

Instructional Design: the Evidence Base

Design decisions you can defend with research, not taste. Each row: the principle, who established it, and what it means for a real build. Cite these in interviews and when a client or subject expert pushes back. Compiled 08/19/2026.

The interview line: "I do not design to preference. I design to cognitive load theory and Mayer's multimedia principles, I build in retrieval practice, and I write measurable objectives. Then I evaluate against them." That sentence separates a professional from someone with a nice eye.

1. Manage the mind (load and media)

Principle	Core idea	Source	For a build
Cognitive Load Theory	Working memory is small. Spend it on learning, not on noise.	John Sweller, 1988; Sweller, Ayres & Kalyuga, "Cognitive Load Theory," 2011	Cut anything that does not serve the objective. This is why trimming the five intro blocks was correct.
Multimedia Principles (about 12)	Controlled studies on how people learn from words + visuals. Includes coherence, redundancy, signaling, segmenting, modality, pre-training, personalization.	Richard E. Mayer, "Multimedia Learning," 2001/2021; Clark & Mayer, "e-Learning and the Science of Instruction," latest ed.	Coherence: remove extraneous words and graphics. Redundancy: do not narrate on-screen text word for word. Segmenting: chunk into learner-paced pieces. The eLearning bible; cite it by name.

2. Make it stick (learning strategies)

Strategy	Core idea	Source	For a build
Retrieval practice (testing effect)	Recalling information strengthens it. Quizzing causes learning, it does not just measure it.	Roediger & Karpicke, 2006; "Make It Stick," Brown, Roediger & McDaniel, 2014	Put low-stakes questions throughout , not just at the end. Your knowledge checks and Myth-to-Reality cards are retrieval practice.
Spacing & interleaving	Spread practice over time and mix related topics rather than blocking one at a time.	"Understanding How We Learn," Weinstein & Sumeracki, 2018	Revisit key ideas across lessons; mix question types. Beats one massed review.
Dual coding	Words plus relevant visuals are remembered better than either alone.	Allan Paivio, 1971; echoed in Mayer	Pair each teaching point with a meaningful image, not decoration.
Concrete examples & worked scenarios	Abstract rules land when tied to a specific case.	Merrill; cognitive-load worked-example research	Lead a concept with a real scenario. Your "veteran in a PM interview" moment is exactly this.

3. Aim it (objectives and taxonomy)

Framework	Core idea	Source	For a build
Bloom's Taxonomy (revised)	Learning has levels, from remember up to create. Match the objective to the level you want.	Bloom, 1956; revised by Anderson & Krathwohl, 2001	Do not stop at "remember." Build items that make learners apply and analyze.
Measurable objectives	An objective needs an observable verb, a condition, and a standard, or you cannot assess it.	Robert Mager, "Preparing Instructional Objectives," 1962/1997	Use "name, explain, spot," never "understand, appreciate." This is why the objectives edit mattered.

4. Structure it (design frameworks)

Framework	Core idea	Source	For a build
Gagne's Nine Events	A research-informed sequence for a lesson: gain attention, state objective, recall prior, present, guide, practice, feedback, assess, retain/transfer.	Robert Gagne, "The Conditions of Learning," 1965	A reliable skeleton for any single lesson.
First Principles of Instruction	What the major theories agree on: task-centered, plus activation, demonstration, application, integration.	M. David Merrill, 2002	Center a real task; do not just present information.
ADDIE / SAT	The process model: Analyze, Design, Develop, Implement, Evaluate. Your Navy Systematic Approach to Training is the same spine.	US military ISD; widely adopted	The lifecycle you already run. Name it as ADDIE in civilian rooms.

5. Prove it, and trust the big evidence

Source	Core idea	Source / body	For a build
Kirkpatrick's Four Levels	Evaluate training at four levels: reaction, learning, behavior, results.	Donald Kirkpatrick, 1959/1994	Decide up front which level you will measure. Most stop at reaction; aim higher.
How People Learn	The authoritative research synthesis on how learning works.	National Academies (NRC), 2000; HPL II, 2018	The credible citation when you need the science, not a vendor's opinion.
Visible Learning	Ranks instructional influences by effect size across 800+ meta-analyses.	John Hattie, 2009	Use for "what has the biggest effect." Note: method is debated, cite with care.
What Works Clearinghouse	A federal body that formally reviews the evidence behind education interventions.	Institute of Education Sciences, US Dept. of Education (ies.ed.gov/ncee/wwc)	The closest thing to a governing evidence review. Check it before adopting a method.

Do not fall for these (they are popular and wrong):

Learning styles. The idea that matching instruction to a "visual, auditory, or kinesthetic" style improves learning is **not supported by evidence**, repeatedly debunked (Pashler, McDaniel, Rohrer & Bjork, 2008). Design for the content and dual coding, not for a style label. When a client or SME insists on it, this citation makes you the credible one in the room.
Related neuromyths to retire: "we only use 10% of our brain," and "digital natives learn differently." Not supported.

and for interview prep, not an exhaustive bibliography. No em dashes.