Multimedia-Based Instructional Design

COMPUTER-BASED TRAINING
WEB-BASED TRAINING
DISTANCE BROADCAST TRAINING
PERFORMANCE-BASED SOLUTIONS
SECOND EDITION

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Pfeiffer
A Wiley Imprint
www.pfeiffer.com
About This Book

Why is this topic important?

Making training solutions available in a timely manner is increasingly critical to add value to an organization. Training groups that are seen to be responsive and in touch with the corporation’s needs are perceived to add increased value. Therefore, a consistent, replicable, and efficient instructional design model that enables rapid development is increasingly critical. Projects move faster when everyone in a training organization or project team understands, adopts, and follows a consistent model.

What can you achieve with this book?

The purpose of this book is to provide a consistent, replicable, and efficient model that will get training and performance solutions to market at the time they will provide the optimum benefit.

How is this book organized?

This book is divided into four parts. Part One is Multimedia Needs Assessment and Analysis. This part explains the activities that must be completed for twelve types of analysis and assessment and a rapid analysis model that can be used once each of the individual activities is completely understood. Tools are provided for each type of assessment and analysis to document and track the data and results of analysis. Part Two is Multimedia Instructional Design, which explains how to develop a Course Design Specification. A Course Design Specification creates the “rules” for all project members to follow to make a project run more efficiently and effectively. Again, tools are provided to complete each activity. Part Three is Multimedia Development and Implementation, which outlines the common and unique elements of producing computer-based, web-based, distance broadcast, and performance-based solutions. Useful task tracking and development tools accompany the explanation of each delivery media. Part Four is Multimedia Evaluation. This part describes how an organization can develop an evaluation strategy and, further, how to create an evaluation plan for each project. Specific instructions on how to collect and analyze data within each project plan are included to help project teams complete an evaluation that is credible, consisting of both validity and reliability. Four appendices contain completed examples of tools, and a fifth appendix shows examples of the tool templates that are included on the CD ROM.
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.
Multimedia-Based Instructional Design
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To Walter M. Lee

—Bill Lee

To my husband, Terry, for his feedback and support, wonderful sense of humor, and the many things I have learned from him that have contributed to this text

To my parents, Luella and Bill Dubois; my son, Rob MacKey; and his wife, Jessica, for their constant demonstrations of love, encouragement, and support

—Diana Owens
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ACKNOWLEDGMENTS

We would like to thank Bob McAvoy of Training Consulting Softek (www.trainingsoftek.com) for providing the resources for automating the Media Analysis Tool and the Objectives Analysis tool; Alex Nestor of the University of Texas at Dallas for developing the original automated the tools; and Charles Chow and Steven Liu of Training Consulting Softek for perfecting the code on the tools. Thanks to Kathy Larson of Granite Technologies, 1772 Platte St., Denver, Colorado, for permission to use Xegy, the tool that automates the step/action table in Appendix A and enables it as a Project Management Tool (www.xegy.com).

Thanks also to Centra Software, Inc., of Lexington, Massachusetts (www.centra.com), for permission to use screen shots of its synchronous web-based software. Thanks to Intellinex (www.Intellinex.com), 925 Euclid Avenue, Cleveland, Ohio, a division of Ernst & Young, for use of screens from its Rapid Development tool; to ONETOUCH Systems, Inc., 40 Airport Freeway, San Jose, California, 95110 (www.onetouch.com), for its cooperation in providing us with materials for this book; and to Global Knowledge Network, Inc., ICN Pharmaceuticals, Costa Mesa, California, and Real Learning Company of Scottsdale, Arizona.

Thanks also to Mlink Technologies, (www.mlinktechnologies.com) Inc., 550 Edmonds, Suite 204, Lewisville, Texas, 75067 for the examples of user-interface graphics shown in the book. Our appreciation goes to Claudia Dineen for the text.
addressing the rationale and business issue for each user-interface design and also for testing our tools and templates.

Thanks to Matthew Davis, our editor, for his belief in the value of our revisions and to Susan Rachmeler for her sound editorial advice. Also a special thank you to Carolyn Murphy of American Airlines Corporate University for her vigilance in keeping current on the latest technologies and sharing the information with us.

And to all of you whom we have worked with over the years who have mentored us, guided us, given us constructive criticism and feedback, and allowed us to experiment and be creative, you are too numerous to mention—but without all of you, we would never have gained the experience to share with others.

To our families, friends, and colleagues over the years—we couldn’t have done it without you behind us and beside us.

Thank you!

February 2004

William W. Lee
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INTRODUCTION:
GETTING THE MOST FROM THIS RESOURCE

WOW! So much has changed since the first edition of our book went to print in 2000 (which really means we began writing it in 1999)! Everything from changes in terminology to attempts to define consistent standards. *Learning management systems* (LMS) have proliferated since our first edition. These LMS have often incorporated *learning content management systems* (LCMS) to deliver learning activities and track them. And we have been learning too! We want to update those of you who purchased the first edition on how all of this has impacted the instructional design model.

Another unexpected surprise for us is that the first edition of the book has been translated into four languages: Korean, Japanese, and two Chinese dialects. “Thanks” from the authors to our international audience!

The major thing we have found that has not changed is how complicated the issue of e-learning is. As a matter of fact, it has become even more complicated. Figure I.1 graphically represents all of the components that need to be considered when implementing learning, including e-learning.
Figure I.1
Components of E-Learning Implementation

Infrastructure (LAN, WAN, Computer Hardware)

Learning and Support

Training Organization

Benefit/Profit

Marketing/Advertising

Performance Management System

- SCORM
- Blend
- Rapid Development Tool
- ID Process

ID Tracking Tools

Employees

Customers

Vendors

Families

Employees

Input

Output

Content

Competency Models

LMS

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This book only deals with the learning components of this model. The inputs to implementing learning usually go through some training organization or learning function whether learning is delivered centrally, say through a corporate university, or if it is decentralized and distributed through numerous training functions within one organization. Many companies are creating new positions called chief learning officers (CLOs) to coordinate and implement this increasingly complex issue.

Trying to stay on the leading edge of technology is nearly impossible. But our continued involvement in the learning arena has brought many of the changes to our doorstep, and we have also gone looking to answer questions for our customers. So we thought it was time to update the book with what we have learned and to bring it more into line with our continually evolving philosophy.

When we began the first edition, the term for online learning was “multimedia.” Now it’s “e-learning.” Multimedia now means what it always should have—“multiple media.” That’s how we always defined it. So we will continue using multimedia to refer to blended solutions (yet another relatively new term).

The emphasis is still very much on multimedia. Maybe even more than at any time before in the discipline of training and learning! Maybe to the extreme! We have seen many instances where “everything to the web” was the dictum. Unfortunately, most of those efforts were less than successful because insufficient thought was given to the process of translating everything in learning to one medium. Most of the edicts are for economic reasons only. While we believe that most of what can be learned can be learned through some electronic medium, given the advances in web technology, we still believe strongly that decisions should be made in a systematic manner based on what the needs are for technology-based solutions for training delivery and solving business issues.

The reason for the emphasis on multimedia is still much the same. In a global corporate environment that is increasingly becoming a virtual world whose people are connected by technology, the need for rapid communication, continuous information flow, and speed to market is critical. Maintaining the business construct of everyone in the same room at the same time is increasingly difficult and often implausible. The need for virtual training to keep people connected is imperative. Yet the physical classroom remains a major delivery method, even though, for large numbers of participants, connecting virtually can be just as effective and more economical.

Economics is a reason to use e-learning, but only if you have the infrastructure in place. Companies that upgraded their technical infrastructure for Y2K, which
became a non-issue, were well positioned to move into e-learning after September 11, 2001. Those companies that decided to move to e-learning for economic reasons after 9/11 often found that the technical capabilities that were required were not there and that the investment in the required technology was too expensive.

There is still a lot of discussion about e-learning not meeting everyone’s learning style. We like what our friend Susan Guest, the vice president of e-learning at Baxter Pharmaceuticals, said recently, “If you were in the financial and accounting business and you told your employer that you had a different accounting method, you would be told to use the system the company uses. However, we still say that e-learning won’t work for everyone because it doesn’t meet everyone’s learning style, so we have to have a variety of ways to deliver training.” We agree with Susan.

And with some of the great software we have seen recently, various learning styles are accommodated. It is not e-learning that has been holding learning back, but the design of e-learning. Too much e-learning has been designed using traditional methodology, much like taking an instructor-led course and delivering it through CBT or WBT. The two media require completely different constructs. Besides, instructor-led training that is basically lecture doesn’t meet everyone’s needs either. Auditory learners make up only about 30 percent of the total population. A well-constructed instructor-led course that uses action learning, activities, PowerPoint®, video, and games accommodates learning styles just as the same course would using e-learning. However, e-learning has the additional advantages of delivering a consistent message, is available on demand when the learner needs it, and reduces the costs and personal inconvenience associated with traveling to receive training. The “rule of thirds” is becoming pretty standard in the industry. “People retain one-third more, in one-third less time, at one-third the cost.” This is well documented by the Department of Defense and can be found in Teitelbaum and Orlansky (1996).

Noonan’s (1993) message is even more relevant ten years after he wrote that if the training function is ever to escape “corporate America’s basement,” it must transform into an organization that ties solutions to business needs and help achieve corporate goals and objectives.

**WHY BUY THIS BOOK?**

One of the reasons to buy this revision, even if you have the original, is that we have improved many of the tools and added even more. The Media Analysis Tool in Chapter Eleven is now automated on the CD-ROM. We have also automated
our objectives analysis process in Chapter Ten. Yes, an automated tool that almost writes your objectives for you! The step/action table in Appendix A is also automated and is now called the Project Management Tool to track your instructional design activities and tasks. There is a special URL and password listed on the Links menu of the CD-ROM for Granite Technologies, the company that owns the tool called Xegy™ (pronounced x-è-g) that is used to automate the step/action table. This URL is available only to purchasers of the book. You have ninety days of free access to the Project Management Tool and can use it to track your projects and print the results. Figure I.2 shows the graphical interface of the Project Management Tool.

Figure I.2
Introductory Page of Automated Project Management Tool

You can check off each activity and task as you complete it, but even more beneficial is the capability to click on any activity or step and immediately hyperlink to the online tools and worksheets that you use to complete that task. Xegy™ is a

Introduction
new approach to focusing business intelligence to drive performance. It provides a performance support framework for:

- Rapid prototyping of a strategy roadmap
- Communicating that roadmap uniquely to different workgroups
- Supporting ongoing management of the process
- Tracking results and capturing input for continuous improvement and innovation

Non-technical people can harness technology to build and implement their strategies.

Figure I.3 shows the conceptual framework of Xegy™. The tool can be used as a process management tool, a project management tool, or a performance support tool taking both systems and human factors into consideration. To learn more about Xegy™, see the website www.xegy.com.

We have added chapters on Issue Analysis, developing an Evaluation Strategy, and creating an Evaluation Plan. We have also created a much more robust tool for evaluating e-learning software that replaces the one in the first edition. There is now a tool for making “build or buy” decisions if the solution must be customized or can it be purchased off-the-shelf.

We have found many new examples of user interface design and restructured the section on design to reflect both the objectivist and constructivist theories of instructional design. These are only a few of the changes you will find in this edition.

Our integrated instructional design model transcends whatever media will deliver the solution and is still a major advantage of this book. There are numerous books on the market today on how to design and develop computer-based training, others for web-based training, and still others for distance broadcast training. So why buy this book rather than one of the others?

Other books are well suited for their specific delivery media, but the approach to the instructional design process differs in each one. Most use the traditional instructional design (ID) model with its phases of analysis, design, development, implementation, and evaluation, but they vary in the tasks and activities to complete during each phase.

Consequently, if you want to design for more than one medium, you have to buy a book on each and adjust or adapt your ID model depending on the medium.
So why buy this book? Because it eliminates multiple procedures. Use the process in this book and design in any media!

Instructional designers are intelligent, creative people who eventually figure out how to meld the best components of each design model given time and experience. We all gain experience by working on multiple projects. But time is usually what we lack. We're often too rushed to reflect on what we did during a project that made it go smoothly—what we did to get over the bumps and around the roadblocks. The revised Multimedia-Based Instructional Design offers time-tested procedures and tools to encapsulate the experience of hundreds of course developers, thereby reducing the time required to reflect on past successes and
problems. Use our book as the basis for projects, and change only those steps you find work differently and better for your group than the way we suggest. The new automated Project Management Tool allows you to make this customization.

**WHO SHOULD BUY THIS BOOK?**

Our revised edition of *Multimedia-Based Instructional Design* is intended for the same audience as the first, but allows us to share the updated information and knowledge we have gained since the first edition. It is for course developers (instructional designers, authors, project managers) who are beginning their first multimedia project, as well as for experienced designers of large projects that require a systematic process that everyone can follow. It is well suited for use by project teams when there is a mixture of experienced and new developers. It imparts a consistent message to those project teams that find members matrixed in and out of projects and that use a combination of internal and outsourced resources.

Although the book discusses many issues encountered by internal training departments, multimedia consulting companies should also find the tools valuable and the tips for managing customer expectations enlightening.

**FOCUS OF THE BOOK**

Our philosophy is to focus on the human-performance arena. This focus presents challenges to multimedia development groups whose philosophy reflects a more traditional approach. We agree with Tom Gilbert (1996) that the purpose of all instruction is to affect human performance through learning or performance support. If multimedia development groups move into the human-performance area, they open new horizons of opportunities to work within an organization and become more valuable. We recommend Judith Hale’s *The Performance Consultant’s Fieldbook: Tools and Techniques for Improving Organizations and People* (1998) to help your group make the necessary shift to performance consulting. Lee and Krayer’s *Organizing Change: An Inclusive, Systemic Approach to Maintain Productivity and Achieve Results* (2003) is also a good companion book to this one because it uses the instructional design model and expands its use to enterprise-wide solutions that can transform a training department into an organizational development department by providing the knowledge, skills, and tools to expand the department’s capabilities. We also recommend Thomas Toth’s book, *Technology
for Trainers: A Primer for the Age of E-Learning (2003), and E-Learning Tools and Technologies (2003) by William and Katherine Horton. These books provide tactical development tips for e-learning solutions. We do not include a glossary of e-learning terms in this book because there is a very good one available on the International ASTD website (www.astd.org) that is continually updated.

We’ve all experienced working on projects for long hours, with budget overruns, missed deadlines, and unnecessary rework. We, too, have experienced the frustration associated with all of these situations. Our goal is to provide you with a handbook that helps you reduce cycle time for completing projects, makes your job easier, and conveys the lessons that will reduce your learning curve.

**STRUCTURE OF THE BOOK**

The book is organized in four parts:

1. Multimedia Needs Assessment and Analysis
2. Multimedia Instructional Design
3. Multimedia Development and Implementation
4. Multimedia Evaluation

Overall, it is structured as a step/action handbook that presents activities and the associated steps required for completing a successful project. We present tools to assist in organizing the information obtained from each activity. Appendix A is a step/action table (now automated on the CD as a Project Management Tool) that lists the steps to follow in each phase of the instructional design process. Project teams can follow the steps as listed or adapt them for their specific needs. The automated version allows you to track your progress through a project.

Each of the chapters is short. We wanted to provide you with critical information without too much extraneous information to get in the way of the way we want the book to be used—as an instructional design process manual.

The graphic that follows this paragraph appears (in varying form) at the beginning of each of the four parts of the book to identify the phase of the instructional design process to be discussed in that part. Note the circular configuration, to demonstrate the circular rather than linear nature of the process. Each phase of the ID process flows through to the next, and the last reflects back on the first. This is the concept of “congruence.”
In Part One we follow Dick and Carey’s model (1990) of separating the analysis phase of instructional design into two parts: needs assessment and front-end analysis. Needs assessment focuses on determining the current state and the desired state and the type of business issue the need arises from. Front-end analysis then determines how to close that gap with a results-driven solution. We address ten types of front-end analysis:

1. **Audience analysis**: determining who the target population is for the solution and their demographic as well as learning needs
2. **Technology analysis**: determining the type of technology available and technological considerations and constraints for delivery of the solution
3. **Situation analysis**: determining the environmental considerations in delivering the solution
4. **Task analysis**: determining the physical and mental requirements for getting the job done
5. **Critical incident analysis**: determining which tasks require that training or information be provided to the target audience
6. **Objective analysis**: determining the performance and instructional objectives for the solution and making the distinction between the types of objectives as
well as when and where to use them; also their impact on the content as well as delivery media

7. **Issue analysis:** categorizing analysis findings into organizational, performance and training issues

8. **Media analysis:** selecting the most appropriate delivery medium (or media) for a solution

9. **Extant data analysis:** determining what materials are available and which need to be developed—basically, making a “build-or-buy” decision

10. **Cost analysis:** determining the up-front benefit the solution has in comparison to the cost of the solution

We also include a rapid analysis model (RAM) in Chapter Fourteen. We developed this model for experienced course developers who intuitively understand the step-by-step process involved in gathering data through needs assessment and the nine types of front-end analysis.

In Part Two, Multimedia Instructional Design, we have provided the activities and steps required to produce a *course design specification* (CDS) document. We include many tips on project management for course developers to fully understand the complexities involved in multimedia projects. Such information should guide them in selecting media. For example, if assessment and analysis result in a web-based solution, the project team should know what’s involved so they can determine whether or not the solution is realistic for their business and can assemble the required resources before the project starts. The complexities might, though, result in choosing another solution.

Part Three is on multimedia development and implementation. Here there is divergence of methodology depending on the media. Therefore, we begin with a chapter on common elements of development and implementation and then explain the particular aspects for computer-based, web-based, distance broadcast, and performance support solutions. We also differentiate the design issues between objectivist and constructivist theories of instruction and their impact on multimedia. We also discuss SCORM (Searchable Content Objects Reference Model) standards and their impact on e-learning development.

Even if different groups perform the authoring and designing, designers should know the complexities involved in the solution they propose in order to determine whether or not the solution is feasible. Designers should also be able to carefully
consider the issues related to implementing a solution. To broaden the knowledge and skills of designers, we have included a discussion on many development topics. We explain the influence of learning management systems (LMS) on implementation. Course developers are expected to acquire increasingly broad skill sets and are becoming the authors of what they design, so we also discuss and provide examples of rapid development tools (RDT) that are designed to reduce the amount of time required for developing e-learning by using templates that require less authoring.

Part Four is on multimedia evaluation. We discuss evaluation from two perspectives: the strategic and the tactical. To address strategic issues, we have included a chapter on how to develop an evaluation strategy for your organization to measure reaction, knowledge, performance, and cost. We provide the templates and a completed model of an evaluation strategy. A crossover tool from strategic to tactical is an e-learning evaluation tool that can be used if you are considering buying off-the-shelf e-learning or to be certain that you include the necessary components in custom-developed e-learning that you build internally. This evaluation tool is a companion to the new tool that assists in making “build or buy” decisions in Chapter Twelve, Extant Data Analysis.

To address tactical issues, we have included a template for an evaluation plan that you should develop for each project. The template includes all of the issues you should consider for the evaluation plan. We still have chapters on designing, developing, and delivering tests and test validity and reliability. We present the steps for constructing various types of objective tests and explain the strengths and weaknesses of each type.

Throughout, we have included sections on applicable learning and instructional design theory as a basis of “why we do what we do.” People outside of the human performance arena often don’t see the need for particular aspects of development. They don’t understand the basic human characteristics surrounding learning that require us to include certain components. We have laid out the theory to help you explain why to them.

We also provide sections in most chapters on our personal experiences, to help you avoid the pitfalls we have experienced and replicate the successes we’ve had. Yet another section in each part of the book explains how e-learning, especially the Internet and web-based technologies, requires us to change the way we think about the traditional instructional design model.
In total, we present a replicable model, adaptable to any delivery medium, diverging only in the development phase of multimedia projects.

THE CD-ROM

The CD-ROM that accompanies this book contains tools we developed that are meant to be modified to meet your particular project requirements, including the following:

• Project Management Tool: this automated tool is a complete checklist of all activities and steps in the multimedia instructional design process as laid out in this book. The checklist is also found in Appendix A. On the CD-ROM, we provide you with the URL for a website that you can access to download the tool and use it to track your projects.

• Tools and templates: the tools directory contains checklists and templates for each phase of the ID process. These tools and templates can be copied and used as-is or customized to meet your needs and used for multiple projects. The directory is divided into sections for assessment and analysis tools, design tools, development and implementation tools, and evaluation tools. A hard copy of each tool is also included in the Appendix (look for the CD-ROM icon): so you can browse through and determine whether and how each one applies to your project.

• A link to Centra Software’s synchronous web-based tool, which explains how the web-based delivery software works.

• A link to Intellinex, a set of rapid development templates that demonstrate the ability to create e-learning without having to possess sophisticated authoring skills.

• An automated version of the Media Analysis Tool found in Part One that will calculate your responses on each of twenty-four factors regarding the content, audience, and cost of various delivery media and provide a chart that lays out a hierarchy of potential components of a blended learning solution.

• An automated version of the objective analysis process we outline in Part One that will assist you in writing measurable performance, terminal, and lesson objectives.
Hardware/Software Requirements and Launch Instructions

The tools found on the CD-ROM require you to have access to a PC running Microsoft Word.

System requirements for the automated objectives tool include:

1. Pentium 100 MegaHertz CPU or above with minimum of 64M of memory and 5M free hard drive space.
3. Internet Explorer® 5 or above.
4. Java Runtime 1.3 or above.

Instructions to Run Automated Objectives Tool

If you have a high-speed Internet connection:

1. Launch objWizard.htm from CD directly by double clicking on the file. Follow the instructions on screen to download and install Java Runtime 1.3.
2. Automated Objectives Analysis Tool content will show up after Java Runtime 1.3 is successfully installed.

If you don’t have a high-speed Internet connection, or if Java Runtime download fails:

1. Run j2re-1_3_1_06-windows-i586.exe program from CD directly. Follow the instruction on screen to install Java Runtime 1.3.
2. Launch Automated Objectives Analysis Tool by double clicking on objWizard.htm from CD.

System Requirements for Automated Media Analysis Tool

1. Pentium 100 MegaHertz CPU or above with minimum of 64M of memory and 5M free hard drive space
2. Microsoft Windows Operating System (WIN9x/2000/ME/XP)
3. Internet Explorer 5 or above

Instructions to Run Media Analysis Tool

Simply double click on MediaAnalysisTool on the CD ROM Menu.
part one

Multimedia Needs Assessment and Analysis
Our approach to analysis breaks the phase into two parts. The first is needs assessment, a systematic way of determining the gap that exists between where the organization is and where it wishes to be. The second is front-end analysis, a collection of techniques that can be used in various combinations to help you bridge the gap by determining what solution(s) will be required.
In completing the activities in this phase you will

- Find the customer’s business issue
- Decide how to satisfy the business issue
- Decide the delivery mechanism for the solution
- Write objectives
- Complete cost analysis

During needs assessment, it is critical to focus on gathering the information you need to be able to make informed decisions. The information from needs assessment provides input into front-end analysis in that, once the need for an intervention is established in needs assessment, front-end analysis explores deeper levels of information needed for the design of the solution. To perform needs assessment and front-end analysis you will need to:

1. Make a judgment about how much assessment and analysis is required to make an informed decision based on your time frame, project size, and project constraints
2. Determine the appropriate sources for collecting information
3. Establish a technique for collecting and assembling information

**E-LEARNING’S IMPACT ON ASSESSMENT AND ANALYSIS**

Assessment and analysis before multimedia technologies consisted of the instructional designer gathering information from subject-matter experts (SMEs) and organizing it in such a manner that it could be delivered in a meaningful way and that learners would retain the information. In the absence of an expert, a great deal of time was spent researching information in libraries and plowing through existing materials. The Internet has aided designers in finding information more quickly and reducing the amount of time required for analysis (Lee, Owens, & Benson, 2002).

In the training world before the technology explosion, only a few delivery methods needed to be considered during analysis. Today, with so many new media to choose from, thorough media and technology analyses are required. A technology analysis yields information about the infrastructure capabilities of a company and...
the current technologies being used. Media analysis yields information on the most appropriate delivery systems for a particular application.

Analysis also includes vendor analysis. Today there are many companies in the industry that claim to have total solutions that will solve all problems. Implementing any e-learning technology has obstacles that will cause huge problems if a company does not do its research on any product it is considering. Vendor research should include investigating the venture capital of a company, its financial standing, and how long it has been in the industry. Discover their goals and objectives. Are they looking to establish themselves in the industry or become a large enough player to be bought out? Often the reasons for buyouts are to eliminate competing products. You may purchase a product that will some day have no technical or customer support, and you may not be able to do it yourself. Also check out the vendor’s customer base. Ask for the names and visit customers who have repeatedly engaged the vendor, as well as customers who have used them only once. Find out how often the vendor plans to upgrade its product. How many upgrades are included in the original purchase price? And how long will it take for your product to become obsolete if you decide not to upgrade?
Needs Assessment

Needs assessment is the systematic process of determining goals, identifying discrepancies between actual and desired conditions, and establishing priorities for action (Lee & Roadman, 1991).

Briggs (1977) identified five types of need, illustrated in Table 2.1.

<table>
<thead>
<tr>
<th>Need</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Normative need</td>
<td>A need that is compared to a standard. Example one: industry standards establish that it should take 750 hours of development time for each hour of computer-based training delivery. Company X currently takes 1,500 hours to do this, so it needs to find ways to reduce the time to meet this standard in order to bid competitively. Example two: bank A is not as competitive as bank B in offering a variety of services to customers because it is not automated enough to efficiently process the paperwork required to deliver those services. Bank A needs automation to bring it to the same level as bank B.</td>
</tr>
<tr>
<td>2. Felt need</td>
<td>What people think they need. Example: the executives of a sales-and-marketing firm believe that their sales representatives need training in interpersonal</td>
</tr>
</tbody>
</table>
There are six activities in the process of conducting a needs assessment:

1. **Determine the present condition.** Identify the root causes of the expressed need.
2. **Define the job.** What knowledge and skills are required to successfully complete the work?
3. Rank the goals in order of importance. Show how goals are interrelated.

4. Identify discrepancies. How do the expected performance and the actual performance encountered in meeting a goal differ? List all discrepancies, as well as missing tasks.

5. Determine positive areas. Identify areas related to the business issue in which the company is doing well, and document their existence.

6. Set priorities for action. Set them against the backdrop of the job goals, desired results, and other relevant factors.

Needs assessment is accomplished by developing assessment questionnaires, establishing procedures for collecting data (such as mailings, telephone and personal interviews), and analyzing data to produce meaningful information.

Consider using the data-collection techniques presented in Table 2.2. Appendix D provides instructions for these data-collection techniques:

- Self-completion questionnaires
- Direct interviews
- Focus groups
- Observation

<table>
<thead>
<tr>
<th>Table 2.2</th>
<th>Data-Collection Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interviews</td>
</tr>
<tr>
<td>Technique</td>
<td>Advantages</td>
</tr>
<tr>
<td>Phone</td>
<td>Fast and inexpensive</td>
</tr>
<tr>
<td></td>
<td>Easy to supervise</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>In person</td>
<td>High response rate, most accurate</td>
</tr>
<tr>
<td></td>
<td>Highest volume of information</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 2.2
Data-Collection Techniques, Cont’d.

<table>
<thead>
<tr>
<th>Questionnaires</th>
<th>Technique</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E-mail</td>
<td>High rate of return</td>
<td>Requires explicit instructions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yields large amount of data</td>
<td>Allows collaboration among respondents (if individual responses are desired)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Does not require trained interviewers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paper questionnaire</td>
<td>Yields large amount of data</td>
<td>Requires explicit instructions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Does not require trained interviewers</td>
<td>Returns tend to be low</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observation</th>
<th>Technique</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Video camera</td>
<td>Find out what people actually do rather than what they say they do</td>
<td>Time consuming</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Less bias of what is observed because more than one person can view the video</td>
<td>Those who analyze the results must be trained</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Workers may perform differently while being observed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Does not allow you to question job performers in real time or experience some of the environmental factors that affect performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>You can only see what the lens of the camera sees, not everything on the periphery</td>
</tr>
<tr>
<td></td>
<td>Observer</td>
<td>Find out what people actually do rather than what they say they do</td>
<td>Time consuming</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Requires skilled observer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Workers may perform differently while they are being observed</td>
</tr>
</tbody>
</table>
Confidentiality is important. To assure employees that none of their individual responses will be reported, use a confidentiality agreement similar to the one in the Assessment and Front-End Analysis Tools section of Appendix E. The organization’s representative signs the agreement and a copy is shared with each participant in the needs assessment.

### NEEDS ASSESSMENT PROCEDURE

Follow these activities:

**Activity One: Determine the Present Condition**

*Step one:* Identify the knowledge and skill needed to perform the task(s).

*Step two:* Identify the job-related knowledge and skill areas used to select people for the task(s).

*Step three:* Check for discrepancies between steps one and two. This step depends on whether there is a match between the results of steps one and two. If there isn’t a match, then identify the skills that are missing and review for possible

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**Table 2.2**

__Data-Collection Techniques, Cont’d.  

<table>
<thead>
<tr>
<th>Technique</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inexpensive mock-up or talk-through</td>
<td>Permits collecting job performance information before equipment is developed</td>
<td>Results may not transfer directly to job performance because mock-up is not realistic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Requires skilled determination of what should be simulated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Will not account for motivational factors</td>
</tr>
<tr>
<td>Use actual equipment or software, but not in the work environment</td>
<td>Only opportunity to observe behavior under controlled conditions of stress, system failure, etc.</td>
<td>Can be very expensive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Requires skilled determination of what should be simulated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Does not account for motivational factors</td>
</tr>
</tbody>
</table>

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*Multimedia-Based Instructional Design, Second Edition*
training or performance support applications, and consider revision of employee-selection criteria.

*Step four:* Look for environmental causes of the problem if there is a match between steps one and two. Visit the work environment and compare average performance with exemplary or ideal performance. Identify gaps in performance, and continue with step five.

*Step five:* Document task performance that is affected by such environmental factors as:
- Noise
- Equipment
- Tools
- Temperature
- Work space

*Step six:* Review all results and identify areas of need.

*Step seven:* Gather data from employees about:
- Management support
- Existing training
- Teamwork and empowerment
- Workflow and processes
- Safety

*Step eight:* Review all results and identify areas of need.

**Activity Two: Define the Job**
Define the ideal situation of the job, and compare the ideal to the tasks currently performed.

**Activity Three: Rank the Goals in Order of Importance**
List goals in order of importance, and show how they interrelate.

**Activity Four: Identify Discrepancies**
Determine the differences between ideal and actual performance. List all discrepancies as well as missing tasks.
Activity Five: Determine Positive Areas
Use the appreciative-inquiry technique (Hammond, 1996) and document what is working. Appreciative inquiry identifies an organization’s strengths, which is important for two reasons. First, the solution might be as simple as applying the same principles and procedures from those strengths to the current issue. Second, it focuses and allows organizations to reflect on and appreciate the positive aspects of what they do rather than focusing only on the negative.

Activity Six: Set Priorities for Action
Step one: List all possible solutions suggested by the needs assessment. Identify the impact on performance goals of not providing a solution.

Step two: Define the impact of each solution in terms of time, money, and customer satisfaction.

Step three: Make recommendations, keeping in mind job goals, desired results, and other relevant factors.

FROM OUR EXPERIENCE
Using the activities and steps outlined in this chapter, you will be surprised by how often the solution is not training. Spend the time you need to gather enough information to make enlightened suggestions for solving the stated business need.

Taking the time to systematically uncover the root of a perceived problem keeps you from wasting your time and your organization’s resources on multimedia projects that do not solve a business need. Use the Needs Assessment Report form in the Assessment and Front-End Analysis Tools section of Appendix E as a starting point to document and report your needs-assessment results.

Those duties and tasks that the company performs well should be analyzed to determine how the successful skills are learned or taught at present. A possible recommendation might be that the successful learning techniques be replicated and included in training, or that where current performance is successful there is no need for training on those skills.

We often begin a needs assessment by analyzing the job descriptions that are usually already available for positions within a company. These descriptions generally detail the types of duties that members of the audience for the training are expected to perform. Job descriptions usually contain a catch-all phrase that reads something like “... and other duties as assigned.” Be certain to identify whether
these other duties fall within or outside the scope of the stated business problem. Generic descriptions can be modified to accurately reflect the job using data collected during interviews or observations.

The status of the job description is a critical issue. If it is current, it probably accurately reflects the duties of the persons holding the position. If it is not current, you should determine its accuracy. The issue of accuracy might well be raised in any case, given the rapid pace of change and growth in business and industry today. More jobs now require people to assume multiple duties and perform tasks once performed by several employees.

At a minimum, the job descriptions you analyze should contain:

- Position title (the job name). This should be part of an overall organizational structure or hierarchy.
- Position description (generic). This can be a broad description or listing of the job actions and activities required for successful job performance.
- Knowledge, skills, and attitudes (KSA) required for the job.
- Proficiency measures. This is a list and explanation of the performance measures used for the job tasks.

If job descriptions do not exist for a position, they should be developed during the needs assessment.

From the job description, make a flowchart of the job, starting with the goal or final product and working backward. Use this flowchart to identify any prerequisite job skills as well as all critical steps in the job process and their related skills.

You can verify the job-description flowchart you have developed by asking the job performers and their supervisors to confirm the current duties and the correct entry-level skills for the job.

An electronic database is often helpful in assessment and front-end analysis efforts. A database format enables you to store, manipulate, and organize data to report your findings clearly and concisely.

We have found the techniques in Table 2.2 useful for data collection. Analyze them to determine what would work best in your unique situation.

After collecting all relevant data, verify that the information is adequate for recommending a solution and (if appropriate) designing the intervention. Document your conclusions with as much detail as time, resources, and project constraints allow.
If you are an experienced instructional designer and if you determine that your project warrants a streamlined process for needs assessment and front-end analysis, use the rapid analysis method outlined in Chapter Fourteen and the information in Chapter Nine on Issue Analysis.

**SUMMARY**

At this point, you have determined whether or not there is a gap between the desired performance and the current state of a job. If a gap exists, move to front-end analysis and determine the type of intervention required to close the gap. If there is no gap, or if the gap is outside the range of interventions permissible for the multimedia development or training group (which might be the case for a performance or systemic issue, as outlined in Chapter Nine on Issue Analysis), then so inform the stakeholders.

Note that instructional developers and multimedia development or training groups should expand their repertoire of skills to assist with issues other than training. At the very least, they need to be aware of other sources of help. If some aspect of the solution is within the purview of the training group, remain involved in the project and stay informed of the changes that occur. In this way, your group can move quickly to implement your portion of any solution once the changes are completed.