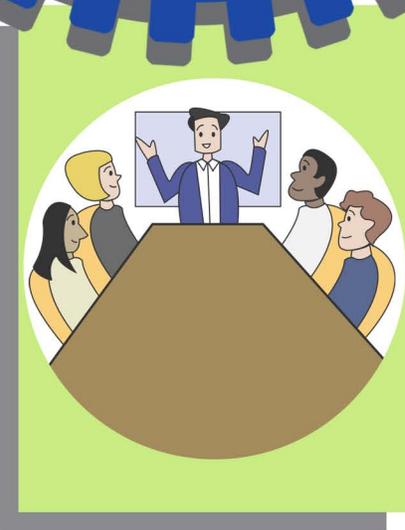


**WHEN  
REMEMBERING  
REALLY MATTERS:**

LEARNING STRATEGIES  
FOR LONG-TERM  
RETENTION



By Sharon Boller

Bottom-Line  
Performance



# Table of Contents

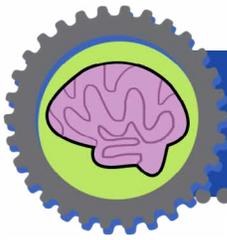


What will learners remember?	1
The cost of not remembering	1
Remembering is HARD; forgetting is easy	3
Four strategies to foster long-term retention	4
Provide spaced intervals	4
Provide multiple repetitions	5
Provide immediate feedback	6
Use stories to drive the learning experience	7
Learning comes before remembering	9
Balance the use of multimedia	9
Limit learner control	10
Personalize the experience	11
Be ruthless in eliminating content	12
Putting it all together	12



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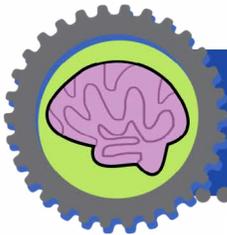


## What Will Learners Remember?



How confident are you that learners really remember what they learn from training delivered in your organization? When a week or a month has passed, how much of what they learned can they recall?

Some of you may respond by replying, “That’s not my priority,” which may be true. Sometimes the goal of training is not about changing learners’ knowledge or skill. Instead the goal is to verify that learners completed the training. Your organization needs to provide organizational proof of compliance or proof that they communicated information. In these instances, you may equate course completion with “effective training.” The question of whether your learners will actually remember the content covered in the training a week or a month afterward is never asked.



## The Cost of Not Remembering

But what about times when remembering REALLY matters? Organizations typically have business challenges to address and growth goals to reach. Leaders frequently identify training as a required element for meeting these challenges or driving growth, and organizations spend billions of dollars creating and delivering these solutions. ASTD estimates that in 2012 organizations spent approximately

**\$164.2 billion** on employee training.

Is that money well spent, or is it wasted? Imagine that you are in charge of designing and implementing a learning solution that addresses one of the business problems on the next page. What would your solution look like?\*



**Employee turnover in a pivotal role is over 20%; the goal is 10%** A thorough performance analysis pinpoints lack of skill and experience as one of the drivers of the unacceptably high turnover. How much money do you save the company if you can design memorable training...and how much do you cost the company if you design training that doesn't work? (Answer: millions of dollars)



**A home dialysis equipment manufacturer recognizes revenue growth is stifled by three issues:** 1) Patients select home therapy, complete the expensive training for it, but opt out of the home therapy after only a few weeks. 2) The time to train a single patient takes too long. 3) Centers can only train one patient at a time on the therapy, which means only .65 patients per month get trained. They want to reduce the patient drop rate, cap the length of the training at four weeks, and double the number of patients trained in a month's time. How do you redesign it to produce the required business result?



**A company wants to roll out a brand new product in a brand new sector.** The sales and support teams are completely unfamiliar with the product offering, and the sector is new to them as well. To make things even more challenging, these teams support products across nine different product lines with new product releases rolling out approximately every two months. How in the world do you get them to remember THIS product? What sales revenue is lost if you cannot produce training that is memorable to members of the sales and support teams?

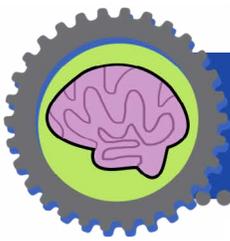


**Hospital labs spend well into six figures to acquire lab equipment your company sells. Your agreement specifies that you provide them with a customer support specialist until they achieve competency in its use.** Each week that your customer support tech spends in a lab is a week the tech isn't available to assist with a new installation. You don't want to hire more techs; you want to reduce the time each tech needs to spend with a customer AND you want your customers' ramp-up time to be reduced. How do you redesign the training to achieve these results? What's the cost of trainees not remembering here?



**Someone has a heart attack on your corporate campus and passes out.** Because you have a large campus with more than a dozen different buildings, the safety protocol is to dial an internal number to report an emergency rather than calling 911. What's the cost here if those who witness the emergency do not remember what number to dial for help? This heart attack really happened at one of our client sites, and the individual who witnessed it DID know what to do because she had completed the safety training we created...and remembered it. Would your employees remember yours? Would your training save a life?

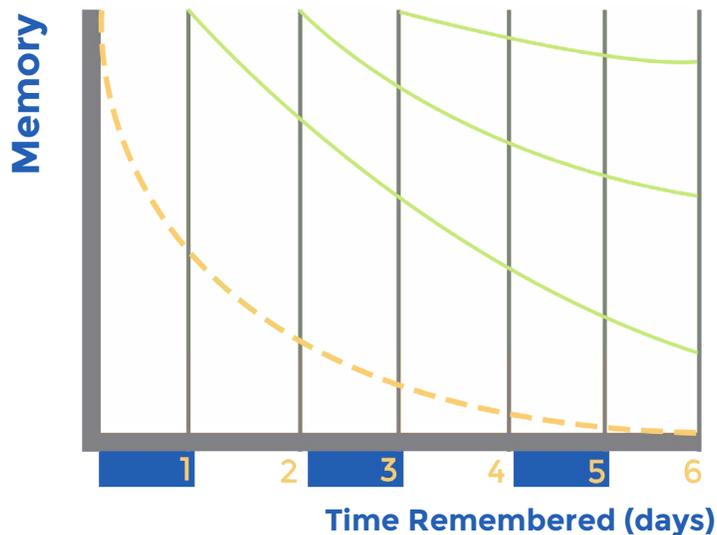
\*(NOTE: We successfully dealt with all of these situations.)



## Remembering is HARD; forgetting is easy.

No one says, “Hey. Let’s spend a bunch of time and money to create and implement a learning solution that no one will remember.” Yet every day stakeholders and designers make choices that sabotage the training effort and result in wasted dollars that produce no result. Learners take a course – and end up not applying what they learned **because they don’t remember what they were taught.**

### The Forgetting Curve



Herman Ebbinghaus was a psychologist who gained fame for his early studies in the late 1880s on memory. Based on his own research studies, he came up with the concept of the “forgetting curve.” He used his study data to create a curve that showed people will forget 90% of what they learn within 3 to 6 days unless learning is reinforced with multiple repetitions. Since then, thousands of studies have been done on spaced repetition, forgetting, memory, etc.

Will Thalheimer published a paper in 2010 that argues against Ebbinghaus’s global 90% state-

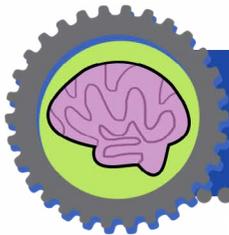
ment.<sup>1</sup> He points to these many subsequent studies – done in a more meaningful way – that show the percentage of forgetting is **highly** variable. It depends on numerous factors such as learners’ pre-existing knowledge, their motivation level, etc. However this still leaves the question:

### What percentage of forgetting IS okay?

Let’s be optimists and assume only a 30% loss in memory after a few days’ time. **Which 30% of your learning content are you okay with people forgetting?**

Dr. John Medina, a molecular biologist, vividly describes the remembering problem in his book, *Brain Rules*. Medina says “memory takes an almost ridiculous amount of time to settle into its permanent form.”<sup>2</sup> He then points out that organizations (schools and businesses) make the situation worse when “learning is supplied in consecutive, uninterrupted glops...the probability for confusion is increased when content is delivered in unstoppable, unrepeated waves.”

Let’s be honest. Forgetting is a major problem. A significant portion of what organizations label as training fits Medina’s descriptions: it’s delivered as a single “glop,” and large volumes of it are delivered up at once with nothing repeated. The intent in these instances is efficiency, but the result is the opposite **because people don’t remember well in these scenarios.**



## Four Strategies to Foster Long-Term Retention

The challenges and cost of not remembering are staggering. The good news is that proven strategies exist that inhibit forgetting and enhance remembering. **We just have to use them.**

The first two strategies are essential; the other two strategies definitely enhance the first two.

1.

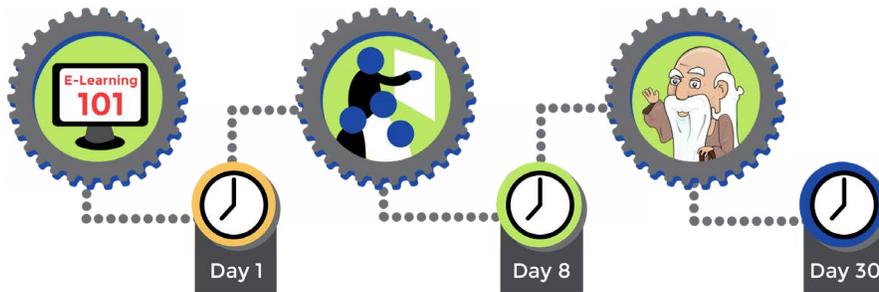
Provide frequent, spaced intervals of learning instead of “glops” or “unrepeated waves.”

This strategy may be the toughest for organizations to embrace because the logistics of making it happen can seem more difficult than scheduling a mass training session or piling a ton of content into a single eLearning course. However, in all of the business case stories highlighted at the start of this paper, spacing the intervals was a key component to delivering the business results. Creating this spacing is not as daunting as it may first seem if you create a wall calendar and Post-It® Notes to help you plot out how you will space out various learning objectives and content over time.

How do you do this? You start by organizing content (knowledge or skill acquisition) into small pieces or groupings and then deliver these pieces via different distribution channels and time points. Use a 10-minute eLearning “snack” to introduce a concept, a live meeting to elaborate on it, and a reinforcement game offered later (such as Knowledge Guru!) to provide additional repetitions. Also consider the simplicity of sending simple email messages or a link to a short video that reinforces, or reiterates a message.

Does this REALLY matter, you ask? Yes! Medina cites a study where researchers had two groups of students study for a college test. One group crammed and studied in a single marathon session the day before the test. The other group spread its study time over 10 sessions done in the week before the test. Each group spent the same total amount of time studying, but the group that spaced its study time out did significantly better on the test. The message here? Get over the glop.<sup>3</sup>

**Blended learning can combine multiple solution types such as eLearning, instructor-led sessions, and serious games.**

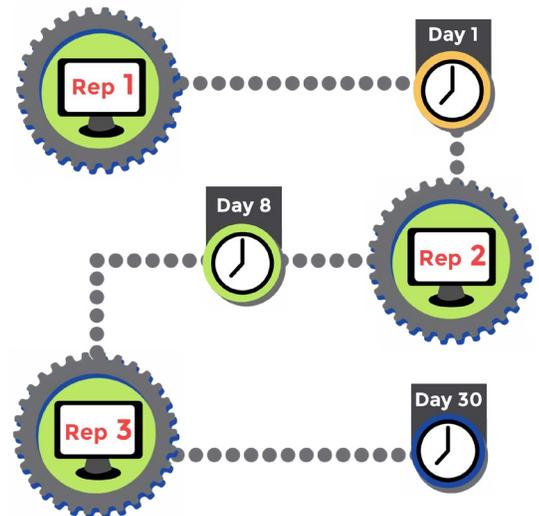


## 2.

### Provide multiple repetitions.

Spacing is one part of the remembering story. Repetition is the second part. Our brain constantly sets priorities for us cognitively. Medina points out that forgetting is a survival skill. The brain continually assesses what info and skills are essential to us and lets go of what is not. Frequent repetitions cue our brain that something is important and needs to be retained.

-  Early repetitions may be iterations of what we already learned to cement recall.
-  Later repetitions should allow for greater elaboration. On the knowledge side, early repetition may involve recall of the fact or a different presentation of the fact. Later repetitions may require learners to apply the fact to a context or a specific setting. On the psychomotor side of things, think in terms of “Show me. Let me practice.”



# 3.

Provide immediate feedback for mistakes, and make sure learners get it right before moving forward.

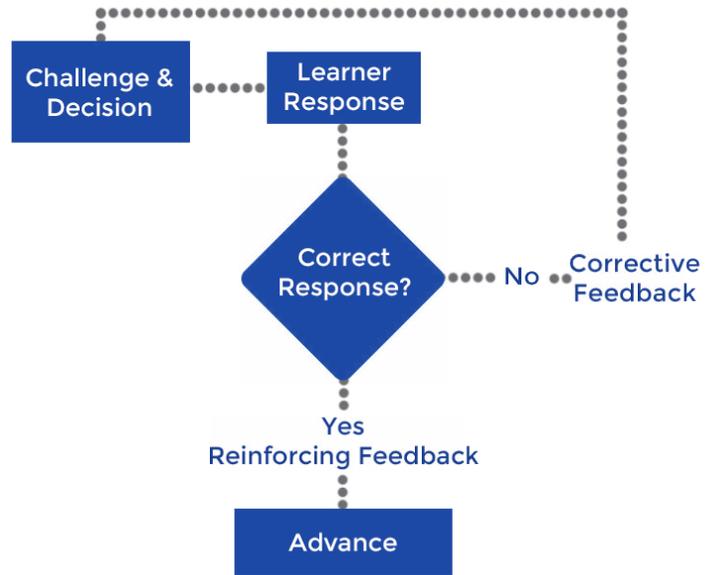
Incorporate these characteristics of good feedback for novice learners who are new to a topic or skill area:



Provide learners with feedback at the point where they make a mistake. Require learners to correct the mistake before they can move on. This action ensures they embed the “correct” way to respond or to perform something rather than embedding incorrect responses.



Make sure feedback specifies exactly what the learner did wrong or offers a clear cue that the learner was successful. For an example of feedback well done, look at games. Games are awesome tools because they typically offer rich, continual feedback to game players.



## See It In Action!



Here’s an example of good feedback design you can review [online](http://theknowledgeguru.com/c2_examples/GGB/MakingGold_v96/). In this mini-game, learners **HAVE** to be successful in distinguishing incidents, accidents, and near-misses to finish the activity. They get immediate feedback with each mistake. There is repetition in doing three rounds of the activity and the feedback offers further, immediate reinforcement.

[http://theknowledgeguru.com/c2\\_examples/GGB/MakingGold\\_v96/](http://theknowledgeguru.com/c2_examples/GGB/MakingGold_v96/)

# 4.

## Use stories to drive the learning experience.

Our brains have a much easier time with things we can store in “episodic” memory.<sup>2</sup> We can far more easily recall facts embedded into a story (aka episode) than we can recall facts presented as discrete items. The story elements serve as a memory trigger for us. Good stories feature:<sup>4</sup>



Well-developed characters; the learner needs to feel some emotional connection for maximum effectiveness of a story.



Some form of conflict – a problem or a challenge that has to be addressed. Again, the conflict or challenge should resonate with the learner. Your goal is to stimulate an emotional reaction within the learners. Make them care.



A “rising action” where the problem or challenge gets amplified. This helps learners recognize why something is critical to learn.



A resolution, which shows the learner the outcome of successfully (or unsuccessfully) using the knowledge or skill they are learning.

## See It In Action!

We developed a 12-course eLearning curriculum for Healthy Families, a child abuse prevention program funded by Prevent Child Abuse America. Our target learners were the home visitors who worked directly with parents of children aged 0 to 3. The overarching goal of the curriculum is for home visitors to know how to effectively address a variety of situations. Home visitors needed to know A LOT of stuff such as how to recognize and address substance abuse, mental health challenges, and domestic violence. They also had to know how to keep babies healthy and safe and how to foster their development. Finally, they had to combine knowledge of these facts with knowledge of how to assess a family situation and how to coach caregivers. Because there is SO MUCH to learn, the curriculum we designed includes a cast of characters who can help learners acquire skill and knowledge through stories, examples, and practice opportunities. We provided lots of worked examples - in story format - for learners to review.

## BUILDING BLOCKS FOR HEALTHIER FAMILIES

### ■ Optimizing Your Effectiveness

Intro

Manage Stress

Maximize Safety

Behave Ethically

Exit To Test

Quit

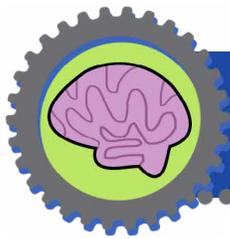


The above image shows Lisa, a home visitor, along with Latifa, a young mom. The characters and their stories help embed knowledge and skill into learners' memory.

#### Health Families Cast of Characters

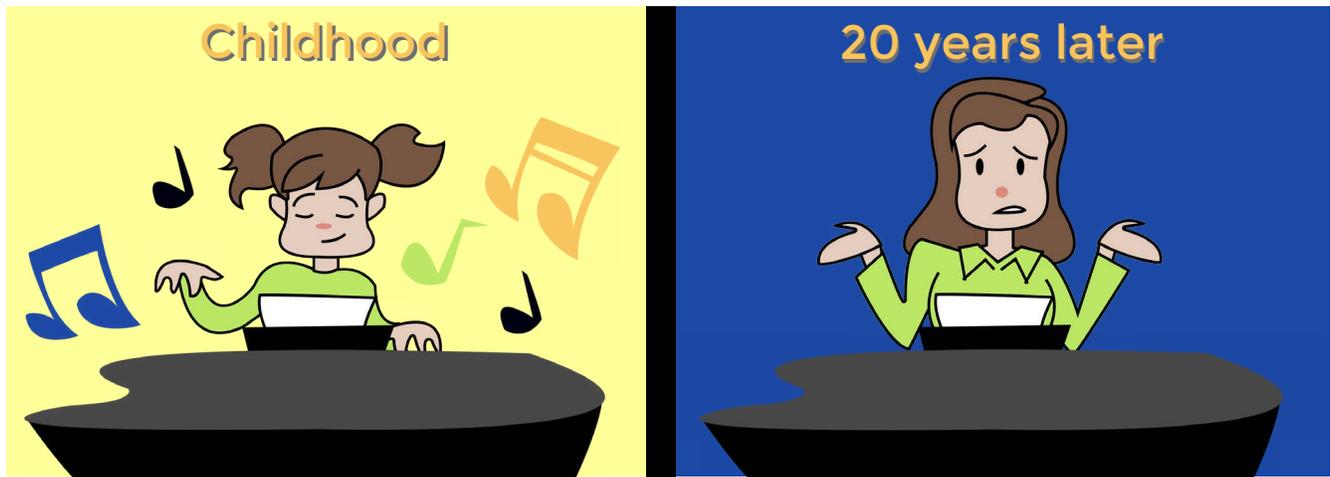
<b>Narrator</b>	Male voice, no image associated with	Voice of authority; guide throughout courses.
<b>Lisa</b>	Home visitor, white, mid-20s	Experienced, offers examples of how to do things correctly. Story teller.
<b>Toni</b>	20-ish white female, single mom w/ one child	Self-esteem issues
<b>Crissy</b>	2 year old gir, biracial or white	
<b>Latifa</b>	Black single mom with two kids -- James and Jaylen	Struggles with depression, hard to reach because of low self-esteem, overwhelmed
<b>James</b>	2-year old black toddler, boy	
<b>Jaylen</b>	9-month old black baby boy	
<b>Roshan</b>	Black, single teenage mother of Latisha and Keelan	smoker, great mom to her kids, very motivated to be a good mom
<b>Keelan</b>	Newborn, black	Crying issues
<b>Latisha</b>	3-year old girl, black	severe asthma
<b>Teresa</b>	Hispanic, married mom - first-time mother	First-time mom, her mother lives with family. Teresa has traditional gender views; subservient to husband. Crazy about Maria. Fearful of making mistakes.
<b>Maria</b>	Newborn hispanic female baby	Good baby; no major issues in terms of crying, etc.

This chart identifies several of the characters who were part of the Healthy Families curriculum. Some characters were "minor" ones; others had a full story developed around them. Stories drive remembering.



# Learning Comes Before Remembering

The preceding section addressed strategies for enhancing remembering. However, you cannot remember what you NEVER learned. A solid instructional design helps facilitate the initial learning experience as well provide mechanisms for remembering. The four strategies that follow all enhance the initial learning experience. All of them are research-based.

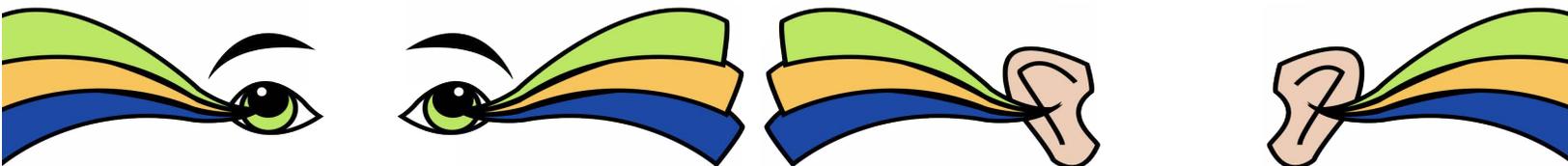


1.

## Balance the use of multimedia.

Ruth Clark and Richard Mayer expound on cognitive load theory across several books they have published on the science of instruction and “evidence-based” best practices. Medina also validates the discussion and its focus on the concept of a working memory as opposed to “short-term” memory. Working memory has multiple channels coming into it, and the goal is to use ALL the channels while not overloading any one channel. What does this mean?

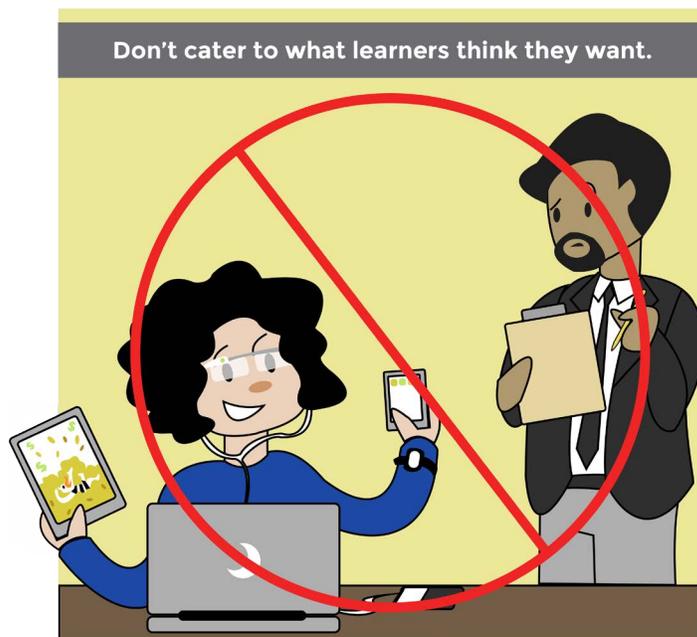
Two of the channels sending info to our working memory are a linguistic channel (think text and auditory info) and a visual channel (think images). We maximize learning opportunity when we leverage both channels because our brain processes them separately. We overload the brain if we try to shove everything through a single channel.<sup>5</sup> The most common error in learning design is to overload the linguistic channel and under-use the visual channel.



## 2.

### Limit learner control in the course design.

Current urban legend has it that today's learners (also called the Millennial generation, which gets horribly picked on) are different than prior generations. Supposedly these learners are used to multi-tasking, are digital whizzes, and want to be self-directed, which means they chart their own learning path and get what they need. The problem with this view is that it is completely unsupported by actual research-based evidence.<sup>1</sup> People say they want to be self-directed. They *believe* they can multi-task well (eat, text, send emails, watch videos, talk on the phone simultaneously). Research *shows* a different picture:



Most of us are terrible at directing our own learning. We make poor choices and don't chart an optimal path.<sup>6</sup>



None of us multi-tasks. Our brain is incapable of it. What we do is shift focus repeatedly. When we attempt to shift from email, to writing a paper (such as this one), to checking our phone for texts, we actually **EXTEND** the time it takes us to do something and perform more poorly on the task.<sup>7</sup>

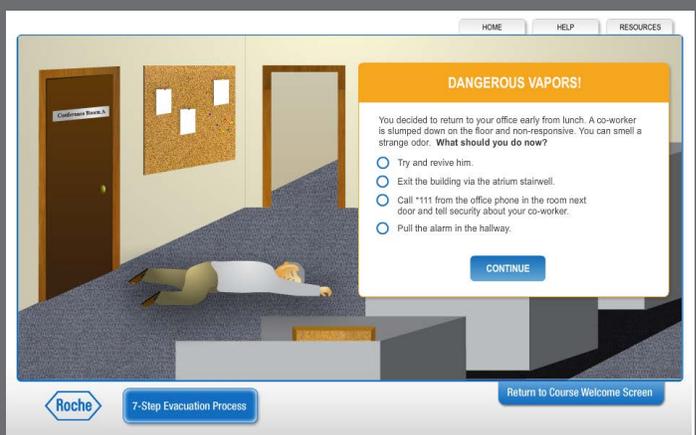
Use an instructional designer to plan out the learning experience and, in essence, save learners from themselves. A good design will start out with high control and gradually enable more learner control as proficiency gains occur. For an example of this, think about most computer or video games. These games gradually allow the player more and more freedom, frequently starting with a tutorial level and then expanding what the players can do as they demonstrate skill gains. Learning design can mimic game design in this respect with good results.

Some of you may be skeptical of the thought that you wouldn't make good learning decisions if allowed full control... so let's take a non-learning scenario to test this concept. When faced with a healthier food choice or a less healthy food choice, how frequently do you see others succumb to a less healthy option even if they have a health problem? The obesity epidemic in America is testimony to the fact that we often won't do what's in our best health interest even when we know what we should be doing. It's hard for us to do what's optimal when the short-term rewards are too enticing.

# See It In Action!



This Building Evacuation course is designed to start with high control and gradually allow the learner more freedom. Each building represents a level with the first level very guided and prescribed for the learner. By the third level, learners are on their own trying to evacuate a building in an emergency.



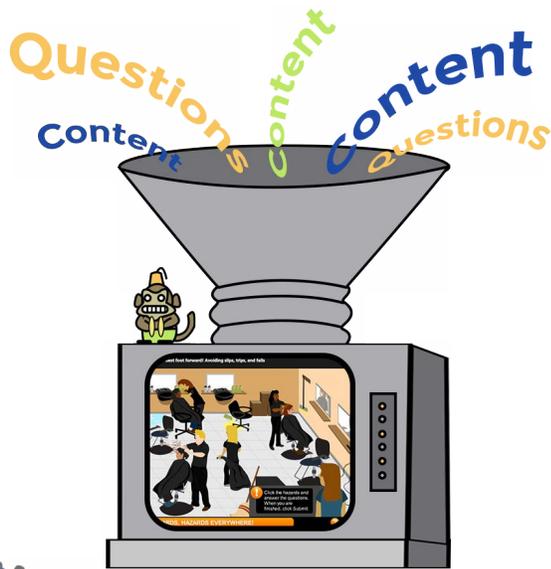
## 3.

Personalize the experience as much as possible.

Most of us are much more intrigued by the topic of “me” and “you” than the topic of “them.” We attend most to what seems directly relevant to us and about us.<sup>5</sup> Design the learning experience to speak directly to the learner as “You” rather than writing in an impersonal third-person voice. Tie the learning into issues that matter to the learner as much as possible.

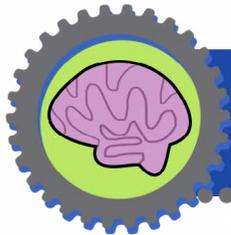
# 4.

Be ruthless in eliminating content.



The more you include, the more the learner has to sift through and attempt to remember later. If you ever hear yourself or someone else saying, “This isn’t essential but it’s nice to know,” or “I don’t expect them to remember it, but I want to make them aware of it,” those are clear cues to eliminate the content from whatever you are creating.

An overabundance of content and unrealistic expectations of what people can learn at one time is the biggest killer of learning experiences.



## Putting It All Together

What should be emerging for you is the realization that a single training “event” is often a major waste of dollars. When remembering really matters, once is not enough. As a close, let’s revisit the business cases at the front of this paper, and identify what we did from a learning design standpoint to generate a business result.

### Business Challenge

Decrease employee turnover.



### Learning Design Elements to Foster Remembering and Results

- We created a curriculum map that organized “orientation” into distinct categories and “buckets” and kept each bucket fairly small. We mapped curriculum over time. (Small spacings)
- We identified multiple distribution channels (eLearning, 1-hour practice sessions done as a See it. Try it. Get Feedback format, and on-the-job experiences with performance checks. (Repetitions and elaborations. Immediate feedback for mistakes.)

## Business Challenge

## Learning Design Elements to Foster Remembering and Results

Decrease patient drop rate out of therapy; increase number of patients trained in a month's time.



- We shifted the training load to eliminate the “glop.” We balanced training topics and learning objectives across four weeks instead of front-loaded into the first week (spaced learning).
- We added in three forms of repetition: 1) Quick Reference Guides that patients were prompted to use throughout the four weeks, 2) eLearning modules that repeated content covered in live sessions and 3) live reviews done by the Nurse Trainer as part of every dialysis session.

Increase sales pipeline and increase first-call support resolution.



- The client produced live webinar sessions on the product.
- We developed a Knowledge Guru game that covered all the key topics (industry, product, messaging). Guru did the heavy lifting of spacing and repetitions as part of its game engine design.
- Implementation of training was kept CLOSE to rollout of product so target learners didn't get to receive the content months before needing to use it.

Reduce onsite time required of customer support personnel when installing lab equipment. Increase lab's speed to proficiency.



- We designed multiple spaced learning opportunities, including a Flash card app for repetition.
- We developed a custom training app that allows the trainer to customize the learning by audience, lab type, and need.
- The client worked with us to cut out the “nice to have” and focus on the “need to have” training.

Prevent loss of life because people don't know safety protocols.



- Produced a 5-minute video that showcased the EXACT situation we wanted to prevent in the form of a story. Actor in video has heart attack. Video simulated emotion and drama and provided multiple opportunities (repetition) for learners to use appropriate safety protocol to dial for help. (Use of story to cement memory as well as use of immediate feedback when learners practiced)
- Video was supported by messaging throughout campus buildings on appropriate action to take. (Repetitions)

# References

<sup>1</sup> Will Thalheimer (2010) "How Much Do People Forget." <http://www.willatworklearning.com/2010/12/how-much-do-people-forget.html>.

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<sup>3</sup> John Dunlosky, Katherine A. Rawson, Elizabeth J. Marsh, Mitchell J. Nathan, and Daniel T. Willingham. "Improving Students' Learning With Effective Learning Techniques: Promising Directions From Cognitive and Educational Psychology" in Psychological Science in the Public Interest. January 2013 vol. 14 no. 1 4-58.

<sup>4</sup> Karl Kapp. Using Stories for Learning: Answers to Five Key Questions (2013) an eLearning Guild Research Report, [www.eLearningGuild.com](http://www.eLearningGuild.com).

<sup>5</sup> Ruth Clark and Richard Mayer (2008, 2011) eLearning and the Science of Instruction, Chapter 4, Chapter 9. Pfeiffer.

<sup>6</sup> Paul A. Kirshchner and Jeroen J.G. van Merriënboer (2013) "Do Learners Really know Best? Urban Legends in Education," in Educational Psychologist, 48:3, 169-183.

<sup>7</sup> John Medina (2008) Brain Rules, Chapter 4.

## Want to work with us?

We treat clients like partners and believe our process, along with our expertise in learning design and exceptional project management skills, is what continues to set us apart from our competitors. We'd love to hear from you.



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