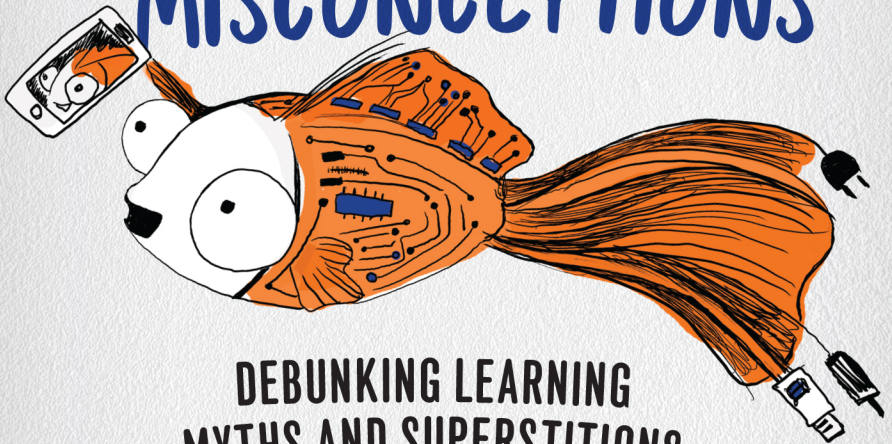# MILLENNIALS, GOLDFISH & OTHER TRAINING MISCONCEPTIONS

DEBUNKING LEARNING MYTHS AND SUPERSTITIONS

CLARK N. QUINN

More Praise for This Book

"Use the concise and engaging information in Clark Quinn's new book to move beyond the myths, fads, and folklore that hold us and our organizations back. One of the best benefits is learning how to analyze others' learning, training, and outcomes claims. So important."

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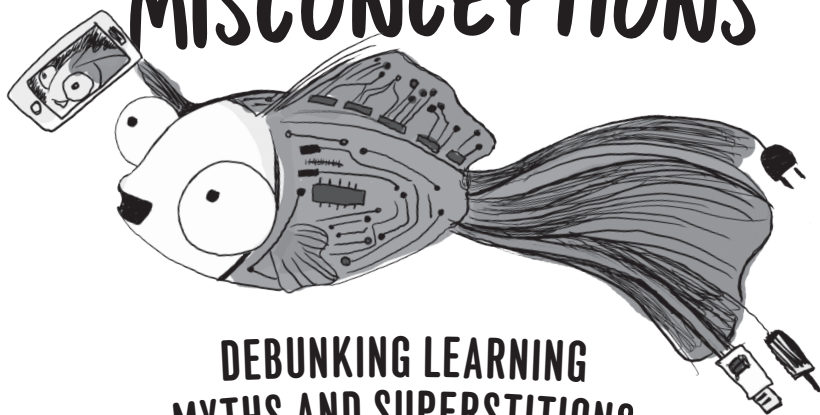
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—Julie Dirksen
Author, *Design for How People Learn*

MILLENNIALS, GOLDFISH & OTHER TRAINING MISCONCEPTIONS

DEBUNKING LEARNING MYTHS AND SUPERSTITIONS

CLARK N. QUINN

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Buy This Book

To all who fight the good fight
for science and improvement in
the human condition.

CONTENTS

THE MYTHS, SUPERSTITIONS, AND MISCONCEPTIONS

FOREWORD

Clark Stanley worked as a cowboy and later as a very successful entrepreneur, selling medicine in the United States that he made based on secrets he learned from an Arizona Hopi Indian medicine man. His elixir was made from rattlesnake oil, and was marketed in the 1890s through public events in which Stanley killed live rattlesnakes and squeezed out their oil in front of admiring crowds. After his medicine gained a wide popularity, he was able to set up production facilities in Massachusetts and Rhode Island with the help of a pharmacist. Stanley made himself a rich man.

You may not know his name, but you've certainly heard of Stanley's time and place. It was the era of patent medicines—false and sometimes dangerous elixirs sold to men and women of all stripes: Dr. Kilmer's Swamp Root. Oxien. Kickapoo Indian Sagwa. Dr. Morse's Indian Root Pills. Enzyte. Bonnore's Electro Magnetic Bathing Fluid. Radithor. Liquozone. And of course, Clark Stanley's Snake Oil Liniment.

These medicines were bought by the millions. Fortunes were made. And millions of people were bamboozled, sickened, or even killed.

Upon being tested, Stanley's elixir was found to be made mostly from mineral oil—a worthless potion sold by a charlatan. His story of the medicine man and the rattlesnake juice was a more potent concoction than his famous elixir.

So what causes men and women to miss the truth, to fail to see, and to continue happily in harming themselves and those around them? This, unfortunately, is not a question just for the era of patent medicines. It is eternal. It goes back to the dawn of humanity and continues today. I have no answer except to assume that our credulity is part of our humanity—and should guide us to be on guard at all times.

What stopped the patent-medicine pandemic of poison, persuasion, and placebo? Did we rise up and throw out the scoundrels, the money-grubbers, the snake-oil salesmen? Did we see that we were deceived because we were too hopeful or too blind? Did we heed our senses and find a way to overcome the hidden dangers? No! We did not!

It was not a mass movement back to rationality and truth that saved us. It was the work of a few intrepid journalists, who began reporting on the deaths, sicknesses, and addictions resulting from the use of patent medicines. In 1905, *Collier's Weekly* published a cover story that exploded the industry: "The Great American Fraud: The Patent Medicine Evil," written by former crime reporter Samuel Hopkins Adams.

This long piece of investigative journalism opened the floodgates and led directly to the Pure Food and Drug Act in 1906. The act was followed by additional regulations and requirements that protect our health and safety.

The ugly truth is that we need help in seeing what we can't or won't see. This is also true in the learning industry, and has been since at least the early 1900s. When I decided to start Work-Learning Research to bridge the gap between research and practice, it was because I kept seeing bogus recommendations steal attention away from more fundamental and effective learning practices. And, about 20 years later, the proverbial snake oil continues to vex our field and push us to make poor decisions about learning.

Alas, I am a faint voice in the howling wind of our industry. Fortunately, there are many other muckraking practitioners today, including folks like Paul Kirschner, Patti Shank, Guy Wallace, Pedro De Bruyckere, Julie Dirksen, Donald Clark, Ruth Clark, Mirjam Neelen, and Jane Bozarth. There are also legions of academic researchers who do the science necessary to enable us to convey research-to-practice wisdom to trainers, instructional designers, e-learning developers, and learning executives.

I am especially optimistic now that Clark Quinn has compiled the myths, superstitions, and misconceptions that imbue our field with faulty decision making and ineffective learning practices. As Clark rightly advises, don't read

the book in one sitting. You will find it too much to think that our field could tolerate so much snake oil.

But here's what many don't realize. Blindly going along with today's workplace learning fads costs the industry billions of dollars in wasted effort, misspent resources, and ill-advised decisions. They distract us from the fundamentals of the science of learning that have proven to be effective! Every time trainers read an article on learning styles and adjust their training programs to make them suitable for visual, auditory, kinesthetic, and olfactory learners. Every time instructional designers attend a conference session touting that neuroscience can replace all other learning design, and then scrap their other learning strategies. Every time a chief learning officer hears that all learning events, no matter their content or purpose, should be shrunk to four-minute microlearning videos—that storytelling is everything, that all learning is social, that virtual reality is the future of learning. Every time our learning executives jump on a bandwagon, we open ourselves up to ignoring what really works.

Let us start anew today. We can begin with Clark's book; it is a veritable treasure chest of wisdom. But let's keep going. Let's stay skeptical. Let's look to the scientific research for knowledge. Let's become more demanding and knowledgeable ourselves, knowing that we all have more to learn. Let's do our own testing. Let's improve our evaluation systems so that we get better feedback day by day. Let's pilot, rework, improve, and continue to learn!

As the history of patent medicine shows, we must be forever vigilant against our blindness and against those who will sell us the miraculous hope of the next workplace cure-alls.

—Will Thalheimer, PhD
President of Work-Learning Research
Somerville, Massachusetts
April 2018

PREFACE

Why This Book

Many myths, despite publicity about their invalidity, still persist in instructional design practices. Beliefs about learners and learning that don't reflect what is known from science continue to exist. It can be costly when we invest resources in developing programs to accommodate them, and they undermine the learning outcomes we're trying to achieve.

In this book, I lay out the myths that affect adult learning in the organization. They're broken up into three categories:

- myths that research has shown are not valid (such as learning styles)
- design practices that are prevalent but aren't backed up by science (such as smile sheets)
- common approaches or beliefs that have been misconstrued and need clarification (including 70-20-10).

Each of these has implications for practice. When we practice in alignment with what is known, our learning approaches are scrutable. When our designs violate learning science prescriptions, we are wasting resources *and* wasting our learners' time.

Whom This Book Is For

This book is for those in organizational learning, whether internal-facing or external learning experiences. You may be at the individual instructional designer, manager, or executive level, but this book is for anyone who makes decisions about how learning is designed and delivered.

Beyond the instructional designer level, this book is for those responsible for learning policies, procedures, and processes: those who determine

how learning *should* be applied. Those who manage or control the process. And those who lead those managers and teams. Practitioners in these roles should be aware of what learning science says—and work in alignment with these practices.

If you are responsible for the design of learning experiences, you should have a copy of this book and be aware of the contents. Ultimately, *you* are the one who needs to commit to learning that withstands any challenges on the quality of the outcome. While cost and speed are understandable concerns, learning that doesn't work is ultimately a waste of time *and* money.

How to Read It

This book is *not* meant to be read from front to back. While that's not a bad idea, the intention is for you to use it as a guide to those issues you face. It's for you to use when confronted with viewpoints contrary to good practices or when facing contention around controversial proposals. Use it to make a case for good learning design!

I strongly encourage you to read the first two chapters, particularly the one on the science of learning. They provide essential background information as well as a foundation for much of the subsequent explanations.

I urge you to look at the table of contents or page through the book, and check out the topics you are curious about. Maybe it's whether Millennials learn differently from other generations. Or maybe you're curious about the attention span of your learners. In fact, you may actually (or implicitly) be practicing some of these myths right now. An important step to correcting a myth is consciously challenging your own assumptions!

Too many situations arise when people ask for or expect designs or implementations that reflect personal beliefs, yet run contrary to what science has determined works. If you struggle to convince your peers of the value of an alternative approach, this book is designed to be your partner. Feel free to wield it as a defense!

ACKNOWLEDGMENTS

Many people through the years have provided contributions that led to this book. While I've been paying attention to learning science (and myths) for decades, the necessary focus on the problem and the need for solutions is more recent. There are many contributors, and I've no doubt missed a few. Mea culpa!

Many years ago, Chad Udell, of Float Mobile, and I did an eLearning Guild presentation on learning myths. His firm provided some excellent graphics, and we debunked a number of myths. That was sort of the gestation of a series of presentations that gradually expanded in scope.

Will Thalheimer has been a friend and colleague, and has been a standard-bearer to the extent of running the Debunker's Club and putting money behind a challenge to anyone who can show value in learning styles. I thought he should be a co-author, but he (perhaps wisely) declined on the lack of a clear business case. He has been an eager supporter of the work, and graciously agreed to write the foreword.

Patti Shank has been a sounding board several times for my work. She previously conducted research for the eLearning Guild, and since has been leading the charge at ATD's Science of Learning blog. I've written for it, and it's generally a good source on what's happening in the field. She's also started a new series of books that compile valuable design guidance.

Julie Dirksen and Michael Allen have been co-campaigners with Will and I in the Serious eLearning Manifesto (elearningmanifesto.org). While not specifically discussing myths, they've both been an inspiration for fighting for what's important. Their writings on good design are based on sound learning science.

In addition to the people named, a number of friends came through in my request for assistance in identifying myths. Jane Bozarth, Connie Malamed, Mark Britz, Karen Hyder, Bianca Woods, Sarah Gilbert, Trina Rimmer, Cammy Bean, Karl Kapp, Megan Torrance, Dave Ferguson, Cathy Moore, Maria Andersen, Steve Nguyen, Jason Haag, Brian Dusablon, Kris Rockwell, Steve Howard, Joe Ganci, Mirjam Neelen, Paul Kirschner, and Guy Wallace all offered their help. Their contributions are greatly appreciated.

Members of the Debunker's Club also responded, including Dan Topf, Margaret Driscoll, Rick Presly, Marty Rosenheck, John McDermott, Paul Kirschner, Adam Neaman, Steve Madsen, Michelle Perry-Slater, Viv Cole, Steve Villachica, Peter Mitchell, Donald H. Taylor, and Mackenzie Peterson. Their support is gratefully accepted.

At ATD, Jack Harlow served as my developmental editor and not only massaged my prose, but made contributions that significantly improved. Melissa Jones served as copy editor and coordinated the comics that accompany the descriptions. Francelyn Fernandez is responsible for the comics themselves, and did a great job interpreting my meaning. Deborah Orgel Hudson and Julia Dragel joined in to assist with marketing. It's been a pleasure to work with them, and I'm grateful to all the folks at ATD.

I owe a special thanks to Justin Brusino. He not only has involved me in a number of projects through the years, but he was the one who suggested that we do this book. He was there for me through *Revolutionize Learning & Development*, and he's been there throughout this process. He's quiet, but he has a big impact on the field. Thanks!

My children, Declan and Erin, provide a regular motivation to continue to fight for what's right. I believe it's important to model principled behavior, and they're an additional reason beyond my personal code of conduct. They make me proud.

Most important, I owe eternal gratitude to my wife, my friend, the mother of our children, and my best editor, LeAnn. She provides the emotional and physical support so I can undertake such endeavors. Thanks, dear lady.

THE MYTHS THAT HOLD US BACK

Beliefs and the State of Design

Many myths persist despite the evidence, and many of them affect the learning and training industry. Despite research results and considerable attention, large numbers of myths are still endorsed by the public (including teachers). For example, researchers have documented that even 78 percent of those with some neuroscience education believe in learning styles (Macdonald et al. 2017)! The data for teachers and the public at large are worse. Other myths have their own persistent believers.

Similarly, there are misconceptions about a variety of learning design topics that lead people to misinterpret the intent or avoid the good elements because of wariness around bad connotations. So, if we hear that a model is controversial, we might avoid it even though there are benefits to be found. If something is derided because of one interpretation but another way to view it is useful, it helps to clarify the meanings to separate out the valuable from the detrimental.

What does this mean? For one, it means that we can practice what we believe is good learning design in many ways—and end up wasting time and money. We can also squander goodwill if what we pursue ends up leading to dissatisfaction on the part of stakeholders.

If learning design is a field that aspires to be truly professional, mistaken beliefs can serve to undermine our credibility. Practitioners must be aware of what is legitimate, what is unproven, and what has been thoroughly debunked. When we follow fads instead of what learning science tells us, we can run into many problems. First, and most important, we may do bad for our learners. Second, we may waste valuable time and money; our organizations should expect better. And third, we could undermine our legitimacy, and thus continue to be seen as a cost, not an investment.

To put it another way, the learning field should be as professional as any other, and knowing what's fanciful from what's factual should be a matter of pride. We wouldn't want to be the perpetrators of learning malpractice, after all. It's not fair to those who employ us or those who depend on us.

Learning Myths

Myths, as I refer to them here, are beliefs that are prevalent despite repeated evidence that they're wrong. These learning myths cause us to invest in approaches that either waste time and money or hinder learning, which harms both the field and our learners. It's like we suddenly decided to go back to astrology instead of astronomy!

It's easy to understand the appeal of many myths—some based on tidy round numbers, others on how we'd prefer to believe people learn—so their persistence would be understandable if there wasn't a surfeit of evidence against them. They tap into our own experiences and beliefs about how the world works, but ultimately don't test out.

In this book, we consider the claim, the appeal, and the potential upsides and downsides for each myth. Then we look at the type of evidence that might illustrate whether the myth is valid. Finally, we'll unpack what the research says. So as not to leave you in the lurch, I also suggest alternate approaches you can use to get the best learning outcomes.

The aim is to provide a succinct, clear argument about why some beliefs are myths, and what to do instead. I encourage you to carry a copy of this book so you can point out the problem to those who ask you to alter your design to accommodate a myth.

Learning Superstitions

In addition to the myths just described, I want to call attention to a second category, which emerged from feedback provided by colleagues in the field. These learning superstitions are semi-myths that we see in practice, which lead to bad learning design. Not as obviously labeled "myths," they are still practices we see too often and work contrary to the best learning outcomes.

In this section, we'll look at the practice, explore the rationale behind why people might believe it, explain why it doesn't work, and dive into what to do instead. These superstitions are a source of irritation for those who proselytize good design and face continuing bad practices.

Again, the intent is for you to have a quick resource to use to counter requests that are contrary to good learning design. You may even find some of your own beliefs challenged!

Learning Misconceptions

Misconceptions are yet a different category. Here, we're not necessarily dealing with "right or wrong." Instead, this section looks at certain models that have led to contention. For each candidate, I lay out the two alternate views and propose a reconciliation. Whether you prefer to believe in the resulting viewpoint is a choice only you can make.

In these cases, some viewpoints say the concept is useful, while others say it has issues. These frameworks can provide value, but they can be misused as well. It's important for you to understand what's good and bad with each, and then choose whether the good can be leveraged to your benefit or it's too problematic.

Being a Smart Consumer

It is incumbent on us, as professionals, to be savvy about what constitutes reputable science. It helps to have a set of principles that can serve as a guide; a "sniff test" of sorts to see if the suggested result seems pure. The following heuristics—or problem-solving strategies—can provide a guide to whether there's a potential problem:

- **Proprietary studies.** When doing your due diligence in researching a topic, you may come across someone saying that *their* data say X. A good rule of thumb is to always ask if the data were published in a peer-reviewed journal. Unpublished data are suspect, because why wouldn't you publish if you could? Peer review isn't everything—it can have its own faults and loopholes—but it's a good source of scientific rigor. If the claim is that the data and the collection method are proprietary, then how can they tell you about it? Be wary of someone saying they have data that can't be shared. Proper research includes sufficient information to replicate the study and see if the same results are produced. If you're required to purchase their proprietary product or service to get the data, you have to wonder about their scrutability.
- **Who's telling you?** Similar to the above, if those who are presenting a particular approach have a vested interest in touting research that supports the approach, be wary. It's usually possible to find *some* study that portrays a particular viewpoint. And you may not be able to decipher whether the data are biased. (Sadly, there is evidence of organizations influencing data across all industries and fields; this is not unique to learning design.) Also, it's possible to pick studies that justify a position regardless of exact relevance. Which leads to . . .
- **Even or round numbers.** When claims are made with numbers that come out round, particularly multiples of 10, you should check to see whether the researchers or organization behind them are touting that the numbers are from real data or are using it as a framework. Real data tend to look messy: you'll get 6.3 percent who do this and 13.9 percent who do that. Quality research is highly unlikely to result in clean numbers (although unround numbers are no guarantee either: see 7-38-55). It's not always a good guide, and the numbers may be used as a guide instead of an exact claim (see 70-20-10), but if someone's saying you should react in exact proportions, you should be leery.

- **Overgeneralization.** Organizations can choose data that address a small fraction of what they're saying, and then generalize to support their point. A recent example I've seen conflated studies about online learning and mobile device usage to make a claim for mobile learning. In the piece, the two things were completely separate, and inferences were used to make a case for something that was at the (empty) intersection. Good research very clearly states the limits to which the data can be generalized.
- **Rival hypotheses.** In graduate school, I was trained using published studies to detect opportunities for alternative, simpler explanations. And a large proportion of studies had alternative hypotheses that couldn't be precluded. It's often the case, even with legitimate research, to create a complex explanation when a more obvious story better suits the outcome. We'll see this with the myth about generations, in which much of the behavior of a younger generation can be explained by stage of life rather than the specific circumstance of growing up. You want to make sure that the claim can't be explained in another, more plausible way.
- **Correlation does not equal causation.** If things occur together, it's easy to infer that they're related. However, that's not necessarily the case. For example, if more people die in hospitals than at home, is it because hospitals are unsafe? Or because people tend to be in the hospital because they're already unwell?
- And, of course, there's always the tried-and-true test: **If it sounds too good to be true, it probably is.**

Now that we've covered some heuristics, what should you do?

- **Look to those who bear the standard of science.** There are individuals in the learning design space who consistently strive to investigate what research tells us and translate it into practical guidance. The appendix includes a list of mythbusters, those who have demonstrated a consistent ability to make sense of the learning science. Track these people!

- **Check for consonant studies.** Don't simply accept one source— look for reinforcements! Are there multiple studies? Is there other converging evidence? Has someone replicated the results? Has the study been published in a peer-reviewed journal?
- **Does the claim pass the "sniff" test?** Our intuitions can be a powerful guide in areas we have some knowledge about. Does the story seem plausible? Under what conditions would this make sense?
- **Use causal reasoning.** You can use casual reasoning to try to see if what's being presented makes sense. Is there a mechanism that explains the result? What cognitive story makes sense here?
- **Check to see the constraints.** Under what conditions should you use the result? You should check to see what the limitations are on the implications. Are the results being extrapolated to situations that aren't representative of the initial study?

Let's be clear, none of this is foolproof. Evidence can be tainted in multiple ways. There are no guarantees. The best you can do is pursue due diligence about the sources and be skeptical. And while I'm confident in my own research, this includes what I cover in this book!

Dealing With Believers

While factual arguments usually convince open minds, there is considerable evidence that this doesn't hold in all cases. In fact, if particular beliefs are tied to an individual's values or world view, facts will actually strengthen them! This makes myths and misconceptions difficult to deal with, so here are some of my suggestions.

This book is designed to give you the ammunition you need to deal with those who might argue against the science. And, since it's not always easy to recall the necessary science, each section not only outlines the belief, but also the reason it's wrong and any other arguments that can be construed. While the sections on superstitions and misconceptions aren't always backed up by a study, each learning myth includes one. I've also created quick reference cards for each myth, superstition, and misconception. You'll find them in the back. Hopefully, that's enough.

Unfortunately, it won't always be. There are those who possess a vested interest in the myth—for instance, if they're selling an associated product—want you to believe it and will cite studies that demonstrate the validity of their claim. Unless you're well-trained in research methodology, it can be challenging to identify potential flaws in their data (although practicing being a smart consumer will help). They might suggest that "our studies have shown," or the research cited in this book is old. While that's possible, it's not likely. As suggested earlier, unless their data have been published in a peer-reviewed journal of repute, it's open to suspicion. Why wouldn't you publish something that demonstrates your superiority? Proprietary methods don't preclude statistically significant studies of impact—they just give you extra reasons to be dubious.

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