Barbara would complete her journal before going down to dinner or at the end of the evening. She was surprised at how useful this process was. The blog gave her a chance to reflect on the day and appreciate how much she had learned. It also provided the opportunity for her to vent any frustrations she was having with skills that wouldn't quite come. Barbara got as much out of reading the journals of her colleagues on the course. It seemed everybody had a fair share of successes and disappointments. Now and then she would add little comments to their postings, perhaps a word of encouragement or a playing tip.

The coach, who wasn't actually Pat, but much better looking by general consensus of the females on the course, read all the blog postings before the course reconvened each morning. He added his own comments and provided links to a special section of the tennis centre's website that he called the "wiki." This turned out to be a mine of useful ten-

Pat Elliott Tennis Centre

Welcome back Barbara

Add a tip   Edit a tip

QuickTips

My tennis   Log Out

SEARCH
Search words:
[   ] Go
☐ Match any keyword

▸ Blog Centre
▸ Hot strokes
▸ Tactics room
▸ War stories

- Patient Passing - Dave Smith
- The Drop Shot: A Weapon at Every Level - Dave Smith
- The Topspin Serve - Tom Avery
- Trap the Ball to Hone Your Toss - Monty Basnyat
- The World Class Half Volley - David Wheaton
- Volley like the Professionals - Dave "Koz" Kozlowski
- How to Hit with Topspin and Control - Tom Avery
- Stay in Line with the Ball - Brenda Shultz McCarthy
- Return of Serve - Hank Pfister
- Make Your Overhead a Weapon - Dave Smith
- What "Punctuation Mark" is Your Overhead? - Dave Smith
- The Lost Art of the Drop Hit - Jim McLennan
- Pointing the Butt Cap Up at the Ball - Jim McLennan
- The Locked Doorknob Volley - Bill Patton
- The Flamingo Forehand - Doug Atkinson
- Getting Your Body Into the Shot - Doug King
- The Open Stance Volley - Cris Bacharach

nis information and materials, provided not only by the staff but by people who attended the camps.

Barbara particularly liked the slow-mo video demonstrations of all the strokes. She figured out how to download these to her iPod, which she brought along with her (much to Penny's annoyance), and to play these back at courtside.

Barbara got on well with everyone on the course, but especially Trevor. They played together regularly in mixed doubles and consoled each other on their defeats through the comments they left on each other's blogs. They had the occasional drink together, but nothing more came of it, and so when the week came to an end, they said their goodbyes, and went their separate ways.

Back home, Barbara maintained her journal at least once a week, usually after a session at the club. Her son Brett asked her what on earth she was doing. "Just posting to my blog," said Barbara. Brett was amazed: "You're what? Let me have a look. You know I've had a blog for over a year now, although you're definitely not looking at that." "I already

have," said his mother. "I found it using Google. You've no idea how much I know about you."

The blogging kept the course alive for Barbara for months after she had returned. She loved reading about the experiences of her colleagues on the course and not just about their tennis. Several people shared photos they had taken at the camp. Trevor went one further on his blog by incorporating a video showing off his new service action. Barbara wasn't that interested in Trevor's new serve, but found herself replaying the video over and over.

On the way to work, Barbara would play back the regular podcasts supplied by the tennis centre. She was amazed at how her iTunes software downloaded these automatically and copied them to her iPod without her having to do anything. The podcasts refreshed many of the skills and tactics that she had learned on the course and encouraged her to keep trying to put them into action. They worked because Barbara was making good progress with her tennis. She had entered a club tournament (although embarrassed to find that the club now considered her to be in the veteran category) and had won through to the final, against the reigning champion. In preparation, Barbara was making extensive use of the tennis centre's wiki, finding out how other players coped with the pressures of competition, sought out and exploited their opponents' weaknesses, and applied their own strengths to achieve greater success.

Before the final, Barbara sat at the side of the court with her iPod, listening to a special audio program prepared by Pat Elliott to help players

relax and focus. Barbara was so focused she was completely unaware of anything except the court and her opponent. The match seemed to whiz by, but that was as much as anything to do with the score—she was beaten 6-2, 6-2. Barbara didn't mind; she had tried her best and lost to a better player. Reaching the final was an achievement in itself.

Barbara didn't have to maintain her brave face for too long, because who

should tap her on the shoulder to say hello but Trevor? He'd read about the final in Barbara's blog, traveled over to watch the match, and had recorded it all on his camcorder. He expressed his commiserations with a kiss and a long hug and suddenly tennis didn't seem so important anymore.

Barbara completed her last posting to her blog with a brief account of the

final and a snapshot of her and Trevor embracing, taken by the club's photographer. With Trevor's help, she created a more permanent record of her experiences by writing an article for the tennis centre's wiki. She used Trevor's video to demonstrate all the new skills and tactics she had been able to apply in the final and to show where she went wrong. It made great reading and earned her a £250 prize from the tennis centre for the best contribution by a player since the wiki had been set up. As Penny hadn't seen the iPod for the past few weeks, Barbara knew where she should spend the money.

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Clive Shepherd is a consultant specializing in e-learning, blended learning, and communications. He works with a broad range of public- and private-sector organizations, helping them to effectively harness the benefits of technology for workplace learning. He established his interest in interactive media while director of Training and Creative Services for American Express in EMEA (Europe—Middle East—Africa). Clive went on to co-found Epic Group plc, the UK's major producer of custom e-learning, where he won many industry awards. He is widely acknowledged as one of the UK's foremost experts in e-learning, with more than one hundred published articles and four books/e-books to his name. He speaks regularly at major international conferences and contributes regularly to his blog, Clive on Learning. He was recognized for Outstanding Contribution to the Training Industry at the World of Learning Conference in 2004.

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Behind the Screens

A LOOK AT THE ELEARNING GUILD'S ONLINE FORUM SERIES

Karen Hyder

Many organizations are looking toward synchronous delivery of e-learning, using software tools on the web to share visuals and audio with a large group of people in real time. But the learning curve is steep, both for presenters and for participants. The eLearning Guild has experience in successful online delivery, and our expert moderator wrote this chapter to get you up and running—synchronously!

YOU'RE TACKLING THE CHALLENGE of delivering training and presentation online using a synchronous interface. You're up to your eyeballs in administrative activities like scheduling and registrations. But at the same time you must prepare learners to learn online and coach speakers to present online. And then there's learning the technology itself! It's like being Magellan, wanting to make it all the way around the globe, but failing to anticipate the obstacles and having no one to ask.

We know how you feel because in The eLearning Guild's Online Forum Series, we're heading around the globe with our programs, too. We've already

encountered some things we'd like to tell you about. So let us guide you through the stormy seas and blustery headwinds of creating synchronous online programs.

Several years ago, The Guild began presenting the Online Forum Series. Each of these events brings four seventy-five-minute conference sessions to you in one day. We address timely themes and offer perspectives on each theme from practitioners, authors, and industry leaders. We teach theories, strategies, and tools that our audience can identify with and can put to use immediately.

We've enjoyed a lot of interest from Guild members and associates, as well as from non-Guild members. We've heard excellent feedback from participants and speakers. We've had the opportunity to make a few mistakes, and learned from them. In the true spirit of the Guild, and because many of you have asked, I'll share some of the lessons we've learned and strategies we've employed while planning, producing, and presenting this online conference series.

The Learning Environment

We selected Elluminate®*Live!*® Version 5 as one of our online interfaces (the product is now up to Version 8). We have used and are using others, and while features, functions, and usability may vary among them, all online interfaces provide software tools and a place on the web to share visuals and audio with a large group of people in real time. Rather than comparing the various products, including Elluminate, WebEX™, Saba® Centra Live, Microsoft® Office Live Meeting, Adobe® Acrobat® Connect™ Professional, or InterWise® Connect™, I'll reference Elluminate and use their language to focus on our Online Forum Series as a case study. (*Editor's Note*: You will find this chapter most useful as a guide to developing and presenting a successful online event. It is not intended as a tutorial on any particular software application. By the time you see this book, any specifics would likely have changed several times.)

Speakers and participants log into the same secure website, where they are able to show and view PowerPoint slides or any running application. In addition, both speakers and participants can draw on a virtual whiteboard,

and they can click emoticon buttons such as "Smiley Face" or "Thumbs Down" to convey their responses to a question or reaction to a statement. (See Figure 18.1.) A menu option turns on polling buttons that appear on the toolbar so that speakers can pose a question on a PowerPoint slide and offer up to five responses. Participants simply click on the letter corresponding with their choices and Elluminate then displays the letters next to their names in the Participant Info window or "list of who's logged in" window. Thanks to the voice-over-IP (VoIP) technology in Elluminate, participants can hear audio through the PC speakers rather than through the telephone. By using a PC microphone, they may also speak to everyone in the session.

In Figure 18.1, the list of participants is in the upper-left corner of the screen. Participants use this area to respond to questions and polls, to "applaud," or "raise their hands" to indicate a question. The Direct Messaging area allows group or private text exchanges. The whiteboard contains the presentations, or you can use it for group collaboration.

Figure 18.1. The Elluminate Interface Provides Many Features to Support Real-Time Dialog Between Speakers and Participants

Production and Technology

Speakers can choose to show slides pre-created in PowerPoint or show a file from any other application to provide a focal point for the entire session (otherwise, why not just conference call?). PowerPoint slides can be loaded directly into most online interfaces and disseminated to the participants as soon as they join the session.

Elluminate converts the slides to a static WDB (or whiteboard) format, which is similar to the PDF format. You can also convert the file in advance to save time and to access different screen resolutions. The conversion reduces the file size, which means the files transfer more quickly. After conversion, the speaker and the participants can annotate or write over the slides, using the whiteboard annotation tools (see Figure 18.2), but they can no longer edit the slides as PowerPoint in the Elluminate interface.

If speakers prefer to show a file from another application, they cannot upload it into PowerPoint. However, most interfaces offer an application

Figure 18.2. Elluminate's Whiteboard Annotation Tools Permit the Speaker and Participants to Annotate or Write Over Slides in the Interface

sharing feature that displays any application or file they can see on their own machines to all participants. It reminds me of video cameras in a store window. When you wave, you can see yourself waving on the adjacent TV screen.

The main concern when using application sharing is that everything is real time. There is no opportunity to transfer content to participants' machines in advance, so broadband connectivity becomes much more important. Also, speakers must consider what the streaming data looks like to participants. If it takes two nanoseconds for the speaker's screen to change and ten seconds for some participants to receive the change, then speakers must reduce the number of changes they make and allow some time for catch-up.

We highly encourage all registrants to use broadband when connecting for sessions that will rely heavily on application sharing. Some participants participate happily and successfully if they are willing to tolerate slower refresh rates on dial-up connections at 56K, and if they are willing to accept the warning.

One of our key considerations for choosing an online interface was voice-over-IP technology, rather than conference calling, in order to use state-of-the-art technology and to reduce the participant's expense for each event. VoIP does have its drawbacks, including a small learning curve for how to be heard, the requirement of a PC headset (or limited ability to communicate with other participants), and potentially frequent queries of, "Can you hear me?," which rarely occur on a phone call.

 Even if someone has presented online before, it's important to be clear about how to use the features and language of the interface. For instance, in some it's "direct messaging" rather than "chat" and users "join" a session, rather than "log into" a session.

Speakers and Moderator: Presentation

I serve both as a presentation coach and as an event moderator. We decided to do this so that we can keep session delivery relatively consistent and not require that each speaker be an expert at using the interface. My role as coach is to be sure speakers can join a session, can use the basic interface features, and that they have a good sense of the options available for them to incorporate into the design of their session.

Some speakers choose to show "polling" slides with questions and up to five possible answers designated with letters. During the session, the speaker asks the questions and requests that the participants respond by clicking on the appropriately labeled button on the toolbar (A-E). (See Figure 18.3.)

As coach, I help speakers to understand where these polling slides would be useful. As moderator, I turn on the polling buttons at the appropriate time during the session. Some speakers design small group discussions for their sessions. This requires organizing the participants into subgroups and moving them into virtual breakout rooms. In the breakout rooms, the small groups discuss a topic by using audio or by typing in Direct Messaging (like Instant Messenger, or Chat). Then they bring their ideas and conclusions back to the main room to compare and share with the entire group.

Presenter Issues

Online speakers tend to fall into one of several camps, represented by these examples:

- *Expert Eric* believes that online synchronous presenting isn't that much different from what he already does with an in-person audience. Eric feels confident that he can transition to the interface and deliver a successful presentation with little or no preparation— and he tends to resist help or advice.

- *Realistic Rick* realizes there's a learning curve when moving to online delivery and is eager to learn how to use the tools to present. Rick is open to feedback and coaching and schedules time to prepare well in advance of the event.

- *Norah Neophyte* is anxious about using an online synchronous training modality. The language alone is frightening, much less trying to

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Figure 18.3. Participants Respond to Speaker Questions by Using Labeled Buttons on a Toolbar

manage the technology. Norah overestimates the difficulty of transitioning to online delivery and dreads presenting without the benefit of eye contact.

- *Gary Green* has little experience presenting in front of any audience. Gary plans to read slides and notes verbatim. He has never seen an online presentation. Luckily, so far there have been no Gary's involved in an Online Forum event. If you need help with Gary, call me. I have a few strategies that can bring him up to speed quickly.

The reality is that all of these people need some amount of coaching and preparation. Yes, even the very experienced person has to acclimate to the interface and to coordinating tasks with the moderator. Don't let anyone off the hook! Offer several opportunities, and require each speaker to spend some time in the software interface, preferably with the moderator, a coach, or a speaker who is experienced in the chosen interface. Dead air and online fumbling are awkward and obvious. A few minutes of planning and preparation can eliminate many potential problems.

Practice, Practice, Practice

I schedule three different opportunities for speakers to practice with me and with fellow speakers to prepare specifically for their Online Forum session. Each practice session is done live online to increase all speakers' familiarity with the interface. Online Forum events involve several speakers each.

During the first session, the All Speaker Meeting, we provide a brief overview of the interface and tools, and then quickly move to each speaker's outline of his or her own part of our event. The first speaker in the lineup usually has the task of creating an overview of that month's Online Forum theme or subject. For instance, what relevance does something like "e-Learning Standards and Learning Objects" have in the real world?

Each subsequent session drills deeper into practical application and relevant tools. The All Speaker Meeting outline review ensures that each speaker sees and hears where his or her material fits into the plan for the day. Doing this prevents overlap of content and encourages cross-referencing of ideas from one session to the next. For instance, a speaker may say, "As you heard in this morning's session, game technology is not just for playing games.

We've found that real learning and long-term recall are some of the positive side-effects."

The second practice session is one-on-one with me. This session focuses on the instructional design of each session and the preparation of each speaker individually. I ask the speakers to come prepared with their draft PowerPoint slides or the application files they will want to share. We go through the content as quickly or slowly as they feel they need to at that point. Some simply ask questions. Others work through every slide and the talk track that goes with each.

During these second sessions, I focus on two main areas: (1) opportunities I see for the speaker to encourage interaction among participants and (2) what I as moderator need to do or say during the session to help the speaker. Ideally, speakers leave notes for me within the Notes section of the PowerPoint presentation. For example, "KAREN: Please send audience to www .elearningguild.com." That way I can just copy and paste the text of the URL into the Direct Messaging box. A new browser window will then automatically open on each participant's machine.

I also show speakers how to regulate their own volume without needing to ask, "Can you hear me?" Volume levels often display as colored bars in the interface. Knowing that green is good and red is too loud is useful. Simply moving the Mic (microphone) slider bar to the left will decrease the volume.

I teach them how to display my preferred window layout option (Wide window layout) in order to see a larger display of the Participant Info and the Direct Messaging windows.

I like to suggest to speakers that they can and should turn off the Talk button (microphone) periodically to take a drink of water, clear their throats, or just breathe. It's impractical to think you can talk for seventy-five minutes straight, and it's rude to never allow a word in edgewise. Speakers can ask a question and then encourage participants to use the Talk button to respond verbally as an alternative to typing their responses in Direct Messaging. The variation in voices can be stimulating, and some participants prefer to contribute verbally. Also, when reading Direct Messaging, it's better to turn off Talk than to try to read and talk at the same time.

The third practice session is a Dress Rehearsal. At this time each speaker has the opportunity to test final changes to his or her presentation, update me on technical needs, and ask last-minute questions about presenting in this interface. Again, some speakers prefer to go slide-by-slide and practice the entire talk track, while other speakers just ask questions. All event speakers are welcomed and encouraged to participate in others' dress rehearsals to ask questions that participants might ask or to map connections to their own content. Typically, we record this session for benchmarking or for review and coaching purposes, if needed.

I also encourage all speakers to join any of the generic instructional sessions hosted by Elluminate's support staff every week. This provides those who need extra practice an additional opportunity.

Instructional Design

When these monthly Online Forum sessions were first conceived, it was decided that we would have four speakers each month address the same theme from different perspectives. The plan was, and still is, to have an overview, followed by three sessions that dig deeper and deeper into the subject.

For the Online Forum Series, we require that sessions be engaging, involve the audience and be much more than a data dump (a.k.a. "chalk and talk"). We're willing to experiment; we encourage and support speakers' use of the interface tools so that they can best adapt the instructional design of the session to suit an online audience. Some people are very creative and try a variety of strategies. Many are eager to engage participants through formal or informal Polling or by requesting responses in Direct Messaging or even verbally, where the speaker releases the Talk button and allows participants to speak up and be heard. Others include activities that call for small group discussions and send participants to breakout rooms.

Why do we need to design instruction for online? Can't we just talk through the slides? Well, no—not really. Sessions need to be engaging and compelling, but online, there's no place to hide. 90 percent of what people pay attention to is the voice of the speaker. A few too many "umms," "ahhhs," and "ya knows" and people will tune out. If you sound distracted or

are fumbling with the interface, people tune out. Dead air? Deadly! During online sessions, you don't just have the threat of something out the classroom window distracting participants; their jobs, meetings, phone calls, or people walking in the door distract them. Remember, participants' inboxes are just a window away. Online speakers have to be prepared to capture and maintain interest. It's important!

Interaction Strategies

So how do you build interaction when you can't make eye contact with people? The number one strategy, bar none, is to ask good questions! I know, it sounds simple, but doing it well is another thing. Saying "Any questions?" at the end of your presentation DOES NOT count as interaction. That just punctuates the end of the session and confirms the disinterest of the speaker in the needs of the audience.

An easy and very effective way for a speaker to connect with participants throughout the session is by asking questions and waiting for responses. It's as true online as in the classroom, and even more important because it's the ONLY real-time feedback we have. There's no eye contact, we can't see confusion, and we don't hear sighs of frustration or boredom.

Formal Polling amounts to a pre-created PowerPoint slide that shows a question and several prescribed answers. You may label the answers with a green check mark for "Yes" or a red X for "No," or with letters A through E. (See Figure 18.4.) A menu option allows the speaker or moderator to show the appropriate buttons on the toolbar. Participants can then click on the buttons that correspond to their choices. Their selections display next to their names in the Participant Info window.

Most online tools have buttons that allow participants to respond affirmatively or negatively. Use that toolset for quick audience analysis and impromptu polling. Start using these early in the session by asking easy questions like "If my microphone volume is at a good level and you can hear me clearly, please click on the smiley face. If not, please click the Thumbs Down button so we can see if adjustments are needed."

You can introduce new topics by, for example, asking the audience to "Click the smiley face if you've ever created an e-learning module or course

Figure 18.4. Formal Polling Combines a PowerPoint Slide with Options to Select Responses

using Flash." Broaden the response opportunity by adding "If you've created an e-learning course using a different software tool, go ahead and type it's name into Direct Messaging." You'll start to see who's in your audience, who's awake, and who has experience. You can further engage the audience by validating their responses. "I see MaryH has used Dreamweaver and SteveS has used HTML. And we have several experienced Flash users. Great! I'm eager to hear your perspectives and ideas during the session today. Feel free to type in your comments or raise your hands to request the use of the microphone." Voila! NOW you have interaction and an invitation to participate at will. From their point of view, you've given them permission to participate.

When using a canned slide set with bulleted points, there's not much room for interaction. Participants will simply read along as the presenter describes each bullet. But here's a handy trick. If there's a chance that some or all of your participants have a conceptual understanding of the topic

(as they should, in our example) you'll likely find that individuals can guess or anticipate what the bullets are without seeing them.

So rather than showing a slide like Figure 18.5 first, show a slide like Figure 18.6. Then, as the entries from the audience appear in Direct Messaging, you can discuss those entries that correspond to your content. When their entries slow down, you can THEN display Figure 18.5 and discuss any remaining ideas. Sidebar 18.1 summarizes the process. (Thanks to Bob Mosher for this idea.)

This, again, is not only a test to see who's awake and listening, but it is also an opportunity to validate participants' knowledge without radically changing your lesson plan. And you may also get lucky and find that participants offer a perspective you hadn't considered.

The extra bonus to using this strategy is the ongoing assessment of learners' knowledge. If 100 percent of the participants are able to fill in the blanks you've left for them, you'll have a good indicator that this audience is not as novice as you anticipated. Additional questioning and evaluation will help confirm that fact.

Figure 18.5. This Slide Presents the Speaker's Prepared List of "Correct" Responses

SIDEBAR 18.1: A QUICK AND EASY WAY TO PROMPT PARTICIPATION

Before the Event

1. Select an original bulleted slide and duplicate it.

2. Remove data on the first copy, leaving only the title or question.

3. Be sure the question is worded clearly to generate the responses you need. It's worth testing the question on some friends to see what responses it is likely to generate. There's little worse than relying on the audience to reveal the responses you need and have them offer every answer but the one you need!

During the Event

1. Pose the question to your participants and ask for their responses.

2. Thank them and validate their answers.

3. Reveal the original slide and data AFTER participants contribute.

4. Address any points that the group did not offer.

Participants/Readiness

There are a few common, solvable problems that participants can run into when using any online interface. Such technical issues can delay a person getting into the session, leaving the help desk to sort things out with the pressure on and the clock ticking. It's far better to connect with each participant well in advance than to wait until two minutes before start time. I've actually had my cell phone ring just as I clicked the Talk button to introduce the first speaker. The caller was someone with a standard technical problem, but I was in no position to help him or her because eighty-seven people were waiting for me to kick off the event.

It's critical to have participants (and speakers) install and test the software they need well *before* the session is due to start. One or two problems are manageable. Ten problems are not manageable, no matter how much support staff you have.

Begin with your software vendor to see whether they have a web page where participants may download software. Also ask whether the vendor supports user installation and testing. If they do, you can refer all participants to them as part of your confirmation notice. Give a due date for performing and testing the installation and login.

If your software vendor does not provide that service, either create a web page that has all the instructions, and a link to the installation files, or send instructions and links in an email. You may schedule "office hours," specific times you'll be logged on and helping whoever calls or joins.

We do both. Our software vendor provides the installation page and support. We guide registrants to their website *and* offer live orientation. Guild staffer Luis Malbas provides demos and practice sessions for a few hours on the Monday and Tuesday prior to our Thursday events.

According to Luis, about 50 percent of online registrants log in during his office hours to:

- Get a brief demo of the Elluminate *Live! Version 5* software interface.

- Experiment with the basic features, such as buttons that indicate smiling or confused faces, thumbs down, applause, and hand raise. They also learn about the Direct Messaging tool that allows participants to use text to communicate with speakers, moderators, or other participants.

- Confirm that software installation was successful. If registrants cannot "Join" the session, they are asked to contact Elluminate support directly. One frequent stumbling block is that users behind a firewall connection need to have a port opened. Organizational restrictions on opening of ports vary, so be sure to check with your network sentry.

- Check their loudspeakers. Interfaces that use voice-over-IP (VoIP) do not require a phone connection. Participants hear people talking through their own PC speakers. It's a nice cost savings over bridge or conference calls or long distance charges.

- Check their microphones. In this interface there is only one microphone and it's usually pushing the sound of the speaker's voice. Participants can also use the microphone, but only one person can speak at a time. There's a tiny learning curve for people who need to remember to click on the Raise Hand button to ask for the speaker to release the microphones, and to then to click TALK before they make their contributions to the discussion. One main advantage is more control over background noises like dogs barking and cell phones ringing.

For participants who don't have a headset, the internal microphone (the small hole in a laptop keyboard panel) is a less-than-optimal option because it can pick up machine noise and create an intolerable online hum. External or desktop microphones are not much better. Invest $20 in a headset (don't bother with expensive ones; they all break just the same as the inexpensive ones).

Conclusion

Building and delivering online events takes a lot of preparation and a few pairs of hands, but with practice, you can create excellent and effective learning experiences. Sidebar 18.2 summarizes, in checklist form, some of my key preparation steps. I hope you and your team will find this case study of our successes and strategies worthwhile. Please experiment with the strategies I've introduced here, and let me know how well they work for you. I also encourage you to write to me to ask additional questions and find out how we're overcoming specific obstacles. You can also suggest ideas that we might try in our monthly Online Forums. I'm looking forward to hearing from you.

SIDEBAR 18.2: MODERATOR'S CHECKLIST

Two Days Before

- Send reminder email to each speaker. Include usernames and passwords, technical support number, my number, room access time, and session start time.

- Update of registration numbers and audience profile information.

- Speakers' files converted to WDB format and ready to be uploaded, files or applications to Application Share, or Quiz files.

Two Hours Before

Confirm that I have:

- Two PCs with Elluminate's Java web software, PowerPoint, and mail access loaded. Both connected via cable modem. Two Elluminate usernames and passwords.

- Two PC headsets. One to use, one backup that stays plugged into the laptop to restrict audio output.

- Meeting notes and list of support tasks (at slide 19 go to URL) list of URLs.

- Speakers' phone numbers (specifically for where they'll be that day).

- Elluminate Technical Support number.

- Speakers' usernames and passwords.

- Link to Guild Event Resource Page, where participants can download handouts.

- Link to post-event survey to push at the end.

- Printed schedule for the day showing at least two time zones.

- Speakers' introduction information.

- List of event registrants with phone numbers and email addresses.

Fifty Minutes Before

- Join Session 1 as soon as link becomes available.

- Load files as needed.

- Set up breakout rooms; load instructions into each room.

- Greet early participants.

Forty Minutes Before

- Use restroom.

- Fill water bottle.

- ChapStick®.

- Ricola® cough drops.

- Turn phone to silent mode.

- Hang "do not disturb" sign on the door.

Thirty Minutes Before

- Start sound checks.

- Chat with early participants.

Fifteen Minutes Before

- Start tutorial.

At the Start

- Start recording.

- Welcome participants.

- Review schedule and agenda for the day.

- Remind participants that they need to log out at the end of this session and log in to the next.

- Request feedback via online surveys—will send URL Direct Messaging and will push link at the end of the day.

- Introduce first speaker.

Karen Hyder serves the Guild as the online events moderator and speaker coach. Karen works to ensure that every presenter is able to effectively communicate his or her message and can comfortably engage learners online. As moderator, Karen hosts the sessions, supports the presenters and participants during the sessions, and manages the presenters' use of the web conferencing technology.

Karen has been teaching people to use technology since 1991. As director of trainer development for Ziff-Davis Education (now Element K), Karen presented train-the-trainer programs to trainers from corporations, higher education, military, and public training centers. In 1998, Karen joined Corporate Learning Ltd., London, to lead trainer development programs in Europe and the UK.

Karen has helped individuals and teams of trainers earn Microsoft Certified Trainer (MCT) and CompTIA Certified Technical Trainer (CTT+) certifications. In addition to her Guild responsibilities, Karen creates programs that teach strategies for training delivery, facilitation, and production for classroom and online programs.

Fast-Track Your e-Learning Video Development

TARGETING PRODUCTION NEEDS ANALYSIS

Laura Levy

> As video editing tools and bandwidth become more available, digital video is becoming an indispensable part of e-learning. However, the skills required for video production are not commonly part of most e-learning developers' backgrounds. This chapter, by an expert in multimedia production, will give you the guidelines you need to make your first e-learning video a resounding success!

YOUR DICTUM FROM SENIOR MANAGEMENT: Develop and deploy a new training video over the LMS by the end of the current quarter. Oh no! And now, with only a few weeks in which to produce a deployed training video, where do you begin?

While you may be experienced in instructional multimedia, video is a whole different animal. First, don't panic! Where would Steven Spielberg be now if he had let anxiety sideline his ambitions?

Second, understand that every aspect of video production has expert specialists: streaming, script writing, videography, editing, and post-production are a fusion of art and science within themselves. Don't expect to achieve even amateur status, let alone join the experts in any of these disciplines overnight. The key to success with your first e-learning videos is to home in on the information, processes, and techniques you absolutely need to know to get the job done now. Over time, you will polish these skills, but that doesn't mean you won't get great results with your initial efforts. It's all in applying the basics.

In this chapter, I'll focus on the important pre-production considerations, showing you how to create a thorough technical and creative needs analysis that will fast-track your video production, saving you time, money, and (most important) excessive deadline-related stress.

Let's look at a needs identification approach that examines the technical and creative considerations of each of the six steps in the production process:

- Identifying the desktop characteristics of your learners

- Determining your deployment platform

- Writing your storyboard

- Shooting your video

- Editing your video

- Testing your video

In each of these steps, I'll give you some questions to ask and a handy planning template at the end of the chapter.

Step 1: Identifying the Desktop Characteristics of Your Learners

The first thing to consider is the environment in which your learners are playing the video. The three questions to consider are:

1. Should I stream video to the learners?

2. What video player(s) do the learners have?

3. Do the learners have audio capability?

1. Should I Stream Video to the Learners?

There are two types of video: *streaming* and *non-streaming*. Streaming video is video sent to a learner's computer in a continuous stream, playing as it arrives. Non-streaming video uses video files that download completely to the learner's desktop before playing. Because file size is an important consideration for this type of video, you should develop clips over thirty seconds long as streaming video.

You can deliver streaming video in one of two ways: *progressive streams* or *real-time streams*. The distinctions between the two are simple, but important.

Progressive streams are sent to learners via conventional web servers. In this method, content is sent from the LMS or other web server to a streaming media player, such as QuickTime, RealPlayer, or Windows Media Player, on the learner's desktop. These media players start playing the files as the video is downloading. In this method, copies of your video files actually download to the learner's computer.

Real-time streaming is the second type of streaming. In real-time streaming, the video files are stored on a streaming server and sent to remote learners a few frames at a time using a streaming server software package, a compatible streaming media player, and a proprietary real-time streaming protocol. In real-time streaming, files play on one of the streaming media players mentioned above, but the learner cannot save them on his or her computer.

The first consideration in terms of delivering streaming video is the bandwidth requirements of your learners. Bandwidth is the amount of data that can be transmitted in a fixed amount of time. High bandwidth connection speeds are essential for receiving clear, uninterrupted streaming video.

Learners with access to high-speed connections such as DSL or cable modems that can transfer an average of 1.5 MB of data per second should enjoy seamless viewing of video encoded at their connection speed or lower. On the other hand, learners with slower 56K or 28.8K modems (transferring 56 and 28.8 kilobytes per second, respectively), will experience video digitized for high speed as choppy and halting. You can accommodate multiple bandwidth configurations either by providing learners with a choice between a high bandwidth version and a low bandwidth version of your video, or by streaming from a dedicated streaming server instead of your LMS or web server.

Let's take a look at the competing advantages of delivering video from either your LMS (or standard web server) or a dedicated streaming video server. The primary advantage of serving video from a web server or LMS is cost savings. Hosting video from an existing learning management system (LMS), a corporate website, or over an intranet lets you take advantage of your current infrastructure—a big cost savings for a first-time tryout video training program. However, the more robust your video training library becomes, and the more learners you serve, the more benefits a dedicated streaming server will yield for you.

Streaming servers offer tremendous value in terms of delivery quality. They are dynamic and can stream content at multiple bit rates, which can be useful when you need to stream to many learners at various connection speeds. Additionally, streaming servers actively communicate with their clients and can adjust audio and video delivery based on network congestion and other variables, eliminating the stops and starts that sometimes characterize video progressive streams. They are also essential if you plan to do live webcasts.

For a detailed analysis of the benefits of each delivery method, go to www .microsoft.com/windows/windowsmedia/compare/webservvstreamserv.aspx.

2. What Video Player(s) Do Learners Have?

Whatever server option you choose, your learners will still need to have desktop access to your designated player. A player is a special program that decompresses audio and video data for viewing on the screen. Currently, the most popular streaming media players are Windows Media, Real Video, QuickTime, and Flash.

Some of these media players come bundled with popular browsers and operating systems. For example, learners on the most current version of Vista or Windows XP will have access to the Windows Media Player 11. Browsers including Internet Explorer 6 or later, Netscape 6+ or later, Mozilla, and Firefox, as well as Safari for Mac OS X, all come with the Flash player as the default installation. Check the features for your learners' preferred operating systems and browsers to determine what media players are readily available to them.

Your video player requirements will dictate your encoding and exporting process. A codec encodes a video file for distribution over the Internet.

Codec is short for compressor/decompressor, a software application that compresses video and audio data for streaming across the Internet, and then converts it back to its original form at the destination. Whatever codec you decide to use, be sure your learners have access to a compatible player.

In my company, the majority of learners have access to Windows Media Player. Knowing this, we encode all our video using the Windows Media codec. This ensures that any learner with a Windows Media player can easily access and view our video.

The DivX codec is popular for producing relatively small video file sizes. However, video compressed with the DivX codec only plays back in the DivX player. If learners do not have the DivX player on their desktops, they will need to download it in order to view the video. You'll find a good introduction to codecs at http://graphics.csail.mit.edu/~tbuehler/video/codecs/index.html.

3. Do the Learners Have Audio Capability?

Do your learners have internal or external speakers on their computers? If not, you may want to reconsider using video until your learners upgrade their systems. If they are able to stream audio, will their work environment require the use of headphones? If so, whose responsibility will it be to provide those headphones?

Step 2: Determining the Deployment Platform

There are four questions to ask about deployment of your video:

1. Is my video file format compatible with my authoring software?

2. What does the LMS require?

3. Will I need to export the video to DVD for deployment?

4. Are there access issues that affect video distribution?

1. Is My Video File Format Compatible with My Authoring Software?

If you plan to import your video into an authoring tool such as Authorware, Toolbook, or Flash, you'll need to confirm that the software supports your

video file format. For example, Authorware supports AVI, MOV, MPEG, and WMV formats only. (See Table 19.1.) If you have a large file size, always test to be sure your published video runs seamlessly from within the authoring tool.

2. What Does the LMS Require?

If you are delivering from your LMS, test a video clip early in the process to be sure it uploads and streams correctly. For example, one LMS would only accept video files packaged in an authoring tool (as opposed, for example, to a standalone AVI). No matter what the LMS documentation tells you, find a sample video clip and test its compatibility with your LMS.

3. Will I Need to Export the Video to DVD for Deployment?

If you're also considering distributing your video on DVD, you'll want to do a second export (assuming you are also exporting the file for streaming) at 720 × 480 size using a DVD encoder such as MPEG-2 which is the codec commonly used to produce DVD videos. You can find more about creating DVDs at www.signvideo.com/d-athr_pt1.htm

Table 19.1. Video Format Descriptions

Format	Description
AVI	AVI stands for Audio Video Interleave and is Microsoft's digital video format.
MPEG-4	MPEG-4 is a high-compression format that supports audio and video streams over a wide range of bandwidths, from cell phone to broadband.
MPEG-2	MPEG-2 is for high-bandwidth and broadband formats; primarily digital TVs and DVD videos.
WMV	WMV stands for Windows Media Video and is the generic name of Microsoft's video encoding solutions.

4. Are There Access Issues That Affect Video Distribution?

If you're posting your video to an existing LMS or web server platform and you have remote or public learners, you've probably already dealt with firewall and digital certificate issues. However, if you're posting to a platform for the first time, talk to your technical support folks about any pertinent user requirements and test, test, and test!

Step 3: Writing Your Storyboard

Video storyboards are different in important ways from the e-learning storyboard created by the instructional designers. You will want to know:

1. What should a video storyboard include?
2. What technical considerations should I keep in mind when creating the video storyboard?
3. What camera shots should I include in my video?

1. What Should a Video Storyboard Include?

Video storyboards are essentially graphic timelines displaying the content and sequences of planned shots. If you're shooting a talking head with one camera in a single area, you might not need a storyboard. However, if you're working with an original script, have multiple location shots, multiple actors or subjects, or multiple camera angles, you'll save yourself (and your team) lots of aggravation and time by working out your shot list and shooting sequence ahead of time.

Video storyboard templates can be highly detailed or, as in the example in Figure 19.1, as basic as a word processing document outlining scene, lighting, and audio information. If you're developing a complex video, you may want to further document details, using professional forms such as a Camera Shot List, Location Release Form, Field Tape Log. Dependent Films (www.dependentfilms.net/files.html) offers a slew of free forms for download including a storyboarding tool.

Figure 19.1. Instructional Video Storyboard Template

Video Title: Storyboard#___of ___   Script/Notes

Actors: *List Actors, SME's, etc*

Scene Description: *Describe scenery, backgrounds, props, actions. Also indicate where the actors will be placed during the scene.*

Draw scene here

Camera Directions: *Describe camera movements to be used in this scene such as two-camera shots, close-ups, long shots, panning.*

Lighting: *Identify the lighting equipment you will need and the type of lighting effect you want for this scene such as bright lights of office setting, soft early evening light, etc.*

2. What Technical Considerations Should I Keep In Mind When Creating the Video Storyboard?

The amount of information (color, transition, movement, sound, and so forth) processed in your video directly impacts viewing quality, especially for your low-bandwidth learners. If you're accommodating 56k connections, don't try to re-create your favorite movie action scene. Instead, keep movement and transitions to a minimum, backgrounds basic, and, if possible,

audio simple and mono (rather than stereo). The ideal (but no doubt most boring) low-bandwidth video would feature a "talking head" against a dark background in a noise-free studio. If you're lucky enough to develop for corporate broadband connections (and especially if you have a dedicated streaming server) you can throw caution to the wind and become creative with action shots and transitions.

Most importantly, remember that your goal is to transfer knowledge. Engaging your audience with bells and whistles is only appropriate if it furthers that goal. Apply adult learning principles to your storyboard by using multi-camera shots and cut-aways to break up the monotony of a talking head, edit videos into short (four- to ten-minute) segments whenever possible, and incorporate thoughtful questions at the end of the training, and so forth. As in all instructional design, special effects are the means to your goal—not an end in itself.

For tips on shooting streaming video, visit these sites:

- www.indigipix.com/webstreaming.html
- www.streamingmedia.com/tutorials/view.asp?tutorial_id=36

3. What Camera Shots Should I Include in My Video?

One-camera, one-angle shots can make for very boring training videos. Even for talking-head videos, a two-camera shot will be more engaging and give you creative freedom during the editing process. If you don't have access to a second camera, use a single camera to create the illusion of a multi-camera shoot by taping a single scene several times from different angles and editing the shots together later.

Step 4: Shooting Your Video

You should be ready at this point to begin shooting. This section answers three common questions:

1. What basic equipment will you need?
2. What about sets?
3. What about professional talent?

1. What Basic Equipment Will You Need?

The world of digital video camera equipment is extensive, and identifying all the options based on your training department budget is beyond the scope of this chapter. With that said, I'll put one foot into the water and advise that, at a minimum, you'll need a decent digital video camera and case, extra batteries, a tripod, a good microphone, and three-point lighting equipment. (Three-point lighting is a common lighting technique that utilizes three lights: key light, fill light, and back light. Placing each light strategically around the subject creates appropriate shadows for a three-dimensional look.)

The sample budget shown in Table 19.2 considers the average cost for mid-range camera equipment that will get you started shooting professional quality video footage.

This budget reflects mid-range prices for Prosumer quality equipment that produces video footage acceptable for streaming and DVD.

If you are new to digital video, learn more about these options at www .desktop-video-guide.com/buying-digital-video-equipment.html

A good site for learning about camcorders (including a camcorder glossary) is www.camcorderinfo.com/

You can find good introductions to three-point lighting at:

Table 19.2. Sample Digital Video Budget

Video Equipment	Approximate Cost
Digital camera	$3,600
Carrying case for camera	$300
Battery pack	$75
Tripod	$100
Wireless microphone system	$700
Three-point lighting system	$900

- www.3drender.com/light/
- www.mediacollege.com/lighting/three-point/

In terms of computer hardware, if your training budget allows, spring for a dedicated video computer. You'll find that video places tremendous demands on a computer. Editing software utilizes every bit of your computer's processor (CPU) and memory (RAM), and the hunger increases with each bit of raw video you add, as well as every time you upgrade your editing system. (New and upgraded features make more demands on your processor.)

One gigabyte of hard-drive space stores about four and a half minutes of digital video footage. Hence, you'll need at least thirteen gigabytes of space just to store one hour of video. Additionally, video capture as well as rendering time, which is the time it takes for editing effects to be applied to your video and output into the final file, is directly impacted by the speed of your processor. The faster the processor, the quicker it can read and write data.

Arguably, the minimum computer hardware requirements for digital video include a 1 gigabyte hard drive for your operating system, editing software, and other programs and a second 20 to 40 gigabyte hard disk for storing video; 256 megabytes of RAM to give you the capacity to open multiple programs at once on your desktop; an IEEE-1394/Firewire/iLink/Lynx (various manufacturers' names for standard video capture cables) for importing raw digital video footage from your camera onto your hard drive; an Intel® Pentium® III processor for editing and rendering video at a reasonable speed; a 16-bit sound card; and a 17-inch monitor. It's also a good idea to check your editing software documentation to verify the minimum hardware requirements you'll need to run the software effectively.

For more detailed explanation of minimum video hardware requirements, see www.computervideo.net/new.html

2. What About Sets?

Chroma Key is a video and film compositing technique that lets you shoot foreground action against a specifically colored light blue or green background, later replacing the colored background with a separately shot background scene. A green or blue screen lets you reuse settings and backgrounds easily and gives you access to locations that might be difficult or costly to use otherwise.

The video storyboard will identify the locations, backgrounds, actors, and props you'll need for each scene in your video. If you can afford it, invest in a good quality portable blue or green screen or, if you're lucky enough to have a dedicated video office, consider painting an entire wall for green or blue screen use. It will add substantial value to your training videos.

For example, a video that's set in your corporate office adds relevancy and realism to your training. Sometimes, however, it's simply too disruptive to shoot in office locations during work hours. A great solution is to tape footage of primary office locations ahead of time for the purpose of creating a library of corporate background scenes. Later, record your SMEs or actors in front of a blue or green screen, and simply drop in the appropriate corporate background during editing. You'll earn well-deserved kudos for placing the corporate logo or the corporate headquarters entrance behind the CEO during her big speech.

Chroma Key software such as Adobe® Visual Communicator® and Adobe Ultra 2® (more on this below in the section, "What Editing Programs Should I Use to Edit My Video?") are comparatively easy to learn and will also give you access to hundreds of professional backgrounds and locations.

For more on shooting against blue and green screens:

- www.seanet.com/Users/bradford/bluscrn.html

- www.greatdv.com/post/bluescreen.html

- www.vce.com/bluescreen. htm

Blue or green screens are available from many digital video supply stores or websites or through the following links:

- www.backdropsource.com/index.asp

- www.filmtools.com/chromkeyfab.html

- www.chroma-key.com/

3. What About Professional Talent?

Actors are another consideration. Many times, when credibility is paramount to the training, you'll use subject-matter experts from your own environment. If you're taping a pre-planned event, chances are the speaker has already been identified for you. In cases in which you're developing a concept from scratch and you need professional narration or a strong on-screen presence

(with minimal budget), the drama department of your local college or your community theatre can be a hotbed of reasonably priced, albeit professional-level, talent. You're likely to find theatre students or local actors willing to work for minimal compensation in exchange for the opportunity to beef up their resumes.

If you opt for professional acting talent, you should be aware that many professional actors belong to the Screen Actors Guild (SAG) union and you will be required to pay minimum wages based on SAG contractual agreements. For more information, see www.sag.org/sagWebApp/index.jsp.

Another consideration is signed release forms. It's a good idea to bring a handful of "Use of Image" authorization forms on all your shoots. Once signed, these releases grant you permission to use the image and/or audio of an employee or passer-by in connection with your video. Consult your legal department for specific wording on these agreements.

Step 5: Editing Your Video

Editing is an entire subject to itself, and you may want to refer to the articles in *The eLearning Developers' Journal* (www.elearningguild.com) by Steve Haskins on shooting and editing digital video. I will only summarize some guidelines on editing software here.

What Editing Program Should I Use to Edit My Video?

Editing is the "meat and potatoes" of the creative digital video process and, in my opinion, the most engaging. Editors are both born (from a creative talent perspective) and made (from a technical skill perspective). But with today's sophisticated software, even folks like me, who weren't born with a natural visual bent, can produce professional-quality videos. There are literally dozens of digital video editing programs on the market that deserve further exploration when you have some time. But for the sake of getting you up and running quickly, I'll introduce you to what is arguably the most commonly used editing software for producing instructional video. All the software applications discussed below have options to output as either streaming video or DVD.

Low Learning Curve, Good Results

- Pinnacle Studio Plus www.pinnaclesys.com

- Microsoft Producer free plug-in for PowerPoint 2003+ lets you capture and synchronize audio and video with your PowerPoint slides adding a new dimension to your SME presentations. (See Figure 19.2.) Find information on Producer at www.microsoft.com/windows/windowsmedia/technologies/producer.mspx

- Adobe® Visual Communicator® is a drag-and-drop editing system with pre-fabricated sets; full video templates; background music and title screen.

Moderate Learning Curve, Richer Options, and Professional Results

- Adobe Premiere Pro®: www.adobe.com/products/premiere/—Adobe's video postproduction tool

Figure 19.2. Microsoft Producer

- Apple's Final Cut Pro®: www.apple.com/finalcutpro/—Apple's video postproduction tool

Steep Learning Curve, Professional Editing Results

- Adobe® FLASH®: www.adobe.com/products/flash/—Adobe's tool is the choice of many web professionals

Chroma Key Programs

- Adobe Ultra 2 www.adobe.com/products/creativesuite/production/ultra/

- Professional chroma key and virtual set software (See an example of a virtual boardroom set in Figure 19.3.) A good site for learning more about editing techniques is www.greatdv.com/index.htm

Not all of these programs are mutually exclusive. For example, I've developed AVI segments in Visual Communicator and brought them into Premiere

Figure 19.3. Serious Magic Ultra in Use

to edit with other footage. I've also edited video in Adobe Premiere and then brought the exported footage into Microsoft Producer for final output.

Step 6: Testing Your Video

The biggest question after production and editing is:

What Do I Test?

Let me get three words out of the way. Test! Test! Test! And when you're done with those steps, Test again! But, of course, the question is not necessarily whether to conduct a usability test (consider this mandatory), but what and how to test. Here are the minimum criteria for testing video usability:

1. Player Controls Click every navigational button two or three times in different orders: forward, back, pause, start, stop, and so forth. Make sure all controls do what they are supposed to do without hesitation.

2. Ease of Player Download Are all learners able to open your video seamlessly (player automatically opens when learners click on your video link) or do they get error messages? Will they need to go to the player's website to download the player? If so, directions should be included (see example below).

3. Multiple Connection Speeds This is especially important if you have remote users. Always test at the learner bandwidth rates you've identified early on in your needs analysis. Even if you feel confident that most learners will access your video from a T-1 line, it may not hurt to get an idea of how your video will stream on a 56K connection in case that renegade learner (who will no doubt be your CEO casually browsing the training curriculum from her home computer) tries to access your video.

4. Visual/Audio Quality This may seem to be a no-brainer, but we've actually posted video that worked fine on our desktop but had no audio once we published to our LMS. Don't take anything for granted. Watch and listen.

5. Load Testing for Multiple Users Ask as many volunteers as possible to access your video at the same time to test performance under multi-user conditions.

After thorough testing, write up a one- to two-page FAQ sheet addressing the most likely help-based scenarios (along with their fixes), for example, "Learner cannot download Windows Media Player," and distribute to anyone who is in a position to field questions from your learners. You may also want to make a version available to your learners through a distributed handout or by a link posted to your site. At the very least, I would recommend posting basic instructions on accessing media players at the point of entry. Here is an example of appropriate verbiage for your video introduction page:

> "To view instructional videos, you will need the Microsoft Media 9 Player installed. Click this Test Video link to check your current video player configuration. If you have problems playing the test video, click Install Windows Media Player."

Summary

This needs analysis is most relevant in the early stages of your video curriculum development. However, even as you gain experience, and as your video curriculum becomes more robust, it's a good idea to periodically review your criteria to be sure you're still in tune with the technical requirements of your learning population.

Use the Instructional Video Development Needs Analysis chart (Table 19.3) at the outset of your project to identify the priorities for instructional video development. The chart highlights the considerations covered in this chapter: identifying the technical capabilities of your learners; deciding on the server you will deploy from; constructing a descriptive, graphic storyboard; determining the type of camera equipment you'll use to shoot your video; outfitting your computer to meet minimum hardware standards in order to edit your video effectively and efficiently; and developing processes to test your video before deploying it to your full learning population.

In addition, Table 19.4 provides a comprehensive guide to developing your video project budget.

Keep in mind that the choice is not whether to address these issues, but *when* to address them. The up-front effort you put into your needs analysis will reflect handsomely in the professionalism of your final product.

Table 19.3. Instructional Video Needs Analysis Worksheet

Learner Characteristics

What are the most common learner
   bandwidths?
Will I stream the video to the learners?
Do my learners have audio capability?

Deployment Platform

Is my video file format compatible with my
   authoring software?
What does the LMS require?
Will I need to export the video to DVD for
   deployment?
Are there access issues that affect video
   distribution?

Storyboard Construction

What video storyboard format will I use?
What technical considerations should I keep in
   mind when creating the video storyboard?
What camera shots will I include in my video?

Video Shoot

What camera equipment do I need?
What hardware upgrades will I need for my
   computer?
What sets will I use?
What talent will I need?

Video Editing

What editing program will I use to edit my
   video?
Usability Testing
What will I test?

Table 19.4. Video Project Budget Template

Items	Costs	Notes
Software		
Editing software 1		
Editing software 2		
Graphics software		
Chroma Key software		
Additional software		
Software subtotal:		
Hardware		
Computer work station		
Additional hard drive		
FireWire		
Sound card		
RAM upgrade		
Additional hardware		
Additional hardware		
Additional hardware		
Hardware subtotal:		
Server expenses		
Streaming server		
Web/LMS server upgrades		
Additional server expenses		
Server subtotal:		
Camera equipment		
Digital camera		
Camera case		
Battery pack		
Tripod		
Microphone		

(Continued)

Table 19.4. (Continued)

Items	Costs	Notes
Lighting equipment		
Additional equipment		
Additional equipment		
Camera equipment subtotal:		

Location costs

Travel expenses		
Green screen		
Props		
Other:		
Location subtotal:		

Personnel

Actors		
Voice-over narrators		
Translators		
Graphic designers		
Other:		
Personnel subtotal:		

Total project cost:

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20

Simulations and Games

REVISITING THEIR STRATEGIC VALUE

Allison Rossett

Games and simulations get a lot of attention in the e-learning world. Either can improve learning in certain cases, but they are not equivalent. What is the difference between them, and when would you use each to best effect? In this insightful chapter by one of the field's leading researchers and educators, you'll learn answers to both of these questions, and you'll find a handy tool you can use to explain the choices to your colleagues and clients!

ONLY RECENTLY have I come to appreciate simulations and games. I don't have a good reason for my delayed enthusiasm. After all, it was simulations that got through to me about how my car works and the power of compound interest.

Games too are dandy. I drilled my vocabulary into reasonable shape by playing games. More recently, we used a computer-based game to boost keyboarding skills for sales professions.

Simulations and games are nifty together. Two favorites come to mind. One is rather old, but made the most extraordinary use of a simulated hospital emergency room. The CD-ROM offered high physical and emotional fidelity. All it lacked was smell, which I could do without. It timed and evaluated decisions. Slow or incorrect choices reduced the likelihood that the patient would survive, with real results displayed on the screen. When I tried mightily to treat a stabbing victim, the patient took an immediate turn for the worse and died because I didn't have a clue about what to do. When one of my graduate students, a nurse, tried the program, it went better, but only for a while. Alas, she wasn't an emergency room nurse. He died under her care too.

Good Programs

I was fortunate enough to get very close to a flight simulator a few years ago. The fidelity was extraordinary, obvious from the grunting, sweating pilots who were using the system. It was real to them. Was it a game? No, but there were game-like elements, such as timed responses, numerous choices, and measured performance and results.

I started to think anew about simulations and games during a U.S. Navy Learning Strategies Conference in August 2004. (You can review the agenda at www.lscconference.com/.) (*Editor's Note:* Please use the Internet Archive to open this site, which has been removed from the web since this chapter was written. Direct your browser to http://archive.org, enter the URL given in the previous sentence, and then open the December 13, 2004, archive. The link to the agenda and the materials is "Post conference" in the navigation bar.) The experience was heartening. Chief of Naval Operations Vern Clark offered the keynote, in itself a victory for a group gathered to talk about learning, technology, and performance. Admiral Clark spoke of his service at the head of a Navy school, noting the lessons learned in that prior role, acknowledging the centrality of learning to the mission of the Navy, and going so far as to proclaim himself a "schoolmarm."

I wondered about a conference with so much attention paid to simulations and games. Might it be an instance of people with hammers, expensive ones in this case, running around and looking for nails? That isn't what happened.

Simulations and games intrigue the Navy because they intrigue current and future sailors. Digital natives, as Mark Prensky dubbed them, are habituated to vivid, rapid-paced digital experiences. (See Mark's site at www .games2train.com for more information.) Still, every presenter, and Navy decision-makers, urged cautious decisions about when to employ simulations and games.

Good Choices

That started me doodling on a napkin, attempting to find sweet spots for investing in simulations and games. Figure 20.1 below represents my efforts.

Figure 20.1. Sweet Spots for Investing in Simulations and Games

GAMES

2

High game-iness, low authenticity

★ Combo of ★ Games/Sims

3

High authenticity AND game-iness

???

1

Low authenticity, Low game-iness

Simulations

4

High authenticity, Low game-iness

Game-iness

Authenticity

I focused on two elements: (1) authenticity and (2) "game-iness." Authenticity is what it sounds like. It's about the parallels individuals perceive between the materials and their lives. How akin is the content to their work and concerns? Can they hear the voices of their customers or see the words and numbers that constitute a challenge to the bottom line? Flight simulation training is very, very authentic; also authentic, but not quite so real, is online problem-based leadership development. (Want an example? See www.simu learn.net/SimuLearn/standalone.htm.) Both mimic the situations confronted at work, with functional and emotional fidelity. The flight simulator, though, presents with the height of physical fidelity—and the purchasing organization pays a lot for that fidelity. At one end of a continuum of authenticity is a flight or fire training simulator. At the other is an in-basket exercise, encountered online or in a room, where leaders contend with realistic output, email, memos, policies, and requests, in timed circumstances.

"Game-iness" is about engagement, tracking, competition, and measurement against standards or peers. I play online Scrabble and Hearts. They're very game-y, but not at all authentic.

Quiz shows? Certification challenges? Word games? Mark Prensky and Sivasailam Thiagarajan provide templates for games that enhance learning. (For some examples, see www.thiagi.com/freebies-and-goodies.html.) These approaches make sense for assisting employees to learn a body of content not especially favored by them, such as indicators of workplace violence, sexual harassment policies, or multiplication tables.

Examples in the Quadrants

Quadrant 4: In Florida students hold their noses and demand alternatives to frog dissection. Thus Florida is about to join other states in permitting frog dissection online, a classic quadrant 4 approach. (Dissect your own frog at www.froguts.com/flash_content/demo/frog.html.) WebMD is another example. Wondering whether the scorching pain at the back of your foot is your Achilles tendon? Worried about what to do about it? WebMD is real and useful, although not much fun at all.

Quadrant 3: But what if we're talking about a topic that people might elect to ignore, such as time management or sexual harassment? Or what do we do

if the target audience loves video games. That's how Battle Stations (www.nstc .navy.mil/battle_stations_21_New.htm) wins the war for hearts and minds.

Quadrant 2: When I was very young, I ignored the multiplication tables. Once my parents noticed that I hadn't a clue, it was games and rewards that got my attention and skills to where they needed to be. Consider fish and oceans. While there are many ways to foul this tasty topic, Build-a-Fish handles it beautifully. (Build-a-Fish is online at http://sv.berkeley.edu/showcase/ flash/fish.html.) Pick an ocean environment; construct a fish to thrive in it, with numerous parts to choose from. Then check your answers. Will your fish survive in that context? If students must know the topic by heart or must have a robust sense of it, and yet they resist, I look to games to move the material to memory and fluency. (Find an example of the way some people approach online games at www.quia.com/.)

Quadrant 1: Alas, this is life as many employees know it. It happens in classrooms and online. Recently a student stopped me in the hall: "There's so much my people all over the world must know about _____. I have them for four hours, no more, no less. It's required. And I can't be everywhere, so we want to create a technology-based program that tells them what they need to know. I intend to lay an audio track on all these PowerPoint slides." I asked about carving the materials up into smaller, use-based segments. I asked about creating a way for them to interact with the materials through activities or reference. He responded, "Nope. Four hours. I need to tell them what they need to know." No nod to game-iness or authenticity. While the material is going to get OUT to the people, no doubt, I wonder if there is any hope of it getting IN. Moving out of Quadrant 1 makes sense here. There are aspects of games and simulations that could greatly improve this strategy.

Good Harry

Let me introduce you to AZTEC Inc., my wholly owned and non-existent subsidiary. For the purposes of this piece, I'll pile some work on Harry, esteemed director of workforce learning and performance. Let's charge him with doing something about fulfilling sexual harassment requirements; assuring that sales people become more successful at making sales; and encouraging employees toward retirement planning.

Harry, good professional that he is, turned to analysis to plan his approaches. (Analysis? Find a guide to knowing what to do at www.jbp.com/rossett.html.) He can't decide how to work on these challenges without deepening his understanding of them.

Harry discovers that the vast majority of employees are not keen on another class about sexual harassment. Based on an admittedly unfocused request from me for more sales, the analysis discovered that sales people have hesitations about closing sales and are fuzzy about certain newer products. The sales people also affirm that they do not want training that takes them away from the field. And nearly every employee is concerned about readiness for retirement and open to getting smarter about the topic.

Let's use Table 20.1 below and refer to Figure 20.1 in order to think about how to handle each challenge. What did Harry propose to do about these tasks? When would you invest in simulations? In gaming? In both? Are there aspects of simulations and games that would strengthen the effort, even if you do not build out full blown simulations or games? Table 20.1 states the possibilities.

Table 20.1. Harry Tackles Real Tasks

The Challenges	*Reflecting on Simulations and Games*
Fulfilling sexual harassment requirements	In the bad old days, Harry's group handled this challenge in Quadrant 1, with instructor-led training. Now, Harry focuses on more authenticity, helping instructors bring real cases and problems to the group, urging them to attempt to solve problems and compare their solutions to those of experts and each other. They commit to Quadrant 3. At a minimum, more authenticity (Quadrant 2) would improve the effort.
Assuring the ability to close sales	Resistant sales people must see the usefulness of the material and be given opportunities to move skills to memory in realistic, active, and lively contexts. Look to Quadrant 4, if instructor-led, and focus on closing sales, not everything about sales, since it's the closing that concerns them. If online, it makes sense to invest in Quadrant 3.

Assuring fluency in product knowledge	Share data that came from customers re lack of fluency on products. Build fluency, driving information into memory through gamey drills and practice. Quadrant 2 ought to do the trick. Quadrant 3 would be even better to assure transfer to customer interactions. Technology makes great sense here and will allow them to stay in the field, where they want to be.
Encouraging retirement planning	Willing participants matter here. No need for fun and games, so get to the heart of the matter by providing stories about people and their choices. Provide useful, realistic information, with direction about how to apply to life. Quadrant 4 is appropriate, perhaps through online tutorials, a performance support tool, and rich knowledge bases. Grab attention with a simulation that tells the tale of somebody with whom they can identify and the impact of varied choices.

Good News

A few weeks ago, I taught about the history of educational technology. Mired in Quadrant 1, it was a struggle. Oh, my students were polite. They always are. But they most certainly were not compelled. What my efforts needed was a dose of those strategies available in the other quadrants. A game would have been dandy. Even better would be an opportunity for them to step back in time and into Thomas Edison's shoes or those of the government leaders frantic to win World War II or reeling from Sputnik. Muzzy Lane Games does just that with World War II and the difficult decisions Neville Chamberlain had to make (www.making-history.com/). What would you have done? How would you decide?

In a world of knowledge work, global threats, regulations, compliance, and fierce competition, there are many good reasons to make tough choices in favor of the strategies associated with simulations and games.

Suggested Resources

Dialog/Coaching: www.dialogcoach.com/cms/

Digital Games Research Association: www.digra.org/

Games for learning: www.angelfire.com/wi2/GamesForLearning/

Games and the Military: www.dodgamecommunity.com

Learning Vocabulary Can be Fun: www.vocabulary.co.il

MIT and Microsoft sponsored consortium: www.educationarcade.org/

North American Simulation and Gaming Association: www.nasaga.org/

Rossett, A. & Sheldon, K. (2001). *Beyond the podium: Delivering training and performance to a digital world.* San Francisco, CA: Pfeiffer (www.pfeiffer.com)

SDSU's Bernie Dodge's Sims and Games course: http://edweb.sdsu.edu/ Courses/EDTEC670

Dr. Allison Rossett long-time professor of educational technology at San Diego State University, works most often on workplace learning and technology-based learning and support. Allison received ASTD's prestigious award for her lifelong contributions to workplace learning and performance. She is also a member of the *Training* magazine HRD Hall of Fame, the CLO Advisory Board, and recipient of the International Society for Performance Improvement's highest honor, Member-for-Life.

Allison's new book is *Job Aids and Performance Support: Moving from Knowledge in the Classroom to Knowledge Everywhere*. Her book and website, *Beyond the Podium: Delivering Training and Performance to a Digital World,* won the ISPI Instructional Communications award for 2001. Rossett also authored the award-winning book and website: *First Things Fast: A Handbook for Performance Analysis*, www.jbp.com/rossett.html

21

Be Constructive

BLOGS, PODCASTS, AND WIKIS AS CONSTRUCTIVIST LEARNING TOOLS

Joyce Seitzinger

As social software (blogs, podcasts, and wikis are just three examples) matures, it presents more opportunities for learners to participate actively in their own learning. Designers can now move significant learning opportunities out of "event mode" and support construction of knowledge and skill beyond the classroom and beyond traditional asynchronous e-learning. This chapter offers a comprehensive survey of what is available, and ways to expand your own learning horizons!

E-LEARNING IS NOT UNLIKE the Borg; it thrives by assimilating technologies never originally intended for education, from the printing press to the audiocassette. (If you are not familiar with *Star Trek,* I apologize for the reference—it's a geek thing.) With the arrival of the World Wide Web, learning stepped up a gear and developed a new sub-entity, e-learning.

In the past ten years, most learning managers, designers, and developers will have encountered HTML and XML, at least four learning management

systems, and probably over fifteen content production tools. And now blogs, podcasts, and wikis have arrived to no educational purpose. What will we do, Captain?

Well, we're not going to lose our heads and let the technology steer us. And we will not take evasive action by ignoring these potentially powerful tools while continuing on our course. Online learning is leaning toward a constructivist pedagogy in which collaborative learning takes an important role, so let's see how we can assimilate these newcomers into the constructive learning we strive for.

Why Target These Three Media?

Why not look at Flickr or the hugely popular MySpace? The justification for singling out these three new media is that they are the most well-known, popular, and widely available of the new media. Podcast was the word of 2005 for the *New Oxford American Dictionary* and blog was the word of 2004 for Merriam-Webster. The success of Wikipedia, which contains 1.8 million articles, has 13,000 volunteer editors, and (according to a recent study) is only slightly less accurate than the *Encyclopedia Britannica*, demonstrates the popularity of wikis.

Additionally all three have already become mainstream items. You will find all of them in use in educational settings, either as official organizational channels or as pioneer actions by a brave educator or trainer. They are no longer "emerging technologies."

Stephen Downes, a leading expert on online learning, sees the use of open media such as blogs, podcasts, and wikis as the key to the future of learning. In his 2004 keynote speech entitled "Reusable Media, Social Software, and Openness in Education" (which you can listen to by using the link in the References at the end of this chapter), he notices that there seems to be a divergence between the learning content producers and the content users. While producers are trying to force everything into closed systems, the users want to use open systems. He predicts, "When we in education cease to heed the demands of traditional producers, and open ourselves wholeheartedly to the idea that content is created, distributed, and owned by the consumer,

only then will the promises of the network age be realized, and the era of online learning truly begun."

It's Learning, Jim, But Not As We Know It—
The Constructivist Learning Beast

We can already see a convergence between these new open media tools and constructivist learning: all three require the users to construct their own content. In recent years, those involved in online learning have had a growing understanding of the benefits of constructivist online learning environments, and a sense of urgency exists to see where this kind of learning can take us. Yet much online training remains page-turners, and many online university courses are only calendars augmented with copies of a professor's lecture notes. Why?

Constructivism can be an intimidating goal; it is a complex pedagogy with its roots in philosophy and psychology, going back to Kant and Hegel. That is a lot of baggage. However, to examine the possibilities for using our three media as constructive learning tools it is not necessary to delve into history. Instead, let's look at constructivist learning in practical terms.

To ensure we are all on the same page, here is one of the most concise and practical descriptions of constructivist learning I have found. Jackie Miers provides this fine summary in a report on a learning management system for the Technology School of the Future:

> Constructivist learning should engage students in meaningful learning and . . . the critical features are that the learning should be . . .
>
> - Active and manipulative, engaging students in interactions and explorations with learning materials and provid[ing] opportunities for them to observe the results of their manipulations
>
> - Constructive and reflective, enabling students to integrate new ideas with prior knowledge to make meaning and enable learning through reflection
>
> - Intentional, providing opportunities for students to articulate their learning goals and monitor their progress in achieving them

- Authentic, challenging, and real-world (or simulated), facilitating better understanding and transfer of learning to new situations

- Cooperative, collaborative, and conversational, providing students with opportunities to interact with each other to clarify and share ideas, to seek assistance, to negotiate problems, and discuss solutions. (Miers, 2004)

Gulp. Well, yes, that is a tall order, whether you are in an academic or corporate training setting. The idea of an organization-wide online learning system, which will facilitate all of the above, never mind obtaining the political clout or hair-raising budget to get it off the ground, is mind-blowing. But does it need to be?

Phasers Set to "Slice"—Constructivist Learning Elements

Rather than going large and setting up organization-wide systems, we can start small by using only elements of constructivist learning. After reading Jackie Miers' report, David Jonassen's 1998 authoritative work on constructive learning environments, an EDUCAUSE list of learning-centered principles, as well as articles by Chris Dede, Peter Doolittle, and Shirley Reushle and her colleagues at the University of Southern Queensland, I came to an incomplete but workable synthesis.

The seven elements below seem to be key components for online constructive learning. Some of these elements can overlap to some extent, such as support and social presence, but we expect that in such an organic system.

- Problem-based learning
- Learner-centeredness
- Collaborative learning
- Social presence
- Interactivity
- Support
- Cognitive tools

In the sections that follow, I provide some background details for readers who are new to constructivism. Bear with me, as this is likely to get quite dry at times. You can scan ahead if you wish. If you find yourself nodding and muttering "uh-huh, uh-huh" to yourself, you can proceed at warp-speed to the next sections (beginning with "The Blog") where I will guide you to some implementation possibilities for each of the three new media, including a mix of articles and real-life examples.

Problem-Based Learning

Problem-based learning consists of several building blocks.

- An appropriate problem—This can be a question, a case, a project, or a problem, but it will be the force behind the learning and so should be (in David Jonassen's words) "interesting, engaging, and relevant."

- Previous experience or related cases—Learners must have previous experience to construct their own solutions to understand the presented problem. This is often missing, but you can supply it in the form of case material.

- Information resources—Learners will also need rich information resources to investigate problems and to build and test their hypotheses. Keeping in mind the fact that novices cannot distinguish between important and superficial information, a designer can help by, for instance, including some sort of evaluation of a source with an Internet link.

- Authenticity—For constructive learning to work, authenticity is needed. It is achievable by providing real-world tasks and making content and skills relevant to the learner.

Learner-Centeredness

Particularly when looking at online learning and the advent of lifelong learning, one can see the growing need for students to be self-steering. Some components of this learner-centeredness are:

- Learner control—The teacher or trainer becomes a facilitator rather than a lecturer, and the learner becomes an active participant in

the learning process. This learner control can lead the student to new learning strategies. Shirley Reushle and her colleagues at USQ mention learning paths, glossaries, and concept maps as possible aids for learner control (Reushle, 1999).

- Active learner—The active learner can perhaps best be described by her actions. Here are some examples as described in the 2005 EDUCAUSE list(EDUCAUSE, 2005):

  - Identify topics, problems, cases, and make informed judgments

  - Present work publicly, teach others, give peer feedback and support

  - Choose how they complete activities

  - Apply the material and ideas to their own context

  - Can contribute to discussion, before, during, and after the class (either online or face-to-face)

- Reflection and articulation—Reflection and articulation might be the area in which most meaning-making as prescribed in constructive learning is done; this can be through learning diaries or other journaling activities.

- Flexibility—This is actually two-fold. On the one hand, a flexible learning system should allow students to work at the time, place, and pace they choose, providing accessibility, convenience, and freedom. On the other, the user should have flexibility to transfer her knowledge to another problem or to the work floor and to apply her skills and thought processes in new situations.

Collaborative Learning

Collaborative learning is an integral part of constructivist environments.

- Learning is best done in teams—Besides being learner-centered, constructive learning is about co-constructing knowledge, that is, collaborative learning. As David Jonassen says, "Learning most naturally occurs not in isolation but by teams of people working together to solve problems. CLEs [Collaborative Learning Environments] should

provide access to shared information and shared knowledge-building tools to help learners to collaboratively construct socially shared knowledge" (Jonassen, 1998).

- Community of Learners [COL]—In a COL, students can share information, values, and goals; the participants carry out research, discuss the knowledge they construct, make shared decisions about that knowledge, and reflect.

Social Presence

An interesting element of constructive learning is the concept of social presence, the online social relationships, and connections with fellow learners and an instructor or experts. At the University of Southern Queensland, they reported it can "influence the quality and quantity of interaction, enthusiasm, and participation," but found that overall it was not more difficult to have relationships online than in a classroom (Reushle, 1999). Consider that some students, who may be uneasy with online social interactions, should have support in this environment.

Interactivity

In 2000, at the height of the e-learning hype, page-turner e-learning was a common phenomenon. If participants could click buttons to navigate, vendors labeled it interactive learning, which was an odd assumption, as one would never accept that a student flipping the pages of a book is automatically learning. Fortunately, interactivity now stands for active engagement with course elements, which can be the computer environment, the student's own learning process, the learning materials, other learners, or the facilitator.

Support

In Lisa Neal's list of e-learning predictions for 2006, Alison Rossett notes that, as responsibility for learning moves to the individual, learners may not be particularly skilled at learning independently and online. Her petition for 2006 is for a shift to happen from a focus on technology to guiding and

developing independent e-learners (Neal, 2006). So how can educators or trainers provide constructive support?

- Feedback—To be most effective, there should be immediate and detailed responses so the student can correct or review her actions. She can reflect on her initial answer or solution and, with the help of the feedback, construct new knowledge.

- Modeling—Another form of support is modeling, the observation of expert performance and consequent imitation.

- Coaching—Coaching support can be prompted or unprompted and can guide the student through any of the learning stages, from imitation of the expert to the skilled original learner performance.

- Scaffolding—This is a more structured form of support and often occurs within the learning system. Essentially it is the breaking up of learning into smaller steps.

Cognitive Tools

As shown above, the activities required in problem-based, learner-centered learning in a social, online setting involve a high degree of variety of cognitive skills from the participants. For this reason, cognitive tools, such as conferencing systems or presentation tools, should be included to prevent students from overloading.

Now that I have set apart the different constructivist learning elements, let's examine how blogs, podcasts, and wikis are already delivering them.

The Blog

Five years ago, only a small percentage of us had heard of a blog and we would probably have called it an online journal or web diary. The entire world began hearing about blogs in this context on the news when an Iraqi known as the Baghdad Blogger told his story from Baghdad during the American invasion of Iraq and its aftermath. Now weblogs are as prevalent and ubiquitous as mobile phones in our daily lives.

BBC reporter Shola Adenekan describes what seems to be a typical story of blog usage in education at Sussex University. One of the professors there accidentally stumbled onto the use of a blog for her courses when she set up a personal blog for her own research. As she added more and more academic posts, the personal research blog slowly became a place where her students could find critical information, and a central location where she could answer their questions (Adenekan, 2005). However, a blog can be much more. Will Richardson, the man behind Weblogg-ed.com (http://weblogg-ed.com/), a widely read blog about edublogging (using weblogs in education), equates blogging with learning. He even quit his job to pursue the possibilities of blogging in education. In his post "Reinvention Chapter 2? I Quit" (http://weblogg-ed.com/2006/reinvention-chapter-2i-quit/), he writes, "There is energy and a potential in this tool . . . and in these connections that for me, at least, is incredibly intriguing. . . . We need to get everyone, and I mean everyone, access to the knowledge and people and ideas that now make up the web. Educators need to be a part of this evolution, and maybe the revolution, too" (Richardson, 2006a).

Blogging for Reflection and Authenticity

With their background, one of the most obvious ways to use blogs in constructive learning is as an online learning journal in which students reflect on their perceptions of the learning materials and on their own learning process. In fact, most edublogs, such as Edublog Insights (http://anne.teachesme.com/) and Weblogg-ed (http://weblogg-ed.com/), are places where educational bloggers reflect on what they are learning about learning. To get a clear sense of this, track a couple of these sites for a few days and pick one you like, because of the author's tone or because his or her work environment resembles your own, or whatever. Now follow this blog for a few weeks and notice how the author learns from his own observations and reflections and builds on his knowledge, often fed and spurred on by the comments of other edubloggers.

Posting blogs publicly on the web can lend a measure of authenticity to learning tasks. Charles Lowe and Terra Williams use blogs in their writing classes. They find that blogging software offers a useful cognitive tool by automating the creation, formatting, and uploading of material, freeing students'

attention for the actual task at hand. But they also noticed that the addition of a real audience by posting assignments on the web creates authentic discourse and forces students to think more carefully about articulation. They found that the potential for actual readers, combined with feedback received, has positively influenced their students' writing skills (Lowe, 2004).

Social Presence and Collaborative Learning Through Blogs

The concept of journaling may conjure up lonely images, but in fact, blogs and networks of blogs can facilitate development of a community of learners and social presence.

Community of Learners A blog and its comments, or a group of blogs, can evolve into a community of learners. This was demonstrated to Konrad Glogowski, a Ph.D. student researching the use of blogs in primary education, in December of 2005 when his class was deprived of their blogs for a few weeks while transferring platforms. In his post "Tools Interiorized" (www.teachandlearn.ca/blog/2005/12/07/tools-interiorized/), he writes "This experience confirmed my belief that blogging is about creating communities. . . . What they missed was situated writing, a cognitive activity situated within a specific space that fosters cognitive engagement. They missed interactions, interactions with texts and with each other *through* texts" (Glogowski, 2005). He further notes that students' blogging identities are so entwined with their writing that discarding the work felt wrong. Faced with new empty blogs, students were anxious to fill them. The new empty space was not "their" community, and "their" community fueled their learning.

It is tempting to assume that this phenomenon will only occur in a very structured classroom. However, look at what happens as a consequence of Glogowski's post. Will Richardson posts his reaction in "Caring about the Content" (http://Weblogg-ed.com/2006/caring-about-the-content/):

"... it's striking to me how much different this level of concern is compared to all the paper content we've created in the past [. . . and always easily discarded] . . . And it's all about the investment that we make in this, the idea that what we're writing has a legitimate

audience. How different it must be for these students who want to stay connected to the people and the ideas that have nurtured their learning" (Richardson, 2006b).

It appears that by creating the learning work in a community, students become more engaged with their learning, and it gains a higher status with them. They "own" it.

In comments on that post, Alan Levine mentioned that perhaps the title should be "Caring About OUR Content" and offers his experiences. Another reader ("Doug") argues for "Caring About the Community." So we see how even in the discussion of this one particular case, a small community of learners arises, shares information, and builds knowledge around this topic. COLs grow almost organically, and it is easy to see how we as learning designers can facilitate such communities through blogs, whether in an academic or corporate setting.

Social Presence Konrad Glogowski's illustrative experiences also show the effect of social presence on learning; when the community was inaccessible, learning ground to a halt. One student asked, "Are we gonna do any work until it's fixed?" Another felt odd writing unpublished in Word: "It was like—like talking to someone who was not listening." The absence of a social presence, which they usually found in their blogs, diminished the students' capacities for learning.

If your interest for using blogs in your learning situation has been piqued, then subscribing to Konrad's "Blog of Proximal Development" would be a good starting point. He was an Edublog Award winner in 2005, and his posts are usually a mix of his practical classroom experiences with insightful looks at the theory of learning.

Group Blogs and the Construction of Knowledge

A group blog can facilitate the collaborative construction of knowledge. Tom Nelson's class is an excellent case of how a class blog can do this. We see the constructive learning aspects of collaborative learning, meaning-making, reflection, information resources, and the creation of meta-cognition about working together and audience awareness, in action.

You can find a description of Tom's experience in "Steps Toward a Successful Classroom Blog" (www.cwrl.utexas.edu/?q=node/233). He divided his class into blog groups according to topic interest. He asked each group's participants to post weekly writings related to their group's topic based on their own research and fed by the posts of their group members. But instead of him dictating criteria for posts, students were asked to set up their own guidelines for inclusion on the blog, deciding on content, style, and length. To do this, students reflected on the goals of their blog, their audience, and their own wishes.

Tom further asked the students to target a particular audience. They did so by generating "blog rolls," lists of relevant links to other blogs about the same topic based on their research. This "blog rolling" aided students in "refin[ing] their own sense of the discourse communities that surround their group's subject" and gave them an idea of where their own writing and thoughts fit in.

The use of blog rolls has two other constructive learning benefits. Inclusion on a blog roll implies some sort of evaluation of a linked information resource as being pertinent and useful. It also allows greater networks to develop, groups of blogs that become a knowledge creation community in their own right.

The Power of Comments: Feedback and Active Learning

The comments on blog posts can be powerful feedback tools; they offer immediate and detailed responses to the learner's thoughts and ideas.

On Edublog Insights (http://anne.teachesme.com/ 2006/02/02/ comments-make-a-difference/), Anne Davis posts about her enthusiasm for comments and the opportunities for learning they offer:

> "Some of our best classroom discussions emerge from comments. We share together. We talk about ones that make us soar, ones that make us pause and rethink, and we just enjoy sharing those delightful morsels of learning that occur. You can construct lessons around them. You get a chance to foster higher-level thinking on the blogs. They read a comment. Then they may read a comment that comments on the comment. They get many short quick practices with writing that is directed

to them, and therein it is highly relevant. Then they have to construct a combined meaning that comes about from thinking about what has been written to them in response to what they wrote."

And learners value comments. In his post that I cited earlier, Konrad Glogowski remarks on his students' deep disappointment when they discovered they could not transfer the comments with the posts to their new environment.

It is almost impossible to be a passive learner when reading comments on your own posts and responding in comments to others' blog posts. It forces learners to engage higher cognitive skills. You cannot just browse; you need to ponder, formulate an opinion about what's read, and then effectively articulate those thoughts—in other words be an active learner.

And best of all, this feedback need not all come from the trainer or teacher or the automatic LMS feedback system; peer and audience comments are equally valid feedback. This moves us further away from the "sage on the stage" role and provides more of the desired learner-centeredness.

The Blog as a Low-Budget Problem Manipulation Space

A problem manipulation space does not automatically entail expensive simulations. As David Jonassen says in his writing on CLEs, it can be enough to ask learners "to articulate their solutions to problems and then to develop a coherent argument to support that solution" (Jonassen, 1998).

One possible way of doing this is through the creation of fictional blogs by fictional stakeholders in a situation similar to your learners' situation. The blog posts can be prepared in advance, but when active, the instructor can adjust them to respond to the learners' explorations.

How would that work? Well, imagine for instance a course on time management in which employees follow the daily life of a fictional employee through his blog. He posts about his upcoming appointments and his crisis when his colleague is on vacation, and agonizes about what project to tackle first. Then you ask learners to comment on his posts with suggestions based on their own experiences and what they have been learning in the regular course material. This is just one way of creating a low-budget problem manipulation space.

See Sidebar 21.1 for more information to help you start blogging.

SIDEBAR 21.1: GET BLOGGING

Blog Hosting

If you are a blogging novice, you are best off using a blog hosting service. You won't need to install anything on your computer or server. Just create an account and you can begin posting. These services usually also provide some ready-made templates that you can personalize. Here are three such services:

- Blogger (www.blogger.com/start)

- LiveJournal (www.livejournal.com/)

- Edublogs (www.edublogs.org/)—free blogs for education professionals

Installing a Blog on Your Own Site

If you want more control over your blog, to customize its looks or perhaps add functionality, or if you want to keep a blog on your organization's intranet, it is best to install blogging software on your own site or server. Some of these are open source, so would be no cost to you, apart from running your server. Here are some of the most popular blogging software tools.

- WordPress (http://wordpress.org/)

- Greymatter (http://noahgrey.com/greysoft/)

- Movable Type (www.sixapart.com/movabletype/)

- Typepad (www.sixapart.com/typepad/)

Group Blogs

Bloggers with a common interest can pool their knowledge and maintain a blog together. With most blogging tools, it is possible to add different users to one blog and so allow several people to post. For educational or training purposes, this means it is possible to create work groups with, for instance, an assignment to keep a blog on a particular topic.

Podcasting in Education

A podcast is nothing more than an MP3 file. You can record a podcast with a microphone and software on your computer, or by calling it in via phone to a service. Podcasts do not require a mobile MP3 player. Users can access them through PCs and through mobile phones. The use of RSS enables listeners to subscribe to certain Podcast feeds and receive new Podcasts as they become available for download. (See Sidebar 21.2 for an explanation of RSS.)

SIDEBAR 21.2: PLANET RSS

What Is RSS?

Blogs, podcasts, and wikis all make use of Really Simple Syndication or RSS. Will Richardson explains RSS as follows in "Blogging and RSS" (www.infotoday .com/MMSchools/jan04/richardson.shtml): "Weblogs (and an ever-growing number of other sites) generate a behind-the-scenes code in a language similar to HTML called XML. This code, usually referred to as a 'feed' (as in 'news feed'), makes it possible for readers to 'subscribe' to the content." These feeds can be collected, displayed, and manipulated in an aggregator known as an RSS reader, and can also be added to spaces like MyYahoo and MyMSN.

The power of RSS is that it collects all the latest news and media on the user's "interest scanner" and puts it all in one searchable, readily available place. So instead of opening your browser and first visiting Yahoo for your entertainment news, checking whether there any items you haven't read yet, and then opening another window to read the BBC's sports news, it is all collected for you in one place. This makes it a powerful learning and teaching tool. Imagine, as Will Richardson does, a "Subscribe to Class 6a's Homework Page." Teachers could have the latest assignments at their fingertips in real time.

So how do you find RSS feeds? There are pointers strewn throughout most sites, probably even those you visit on a daily basis. Until a few months ago, they consisted mainly of little orange blocks with "RSS" or "XML" written in white letters. Now many aggregators provide their own icons.

RSS and RSS aggregators can be seen as the driving force behind the boom in blogs, podcasts, and wikis of the last years. And the new kids on the block, Flickr and MySpace (albeit in a roundabout way), also support the use of RSS.

RSS Readers

There are many different RSS readers. Visit these sites to see which RSS reader will suit your need:

- Bloglines (online tool and probably the most popular) (www.bloglines.com/)

- FeedDemon (desktop) (www.newsgator.com/NGOLProduct.aspx?ProdId=FeedDemon/)

- NewsGatorInbox (integrates with Outlook) (www.newsgator.com/NGOLProduct.aspx?ProdID=NewsGator+Inbox/)

- NetNewsWire (Mac OS X) (www.newsgator.com/NGOLProduct.aspx?ProdID=NetNewsWire/)

- Live Bookmarks (integrated in Mozilla's Firefox browser)

- (www.mozilla.com/firefox/livebookmarks.html/)

Can I Make RSS Feeds?

Yes, you can and it won't cost you a thing. Most blogging, podcasting, and wiki software will take this out of your hands and create your RSS feeds automatically.

Many in education have noticed the possibilities for podcasting. In her 2006 *Learning Circuits* article "Trend: Podcasting in Academic and Corporate Learning" (www.learningcircuits.org/2005/jun2005/0506_trends.htm), Eva Kaplan-Leiserson mentions how podcasts can assist auditory learners and non-native speakers, create an alternate channel of material review, provide feedback for students, make it possible to review lectures or training, and provide supplementary content.

And even back in 2004, D'Arcy Norman and Steve Sloan offered the following ideas in the post "Podcasting for Education" (www.darcynorman.net/2004/10/30/podcasting-for-education):

- To facilitate self-paced learning

- To allow faculty to offer advanced and or highly motivated learners extra content

- To make available recorded interviews with external experts

- To allow guest speakers the ability to present once, but to many classes

- To offer a richer learning environment

Because podcasts are one-way traffic, their use for interactivity, constructing knowledge, and collaboration may appear limited. However, there are other effective applications for podcasts in constructive learning.

Hearing Aid: The Use of Podcasts in Case-Based Instruction

In his article on CLEs, David Jonassen pleads for the use of multiple related cases to convey the complexity of most problems. He gives the example of providing "divergent personal interpretations of [a] dilemma" in a case in which ethical dilemmas have to be solved. But how can you do this through podcasting?

Imagine a course on courtroom judgments for a law firm. You can create various podcasts to relate the personal views of witnesses, accused, and lawyers as well as, perhaps, the lawyers' closing statements. Hearing the voices of the stakeholders in the case will lend an authenticity perhaps more difficult to attain when reading about the case on paper. It is possible to add some reflection questions at the end of each podcast. Law firm employees can listen to these podcasts in their own time as often as they like, and then come together in the classroom or online to discuss the case.

This relates to Jonassen's thoughts on learner "buy-in." The problem context is its physical, organizational, and social environment. Its representation should be such that learners feel they are engaged in an authentic problem and that they have the full picture.

The use of simulations to enable this buy-in and authentic learning has been gospel in e-learning, but the expenses were often prohibitive and not justifiable. With podcasting, simulations become affordable. For example, it is easy for designers to create an "overheard" conversation between stakeholders or people affected by the learning problem.

Up Close and Personal: Podcasting Feedback and Social Presence

When work groups or a class work together to produce a podcast, and they publish it on the web, the comments received can be just as powerful as those described by Anne Davis above.

Jo McLeay describes a case in point on her blog The Open Classroom. In "Podcast Conversations" (http://theopenclassroom.blogspot.com/2006_01_01_archive.html) she describes a podcast exchange that took place between a class and a Doubting Thomas. The class had created a podcast on the False-Wikipedia Entry-Incident, which was so insightful that someone who heard it did not believe this class could have done it. His podcast comments and their reactions created a true podcast conversation that Jo says "really shows the potential of this technology and the learning that can happen."

And again, this is not an option limited to the classroom nor is it necessary to publish on the net. The potency of feedback also goes for published podcasts posted on a corporate intranet, which share insights taken away from a course or seminar.

Another use for podcasts is as an aid in establishing social presence. Think about asking learners to upload an introductory podcast, or, as a teacher, providing personal feedback on assignments through mini-podcasts.

Reflection Podcast

For the student who is not a strong writer, podcasts enable him to choose another medium for reflection. He can record his thoughts on a PC or mobile phone, listen to it and ponder his thoughts, consequently add to or edit this recording, and post it. And, as the rise of video (or "vodcasts") is predicted by both Stephen Downes and Karl Kapp in Lisa Neal's list for 2006, the potential for reflection and articulation only expands.

The I in iPod: Learner Control and Flexibility

The learner-control and flexibility that podcasting provides is surely the most obvious way in which it can support constructive learning.

Self-Paced Learning By recording a lecture and making it available for download, a professor can increase learner control. The students can listen to the lecture at a time when they are most receptive to it. And they can repeat it if they feel the need.

The 2005 *Newsweek* article "Professor in Your Pocket" calls this recording of lectures course-casting. The technology allows the easy addition of guest speakers and primary-source material. "Some professors actually act more like DJs than Ph.D.s, composing musical intros, adding gong sounds, jokes, and other aural cues to emphasize important ideas on the digitalized version of their lectures" (Tyre, 2005). This counters parental concerns about students missing lectures, and therefore missing social interactions. One of the professors is dispensing with live lectures altogether. Instead, he will make his podcast lectures mandatory listening, and will hold group discussions based on those lectures instead.

Interview with an Expert An interview with an expert is another excellent way of using podcasts in constructive learning. The expert can simply relate her knowledge once and learners can access it at their convenience and as often as they need. And not just the participants in this course, but also in next year's course. An added advantage is that the expert does not need to visit. These are clear benefits for larger companies who may, until now, fly their oil-drilling experts to lecture at all their facilities.

One can also use the expert podcast to supply modeling. Experts can comment on the case in question, or provide articulate reasoning as they perform a task that will also be asked of the learners.

See Sidebar 21.3 for some helpful information on podcast creation.

SIDEBAR 21.3: GET PODCASTING

Creating a Podcast

Creating a podcast is as simple as recording an MP3 file directly on your computer's hard drive, using a microphone and any of a number of audio utilities. You can also subscribe to online services that allow you to use your telephone (mobile, landline, or VoIP) to "phone in" your spoken report, interview, or other information. At the most basic level, that is all it takes.

Of course, it will take a bit more effort to create a decent quality podcast that you would use in a training setting. You can find a number of guides to creating a podcast on the web and in books.

Podcast Creation Software

- Audacity (open source) (http://audacity.sourceforge.net/)

- Gabcast (record with your phone or VoIP) (www.gabcast.com/)

- Propaganda (not free) (www.makepropaganda.com/)

- Garageband (Mac OS X) (www.apple.com/ilife/garageband/)

Podcast Hosting and Publishing

When you've created your podcast, you need to put it somewhere and let people know where to find it. Many blogging tools now also allow the hosting of podcasts on their service, as do spaces like MySpace and Windows Live Spaces (prior to August 2006, this was known as MSNSpaces). But audio files are large, so there are usually some limitations. Here are some specific podcast hosting and publishing services.

- Odeo (www.odeo.com/)

- Podbean (www.podbean.com/)

- Podomatic (http://podomatic.com/)

- Switchpod (www.switchpod.com/)

How Often Should I Update My Podcast?

Podcasting is not radio. You are not required to fill a half-hour show nor are you required to publish it every week on the precise same hour. The best guideline for updating your podcasts is when you have something new to share.

Wikis in Education

Linda Schwartz and her colleagues examined twenty-four university wikis to generate a list of selection criteria for the use of wikis. They collected their findings in their 2004 article "Educational Wikis: Features and Selection Criteria." They found few used for distance learning purposes, "yet wikis can provide an efficient, flexible, user-friendly, and cost-effective interface for collaboration, knowledge creation and archiving, and student interaction."

Brian Lamb's "Wide Open Spaces: Wikis Ready or Not" gives an honest introduction to wikis (www.educause.edu/pub/er/erm04/erm0452.asp). He offers a history of the wiki and describes some examples of academic use ranging from a "Romantic Audience Project" to supporting writing instruction. He also warns about the pedagogical challenges and technological considerations involved in wikis in an educational context. Tracking changes can be a challenge; course management can spiral out of control; attribution of work can be difficult; and there is a lack of hard security and privacy. Another issue is plagiarism, which appears to be accepted practice among wiki contributors.

Overcoming Wikiphobia

Many educators and trainers write and podcast about their successful and enjoyable blogging and podcasting experiences in education. But such experiential information sources for using the wiki in learning in general and online learning in particular are much scarcer on the ground.

Perhaps the issues Brian Lamb warns us about are the inducing factors for what one can call "wikiphobia" in trainers, teachers, designers, and learning managers alike. The main objection appears to be, "But anyone can change anything." Of course, that is the point of learning together in an open environment. So let's look at some tips to overcome wikiphobia.

- It is possible to host a wiki in your protected corporate intranet environment, protecting sensitive information.

- If you work with younger learners, it is, of course, your duty not to expose them to "weirdos on the net." You can take two steps. As in the corporate environment, you can take the wiki behind closed doors. Or you can still publish everything on the web, but limit who can make changes to the wiki, so you can screen users. That way you can allow parents to take part, but protect young minds.

- Start with baby steps. Before implementing a wiki in your training, get some experience as a wiki participant yourself. Go to the Wikipedia, find one of your pet interests or hobbies, and see what you can do to improve or add to that Wikipedia entry.

- Wikis have a form of social control called "soft-security." Brian Lamb describes it as follows, "Think of an open wiki space as a home that leaves its front door unlocked but doesn't get robbed because the neighbors are all out on their front steps gossiping, keeping a friendly eye on the street, and never missing a thing."

- The built-in versioning abilities of wikis mean no earlier version of a page need be lost. If some crackpot does get through and "ruins" a page, the administrator can restore an earlier version.

- But perhaps most importantly, it doesn't really matter whether some overbearing know-it-all posts a lot of nonsense to the "final draft." In wikis, there is no real final draft, but even finishing a draft is really not as important as the process of collaborating with fellow participants to attain that draft.

The Constructive Wiki

The 2005 EDUCAUSE Learning Initiative "7 Things You Should Know About Wikis" states that wikis can provide individual interactivity, collaborative learning, cognitive tools, authenticity, and more—all constructive learning elements. "Wikis might be the easiest and most effective web-based collaboration tool in any instructional portfolio. . . . A wiki's versioning capability can show the evolution of thought processes as students interact with the site and its contents. These collaborative projects help promote 'pride of authorship' and ownership in the team's activities."

Wikis seem to be the ultimate tool for constructive learning, providing a problem manipulation space, cognitive tools, learner-centeredness, and social presence through communities of learners, interactivity, and support, all in one place.

Problem Manipulation Space David Jonassen sees the problem manipulation space as the very place for meaningful interaction with the problem, so a wiki is almost by definition such a problem manipulation space.

"Aiming for communal constructivism in a wiki environment" (http://kairosnews.org/node/3809) is the story of a teacher named Heather, which

accurately depicts this meaningful interaction. She participated in a wiki with the aim of developing a joint online document. In this reflection, she examines her own wiki learning after failing to successfully implement a wiki in her classroom:

> "As a newcomer you begin to understand the established community's shared knowledge, and you learn where you can introduce your voice in the discussion. Your words then become absorbed by the group, and 'refactored,' as they say in wikispeak. And, as others come to understand your ideas, it becomes their own, and new thoughts spring from your page, in a very literal sense: new links. The wiki, in a constructionist sense, becomes 'an object to think with.' Issues of ownership become blurry, yet the social support and feedback system still provides a sense of accomplishment and pride."

Cognitive Tools The discussion, formatting, posting, and tracking tools are cognitive tools, automating tasks to allow participants to focus on the shared construction of content instead.

Learner Control and Community of Learners Each member of a wiki can change anything about an article, but it is considered bad form to change anything without consent of the community. In that way, it is both learner-centered and community-centered. The individual active learner can concentrate on a piece of an article she wants to improve on, but she will have to negotiate and argue to have her idea or interpretation accepted by the group.

> Linda Schwartz and her colleagues touch on the concept of social presence in wikis: "Wikis may also exhibit some of the elements that Wenger . . . considers fundamental to the creation of successful communities of practice—among them, a virtual presence, a variety of interactions, easy participation, valuable content, connections to a broader subject field, personal and community identity, and interaction, democratic participation, and evolution over time. Many wikis also have a core group or individual that takes active responsibility for directing the community."

The wiki can become an umbrella for learning in your institution; supposing that community does not just consist of this year's students. You can keep the wiki online and let next year's class add to it, and the next. . . .

Interactivity You only have to read Heather's story and Lisa Schwartz's findings to note that there is room for both meaningful interactions with the content and with other learners in wikis.

Support Although it is not mandatory for wiki users to "lurk" for a while before posting, there appears to be an automatic form of modeling by new users; they model their participation on how other wiki contributors communicate, act, and write within the wiki.

Another form of support that often occurs in wikis is coaching. Topic experts or prolific writers will take newcomers under their wings and guide them through their first few contributions.

Sidebar 21.4 will help you get started with wikis.

SIDEBAR 21.4: GETTING STARTED WITH WIKIS

The Trouble with Wikis

Wikis intimidate many people, but the facts are simple: if you can type, you can wiki. A very useful step-by-step guide to getting started can be found at WikiHow—The How-to Manual That Anyone Can Write or Edit (www.wikihow.com/Start-a-Wiki)

Wiki Hosting

The services below will allow you to kick off your wiki after creating an account.

- Wikihost (http://wikihost.org/)
- Wikia (www.wikia.com/wiki/Wikia)

Wiki Software

Here is wiki software that you can install on your own site or server:

- Mediawiki (of Wikipedia fame) (www.mediawiki.org/wiki/MediaWiki)

- Tikiwiki (http://tikiwiki.org/)

- Dokuwiki (http://wiki.splitbrain.org/wiki:dokuwiki)

Compare Wikis

Find the wiki that suits your need by reading Carl Challborn's and Teresa Reimann's technical evaluation report "Wiki Products: A Comparison" (www.irrodl.org/index .php/irrodl/article/view/229/312/), which examines wikis for use in education.

Conclusion: Engage

Looking at the evidence, one can conclude that not only are blogs, podcasts, and wikis effective, but they are also affordable tools for constructive learning. They can facilitate key elements of constructive learning such as problem-based and collaborative learning, learner-centeredness, cognitive tools, social presence, interactivity, and support.

The applications mentioned and demonstrated in existing examples in the eclectic list above are only a fraction of the ways in which blogs, podcasts, and wikis are being used to achieve constructive learning. One theme that seems to emerge across all three media is the concept of ownership and participation.

If you are unable to begin with large organization-wide constructivist learning systems, then blogs, podcasts, and wikis can be powerful tools to get started with constructivist learning on a small scale, even if it's only as an addition to a traditional training or course. Any of these open media could be a fully fledged part of a CLE, and conceivably a combination of these tools could constitute an entire constructivist learning environment in its own right. We have the constructivist theory, we have the constructivist tools, and it is now up to us as online learning designers, developers, tutors, and managers to be constructive. Engage.

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22

Using Radio Production Techniques to Improve Synchronous Communication

Marc Gamble

Many synchronous e-learning designs assume that online instruction is primarily a visual medium. This may be due to the dependence of so many designs on slide-like visuals for support. But in fact the audio component often carries much of the information that you wish to teach. In this chapter, an experienced producer explains how techniques from radio broadcasting can transform your virtual presentations into engaging, compelling, highly effective instruction.

IN 2000, I produced my first synchronous e-learning event. I took a well-received classroom presentation and converted it to an online synchronous presentation. I did what most people would do in this situation—I took the classroom PowerPoint slides and put them online with little or no redesign. I added some online surveys, but for the most part, the presentation was unchanged from the way it was delivered in the classroom.

When the event ran, I went back to my desk and logged on to the synchronous sessions so I could experience it as a user. Overall, the event

disappointed me. It was a very different experience from seeing it in person. I found myself much less engaged as a learner than when I heard the same presentation in a classroom. In short, it was boring.

Ever since that day, I have been looking for ways to improve online synchronous events. My goal is to make them more interesting and engaging. I struggled with this until I hired a radio producer from Chicago Public Radio to review one of my synchronous sessions, critique it, and suggest ways to make synchronous events more engaging, using radio broadcast techniques. From his input came several techniques and strategies that can improve any synchronous event.

What Is Lost by Leaving the Classroom?

To start to improve synchronous events, first analyze and appreciate what you lose by leaving the classroom. Once you know what you lose, you can design to overcome these deficits. So what is lost when you leave the classroom? I count five important features.

1. Eye Contact

Eye contact is a powerful two-way force between human beings. Eye contact between strangers is not a comfortable behavior. If someone is looking directly at you, especially someone you don't know very well, that person does get your attention. If you are looking someone directly in the eyes, you want him to give you all of his attention. Good public speakers use eye contact to hold an audience's attention.

In addition, a speaker can read the audience and see whether they are paying attention. She can also read their body language to see whether they understand the content, or if she is moving too fast.

Do not underestimate how much is lost once the instructor cannot see the audience, and vice versa.

2. Non-Verbal Communication

As anyone who has taken a public speaking class can tell you, your non-verbal communication reinforces your verbal content. Visible non-verbal

communication, that is, facial expressions, body posture, and gestures, can help you emphasize points. Good non-verbals (visible and audible) can help you "sell" the emotional side of your message. A speaker who is appropriately animated can hold an audience's attention much more effectively than a speaker who stands still and who does not show any movement.

In a synchronous environment, you lose the ability to use the visible non-verbal communication channels. So you lose key tools in your speaker's toolbox to grab and hold people's attention.

3. Freedom from Distractions

In a classroom the learners may have relatively little to distract them from the instructor. In a synchronous session, however, participants are most likely at their desks at work, taking the session on their computers. This environment is rife with distractions. Learners could have people talking to them, emails coming in, voice mails to check, instant messaging, and so forth. You get the picture. Maybe you have experienced it.

4. Controlled Environment

In addition to external distractions, participants in synchronous communication also have a degree of freedom that they never had in a classroom. They are not just victims of external distractions. If your session is not engaging them, they will exercise this new freedom by *initiating* emails, phone calls, conversations, and so on. They might never think of doing these things in the classroom.

5. Peer Pressure

Imagine that you are at a conference and you see in the conference guide a presentation that sounds really interesting. You go to the presentation early and sit in the front row. Three minutes into the presentation, you realize that it is not what you expected and that this presentation will just be a waste of your time.

What to do? You want to stand up and leave. But you think twice about standing up and leaving because you don't want to be rude to the speaker and the other people in the room.

In a synchronous environment this "peer pressure," or need to be polite, that holds people in their seats is gone. Now people can leave your session guilt-free with one click of the mouse because no one is watching them.

So, without redesign, your synchronous event is in danger of being inferior compared to the same presentation in the classroom because you lose eye contact and the visible non-verbal cues that help you maintain attention, and you lose support from peer pressure. At the same time, if you produce an inferior product, the audience has new distractions, freedom, and the ability to leave your session unnoticed.

What Tools Can You Leverage Online?

This is a serious problem. What are organizations doing about it as they produce synchronous events? The answer: Not much!

The biggest mistake I see is that people are doing what I did the first time I produced with this technology. They are taking PowerPoint presentations that worked in the classroom and broadcasting them online, with little or no redesign for this medium.

To be successful, we need to design synchronous sessions that will overcome what is lost when you leave the classroom. To do this, we need to emphasize and make the most of what we have NOT lost, and take advantage of what we have gained to engage the learner.

So let's take a look at what we have not lost, to determine what we can use to improve synchronous events. At the highest level, a synchronous event uses these four components to communicate with and engage the audience.

- Visuals

- Interactivity

- Chat

- Audio

All of these are important in any synchronous event. But of these four techniques, which is the most important? That is, which one holds learners in your session every second of the presentation? Which is the component that you could least afford to lose? To answer these questions let's analyze them one by one.

Visual Elements

When I first started to develop synchronous e-learning, I considered it a visual medium. I don't anymore. Don't get me wrong, the right graphics in synchronous communications, or PowerPoint for that matter, are important. A good visual can illustrate a point or organize content. But this is not TV, or even a photograph. As visual information display expert Edward Tufte points out, "PowerPoint slides projected up on a wall are very low resolution—compared to paper, 35 mm slides, and the immensely greater capacities of the human eye-brain system" (Tufte, 2003).

Since synchronous graphics are PowerPoint-based, you can expect to have the same, or less, resolution in your presentation. In reality, you can't effectively have much text and graphics on a slide. This limits the amount of information you can communicate visually.

Also, compared to video, the visuals in synchronous communication are static. The frames in video change approximately every twenty-fourth of a second. How often do the slides in a synchronous session change? This depends on the speaker, but it can be as infrequently as once every five minutes, and it is rare if it is less than every two minutes.

Are these slides communicating for the entire time they appear? The human brain can take in visual information in seconds. A PowerPoint slide containing forty words may require as little as eight seconds to read silently. So if one of your slides appears for three minutes in a presentation, your audience "got it" in the first few seconds. At this point, we have to ask ourselves: What purpose is the visual serving during the rest of the time?

I am not proposing that you ignore your graphics, or that you show more graphics at a faster rate to attempt to emulate video. Just understand the limits of this technology in displaying information visually. Your graphics may help you make a point, but they will not engage your audience throughout your session.

Interactivity

We can give the learner much more interactivity in a synchronous event than we normally can (or do) in the classroom. This is actually a big advantage of synchronous communication over the classroom. Most classrooms

do not have the technology support needed to take polls and surveys and then collate the data instantaneously, as we can online.

Interactivity provides many opportunities to engage the learner and improve any presentation. For example, you can use interactivity to gain information from the audience so that you can tailor the content on the fly in order to make sure it meets their needs. Good interactivity stimulates users and leads to good questions for the instructor, as well as good discussion in the chat area.

However, it is difficult to have meaningful interactions for the audience more often than once every five minutes. If you have interactive exercises too frequently, it will break up the flow of your presentation. Interactivity will not hold your audience in your session second by second.

Chat

Since the first grade, we have been told to sit in our chairs, listen to the teacher, and not to talk in class. That would disrupt the presentation and distract the other learners. In a classroom, this is still true today. But once you go into a synchronous environment, all of this changes. Now your participants can use the chat feature in most synchronous tools to carry on conversations and it will not distract the speaker.

Like interactivity, this is an advantage that synchronous training has over the classroom—and even over asynchronous training. The potential to engage your audience with chat is great. If you can make it one-fourth as interesting as teenagers find instant messaging and texting, then your presentation and the sideline discussions will so occupy your audience that they will not think of checking their emails.

Although chat is constant, it is, unfortunately, your participants who drive its content. It is out of your control, so you can't depend on it to deliver your key messages. Chat is great at holding your audience in a session, but it is not the most important of the four components in your synchronous event.

Audio

Unlike visuals and interactivity in a synchronous session, audio is constantly present. Imagine that the audio in a synchronous session stopped for fifteen seconds. That "dead air" could be a disaster for your session. If you went

ten minutes with the same graphics, it would be boring, but might not be a disaster. If an entire synchronous event contained no interactivity or chat, it would be a shame, but it would not necessarily be a disaster. The reality is that the audio of a synchronous event never stops—and should never stop.

Audio delivers the vast majority of your content in synchronous sessions. This is even true with the majority of TV news broadcasts. Ask yourself: Is your experience of a TV news broadcast a visual or an auditory experience? Let's do a quick thought experiment to illustrate the power of audio in TV and how we take it for granted.

First, imagine that you are on a treadmill at a health club. Above the treadmill a TV is tuned to CNN, but the audio is off. You watch the TV and see foreign soldiers walking through a rainforest.

You see some wreckage. You see a man talking whom you have never seen before, and then you see someone you recognize as the American Secretary of State talking. What have you learned by just seeing this news and not hearing a word? You don't really know what happened. You don't know where. You don't know a whole lot more than you did before you saw the news.

Now let's experience this same video clip in a different way. You are preparing dinner in the kitchen with the TV on. You are cutting an onion, and you can't watch the TV because your eyes are watering and you need to concentrate so you do not cut your fingers. While you listen to the TV, you hear that rebels in Columbia have bombed an oil pipeline. You learn that the blast was in retaliation for a recent crackdown from the Columbian government. You learn what the Columbian government's planned response would be from the Columbian interior minister. You learn, from a woman who sounds like the American Secretary of State, the specifics of the State Department's plans to help the Columbian government. What have you learned by just hearing the news and not seeing any of it? You know what happened. You know where. You know more about the whole story than you would have gained from watching the video without sound.

In this example, you learned much more from the audio alone than you did from the visuals alone. You learned details of the story that just don't come across in the visuals. Yes, there are TV news stories for which the visuals are crucial and will tell you more than the audio. Think about the visual images of the floodwaters after Hurricane Katrina. Words could

not do justice to that story the way a few seconds of video did. But in all news stories, the audio plays a crucial role, and in many cases it is clearly the more important of the two media.

Ask yourself what kind of content you need to communicate with a synchronous event. A majority of topics in corporate training are not visual in nature. How visual (relatively) is sales training, project management, C++ updates, or teaching accountants about regulatory revisions? Many content areas in corporate or adult education will not be primarily visual, and so audio will be the workhorse method for communicating your content.

The Bottom Line

Audio is extremely important in any broadcast communication. Audio is the main technology that can hold participants in a synchronous e-learning session, and it is the medium conveying a majority of your content.

But what is being done to improve audio in synchronous sessions? Not much. Most people take the audio for granted and do not make the effort to improve it.

Luckily, there is a technology that has successfully been attracting and holding audiences for more than ninety years. Radio has been a very successful means of communication and entertainment without eye contact or visible non-verbal behaviors. Because of this, in my opinion, radio is a better model for developing synchronous sessions than the corporate PowerPoint presentation.

Radio Broadcast Techniques

We need to appreciate the audio in our synchronous sessions and take steps to improve it. Here are several techniques used by radio producers that you can use to improve your synchronous communication.

Find Great Speakers

In radio, producers put a premium on the talent they allow to go on the air. Radio producers know that great content, interviews, and scripts can all go to waste if not presented well.

In order to present your content well, it is extremely important that you have an instructor who is a strong speaker. In the online environment, instructors who are adequate speakers in the classroom can quickly seem mediocre. And it gets worse: mediocre speakers quickly become intolerable to listen to. So take extra care when you select individuals to deliver your content in synchronous events.

If you have a good speaker and you want to improve his or her performance, there are some steps you can take. Robert McLeish, who wrote *Radio Production*, names the following skills that radio talent needs to be conscious of, and to work on constantly to improve:

- **Projection**—Is the vocal energy of the speaker's voice appropriate?

- **Voice Inflection**—Does your speaker have the appropriate rise and fall in his or her voice? As McLeish says, "It is the predictability of the vocal pattern that becomes boring." Not enough rise and fall in the voice will become monotonous. Too predictable a rise and fall becomes too rhythmic.

- **Pause**—Does your speaker stop at appropriate times to separate ideas and allow the audience time to absorb thoughts?

- **Personality**—How does the broadcaster come across as a person? What visual image is the speaker creating in the listeners' minds?

- **Vocal stressing**—Is there emphasis on the appropriate words in each sentence to communicate the desired meaning? (McLeish, 2005)

The simplest way to improve the speech style of your presenter is to record her (or him) delivering your content in a dry run. Then replay this recording for your speaker and the synchronous development team to critique. Everyone, including the speaker, can learn a lot from listening to these replays and will have ideas on how to improve.

Do several different takes and encourage your speaker to vary projection, inflection, and vocal stressing. By experimenting, you can optimize the speaker's voice. Encourage your speaker to exaggerate or even "ham up" the delivery in some takes. Many times when a speaker believes the performance is "over the top," the delivery actually comes across as clear, animated, and engaging. It takes the replay to demonstrate this to the speaker.

Create Dialog

Currently, a majority of synchronous events just consist of a basic monologue. This is the effect of thinking of your synchronous event as a corporate PowerPoint presentation online. This is a mistake.

How many monologues, lasting more than three minutes, do you hear on radio or TV? The answer is very few. Maybe the President's State of the Union address, but that is because it is beyond the control of radio and TV producers.

Look at successful radio and TV formats. All but the smallest TV markets have two news anchors. Why? So the audience never hears one person for more than two minutes.

Try to think of professional football with one announcer. One person could easily announce the entire game and describe every play to the audience, but that is not enough for the producers. Ultimately, these producers want to prevent the audience from changing the channel or going to bed. The producers create a dialog so the broadcast is more interesting and easier to listen to. They want each speaker to build off what the other is saying. The producers want banter, laughter, reaction, and even disagreement.

Let's look at how "talk radio" hosts and "shock jocks" engage their audiences. Do they entertain with monologues? No. Love them or loathe them, they surround themselves with characters and then encourage dialog between them. They want banter, and they want their teams to build on a topic.

The rule of thumb in radio is to keep speakers speaking for no more than two and a half minutes at a time, and preferably to hold them to a minute and a half.

Why dialog? Monologues or lectures are one person, talking unchecked for a long time. Lecturers know they won't hear a challenge to their message until the Q&A session at the end of the presentation. They know it is unlikely that someone will disagree or ask them to reiterate something right away.

Compare this to a dialog. In a dialog, you are talking to someone, so every word can be challenged immediately. The listener can and will ask the speaker to clarify or reiterate the speaker's statements. Therefore, speakers are more careful about how they phrase things. That is, *speakers tend to use*

simpler language in dialogs. They speak more slowly and deliberately. They speak in conversational tones instead of the monotone of a rigid lecture.

Vary Voice Types

I once produced a synchronous event in which there were two British men, of the same age and accent, having a dialog. For my U.S.-based audience, and for me, it became very difficult to tell who was talking because their voices were so similar. The flow of the conversation became confusing because listeners did not know who was talking. All the benefits of a dialog were lost. This would probably be the case as well in an event in which two Americans were before a British audience.

When you look for two or more people to be in your synchronous event, try to find individuals with different-sounding voices. The easiest way to do this is to vary the gender of your speakers. It is not coincidental that most radio and TV news teams consist of a man and a woman.

Another option is to look for speakers with accents distinct from each other. In my event, a British accent would have been perfect if paired with any non-British accent. Also, try to vary the tone level of your speakers. By varying the voices, you will have clear distinctions between the speakers—and thus better dialog.

Interview

Interviewing is not only a great way to create dialog; it also focuses the presentation on the audience's needs. Let me explain. Experts tend to think about content differently than the way novices do, and they are usually unaware of this fact. Experts may not explain the topic in a way best understood by novices. For example, the expert may stay too abstract. Radio and TV producers are aware of this, and they try not to put an expert in any topic on the air without "supervision." They normally will have someone interview the expert.

In radio and TV, the job of an interviewer is to represent the listeners: to be an advocate for the listener, to ask the questions the listener wants to ask but cannot, and to keep the speaker focused on what is important or relevant to the audience.

A good interviewer will encourage the speaker to:

- Reiterate points for better clarification;

- Support assertions with real-world examples and stories to make it more tangible for the listener;

- Stay concrete and do not become so abstract the audience can't relate to the content;

- Relax and thus create a more casual and understandable discourse;

- Stay on schedule to make the best use of time; and

- Maintain an appropriate pace. (This is especially important in a synchronous event. Without eye contact, an expert can forget that the audience even exists and charge through the content.)

Who makes a good interviewer? You want someone who is a good speaker and who can think on his or her feet. You also want someone who knows enough about the topic to be "dangerous." That is, the person knows enough to ask the right questions, but not enough to be able to answer those questions.

For example, if the interviewer is an expert in the field and can answer the right questions, then he or she will not ask the relevant questions for a novice audience. On the other end of the spectrum, you might be tempted to hire someone who has radio or TV experience. This is a mistake if the person does not know anything about your content. He or she will not be able to ask the right questions. Even if you feed the person good questions, he or she will not be able to ask the appropriate follow-up questions.

The best person to be an interviewer knows enough about your content to ask the right questions, but doesn't know the content so well that he or she ignores the needs of the novice audience. That is why I recommend finding someone from your target audience to be the interviewer.

Here are two techniques used in radio that will help you improve interviews right away.

Pre-Interview Before you go into your synchronous session, always do a pre-interview between the interviewer and the interviewee. This will build familiarity and trust between the two, and that will help to make the interview more relaxed and thus promote natural dialog.

In the pre-interview, they each find out where the other wants to take the interview. The interviewer explains what he believes the audience wants to get out of the interview; the person being interviewed states what message he or she wants to convey to the audience. They also must agree on what graphics to show and when. It is NOT a time for the interviewer to ask the exact questions planned for the interview. This could lead to the interviewee preparing rote responses, which tend to develop into the monologues that you are trying so hard to avoid.

Politely Interrupt Another important skill an interviewer must have is the ability to politely interrupt the speaker. If an interviewer is to represent the audience, he or she has to guide the speaker in a direction that is helpful to the audience. This means it may be necessary to stop the guest occasionally to clarify a point or to get the person back on track. Doing this live in front of an audience is a skill that takes tact and politeness.

Keep Audio Quality High

Radio producers have a keen ear and are always conscious of the audio quality of their broadcasts. They know that the quality of the audio makes their sessions more pleasurable for the listener.

When I had the radio producer critique my synchronous session, I had my speaker talking through a speakerphone instead of a microphone close to his mouth. The audio quality appalled the radio producer. He felt that the speakerphone, with its background noise and less than optimal voice clarity, was degrading the audio and making it "scratchy." He felt strongly that for an hour-long presentation this would eventually "grate on the listeners' ears."

We do not want to have an unpleasant presentation. To guarantee that we have pleasing presentations, we must do everything we can to improve their sound quality. Make sure your speakers have high-quality microphones and that they are the appropriate distance from them. If you are choosing between IP audio or a telephone conference call, please test them out first and consider the audio quality of each before you make your decision.

Pre-Recorded Sessions

In my experience, one executive normally starts and sponsors good training initiatives. I have always tried to encourage these sponsors to kick off the training events they created. They could explain why this training is valuable to the organization and is a good use of the audience's time.

The problem is that these executives' schedules prevented them from being at the synchronous event when I needed them. So I started to record them prior to the events and use their recordings to kick off my synchronous training sessions. This worked out for everyone. The executive wasn't inconvenienced, and the learners received a compelling and motivating message that explained the purpose of the training.

Pre-recorded segments are a powerful tool used in radio and TV that brings control and flexibility to the producer. In the United States, the majority of a National Public Radio (NPR) broadcast consists of pre-recorded segments. (*Editor's Note*: National Public Radio is a semi-independent, privately and publicly funded non-profit membership media organization that produces and distributes noncommercial news, talk, and entertainment programming.)

If you interview someone live, you have ten or fifteen minutes to get it right and no second chance. If you interview someone for a pre-recorded segment, you have as much time as the interviewee will give you. Once done with the interview, you edit out the fluff and reconstruct the audio to tell a coherent, concise story that delivers the message you want. Pre-recorded sessions give you a second chance.

The other advantage of a pre-recorded interview is that it allows you to have individuals in your presentation you would have a hard time using during your synchronous event. If you can get your sponsor in your presentation, think of whom else you could use. Think of how testimonials from members of your target audience, customers, vendors, suppliers, clients, and high-level executives would improve your synchronous event.

Also, think of the control you have. Now you can interview several individuals and go with the ones who deliver the best message. If you pre-record someone, and he says a few great things but lots of inappropriate things, you can choose not to play the segment at all or edit it down to deliver just the great things.

What makes pre-recording sessions work is the editing. This used to be the domain of the sound engineers. Now, with low-cost editing software, you can have novices create effective audio presentations.

People do not realize how much is edited out of a professional radio pre-recorded interview. For example, at Chicago Public Radio an eight-minute pre-recorded segment normally is the result of editing down an hour-plus interview.

Other Radio Techniques

Here are three more techniques that radio producers use that may benefit your synchronous session.

- **Formats.** Many radio shows are arranged into multiple segments consisting of various types of presentations. This magazine format makes the broadcast more interesting by adding variety and breaking up your session.

- **Music.** Use music to start and close a segment or your entire program. This adds a professional touch to your synchronous event.

- **Host.** Having a host adds a level of consistency and professionalism to your programs.

Conclusion

Organizations like synchronous communication because of the money they save on travel, lodging, and lost productivity. All of these are good reasons to have them. There is a potential to save money by using synchronous communication.

However, what good is saving money if you are not meeting your communication or training objectives? If you do not have your audience's full attention, how can you reach your goals? Also, your goal should not be to save money once with one presentation. Your goal should be to save money over the long term by using synchronous events repeatedly. Can you achieve this long-term goal if you create a product that users are reluctant to return to?

Corporate PowerPoint presentations work in the classroom because the instructor has control over the audience. In a synchronous event, we cannot see our audience and thus we have much less control over them. Radio producers have never seen their audience, but have done a great job engaging them. Radio producers know their listeners can and will change the station quickly if the program is monotonous. And now, your audience can basically change "stations" as easily as any radio listener.

There is potential to make synchronous sessions compelling experiences without adding significant costs to your development budget. Instead of thinking of yourself as producing a PowerPoint presentation online, start to believe that you are a radio producer, creating a radio show with the supporting ability to show graphics and have interactivity. This will lead to engaging audio that anchors your audience in your sessions from start to finish—that will have them coming back to future synchronous events.

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Marc Gamble is an independent consultant specializing in the design and development of creative, cost-effective, and educationally sound e-learning solutions. For fourteen years, Marc has developed a variety of e-learning products, including case-based simulations, application simulations, and performance support tools, as well as synchronous training products. Marc is currently producing e-learning products for both corporate training and teacher professional development. His clients include several Fortune 500 companies. Previously, Marc was a learning architect with Accenture (formerly Andersen Consulting) for ten years. Marc holds a master's degree in instructional technology from Indiana University.

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ABOUT THE EDITOR

BILL BRANDON HAS BEEN THE EDITOR at The eLearning Guild since the organization launched in 2002. He is responsible for *Learning Solutions e-Magazine* and for The Guild's growing e-Book offerings. Prior to The eLearning Guild, Bill developed professional conference programs for trainers and documentation specialists. He has also been a freelance writer and owned and operated a consulting business. He was the president of the former Texas Chapter of ISPI (then NSPI) from 1986 to 1988. From 1968 to 1987, Bill designed, delivered, and managed training and e-learning for the U.S. Navy, for two large public utility companies, and for an international restaurant chain. He has been a co-author or contributor for seven books and has written dozens of articles on a variety of technical topics.

Bill graduated from the University of Texas and did post-graduate work at United States International University. He is married and lives in Mesquite, Texas, with his wife. They have two children and (so far) three grandchildren.

Pfeiffer Publications Guide

This guide is designed to familiarize you with the various types of Pfeiffer publications. The formats section describes the various types of products that we publish; the methodologies section describes the many different ways that content might be provided within a product. We also provide a list of the topic areas in which we publish.

FORMATS

In addition to its extensive book-publishing program, Pfeiffer offers content in an array of formats, from fieldbooks for the practitioner to complete, ready-to-use training packages that support group learning.

FIELDBOOK Designed to provide information and guidance to practitioners in the midst of action. Most fieldbooks are companions to another, sometimes earlier, work, from which its ideas are derived; the fieldbook makes practical what was theoretical in the original text. Fieldbooks can certainly be read from cover to cover. More likely, though, you'll find yourself bouncing around following a particular theme, or dipping in as the mood, and the situation, dictate.

HANDBOOK A contributed volume of work on a single topic, comprising an eclectic mix of ideas, case studies, and best practices sourced by practitioners and experts in the field.

An editor or team of editors usually is appointed to seek out contributors and to evaluate content for relevance to the topic. Think of a handbook not as a ready-to-eat meal, but as a cookbook of ingredients that enables you to create the most fitting experience for the occasion.

RESOURCE Materials designed to support group learning. They come in many forms: a complete, ready-to-use exercise (such as a game); a comprehensive resource on one topic (such as conflict management) containing a variety of methods and approaches; or a collection of like-minded activities (such as icebreakers) on multiple subjects and situations.

TRAINING PACKAGE An entire, ready-to-use learning program that focuses on a particular topic or skill. All packages comprise a guide for the facilitator/trainer and a workbook for the participants. Some packages are supported with additional media—such as video—or learning aids, instruments, or other devices to help participants understand concepts or practice and develop skills.

- *Facilitator/trainer's guide* Contains an introduction to the program, advice on how to organize and facilitate the learning event, and step-by-step instructor notes. The guide also contains copies of presentation materials—handouts, presentations, and overhead designs, for example—used in the program.
- *Participant's workbook* Contains exercises and reading materials that support the learning goal and serves as a valuable reference and support guide for participants in the weeks and months that follow the learning event. Typically, each participant will require his or her own workbook.

ELECTRONIC CD-ROMs and web-based products transform static Pfeiffer content into dynamic, interactive experiences. Designed to take advantage of the searchability, automation, and ease-of-use that technology provides, our e-products bring convenience and immediate accessibility to your workspace.

METHODOLOGIES

CASE STUDY A presentation, in narrative form, of an actual event that has occurred inside an organization. Case studies are not prescriptive, nor are they used to prove a point; they are designed to develop critical analysis and decision-making skills. A case study has a specific time frame, specifies a sequence of events, is narrative in structure, and contains a plot structure—an issue (what should be/have been done?). Use case studies when the goal is to enable participants to apply previously learned theories to the circumstances in the case, decide what is pertinent, identify the real issues, decide what should have been done, and develop a plan of action.

ENERGIZER A short activity that develops readiness for the next session or learning event. Energizers are most commonly used after a break or lunch to stimulate or refocus the group. Many involve some form of physical activity, so they are a useful way to counter post-lunch lethargy. Other uses include transitioning from one topic to another, where "mental" distancing is important.

EXPERIENTIAL LEARNING ACTIVITY (ELA) A facilitator-led intervention that moves participants through the learning cycle from experience to application (also known as a Structured Experience). ELAs are carefully thought-out designs in which there is a definite learning purpose and intended outcome. Each step—everything that participants do during the activity—facilitates the accomplishment of the stated goal. Each ELA includes complete instructions for facilitating the intervention and a clear statement of goals, suggested group size and timing, materials required, an explanation of the process, and, where appropriate,

possible variations to the activity. (For more detail on Experiential Learning Activities, see the Introduction to the *Reference Guide to Handbooks and Annuals*, 1999 edition, Pfeiffer, San Francisco.)

GAME A group activity that has the purpose of fostering team spirit and togetherness in addition to the achievement of a pre-stated goal. Usually contrived—undertaking a desert expedition, for example—this type of learning method offers an engaging means for participants to demonstrate and practice business and interpersonal skills. Games are effective for team building and personal development mainly because the goal is subordinate to the process—the means through which participants reach decisions, collaborate, communicate, and generate trust and understanding. Games often engage teams in "friendly" competition.

ICEBREAKER A (usually) short activity designed to help participants overcome initial anxiety in a training session and/or to acquaint the participants with one another. An icebreaker can be a fun activity or can be tied to specific topics or training goals. While a useful tool in itself, the icebreaker comes into its own in situations where tension or resistance exists within a group.

INSTRUMENT A device used to assess, appraise, evaluate, describe, classify, and summarize various aspects of human behavior. The term used to describe an instrument depends primarily on its format and purpose. These terms include survey, questionnaire, inventory, diagnostic, survey, and poll. Some uses of instruments include providing instrumental feedback to group members, studying here-and-now processes or functioning within a group, manipulating group composition, and evaluating outcomes of training and other interventions.

Instruments are popular in the training and HR field because, in general, more growth can occur if an individual is provided with a method for focusing specifically on his or her own behavior. Instruments also are used to obtain information that will serve as a basis for change and to assist in workforce planning efforts.

Paper-and-pencil tests still dominate the instrument landscape with a typical package comprising a facilitator's guide, which offers advice on administering the instrument and interpreting the collected data, and an initial set of instruments. Additional instruments are available separately. Pfeiffer, though, is investing heavily in e-instruments. Electronic instrumentation provides effortless distribution and, for larger groups particularly, offers advantages over paper-and-pencil tests in the time it takes to analyze data and provide feedback.

LECTURETTE A short talk that provides an explanation of a principle, model, or process that is pertinent to the participants' current learning needs. A lecturette is intended to establish a common language bond between the trainer and the participants by providing a mutual frame of reference. Use a lecturette as an introduction to a group activity or event, as an interjection during an event, or as a handout.

MODEL A graphic depiction of a system or process and the relationship among its elements. Models provide a frame of reference and something more tangible, and more easily remembered, than a verbal explanation. They also give participants something to "go on," enabling them to track their own progress as they experience the dynamics, processes, and relationships being depicted in the model.

ROLE PLAY A technique in which people assume a role in a situation/scenario: a customer service rep in an angry-customer exchange, for example. The way in which the role is approached is then discussed and feedback is offered. The role play is often repeated using a different approach and/or incorporating changes made based on feedback received. In other words, role playing is a spontaneous interaction involving realistic behavior under artificial (and safe) conditions.

SIMULATION A methodology for understanding the interrelationships among components of a system or process. Simulations differ from games in that they test or use a model that depicts or mirrors some aspect of reality in form, if not necessarily in content. Learning occurs by studying the effects of change on one or more factors of the model. Simulations are commonly used to test hypotheses about what happens in a system—often referred to as "what if?" analysis—or to examine best-case/worst-case scenarios.

THEORY A presentation of an idea from a conjectural perspective. Theories are useful because they encourage us to examine behavior and phenomena through a different lens.
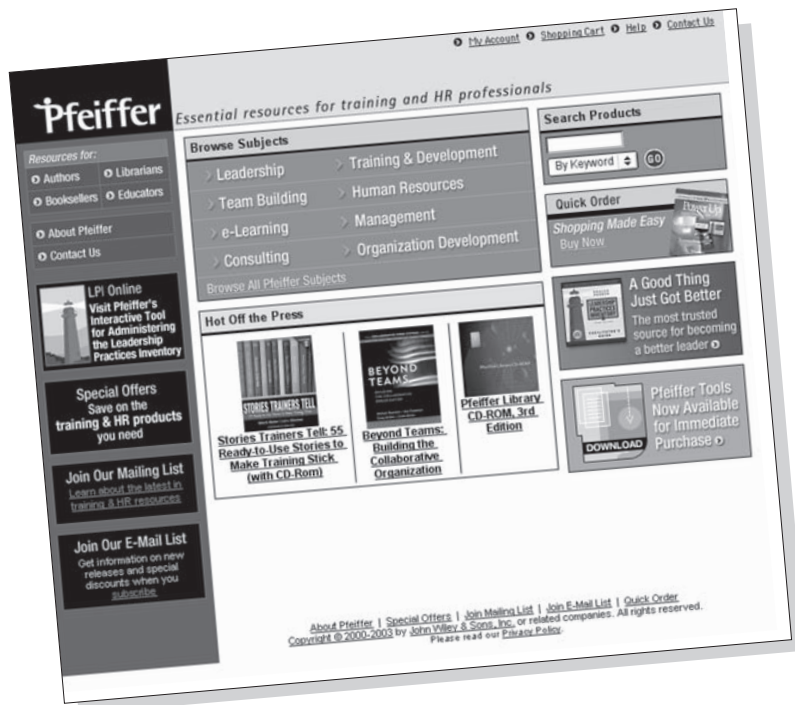
TOPICS

The twin goals of providing effective and practical solutions for workforce training and organization development and meeting the educational needs of training and human resource professionals shape Pfeiffer's publishing program. Core topics include the following:

Leadership & Management

Communication & Presentation

Coaching & Mentoring

Training & Development

E-Learning

Teams & Collaboration

OD & Strategic Planning

Human Resources

Consulting

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