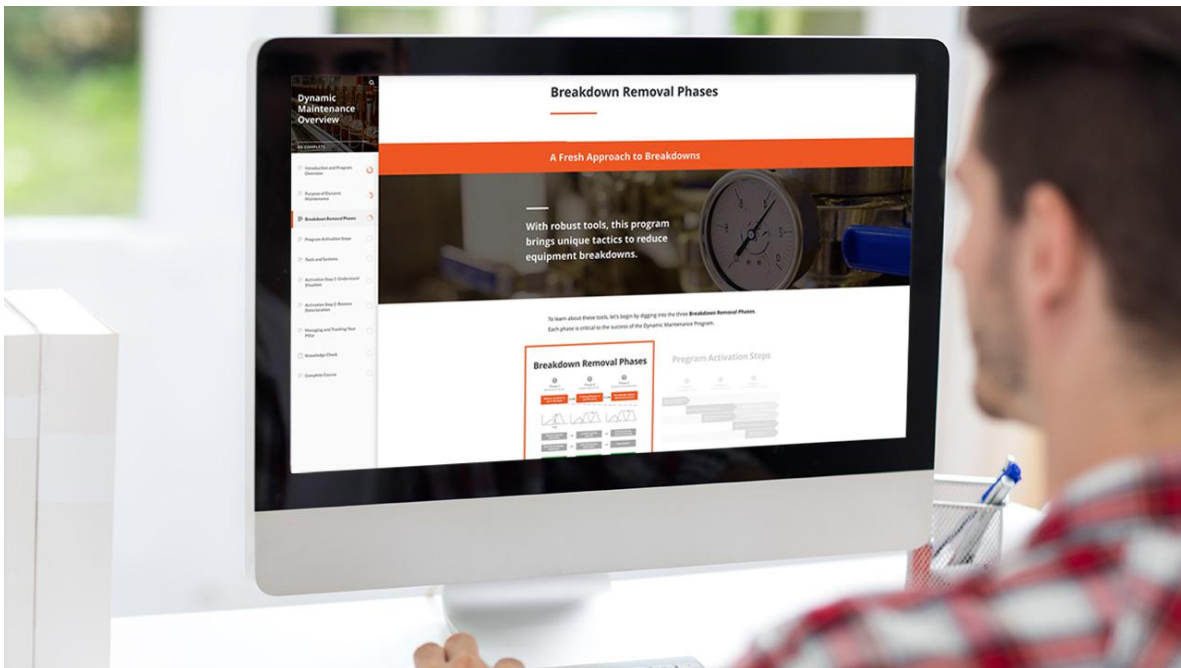


Original article located at:
<https://waterbearlearning.com/mayers-principles-multimedia-learning/>

How to use Mayer's 12 Principles of Multimedia [Examples Included]

By Andrew DeBell



If you're creating a [training video](#), PowerPoint presentation, or eLearning course, how do you ensure your final product will be an effective learning resource?

You don't want to spend hundreds of hours developing an eLearning only to find that your audience thinks it confusing and uninteresting.

To help us create the most effective multimedia learning experiences, [Richard Mayer](#) has developed a theory of [12 Principles of Multimedia Learning](#). Think of these principles as 'guidelines' as you develop your digital learning experiences – learning videos, [eLearning courses](#), and instructor-led PowerPoint presentations.

As you begin building your next multimedia learning experience, we suggest printing out the 12 principles as a checklist. Keep the checklist next to your computer as a helpful reference to design and develop your learning experience.

Instead of flooding your audience with paragraphs of Arial text, why not use a little science theory to help you stay on track.

Let's start by defining some terms.

What is multimedia learning?

[Multimedia learning](#) can be defined as a form of computer-aided instruction that uses two modalities concurrently. This means learning through the combined use of visuals (through pictures, animations, text, and videos) and audio (through narrated voiceover).

Since the 1970's, the science has been well established that visual elements such as images are far [more effective for learning](#) compared to text alone. Fast forward to the modern digital age, and we all experience multimedia learning every single day – through YouTube videos, eLearning courses, PowerPoint decks, free online MOOCs. The list goes on and on.

Researcher Richard Mayer wrote a book called [Multimedia Learning](#) where he explains his research on how best to structure multimedia learning experiences to maximize learner comprehension. Today, we're going to cover the basics of his 12 Principles of Multimedia Learning.

1. The Coherence Principle

First up is the Coherence Principle, which states that **humans learn best when extraneous, distracting material is not included.**

Simply said, cut out the extras. Use only the information that the learner needs. And most often, that means simple text and simple visuals that relate directly to the learning topic. Remove all the fluff.

COHERENCE PRINCIPLE

The diagram illustrates the Coherence Principle with two examples. On the left, a worker in a blue uniform and yellow hard hat is working on a conveyor belt in a factory setting. This image is labeled 'This' in a green box. On the right, the same worker is shown, but the image is cluttered with additional elements: a large block of text, two circular icons labeled 'Optimal Equipment Conditions' and 'Optimal Process Conditions', and a grey background. This image is labeled 'Not This' in a grey box.

Cut out the extras. Remove all the fluff. Use only the information that the learner needs.
That means simple text and simple visuals that relate directly to the learning topic.

How to use the Coherence Principle:

You can use the Coherence Principle as you're planning your visual elements. Ask yourself, "Is this image 100% necessary to help with comprehension? Or could you find a better one? Does this message use simple enough language so the audience will understand? Maybe I could trim down a few words."

The Coherence Principle is also quite helpful when you're editing your training video or eLearning course. As you re-watch the experience, make sure to watch with a critical "Coherence Principle" eye. Determine how you can reduce, simplify, and clarify.

2. The Signaling Principle

Next up is the Signaling Principle, which essentially means that **humans learn best when they are shown exactly what to pay attention to on the screen.** If there is a ton of information on the screen, how is the learner supposed to know what is the most important part?

SIGNALING PRINCIPLE

The diagram shows two identical orange rectangular boxes side-by-side. Each box contains the text: "The methodical and deliberate activity of creating and continuously improving maintenance systems." Below each box is a label: "This" under the left box and "Not This" under the right box. The left box has a teal border and highlights the words "methodical and deliberate activity" in teal. The right box has a grey border and no highlights.

Show the learner exactly what to pay attention to on the screen.
Highlight important words and use arrows to point out significant information.

How to use the Signaling Principle:

As a learning developer, this is where you can utilize the signaling principle by thoughtfully using features such as highlighting important words and using animated arrows to point out significant information. Another way you can use the signaling principle is by having slides or scenes that separate learning sections. This is a quick and easy way to signal to the learner that we're moving on to the next topic.

3. The Redundancy Principle

Next up? The Redundancy Principle. This principle suggests that **humans learn best with narration and graphics, as opposed to narration, graphics, and text.** The theory here is that if you already have narration and graphics, then the text on top is just redundant information. And this can be overwhelming for a learner.

REDUNDANCY PRINCIPLE



This



Not This

With an audio narration voiceover, use only graphics on screen. Don't use graphics and text. Add optional closed captioning for learners that prefer to read subtitles.

How to use the Redundancy Principle:

You can use this principle for videos or eLearning courses that have narrated audio. Try to only include graphics or text, but not both together. Or if they are together, make the text minimal.

Personally, from a learning perspective, I enjoy reading text on screen so I what I suggest whenever possible is to include closed captioning that can be optionally turned on and off. This can't be done in all cases, but I definitely suggest that whenever possible.

4. The Spatial Contiguity Principle

The Spatial Contiguity Principle is about the actual space in between your text and visuals on the screen, stating that **humans learn best when relevant text and visuals are physically close together.**

SPATIAL CONTIGUITY PRINCIPLE



Keep all related text and graphics physically close together in your frame.
Make it easy for learners to understand how text and graphics are related.

How to use the Spatial Contiguity Principle:

This one makes sense intuitively. You should keep all related text and graphics physically close together in your frame. This makes it much easier for learners to process the information, using less energy to decipher meaning. This principle is pretty straight forward. Make it easy for your audience to know where to look for information.

5. The Temporal Contiguity Principle

The Temporal Contiguity Principle states that **humans learn best when corresponding words and visuals are presented together, instead of in consecutive order.**

TEMPORAL CONTIGUITY PRINCIPLE



Make sure the visuals and audio *occur at the same time* as opposed to having the voiceover audio play before the visual is shown.

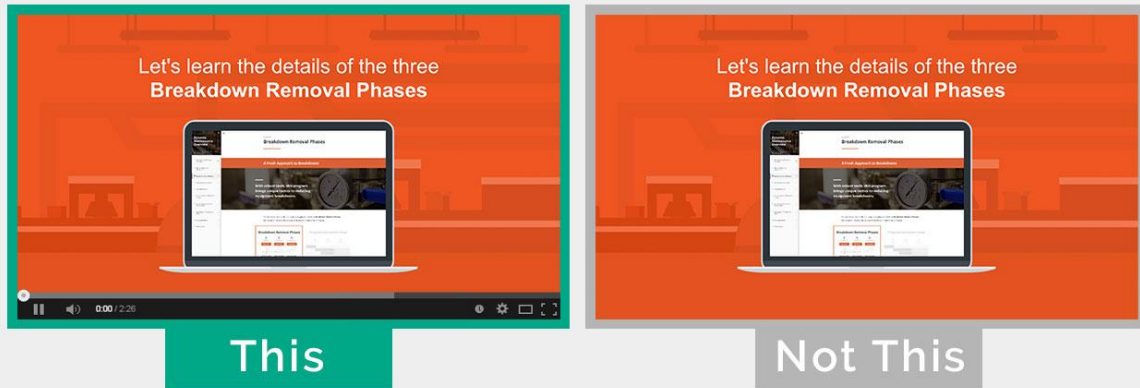
How to use the Temporal Contiguity Principle:

If you're introducing a new process, the animation (or visual) should be occurring at the same time as the voiceover audio. This is preferred to having the voiceover audio play first, and then watching a visual after. You can use this by making sure your voiceover audio is always timed well with your visuals or animations.

6. The Segmenting Principle

Next is the Segmenting Principle which states that **humans learn best when information is presented in segments, rather than one long continuous stream**. Mayer found that when learners can control the pace of their learning, they performed better on recall tests.

SEGMENTING PRINCIPLE



Provide learners with control over their learning by including 'next' buttons and customizable video settings. Also, make sure learning is segmented into small chunks.

How to use the Segmenting Principle:

You can use this principle by providing learners with more control over their learning. This is done by adding next buttons or allowing the speed which a video plays.

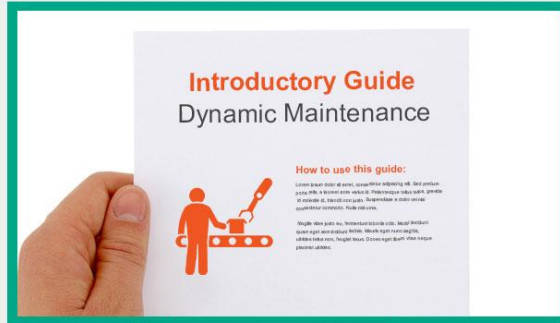
This principle also suggests that learning is broken up into smaller, bite-sized chunks. Make sure that no one lesson, slide, or video has too much information packed in it.

7. The Pre-Training Principle

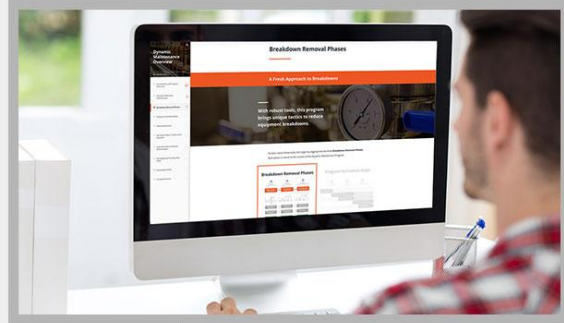
The Pre-training Principle states that **humans learn more efficiently if they already know some of the basics**. This often means understanding basic definitions, terms, or concepts before beginning the learning experience.

And this makes intuitive sense. If a learner starts an eLearning course knowing about the topic, they can easily become overwhelmed once complex visuals and definitions start being thrown their way. A bit of pre-training before starting the course really would have helped.

PRE-TRAINING PRINCIPLE



This



Not This

Instead of having learners begin the course right away, create an introductory guide that teaches the basic definitions, terms, and concepts.

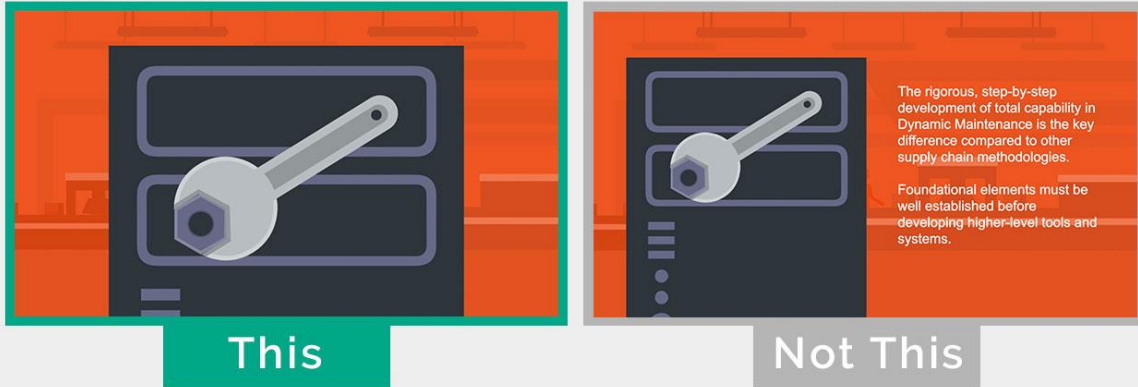
How to use the Pre-Training Principle:

You can use this principle by creating an introductory “guide” or “cheat sheet” for learners to use throughout the course. Or you can create an entire lesson up front dedicated to understanding the basics, before the learner moves into the actual course.

8. The Modality Principle

The Modality Principle states that **humans learn best from visuals and spoken words than from visuals and printed words**. This doesn't mean that you should never use text on screen, it simply means that if there are visuals and too much text, learners will be overwhelmed.

MODALITY PRINCIPLE



In voiceover supported learning, try to limit the amount of text used. Rely on visuals instead. Text should be used only for key definitions, lists, and directions.

How to use the Modality Principle:

Try to limit the amount of text you use on screen overall. Rely more on visuals, unless you need to define key terms, list steps, or provide directions.

9. The Multimedia Principle

The Multimedia Principle states that **humans learn best from words and pictures than just words alone**. This principle is sort of the foundation of all Mayer's principles, that images and words are more effective than words alone.

MULTIMEDIA PRINCIPLE



The image shows two side-by-side examples of presentation slides. The left slide, labeled 'This', has an orange background with a green border. It features the text 'Phase 1' in large white font, followed by 'Develop optimal equipment conditions' in smaller white font. Below the text is an illustration of a worker in a blue uniform and yellow hard hat standing next to a yellow forklift. The right slide, labeled 'Not This', has an orange background with a grey border. It contains three paragraphs of white text. The first paragraph reads: 'Phase 1 is achieved through proper implementation of our tools and systems using the Breakdown Removal Phases and the five Program Activation Steps that we will discuss further in this course.' The second paragraph reads: 'The rigorous, step-by-step development of total capability in Dynamic Maintenance is the key difference compared to other supply chain methodologies.' The third paragraph reads: 'Foundational elements must be well established before developing higher-level tools and systems.'

Phase 1
Develop optimal equipment conditions

Phase 1 is achieved through proper implementation of our tools and systems using the Breakdown Removal Phases and the five Program Activation Steps that we will discuss further in this course.

The rigorous, step-by-step development of total capability in Dynamic Maintenance is the key difference compared to other supply chain methodologies.

Foundational elements must be well established before developing higher-level tools and systems.

This

Not This

Avoid using text on screen alone. Use relevant visuals instead. Be thoughtful about the visuals you select, making sure they enhance or clarify the information.

How to use the Multimedia Principle:

You can use this principle by being very thoughtful about the images you select. Remember that these images need to enhance or clarify the information.

10. The Personalization Principle

The Personalization Principle says that **humans learn best from a more informal, conversational voice than an overly formal voice.** Having a more casual voice actually improves the learning experience.

PERSONALIZATION PRINCIPLE

How is Phase 1 achieved?

Phase 1 is achieved by establishing a 30% decrease in breakdowns.



This

How is Phase 1 achieved?

Phase 1 is achieved by implementing the appropriate maintenance tools and structural conformities which meet our organizations core competencies of establishing a 30% decrease in breakdowns.



Not This

Keep your message simple and casual. It allows learners feel more comfortable.
Avoid using overly professional sounding text, or long, complex words.

How to use the Personalization Principle:

You can use this by keeping your language simple and casual. Try to avoid overly professional sounding text, or long, complex words. It also helps to use the first person (you, I, we, our). This is where it helps to consider your audience demographics and try to match the tone of your voiceover to enhance personalization.

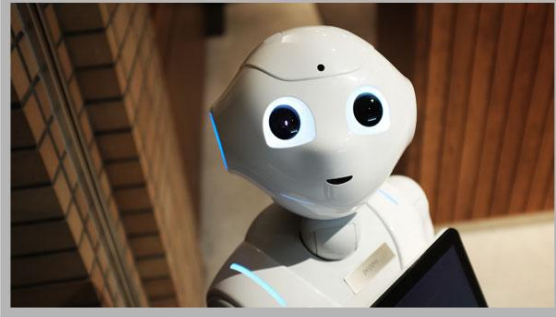
11. The Voice Principle

The Voice Principle states that **humans learn best from a human voice than a computer voice**. While Siri and Alexa are getting pretty close, there is no substitution for a human voice. It's important to note that the studies are still rather preliminary for the Voice Principle. But even so, it makes sense to use a human for your voiceover.

VOICE PRINCIPLE



This



Not This

Use audio that was recorded professionally by a human.
Don't use an automated, robotic, computer voice.

How to use the Voice Principle:

You can use this principle by recording your own professional narration, or hiring a professional to create an audio voiceover. Make sure your audio is high quality by using a professional microphone and mastering in audio editing software.

12. The Image Principle

The Image Principle states that **humans do not necessarily learn better from a talking head video**. Talking head videos are incredibly common in eLearning courses and MOOCs. The research on this one is also still in its early phases, so take this principle with a grain of salt.

The thinking here is that if there is important information to be learned, relevant visuals on the screen will be more effective than showing a talking head of an instructor.

IMAGE PRINCIPLE



This



Not This

Use relevant animations and visuals that help reinforce the audio voiceover.
Try to limit the amount of talking head screen time by the instructor.

How to use the Image Principle:

Instead of having a talking head of the instructor, use relevant animations and visuals that help reinforce the audio voiceover. Note that talking heads can provide some value for the instructor by building credibility and trust. This is especially useful to establish at the beginning of your learning experience. Just try to limit your use of talking heads as your video or course dives deeper into the learning content.



About the Author:

Andrew DeBell is a training consultant and digital marketing strategist at [Water Bear Learning](#). He helps companies develop creative learning programs, infusing marketing principles into each step of the design process. Give him a shout on [LinkedIn](#) to learn more.