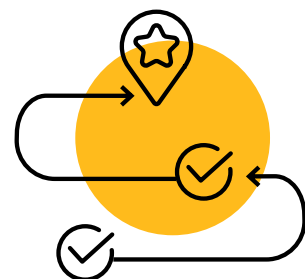




Learning Design Principles
Purposeful Design

Authentic Learning



Summary

What are Pearson's Learning Design Principles?



Our Learning Foundations describe the optimal conditions for learning and reflect the learner experience we hope our products will create. We do this by incorporating our Learning Design Principles.

Each of our Learning Design Principles goes into detail about a key principle, supporting product design and marketing by describing:

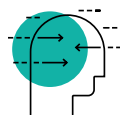
- the research that informs the principle
- why it matters in learning
- how we can apply it in practice

Our portfolio of Learning Design Principles will continue to grow over time.



Welcoming Experience

- Motivation & Mindset
- Social & Collaborative Learning



Minds in Mind

- Developing Understanding
- Attention & Cognitive Load
- Active Learning, Memory & Practice
- Desirable Difficulty & Scaffolding
- Feedback for Learning



Learning Behavior

- Self-Regulated Learning & Metacognition



Purposeful Design

- Objective Design
- Assessment & Evidence-Centered Design
- Personalized Learning & Adaptive Systems
- Authentic Learning



Learn Anywhere

- English Performance Standards
- Digital & Virtual Learning

Authentic Learning

Learners can struggle to see the relevance of what they're learning and how it applies to the real world.

How can we put learning in context to help make it stick for learners?

Authentic learning is where learners become immersed in problem-solving within realistic situations, resembling the contexts where the knowledge they are learning can be realistically applied. It's the difference between learning about physics and learning to be a physicist.

Authentic learning scenarios include:

- **Authentic tasks** that have real-world relevance and utility, are appropriately complex, and allow learners to select appropriate levels of difficulty or involvement
- **Authentic learning environments** where learners engage with the content to be learned in a simulated, realistic environment so that they can practice working with it in a similar way to how a professional would in the field

Why it matters

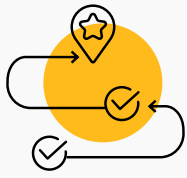
When the content is relevant, learners are motivated to learn. When they learn to navigate a realistic setting, they achieve better outcomes.

It also addresses the knowledge transfer problem. Usually, transferring knowledge learned in one environment to another is hard. But when the learning environment resembles the new situation (i.e., is authentic), it makes the transfer easier. Authentic environments include the same complexity, situations and cues learners will face in the real world, and allow learners to practice while receiving support.

Impact

When we successfully incorporate this principle into learning experiences, we can have an impact on these learner outcomes:

- learners enjoy what they are learning and are motivated, because they see the content as relevant and connected to realistic practice
- learners persist through difficulty because they receive direct instruction before attempting authentic problems, so they know enough to reduce frustration and can self-direct their own learning
- learners build and refine mental models for problem solving, after reviewing a range of models
- learners can transfer their learning to new situations and contexts, because they have constructed mental models via realistic practice



Authentic Learning

The big ideas

1

When learning experiences are explicitly linked to achieving a **real-world goal**, learners find them more meaningful and so are more engaged and motivated.

I get why I'm learning this.

2

When learners understand the **underlying concepts** and rationales, they can make better use of practice in an authentic environment.

I understand why we're doing things this way, and I've been taught enough that I can make good use of my practice time.

3

Models and demonstrations help learners learn what good performance looks like (and what it doesn't).

I see what it looks like when it's done right.

4

Practicing in **authentic scenarios** with real-world problems prepares learners better for real-world tasks.

When I use this in the real world, I'll know what I'm doing.

5

Learning authentic tasks happens best when learners tackle **ill-defined problems**, **craft their own path** to a solution, and **reflect** to become good self-directed learners.

How I tackle these tasks is up to me.

6

Genuinely taking part in a **community of practitioners** hones the knowledge and **habits of mind** needed to join that community for real.

I see how to work with others to get things done.

Real-world relevance

When learning experiences are explicitly linked to achieving a real-world goal, learners find them more meaningful and so are more engaged and motivated.

Showing learners the relevance of what they're learning helps them understand why they are learning; makes the learning meaningful; and motivates them to learn.

What it feels like for learners

I get why I'm learning this.

- **Real-world relevance motivates learners**

Research indicates that explaining to learners why they are learning helps them connect their learning to the real world. When learners can see how the content matters, learning becomes more meaningful and learners are motivated to learn.

- **Real-world relevance aids learning**

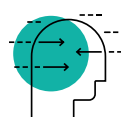
When learners expect to use what they are learning in the real world, they find it more valuable. And when they believe what they are learning is valuable, they are more motivated, persist longer, and learn more.

What it means for designing learning experiences

- Explicitly explain how the content being learned is relevant to the real world
 - When learners know that the content they are learning will help them later in life, they will be more motivated to learn
- Have learners explain how the content is relevant to them
 - Potentially even more useful than telling them how the content is relevant; when students have to define relevance for themselves, they may discover how the content is relevant specifically to themselves
- Give learners problems to solve that are similar to problems professionals solve in their work
- Center content and skills around authentic problems to solve



See this Learning Design Principle:
Motivation & Mindset



See this Learning Design Principle:
Developing Understanding

Instruction before practice

When learners understand the underlying concepts and rationales, they can make better use of practice in an authentic environment.

Learning is more effective when learners have sufficient knowledge before practicing or performing themselves. Providing students with key information first allows for more effective exploration of the authentic environment.

What it feels like for learners

I understand why we're doing things this way, and I've been taught enough that I can make good use of my practice time.

- **Using direct instruction**

Learning is more effective and efficient when students receive direct instruction before engaging with authentic environments. Learners need a base of knowledge to effectively engage in authentic learning tasks.

As learners master the necessary skills and concepts, they combine them in more complicated and sophisticated ways. Eventually, they can apply their skills in an authentic learning environment.

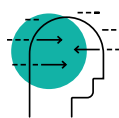
A meta-analysis of different studies found that these effects were robust across different situations (Stockard, et al., 2018).

- **Using exploratory problem-solving**

In tightly controlled scenarios, it can be beneficial to have learners engage in exploratory problem-solving tasks before direct instruction. These activate relevant prior knowledge, partially build learners' understanding, and increase motivation and curiosity. These tasks must be carefully designed to be effective, though, and in general, direct instruction is more robust and consistent across learners.

What it means for designing learning experiences

- Provide direct instruction on underlying skills and principles first
- Ensure learners have sufficient foundational knowledge to effectively engage in problem solving
- Explicitly link back to concepts from instruction (especially when these skills are not readily apparent to the learners, e.g., soft skills)
- Explain different philosophies or schools of thought and how they interact with the underlying conceptual framework



See these Learning Design Principles:

Developing Understanding
Desirable Difficulty
& Scaffolding

Modeling

Models and demonstrations help learners learn what good performance looks like (and what it doesn't).

What it feels like for learners

I see what it looks like when it's done right.

- **Learning from models is efficient and effective**

Observing how others complete a task before attempting the task themselves is effective and efficient, especially for novice learners. Compared to learning through trial and error, learning through modeling — where another person (usually an expert) solves the problem in front of learners while describing their process — is more efficient and less likely to lead to negative outcomes.

- **Modeling is more beneficial when varied**

Multiple models with varying scenarios and performance quality (including incorrect solutions) are more beneficial than a single, 'ideal' model.

- **Combine with problem-solving**

Interspersing modeling or examples with problem-solving allows learners to refine their mental models before attempting to solve problems themselves.

- **Modeling includes cognitive apprenticeships**

Cognitive apprenticeships are like traditional apprenticeships, except learners learn cognitive skills. Learners observe an expert completing the task, then attempt the task with expert support. Over time the expert fades out support until learners can act independently. Experts help learners develop conceptual models which serve as a basis for developing self-monitoring skills. Cognitive apprenticeship is the underlying model used to design intelligent tutoring systems, which have been found to consistently outperform traditional instruction.



See this Learning Design Principle:
Social & Collaborative Learning



See this Learning Design Principle:
Desirable Difficulty & Scaffolding

What it means for designing learning experiences

- Provide a demonstration or have an expert practitioner model the behavior
- Models should be scaffolded with a think-aloud of the process that explicitly labels skills
- Modeling can take the form of a live demonstration or expert-level performance (ideally with commentary or a talk-aloud on how they did it); direct verbal/visual instructions; worked examples; or a symbolic model, such as a movie or a story
- Include opportunities for the learner to try it out, reflect and compare their performance, and integrate it into their regular behavior
- Use a wide range of models of varying quality, including models of what not to do

Authentic practice

Practicing in authentic scenarios with real-world problems prepares learners better for real-world tasks.

Learning is grounded in the context in which it was learned. Authentic learning environments match the professional context and so promote learning and transfer.

What it feels like for learners

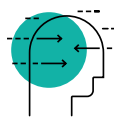
When I use this learning in the real world, I'll know exactly what I'm doing.

- **Authentic practice helps learners connect practice to the real world**
Transferring abstract knowledge to a novel context is difficult. To help learners build connections, the learning process should make its relevance to the real world explicit.
- **Authentic practice aids transfer when grounded in real-world situations**
Grounding learning in a real-world situation improves the likelihood that knowledge will transfer. Authentic learning environments do not need to exactly match the real-world context to be effective, but the constraints of the task should be authentic, and learners must suspend disbelief to accept the environment as realistic. Authentic

learning involves learners solving real-world problems presented as complex real-world activities.

What it means for designing learning experiences

- Provide learners with opportunities to practice with authentic tasks that mimic the real-world complexity and demands (e.g., simulations, teamwork)
- Provide support during practice by integrating formative assessment and feedback throughout the activity
- Guide learners through nuances, relevant cues, and boundary conditions relevant to the context
- Consider learning activities that result in real world deliverables
- Allow ample time (days/weeks) for learners to solve problems, like how professionals complete long-term projects



See this Learning Design Principle:
Developing Understanding

Self-directed problem-solving

Learning authentic tasks happens best when learners tackle complex, ill-defined problems, craft their own path to a solution, and reflect to become good self-directed learners.

Learning experiences should support them in becoming authentic practitioners and so build self-directed learning, authority, and knowledge of disciplinary norms.

What it feels like for learners

How I tackle these tasks is up to me.

- **Self-directed problem-solving involves ill-defined problems with multiple solutions**

Authentic learning activities are open to multiple interpretations and allow for multiple perspectives. Learners explore the environment and develop their own objectives, approaches, and solutions. They feel supported by the instructor and able to ask questions. Instructors fade support over time while learners define a path to a solution.

- **Self-directed problem-solving involves learners defining their own approaches**

Instructors support learners in developing metacognitive skills through modeling and prompts. Learners engage in self-reflection throughout the experience to evaluate their current learning process, changing their process if they determine it will not help them reach their goal.



See this Learning Design Principle:

Self-Regulated Learning & Metacognition



See this Learning Design Principle:

Desirable Difficulty & Scaffolding

What it means for designing learning experiences

- Provide complex problems that can be solved or approached in multiple ways
- Provide ill-defined problems with multiple possible solutions
- Provide a mix of relevant and irrelevant information for learners to sort through
- Allow for and support independent, self-directed learning
 - Allow learners to determine the tasks and sub-tasks needed to complete the activity
 - Provide opportunities for learners to ask clarifying questions
 - Provide learners with scaffolded guidance
 - Provide opportunities for learners to self-reflect and adjust learning strategies as needed

Stepping into the community

Genuinely taking part in a community of practitioners hones the knowledge and habits of mind learners needed to join that community for real.

What it feels like for learners

I can take on real tasks and learn from people more advanced than me what I need to do, and how I need to do it.

mind of full and mature participants. Participation helps learners develop their identity as true participants in the domain. This can increase motivation and satisfaction, and provide a deeper sense of the value of participating.



See this Learning Design Principle:
Social & Collaborative Learning

- **Legitimate community participation hones knowledge and habits of mind**

Learning how to act as a member of a community is just as important an outcome as learning knowledge and skills. Participating in authentic but appropriately-sized tasks bolsters both outcomes.

- **Participation as a path to learning**

The community's practices form a "curriculum" which the learner can learn by participating. Learners must have access to arenas of mature practice to effectively learn. To go from newcomer to seasoned practitioner, one must learn: what to do, how to behave, what to create, and what activities, people, communities and sources of knowledge are valued.

Situating authentic learning tasks within authentic communities helps learners acquire the practices and habits of

What it means for designing learning experiences

- Provide access to a mature authentic community of practice, so learners can learn different ways to accomplish meaningful tasks
- Have learners act as part of the practitioner community by doing genuine tasks (more than observation)
- Provide instruction, guidance and reflection opportunities alongside these tasks
- Sequence learning activities appropriately
 - Conceptualize the whole task before executing specific parts
 - Early tasks should be short and simple, with small cost for errors
 - Increase task complexity and diversity over time
- Provide access to the help resources and informal networks that real practitioners use
- Provide peer or near-peer support and feedback
- Support self-directed learning by encouraging learners to verbalize their knowledge and thinking, and engage in comparison, reflection, and exploration

Authors



Kayla Morehead, Ph.D.

Kayla Morehead received her Ph.D. in cognitive psychology and a minor in quantitative methods from Kent State University with Dr. John Dunlosky. She is an expert in self-regulated learning and metacognition, and her research focused on how students make learning decisions and engage in effective note-taking. Currently she works at Denver Public Schools as a research analyst, where she evaluates the effectiveness of a variety of district programs.



Katherine McEldoon, Ph.D.

Katherine McEldoon is a research-to-practice connector. After earning her Ph.D. in cognitive and learning sciences at Vanderbilt University and a post at Arizona State University's Learning Sciences Institute, she has worked in academia, government, and industry to ensure the best scientific insights support student learning, no matter the context. Katherine has most recently worked as Lead Learning Scientist on Pearson's Efficacy & Learning team, bringing evidence-based insights to Pearson's world of learners.

Reviewers

Sara Finnigan, M.A.

Principal Learning Designer

Amy Wood, M.A.

Director, Learning Research and Design

Matthew Ventura, Ph.D.

Director, Advanced Technology Research and Design

Emily Lai, Ph.D.

Vice President, Learning Impact Measurement

Muireann Kelly, Ph.D.

Senior Research Scientist

Autumn Westphal, M.A.

Learning Designer

Tanya Churaman, M.S.

Researcher

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