

THE ART AND SCIENCE OF TRAINING

ELAINE BIECH

"THE NEW BIBLE FOR TRAINING PROFESSIONALS.
ANOTHER GEM FROM ELAINE BIECH!"

—KEN BLANCHARD, CO-AUTHOR OF *THE NEW ONE MINUTE MANAGER*

More Praise for *The Art and Science of Training*

“If you could have only one book in your library that presents the latest research on training, choose this one. It is a veritable tour de force that cleverly combines the perspectives of art and science. With wonderful insights including learning theory, technology, enhanced delivery, and the latest research on transfer, this is destined to be the bible of treatises on learning and development.”

—Jack Zenger, CEO, Zenger Folkman, Bestselling Author, The Extraordinary Leader

“Elaine Biech has captured several key validations for me within the same chapter: ‘learners do better when they are solving a problem’ and a ‘moderate amount of stress helps in the learning process.’ Now I know why as a lifelong complex problem solver, I love being in the mix of learning from these challenges!”

—Rear Admiral (ret) Gib Godwin, Managing Director, PricewaterhouseCoopers

“Training and development and teaching professionals in all types of organizations have long needed practical but sound advice on how best to approach the baffling task of helping others learn. Elaine Biech’s book and its intuitive and easy-to-access structure fill the bill to a T.”

—Robert O. Brinkerhoff, Professor Emeritus, Western Michigan University

“*The Art and Science of Training* provides the perfect balance between scientific fact and the artistic elements that, when combined, make training impactful, meaningful, and engaging. I strongly recommend this book for practitioners who want to raise the bar on their training design and for academics who want to complement their scientific teachings with real-world examples and application.”

—Karl Kapp, Professor of Instructional Technology, Bloomsburg University,
Author, *The Gamification of Learning and Instruction*

“Elaine Biech nailed it from the title to the last page—training truly is an art and science. But how many trainers can say they’ve mastered the art or truly understand the brain science? Whether you’ve been in the industry for days or decades, *The Art and Science of Training* is a go-to guide for your professional library. The Bob Pike Group pioneered instructor-led, participant-centered training 40 years ago, and this book earns our stamp of approval.”

—Becky Pike Pluth, CEO, The Bob Pike Group

"I've always believed that the longest distance in training is the 15 inches from a participant's head to his or her heart. When attempting to provide the transformational experience for the learner, the trainer must connect with both (and understand why). In *The Art and Science of Training*, you'll examine the 'how' and the 'why' for making this a part of every session you lead. Through this rich and timely behind-the-curtain look, Elaine Biech shows you how to consistently lead sessions in which your learners hear, see, and feel what you're saying—and do something with it."

—Jim "Mr. Energy" Smith Jr., Author, Speaker, Trainer, Coach,
President and CEO, Jim Smith Jr. International

"In the search for understanding learners better, Elaine Biech has simplified a vast, complex topic by presenting practical information supported by research and experience. In *The Art and Science of Training*, you'll discover countless gems connecting the science of training with the art of facilitation. This is a must-read for anyone who wants to better connect with today's learners and be a more effective facilitator."

—Julie Straw, Vice President of Assessment Solutions, John Wiley & Sons

"Practical, credible, insightful, useful, immediately relevant, research-based—*The Art and Science of Training* is the most valuable guide I've read in a long time. Elaine Biech takes us on a journey through the scientific foundation of learning and the artistic application of principles. Have you ever wondered how the research of Gagné and Knowles are best applied in today's world of virtual and social learning? Look no further. Elaine has done all the research for you!"

—Jenn Labin, Principal, TERP associates, Author, Real World Training Design

"Elaine Biech extols us to see training as both an art and a science. When you infuse objective research and scientific foundations with creativity and flexibility tailored to the learners' needs and your own style, the results can be epic. Don't let your training be stagnant—check out the many ideas, tips, and actionable insights in this book to become a master in our profession."

—Halelly Azulay, Author, Employee Development on a Shoestring, Host,
The TalentGrow Show podcast

"You really need to read this book, especially if you're a trainer or facilitator. The whole point of training is to improve the performance of the learner. As Elaine Biech masterfully shows, effective trainers need to deliver research-based content (science) in creative and imaginative ways (art). Read this book and you'll be a better trainer. Period."

—Bill Treasurer, Author, Leaders Open Doors

“Elaine Biech has put the entire ‘system’ of training together, explaining clearly the process and passion for our work in learning and development. She starts by clarifying the learners and the needs and then continues all the way through how to change performance when the learners get back to their workplace. These are big questions for us in our profession and questions we very often ignore. This book will have a place on my desk and be required reading for my team.”

—Lou Russell, *Queen/CEO, Russell Martin & Associates*

“Trainers and instructional designers are truly engaged in work that demands creativity shaped by research evidence of methods that support learning. In this book, you will find a rare synthesis of how evidence-based research principles can be implemented in creative ways. It’s a must-read practical and grounded guide for talent development professionals.”

—Ruth Colvin Clark, *Author, Evidence-Based Training Methods*

“In *The Art and Science of Training*, we have a way to explain the science behind the magic we weave. If you are just starting out in the training field, no one can give you a better foundation than Elaine Biech. A self-taught trainer, she summarizes her years of experience into practical ‘how-to’ steps that make the science work for you while you use the artist within to encourage learning and create an environment conducive to the same. For those with more experience, she does a masterful job of cutting through all the ‘neuroscience noise’ that is all the rage, as she demonstrates chapter by chapter how the early cognitive science of training we have used for decades is still relevant. This is my new favorite go-to book to share with staff and colleagues, whether they are artists or scientists—or a little of both!”

—Kathy Shurte, *Performance and Training Manager, Florida Department of Transportation*

“Do you need to know the state of the training and development field today? If so, you want this book. It provides a concise, easy-to-read description of how the field has evolved. I strongly recommend it.”

—William J. Rothwell, *President, Rothwell & Associates, Inc., Professor, Workforce, Education & Development, The Pennsylvania State University*

“*The Art and Science of Training* is a master class in instructional design and delivery. It includes decades of the best research on what makes training world class. And it’s beautifully organized and accessible. Like a master teacher, the book is ready to inspire on every page to propel you beyond your current level of expertise. When you put what you read into action, your participants will produce workplace outcomes beyond expectation.”

—Calhoun Wick, *Founder, Fort Hill Company*

"The Art and Science of Training enthusiastically celebrates reality—you can't have one without the other! Embedded in every chapter are crucial training tools to ensure trainers have a balanced game plan for learning. Elaine Biech has done it again—this book is a great guide for a relevant learning strategy that works!"

—Pamela J. Schmidt, Executive Director, ISA—*The Association of Learning Providers*

"Regardless of your knowledge or experience, this book must be in the library of every talent development and human resources professional. Elaine Biech eloquently summarizes extensive scientific background in familiar terms. Her thought-provoking questions make you think and apply a step-by-step approach to delivery as an art form that guarantees success."

—Norma Dávila and Wanda Piña-Ramírez, Partners, *The Human Factor Consulting Group*,
Authors, *Cutting Through the Noise and Passing the Torch*

"If you're a training professional who wants to ensure success for your learners, then Elaine Biech's new book, *The Art and Science of Training*, is for you. She shares training secrets from both the science (data) point of view as well as the art (creative) point of view. Both sides are important, both sides are needed, and you will appreciate how skillfully she weaves them together. You'll gain clarity on the reasons why certain activities are a hit in your classes and gain confidence in creating new exercises to achieve results."

—Cindy Huggett, Author, *The Virtual Training Guidebook*

"Most people think of training as soft skills and not related to hard skills such as science or the creative skill of art. Who better to help us understand this relationship than training guru Elaine Biech? I fell in love with her recipe analogy. In a delicious recipe, there is science to the ingredient proportions but there is also the art of knowing when you need to improvise to make it delicious. The same is true with your training. I highly recommend *The Art and Science of Training* for both seasoned and new learning and development professionals."

—Deborah Covin Wilson, Director, *Organizational Development and Consulting Services*,
Georgia State University

"The Art and Science of Training is a masterful look at the profession of adult learning and talent development. Elaine Biech captures the essence of what it really takes to design and deliver effective learning and development programs. She reminds us that 'it's all about the learner,' while at the same time emphasizes the importance of the facilitator's role to balance technique and style to bring it all together for the learner."

—Maureen Orey, Founder, *Workplace Learning & Performance Group*

The Art and Science of Training

Elaine Biech

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PRESS

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*For Shane and Thad
who taught me the value of asking questions
and the wisdom of replying creatively.*

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Acknowledgments

Those of you who know me know how important ASTD and now ATD have been in my life. It has given me a lifetime of learning and development. It has provided an enthusiastic laboratory for me to try out my own scientific hypotheses. It has offered me many blank canvases for dabbling in my art to create books, conference presentations, and certificate programs. I value every staff member with whom I've interacted, every committee I've supported, and every opportunity I've had to lend an ear or a hand when I could. ATD is responsible for my professional happiness in finding the work I love.

Thank you, Justin Brusino, for inviting me to write this book. "Art and Science" immediately excited me, then confused me, then terrified me! The topic is so vast; science so precise; art so innovative. Could I do it? After weeks and weeks of investigating the research, clarifying the creative, and stacking the results in piles around my office, I decided I was ready. Then I read a quote from one of my just-for-fun authors that said, "But even Picasso had classical training. You have to know what the rules are before you break them." At that point I became energized and couldn't wait to start. It's been another fantastic learning experience. Thank you.

As I write in the book, all trainers owe a great deal to those learning leaders who came before us. A partial list includes Malcolm Knowles, Robert Gagné, Robert Mager, Howard Gardner, Kurt Lewin, Benjamin Bloom, B.F. Skinner, Jerome Bruner, Albert Bandura, Abraham Maslow, David Kolb, Walter Dick, Lou Carey, M. David Merrill, Hermann Ebbinghaus, Michael Lombardo, and

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Robert Eichinger. And, yes, there are certainly others who deserve to be on this list.

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Introduction

Writing *The Art and Science of Training* is a once-in-a-lifetime opportunity. The name is one of those titles that exudes both intelligence and passion. But what does it mean? A quick search on Amazon led me to these books: *The Art and Science of Negotiation*, *The Art and Science of Low Carbohydrate Living*, *The Art and Science of Cytopathology*, *The Art and Science of Getting What You Want*, *The Art and Science of Leadership*, *The Art and Science of Hand Reading*, *The Art and Science of Java*. *The Art and . . .* well, you get the idea. I assumed these titles would offer some insight into the “art and science” framework.

- Art: The creative, imaginative, artistic, free-wheeling perspective.
- Science: The logical, data, research, testing numbers perspective.

Unfortunately, they didn’t and I realized that these authors were not treating art and science as two different topics.

What does “art and science” mean? Do the paths of art and science cross? Do similarities exist? What is the relationship between science and art? Do scientists find value in art? Do artists find value in science? Do scientists stay in their logical, data-driven lane? Do artists maintain their innovative, unique mystique? Let’s view a couple of examples.

Leonardo da Vinci is best known as an artist, but his works were informed by his scientific investigation. He studied physiology and anatomy to create accurate images of people. Claude Monet, Edgar Degas, and Vincent van Gogh all

studied the physiological, psychological, and phenomenal effects of color and light before they created their masterpieces (Eskridge n.d.)

Albert Einstein, one of the world's greatest physicists, was also a great pianist and violinist. He believed that "all great achievements of science must start from intuitive knowledge" (Calaprice 2000). He stated in no uncertain terms that the Theory of Relativity was a "musical thought that came to him intuitively." It seems that the artistic qualities of music would guide him in new and creative directions.

Another scientist, Jonas Salk, strongly believed that art and science go hand-in-hand. The institute that bears Salk's name is recognized by scientists around the world for research in neurobiology and stem cells, but it also plays host to symphonies and artists such as glass sculptor Dale Chihuly.

"I am enough of an artist to draw freely upon my imagination. Imagination is more important than knowledge."

—Albert Einstein

Although it would seem that data-driven science and emotion-driven art are different, there are more similarities than differences between how artists and scientists work. Both ask many questions. Both search for answers. Both are dedicated to achieving the "best" outcome, whatever that might be. DaVinci said, "Art is the queen of all sciences communicating knowledge to all the generations of the world."

Whether the result is from the world of science or the world of art, it seems that science is the basis. Picasso, for example, succeeded at Cubism after becoming an accomplished representational painter. The science of the skill is the foundation, but the passionate use of art creates spectacular results.

Could it be that the connection between art and science goes back as far as the Egyptian pyramids? Certainly someone had an artistic vision of a beautiful potential structure. Perhaps another possessed the mathematical and

scientific knowledge of how the vision could become a reality. Combining the artistic vision and scientific methods produced one of the Seven Wonders of the Ancient World.

Art and Science in Training

Although development strategies should clearly be based on sound science and research, knowing when to use them and with whom is more of an art. This book's title was selected to convey that effective training is both art and science. It is an art in the sense that effective trainers are as varied as their effective techniques. It is a science in the sense that there are effective learning strategies supported by research. These strategies are tools in a trainer's toolbox. All trainers use these tools in different ways and at different times. Research will never be able to define a one-way-works-best approach. Excellent trainers will continue to create approaches that fit between the lines. And we are all thankful that they do.

The Art and Science of Training is like a recipe. It's about understanding the science behind best practices (for example, what proportions of butter to flour to milk to sugar make the best cake) and where a little spicing up will make it taste better (for example, adding cocoa, cinnamon, or salt). A professional baker is astute enough to know when something will work "by the book" and when it needs pecans or chocolate chips to make it even better. As a trainer you know when the addition of novelty is required to get the desired results.

Art and science have always been interconnected and they naturally overlap. Whether you think of your training role more like a scientist who is discovering or an artist who is originating, both require dedication and an innate, intrinsic desire to develop others.

It's all about looking for the right blend to support the needs of your learners and the organization. You have various techniques from which you can select: live classroom sessions, online instructor-led sessions, games, informal learning opportunities, on-the-job experiences, reading, social learning, performance support, self-paced asynchronous courses, MOOCs, coaching,

and mentoring, to name a few. You have an opportunity to try these different approaches and determine the right mix of blended learning. When you have the science within you, adding your artistic touches will only make your training better.

Both science and art help trainers define the qualities that make them great facilitators. Both science and art help them deliver what their learners need. Know the science and apply your art to facilitate others' learning.

Chapter Design

In the chapters that follow, I present both an artistic and a scientific strategy. Each chapter has a common design: The title of each chapter is a question. That question is answered at the end of the chapter after both the scientific data and the artistic ideas are presented to you.

Although I have not separated the science from the art exclusively, I do emphasize that the smart people who laid the foundation for the training profession knew what they were doing. The experts who conducted research, evaluated results, and documented valid conclusions still guide learning practices, ensuring that training is done correctly. Therefore the content of each chapter is summarized with a list of the scientific facts: "What We Know for Sure." You will find facts that guide how we design, deliver, and evaluate learning options.

"The Art Part" presents ideas that you can use immediately to implement some of the concepts in each chapter. You can enjoy putting your own artistic spin on each and using them with your team or your learners.

Finally, any good research that looks into the future should produce more questions than answers. And so it is with this book. View the questions in "Art and Science Questions You Might Ask" as a challenge for you to create your own mini-hypotheses.

Know the science; apply your art.

“There are only two ways to live your life. One is as though nothing is a miracle. The other is as though everything is a miracle.”

—Albert Einstein

Resources

Calaprice, A., ed. 2000. *The Expanded Quotable Einstein*. Princeton, NJ: Princeton University Press.

Eskridge, R. n.d. “The Enduring Relationship of Science and Art.” The Art Institute of Chicago, Science, Art, and Technology Program. www.artic.edu/aic/education/sciarttech/2a1.html.

What Is the Science and Art of Training?

The Greek philosopher Aristotle once declared that “Teaching is the highest form of understanding,” meaning that one who teaches has the deepest understanding of the topic. That’s still true today. I’m no Greek philosopher, but I’d like to suggest that another way to view learning is that “Understanding is the highest form of teaching.”

It seems that to truly facilitate learning for others, trainers must understand them first; learning comes after that. Trying to impart knowledge without thoroughly understanding the learner is like venturing into enemy territory without first doing reconnaissance. Success happens because you understand others; it’s not from understanding the content.

This book examines this point through science and artistic perspectives. Let’s establish a few definitions to make sure we both have the same foundation and are using the same language. Are you a facilitator, trainer, talent development professional, teacher, instructor, designer, or something else? What distinguishes learners, participants, trainees, and students? How about the difference between training, educating, and instructing? And finally, what’s the difference between learning, knowledge, skills, and performance?

Who's Who?

Our profession has debated for years about what to call ourselves. This book does not attempt to resolve that issue. Instead it will help you find the best way to help others learn and develop. What you do is much more important than what you call yourself. So what's in a name? Here are my thoughts:

- *Facilitators* make sure learners take an active role in their learning; the term is sometimes interchangeable with trainers.
- *Trainers* are the learning catalysts that help adults learn new skills and obtain knowledge; their role is interchangeable with facilitators.
- *Talent developer* is the newest name bestowed upon us.
- *Presenters* deliver speeches at conferences or to larger groups; there is a minimal amount of emphasis on two-way communication.
- *Instructors* are teachers typically found in academia. They may also teach a specific skill set, such as tennis instructors or flight instructors.
- *Teachers* instruct children and focus on pedagogy.

What about the terms for individuals who receive training?

- *Learner* is a neutral term that can be used for anyone gaining information.
- *Participant* is a general term used by facilitators and trainers to refer to anyone in a learning or training session; that is, a learner.
- *Trainee* is synonymous with *participant*; the term has most recently been replaced by *learners* or *participants*. It may not project professionalism, especially when the learners are employed beyond entry-level jobs.
- *Student* is used for young children—again, pedagogical.

You will find that I use *facilitator*, *trainer*, and *talent development professional*. I also prefer *learner* or *participant*. These words send a message that says this is adult learning for adults.

What's What?

The activity that occurs between the facilitator and the learner in the preceding section may be called any of these:

- *Facilitating* may be interchanged with the term *training*. It usually refers to taking less of a leading role and being more of a catalyst of learning.
- *Training* is the activity conducted by adults who are learning new skills. Knowledge is generally put to immediate use; hands-on practice is included.
- *Instructing* allows participants to generalize beyond what has been taught. It involves minimal hands-on practice, but sounds too much like a college class to me.
- *Teaching* and *educating* generally impart knowledge in a broader context with delayed implementation. Historically there is little hands-on practice and both suggest pedagogical learning.

I prefer *facilitating* because it implies that you are enabling learners; pulling it out of them rather than pushing learning toward them.

The Results?

So what do learners take away from the activities? Each of the following, when training is done correctly:

- *Learning* is gaining knowledge and skills to make change.
- *Knowledge* is gaining cognitive competence and information assimilation.
- *Skill development* is gaining psychomotor competence and the ability to perform better or in a new way.
- *Attitude* is the willingness to change based on new knowledge.
- *Performance* is the ability to implement the knowledge and skills that have been learned.

You may find other labels for these roles and what occurs; as the profession grows and changes you're likely to find even more. What you call yourself is not nearly as important as the significant work you accomplish: Helping adults learn so they can improve their performance.

Does label choice make a difference? In their groundbreaking research, neuroscientist Andrew Newberg and Loyola professor Mark Waldman discovered a valuable communication strategy that includes the power of words. They write: "a single word has the power to influence the expression of genes that regulate physical and emotional stress" (Newberg and Waldman 2012). They found that the use of words, both positive and negative, can be recorded on an fMRI scan. You can see an increase of activity in the amygdala and the release of dozens of hormones and neurotransmitters when we listen to someone speak. Single words have the ability to support or interrupt the normal functions of the brain, such as those involved with logic, reason, language processing, and communication.

Adults may have negative memories of school, which they could bring with them to your training. Why use words such as *teacher*, *lesson plan*, or *student* if they may generate negative memories—especially if you don't need to. If science tells you words can make a difference, be artful and use terms and labels that have a more positive connotation. For example, use *learner* instead of *student* or *project* instead of *homework*.

A Final Note

As training professionals, our role has been changing and expanding for some time. If you've coached managers about how to develop their people; if you've mentored senior leaders about how to best implement change; if you've led an initiative to build a department team; or if you've acted as a consultant to illustrate how social media can extend learning, you've experienced a trainer's changing role. We'll address these changes further in chapter 13.

Defining Science

This book is about the *art* and *science* of training, so it's important to define what that means. Remember coming up with a hypothesis for your science project back in sixth grade? "If (I do this) then (this) will happen." Remember studying the scientific method in high school?

The word *science* probably conjures up a variety of images: your biology textbook, white lab coats, microscopes, telescopes, Einstein's equations scribbled on a chalkboard, the space shuttle launch, bubbling beakers. These images reflect an aspect of science, but none provides a complete picture because science has so many facets.

Science is both a body of knowledge and a process. You might remember studying the Mohs scale, the laws of motion, the periodic table of elements, or differential calculus. Equally important to all the facts is the process of discovery that allows you to link isolated facts into a comprehensive understanding of the natural world. This process is the scientific method. It is the process of asking scientific questions and conducting experiments. The steps of the scientific method are:

1. Ask a question.
2. Do background research.
3. Construct a hypothesis.
4. Test your hypothesis by conducting an experiment.
5. Analyze your data and draw a conclusion.
6. Communicate your results.

So what, you might ask. Well, the science part of this book ferrets out the facts and processes that create a foundation of understanding and the body of knowledge that trainers call their profession. The science of training provides a way to discover what's new and what works. Knowledge generated by science is powerful and reliable. It can be used to develop new training techniques or address current problems. It's exciting that science will continue to expand our knowledge of the profession.

Most of what we do as trainers is based on scientific research conducted by Gagné, Bloom, Skinner, and a host of others. These researchers conducted studies, evaluated the results, and presented valid conclusions about what really works—separating fact from fiction. But it isn’t all facts and logic. Training is also dynamic and creative, so we’ll also look at the “art” of training.

Defining Art

When you hear the word *art*, what comes to mind? Perhaps you think about paintings, art galleries, sculptures, a ballet, or a concert. Like science, art has many facets; though presented from a different perspective.

Art is the expression or application of a diverse range of human creative skills and imagination. It is typically presented in visual form, but can also be auditory or performing works intended to be appreciated for their beauty or emotional power.

Again, you might be thinking, so what? Well everything doesn’t always occur the way science says it should. There will always be exceptions to the rule: the unwilling learner, the uninformed supervisor, the inappropriate delivery medium, mismatched content, or the unmanageable performance challenge. When you come upon these—and I am sure you have—you need to think on your feet and become an artist of sorts. You need to paint a new plan and sculpt a successful learning experience for all of your learners.

As stated in the previous section, this book provides the science for learning and development, but it’s important to recognize that success is all about Plan B: what you do when things don’t follow the rules of science. There will be plenty of opportunities to put on your artist’s beret and create Plan B for your learners. I’ve been in many “what’s-Plan-B” scenarios, so I can speak of successes, mistakes, and experiences. That’s the art.

The refrain throughout this book is, “It’s all about the learner.” It’s important to make everything come together to ensure that your learners gain the knowledge and skills to improve their performance. You work in an exciting profession. You develop others through the art and science of training. When

you put the learner first you ensure that “understanding is the highest form of teaching.”

“The aim of art is to represent not the outward appearance of things, but their inward significance.”

—Aristotle

Adults and Learning

There are a couple of points to make about the fundamentals of training. You’re an adult and you are learning all the time. Think back over the past two months. What did you learn and why did you learn it? List two or three on a piece of paper or enter them on your tablet. Remember to list *what* you learned and *why* you learned it. You can use this format:

I learned _____, because _____.
(what?) (why?)

What did you learn? When your car had a flat tire, did you *need* to learn how to change it? When your supervisor asked you to prepare a plan for how your department could use mobile learning, did you *need* to conduct research to learn more? Do your friends golf, so you also *want* to learn? Does your neighbor bake delicious bread, so you *want* to learn her secrets? These examples illustrate that almost all of what you learn as an adult is steeped in your desires. You either *need* to learn something to solve a problem or you *want* to learn something to satisfy yourself.

Review your examples again. What did you discover about why you learn? Generally you will find that you learned something because you need to learn it or want to learn it. This is somewhat different from children who learn something in school to prepare to learn something at the next stage of their lives. For example, you learned to count to 10 as a child so that when you reached school you could learn to add. You learned to add so that you could learn to subtract

and multiply. Later you used this knowledge so that you could learn algebra, trigonometry, and calculus.

Adult Learning Theory—Not Just for Adults

Adult learning theory is not only for adults. It is also a great way for children to learn. Many U.S. schools have started to implement concepts similar to adult learning strategies, such as learning in teams, respecting learners, and helping learners relate the content to their real world. I have always been a proponent that learning should be fun and relevant for everyone!

It's All About the Learner

Carl Rogers first introduced the concept of “learner-centered learning.” In their book, *Telling Ain't Training*, Harold Stolovitch and Erica Keeps support Rogers' concept. They admonish us to remember their mantra, “learner centered . . . performance based . . . learner centered . . . performance based.” Why? They want their readers to remember that these are the keys to transforming learners.

They have found that most trainers begin any quest to train by looking at the content. However, they argue that trainers should first focus on the learners' needs, concerns, desires, fears, frustrations, and characteristics. I couldn't agree more. Focus on the learner. It's not about covering content. It's about helping the learner do something better, faster, easier. It's about transformation.

Sure, easy for me to write that. But you've got a real program with pages of material supported by dozens of PowerPoint slides. You will be evaluated on how well you complete all the activities. You are measured on how thoroughly you deliver your material. In addition, the three-hour classroom has been cut to a 90-minute virtual training session. This is when you tap into the art of training. Here are a few ideas to start your thinking. There will be more in the upcoming chapters.

- Mind the time basics. Start your session on time. Start on time after every break, even if it means you might start without some participants. Use timekeepers for activities.

- Organize your materials and yourself. Use the most efficient method for distributing materials—perhaps set them up on the tables ahead of time.
- Prepare to run out of time: Know what content can be shortened, mentioned as a reference, or even be skipped completely.
- Manage large group discussions. Time can get away from you during group discussions. If everyone isn't interested and involved, you could be frittering away valuable minutes.
- In a virtual session, the biggest time waster can be at the start: too much time spent on introductions, logistics, or how to use the tools. It's not that these aren't important; simply find the most efficient way to handle them, including prior to the event.
- Use pre- and post-training strategies: video introductions; pre-reading; participant- and supervisor-guided discussions; learning what's most important to participants and their supervisors; or developing checklists, job aids, and tip sheets that make the learning go faster and can be used after the training event.

Yes, the content is important, but what is the best way to help your participants learn to improve their performance? What's the best use of their time? It's all about the learner.

Tapping Into the Early Science of the Profession

Many people have contributed to the foundation of the training profession. It is less important to be able to repeat their theories, but it is critical that you know how to implement their theories for training and development. And it's important to understand their value. Let's begin by looking at Instructional Systems Design (ISD), Bloom's Taxonomy, and Gagné's Conditions of Learning.

"He who loves practice without theory is like the sailor who boards a ship without a rudder and compass and never knows where he may cast."

—Leonardo da Vinci

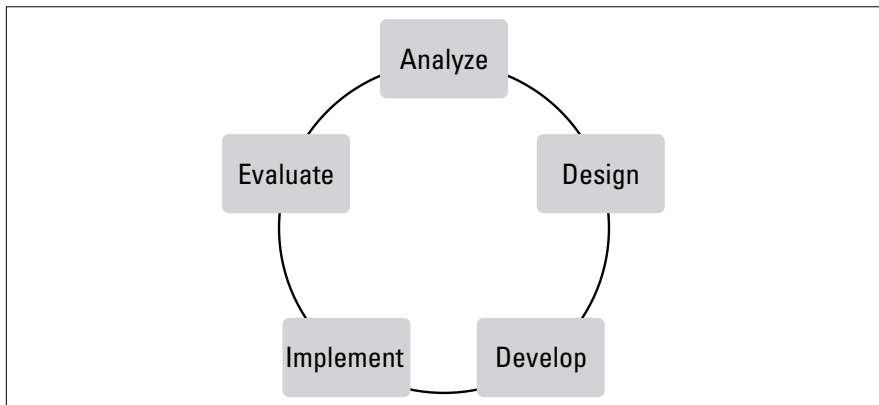
The Training Cycle

The training cycle, commonly called Instructional Systems Design (ISD), is the first thing trainers think about when designing or developing training programs. ISD models have been around since the 1950s. ADDIE is the most familiar and was developed initially by the U.S. military to effectively create training programs. The acronym ADDIE represents the five steps required to design, deliver, and continue to improve the delivery of training:

- analyze
- design
- develop
- implement
- evaluate.

It's important to picture these steps in a circular model to serve as a reminder that training needs to be continually improved. The model was originally developed by Florida State University and was presented as a linear model in 1981 by Russell Watson, chief of the staff and faculty training division at Fort Huachuca, Arizona.

Figure 1-1: The Training Cycle



The training cycle starts with an analysis. Evaluate is the final step of the cycle, but once you move around it the first time you'll use what you learn during

evaluation as input to analyze the results and determine if it is the best it can be. This training cycle is used whether you are designing from scratch or just tailoring a training program you purchased from a vendor.

Analyze

The first stage of the training cycle is called analysis in the ADDIE acronym. Generally, you need to conduct an assessment and analyze the data to identify specific needs. There are two main reasons for completing an assessment and analysis.

First, you want to make sure there is a reason to conduct training. You may discover after conducting the analysis that the relevant issue can be addressed by something other than training. For example, you may be able to do on-the-job coaching; or online content may exist that could be delivered either asynchronously or synchronously; or you may believe an article in the company newsletter alerts employees to the information needed. Or you may find that the issue isn't the learners' performance at all. Perhaps it is a process or equipment or another issue unrelated to your learners.

Second, if you do determine that training is necessary, the analysis tells you exactly what should be taught in the training session. It also helps determine your training objectives.

There are many ways to conduct assessments. You can use a formal instrument that measures a person's skill or knowledge, or one that simply measures a person's preference. You can also use written questionnaires or personal interviews with employees or supervisors. If you use interviews, you can meet with individuals one-on-one or conduct small focus groups. Another way to assess a need is to observe an employee working or to take a work sample. Or you can obtain records or reports that already exist.

Your goal in collecting the data is to determine the gap between a job requirement and an individual's actual skill or knowledge. The bottom line is to determine what is preventing the desired performance. You will need this information for the next stage of the training cycle.

Design

After you have determined that there is a legitimate training requirement, your next step is to state exactly what you want the training to accomplish. You do this by writing objectives. Two kinds of objectives from two perspectives are used in training.

The Learning or Performance Objective

This is a statement of the desired performance (knowledge or skill) after the training has been conducted. It doesn't matter whether you call them learning or performance objectives, as long as you understand that the purpose is to demonstrate what your participants have learned and can perform. What behavior changes did they make? Learning objectives should be based on the information you discovered during the analysis step. For example, at the end of this training session, "Participants will be able to design participant-focused learning activities."

The Training Objective

This is a statement of what the instructor hopes to accomplish during the training session. This may be an outcome, or it may be a description of what the instructor plans to do to accomplish the learning objectives. For example, "This session will create a positive learning climate that encourages participants to get involved and ask questions."

Some trainers include both learning and training objectives in their design. Learning objectives are a required step in every good training design. Training objectives help the trainer to focus on designing and delivering a first-class training program by setting targets for the trainer to achieve.

Learners are informed of the learning objectives at the beginning of a training session, and it's preferable that they are also told about the training content at the same time.

Develop

After you determine the objectives, you can begin to develop the program. This is the stage of the training cycle that I like best. You decide exactly what

you're going to do to accomplish the objectives you set. There are many things to consider in designing a training program.

If you haven't already, you will decide which type of delivery will achieve the best results based on your analysis: on-site classroom, virtual classroom, self-paced e-learning, performance support tools, self-study, or a combination of these and others in a blended learning solution. These questions will help determine the type and location of the training program:

- How many participants need new knowledge or skills?
- What performance is required?
- Where are participants located?
- How much time is required?
- How much consistency is needed?
- When is training required?
- How many participants will be in each class?
- What level of trainer expertise will be required?

You may also decide whether you even need to develop the content. Given the availability of thousands of off-the-shelf products, you may decide to purchase predesigned content and customize it. In addition to ensuring that learning objectives are met, consider the following:

- your audience
- the best training techniques
- how to provide opportunities to practice
- what will be meaningful
- how they will implement learning in the real world
- how it will improve performance
- how to add creativity to the program.

You should also build in methods to ensure that the learning is applied back on the job, as well as a process to evaluate the program's effectiveness.

If you design the training, it will be a big task to develop the materials. What participant materials do the learners need? What audiovisual materials and equipment will you use? If it is an online course, what technical support

will you require? Will your learners require job aids—either paper or electronic? While this stage can be exciting, it can also be exhausting.

Implement

This is the training cycle stage during which you actually conduct the training program. There is a huge amount of preparation before the program. And even after taking the time to prepare, there is no guarantee that it will go off without a hitch. That's why some trainers pilot a program with a group of pseudolearners who provide feedback before the session is ready.

Trainers use presentation and facilitation skills in both the traditional and virtual classroom.

- Presenters provide more information. If much of the information is new or technical, trainers may need to present. The preferred role, however, is as a facilitator.
- Facilitators are catalysts who are tasked with ensuring learners' participation. A good trainer is often synonymous with the term *facilitator*.

Excellent delivery skills are required whether you're facilitating a virtual or traditional classroom. While conducting the training, you want to constantly read your audience to find out whether you're meeting their needs. If you see that an approach isn't working, stop and try another. Don't be afraid to stray from the agenda if it will be more helpful to the learners. This is the stage during which platform experience and good facilitation skills are required.

Evaluate

When it's over, it's not actually over. The evaluation stage is an important part of the training cycle for three reasons:

- First, the evaluation tells you whether the objectives were accomplished.
- Second, information from the evaluation stage should be fed into the analyze stage. It is used to improve the training program should it be conducted again. This is why this model is circular.

- Finally, evaluation information serves as the basis for determining needs for future programs or other changes an organization may need to make.

The stages and the science behind them will be addressed in more depth starting in chapter 3, “How Do You Design So Others Can Learn?” ADDIE presents a good ISD basis, and organizations often adapt or combine concepts to create their own customized model.

Is ADDIE Too Old and Cumbersome?

I’m sure you’ve heard the battle to “leave ADDIE” for SAM because ADDIE is too old, too cumbersome, too rigid, and has outlived its usefulness. Maybe it’s the training profession. Maybe it’s a need to be a guru. Maybe it’s just human nature to sensationalize when possible. Rather than adapt a good thing, the training profession often wants to get rid of it and create something new. This is confusing to new trainers who are trying to understand the elements of the profession, the acronyms, and the jargon! If you’ve heard the battle of ADDIE vs. Agile vs. SAM, I suggest that you stick with ADDIE.

Here’s the rest of the story. Because ADDIE has been around since the 1970s, it is believed to be outdated and too rigid for practical use. I’m a self-taught trainer and I have used ADDIE all my life. No one told me that it was rigid, so I used common sense and made it my tool, increasing agility when needed.

The perceived advantage of Agile is that the model allows you to share your mockups, prototypes, and early suggestions with the customer, allowing you to adjust along the way. No one ever told me that I was not allowed to do that with ADDIE, so I do work with my customers right from the start. It’s just common sense. Feel free to explore other options, but I recommend that you use ADDIE and add what works for you. This is a great example of making the science work for you using your creative side.

Is ADDIE outdated? The U.S. Armed Forces doesn’t think so. They have been using it quite successfully in today’s VUCA (volatile, uncertain, complex, and ambiguous) environment. In case you are unaware, the U.S. military invented the term VUCA.

Bloom’s Taxonomy

In the early 1950s, Benjamin Bloom and a university committee identified three learning domains: cognitive, psychomotor, and affective. Because the project was completed by academics, the terms may seem a bit abstract. Trainers typically use knowledge (cognitive), skills (psychomotor), and attitude (affective)—frequently referred to as KSAs—to describe the three categories of learning. You may think of these as the ultimate goal of the training process—what your learner acquires as a result of training.

Bloom’s group further expanded on the domains, creating a hierarchical ordering of the cognitive and affective learning outcomes. Their work subdivided each domain, starting from the simplest behavior to the most complex: knowledge, comprehension, application, analysis, synthesis, and evaluation (Table 1-1). Each level builds on the earlier one. For example, knowledge must occur prior to comprehension; comprehension must occur before application. Each level of learning identifies a desired specific, observable, and measurable result.

Table 1-1: Bloom’s Taxonomy

Behavioral Level	Skills	Examples
Knowledge	Define, list, name, recall, or repeat knowledge or information.	Name six levels of Bloom’s Taxonomy.
Comprehension	Translate, describe, or explain information in your own words.	Explain Bloom’s six levels.
Application	Apply, demonstrate, or use knowledge in new situations.	Apply Bloom’s theory to write learning objectives.
Analysis	Analyze, compare, question, or break knowledge into parts.	Compare and contrast aspects of Bloom’s model.
Synthesis	Arrange, create, plan, or prepare a new whole from parts.	Design a new learning model.
Evaluation	Appraise, assess, judge, or score information based on knowledge.	Evaluate and defend the benefits of Bloom’s Taxonomy.

This work is known as Bloom’s Taxonomy, and the research will help you in the design and the delivery phases of training (Bloom et al. 1956). The

learning categories are not absolute, and other systems and hierarchies have been developed since then. Bloom's Taxonomy, however, is easily understood and may be the most widely applied to learning objectives.

Gagné's Conditions of Learning

Robert Gagné and his Conditions of Learning provide the third body of knowledge that forms foundational concepts for you as a trainer. Learning theories attempt to describe what is happening when people learn. A learning theory leads to learning strategies, tactics, and experiences that support the theory.

"Learning theories try to provide conceptual structures involved in the process of taking in information and getting it transformed so that it is stored in long-term memory and later recalled as an observable human performance."

—Robert Gagné

Gagné identified nine instructional events. Applying these events to your training is helpful and ensures that learning will occur. Here are Gagné's Instructional Events:

- Gain the learners' attention.
- Share the objectives of the session.
- Ask learners to recall prior learning.
- Deliver the content.
- Use methods to enhance understanding; for example, case studies, examples, graphs.
- Provide an opportunity to practice.
- Provide feedback.
- Assess performance.
- Provide job aids or references to ensure transfer to the job.

If you've been around the training field for a while, you know that these events are commonplace and are assumed to be a part of any effective

training program. If you are new to the training field, add these to your list of steps required to ensure effective training.

We'll refer to these three theories—The Training Cycle, Bloom's Taxonomy, and Gagné's Conditions of Learning—in the next chapter, "How Do You Learn?"



What We Know for Sure

Science tells us that we can rely on several proven facts:

- Words matter. Choose yours carefully.
- Adults learn because they want to or need to.
- Training is all about the learner.
- Using an ISD model ensures an efficient and effective process.
- The ADDIE ISD model is effective.
- Bloom's Taxonomy is an excellent resource for setting objectives.
- A wealth of practical advice is embedded in Gagné's Conditions of Learning.



The Art Part

Your success will depend upon how well you adapt to the situation and your learners' needs. Tap into some of these ideas to help your learners grow, to develop yourself, and to add your personal creative touch.

Make ADDIE work for you. When people complain that the ADDIE model takes too long, I ask what they are doing to shorten the time. I work iteratively between the design and development stages. To me they are one step. That way I don't get too far along with making a decision that "officially" falls into the design phase before moving to the development phase and learning that I have too little time or not enough variety in my activities. This is much more efficient than working in a linear fashion—doing all design first before you start development. I also build evaluation into every ADDIE step to ensure I'm planning with the end in mind.

Partner with your client. If you use ADDIE, connect with your client or customer early and often. Share your learning objectives and preliminary

plan to create a dialogue. Don't worry if it is not perfect and pretty. You are in a partnership and both of you want the best for the learners and the best for the organization.



Art and Science Questions You Might Ask

These questions provide you with potential challenges for your personal growth and development:

- What foundational content can you develop and improve?
- How well do you learn about your learners?
- How likely are you to start with the basics of a theory and creatively mold it to meet your learners' needs?
- How do you rate regarding keeping your learners' needs and desires at the forefront? What could you do better?

What Is the Science and Art of Training?

Well, that's the question, isn't it? This book presents the scientific angle, addressing humans, society, and the laws of existence. Science is expected to be free of subjectivity and is guided by a high level of consciousness. Science offers learners competence.

This book also presents the artistic angle, addressing the message that is grounded in emotion and intuition. Art is expected to affect emotions and create pleasure. Art offers learners confidence and commitment.

What is science and art? Imagine that science helps to explain *why* and art demonstrates *how*.

Resources

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