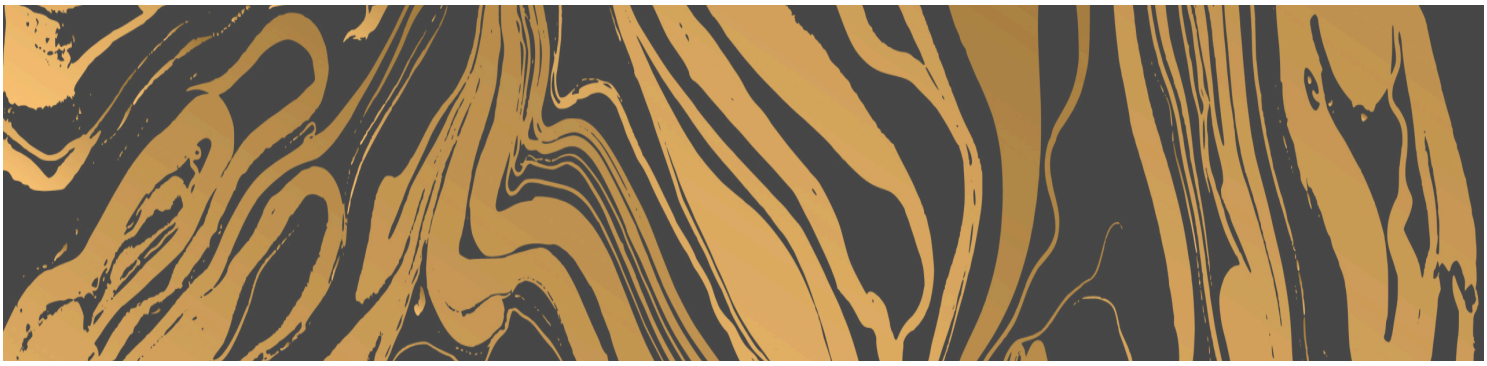

L-Tech Newsletter


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October 2025: Multimedia Learning

Welcome to this month's L-Tech Newsletter, where we dive into using **multimedia** effectively in online courses. Simply put, multimedia in learning is the combination of **words** (written or spoken text) and **pictures** (static images, graphs, animation, or video) to teach. Educational research shows that presenting information through both **visual and verbal channels** can lead to deeper understanding and better retention.

The Dangers of Overdesign (Avoiding Cognitive Overload)

While **multimedia** can deepen learning for students, it's easy to fall into the trap of *overdesign*. The goal isn't to make your course look busy; it's to **make it easy to learn**. We all have a **limited working memory**, and when you include too many irrelevant elements, like distracting background music, decorative images, or too much text on a screen, you create **extraneous cognitive load**. This "mental noise" forces students to sort through distractions instead of focusing on the core content. To avoid overdesign, prioritize **simplicity, clarity, and direct alignment** with learning objectives to ensure the media supports learning in your course.

Five Common Multimedia Examples in Online Courses

Faculty are already leveraging multimedia through:

1. **Animated Process Diagrams:** For illustrating technical or cyclical procedures (e.g., the water cycle, a software workflow).
2. **Narrated Screencasts:** For software training or demonstrating problem-solving steps.
3. **Audio Podcasts/Vox Pops:** For expert interviews or student reflections, allowing auditory processing on the go.
4. **Interactive Simulations:** For practicing complex, high-risk tasks (e.g., lab procedures, negotiation scenarios).
5. **Concept Maps/Infographics:** For visually organizing complex relationships and data.

Mayer's 12 Principles of Multimedia Learning: Theory and Practice

Richard Mayer's Cognitive Theory of Multimedia Learning (CTML) provides a scientifically validated framework for designing instructional materials. By following these 12 principles, we can **manage students' cognitive load** and make their learning more efficient. Read through the 12 principles below, separated into their purpose with an example for application.

For more information, check out the Digital Learning Institute's article: Mayer's 12 Principles of Multimedia Learning or Dr. Mayer's paper: A Cognitive Theory of Multimedia Learning: Implications for Design Principles.

Principles to **Reduce Extraneous Processing** (Avoiding Distractions)

- **1. Coherence**
  - **Explanation:** People learn better when extraneous material is excluded.
  - **Application Example:** Eliminate distracting background music, irrelevant photos, or non-essential jargon from presentation slides and videos.
- **2. Redundancy**
  - **Explanation:** People learn better from graphics and narration than from graphics, narration, and on-screen text.
  - **Application Example:** If you are narrating a graphic or animation, do not put the *exact* same spoken words on the screen as text (i.e., avoid reading your slides word-for-word).
- **3. Spatial Contiguity**
  - **Explanation:** People learn better when corresponding words and pictures are presented near each other.
  - **Application Example:** Place labels directly next to the parts of a diagram or equation they describe, rather than using a separate legend or key far away.
- **4. Temporal Contiguity**
  - **Explanation:** People learn better when corresponding words and pictures are presented simultaneously.
  - **Application Example:** Synchronize the voice-over explaining a step in an animation to play *exactly* when that step is shown visually.

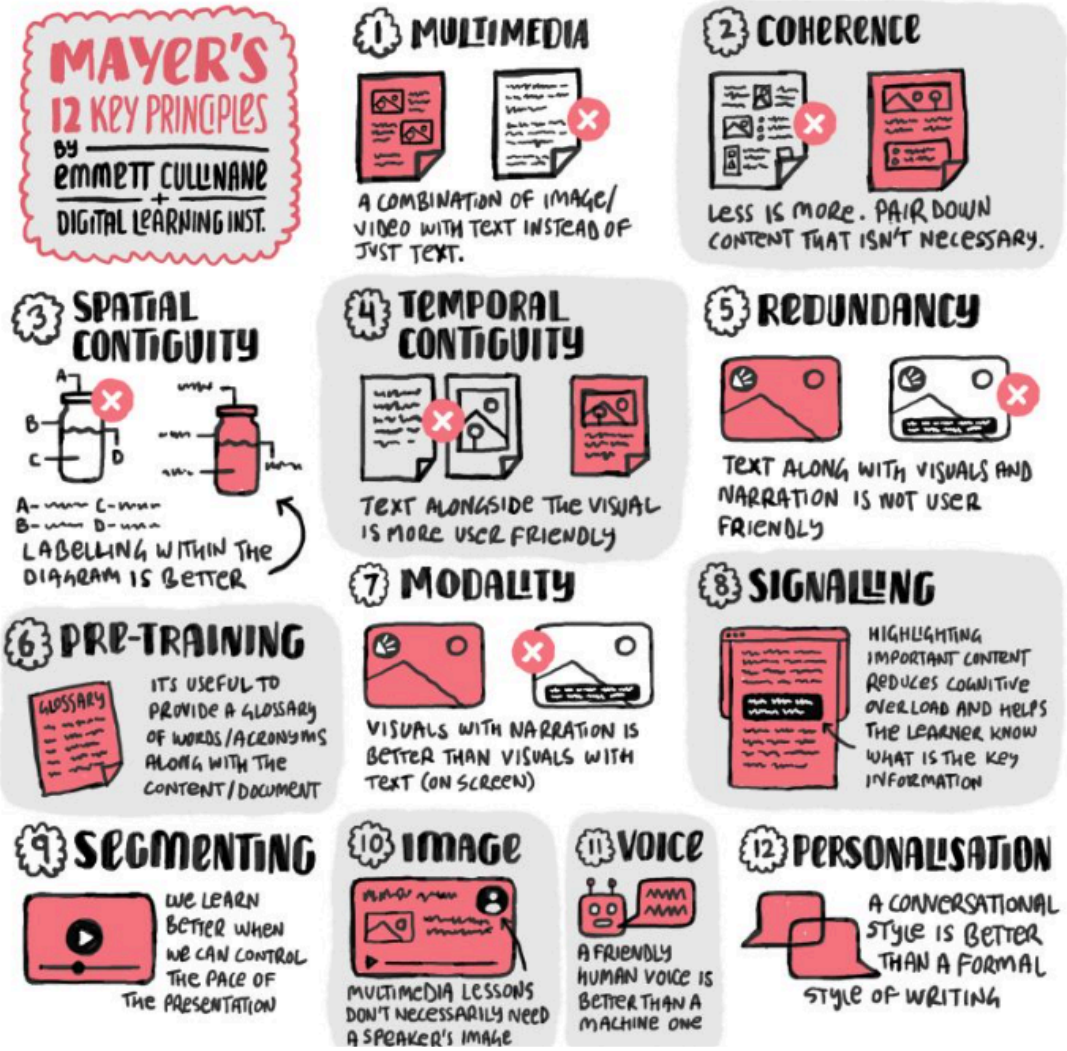
Principles to **Manage Essential Processing** (Helping Organize Information)

- **5. Segmenting**
  - **Explanation:** People learn better when a long lesson is broken into user-paced chunks.
  - **Application Example:** Break down a 30-minute lecture into three 10-minute videos, allowing the learner to control when they move to the next topic.
- **6. Pre-training**
  - **Explanation:** People learn better when they already know the names and characteristics of key concepts.
  - **Application Example:** Before a complex module, provide a brief glossary or a 2-minute introductory video defining the key technical terms students will encounter.
- **7. Signaling**
  - **Explanation:** People learn better when cues highlight essential material organization.
  - **Application Example:** Use bolding, color changes, arrows, or zooming in videos to visually direct the student's attention to the most important information or steps.
- **8. Modality**
  - **Explanation:** People learn better from graphics and narration than from graphics and on-screen text.
  - **Application Example:** When explaining a technical diagram, rely on spoken narration rather than written on-screen captions to avoid overloading the visual channel.

Principles to **Foster Generative Processing** (Encouraging Deeper Engagement)

- **9. Multimedia**
  - **Explanation:** People learn better from words and pictures than from words alone.

    - **Application Example:** Always pair abstract text concepts (like a theory or law) with a relevant chart, diagram, or concrete visual example.
- **10. Personalization**
    - **Explanation:** People learn better when words are presented in a conversational, friendly style.
    - **Application Example:** Use "I" and "you," adopt an enthusiastic tone, and phrase instructions as guidance rather than formal commands.
- **11. Voice**
    - **Explanation:** People learn better when the narration is in a standard accent and a friendly, human voice (vs. a robotic, machine voice).
    - **Application Example:** Invest in high-quality human voice recording or use the most natural-sounding text-to-speech options available.
- **12. Image**
    - **Explanation:** Including the instructor's image ("talking head") does not improve learning unless it builds social presence.
    - **Application Example:** Limit "talking head" video to short introductions or conclusions. Otherwise, replace the instructor's image with relevant course visuals that reinforce the concept being explained.



Graphic by Learning Designer Emmett Cullinane

Why Multimedia Design Matters

Understanding the *why* behind these principles is key to applying them effectively. Watch this short video to hear directly from and instructional design expert on how these principles translate into better educational practice.

Multimedia in Practice: Examples for the Junior College Setting

Here are some examples you can implement in your online or hybrid course right now:

- **Simple Data Visualization:** Instead of long descriptive paragraphs, replace a list of statistics with a clear, high-contrast graph or chart.
- **Module Header Banners:** Use a consistent, well-designed graphic banner (created in a free system like PowerPoint or Canva) at the top of each Module Introduction page to visually segment content and provide navigational cues.
- **Mini-Lecture Animation:** Create a 3-minute video explaining a challenging math problem (like factoring polynomials) using an animated demonstration, not just static whiteboard notes.
- **"How-To" Screencast:** Use a tool like Panopto or Camtasia to record a 1-minute video showing students exactly how to submit a file for a Canvas assignment or how to correctly format a bibliography entry.
- **Annotated Image:** For an art history course, use an image of a famous painting with interactive hotspots or callouts that appear when the student hovers over them, providing specific details about the piece of 🖼️ .
- **Digital Field Trip:** Use a 360-degree video or interactive map (like Google Earth) to let students virtually explore a geographical site relevant to a history or geology course.

Self-Assessment: How Your Course Stacks Up to Mayer's Principles

This rubric is designed to help you evaluate your multimedia instructional materials (videos, narrated presentations, interactive graphics) to ensure they are designed for maximum learning and minimum cognitive

load.

Principle	Question for Self-Assessment
Coherence	Is all non-essential/extraneous information (sounds, text, decorative images) removed?
Redundancy	Do I avoid reading on-screen text aloud? Is the exact same information not presented in all three forms (narration, graphic, and on-screen text)?
Spatial Contiguity	Are related text captions/labels placed physically near the graphic or image they describe?
Temporal Contiguity	Are corresponding visuals and audio/narration presented at the same time, not one after the other?
Segmenting	Is the content broken into short, coherent, and user-paced segments (e.g., videos under 10 minutes with clear stopping points)?
Pre-training	Have I introduced key terms, concepts, and component names before the main instructional video or activity begins?
Signaling	Do I use cues (highlighting, arrows, bolding) to direct the learner's attention to the most important parts of the visual information?
Modality	When explaining a complex visual, do I use spoken narration rather than lengthy on-screen text?
Multimedia	Do I consistently combine relevant visuals/graphics with words/text to explain concepts, rather than relying on words alone?
Personalization	Do I use a conversational, friendly style ("you," "we") instead of a highly formal or detached voice?
Voice	Is the narration delivered by a clear, friendly, human voice (or a high-quality, natural-sounding synthetic voice)?
Image	Is my talking head video presence minimized, focusing the screen space on the relevant visuals and content unless building social presence is the primary goal?

Thanks for reading!

Have suggestions for future L-Tech newsletters? Let me know!

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