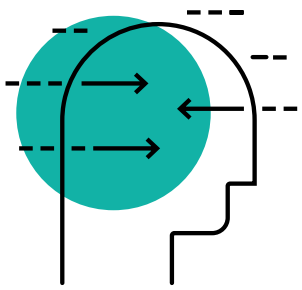
Pearson

Learning Design Principles

Minds in Mind

Feedback for 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

Feedback for Learning

Feedback is one of the most powerful ways to support learning.

At its core, **feedback** is information for learning. It contains information about a learner's performance or understanding and is used to adjust thinking or behaviour to improve learning. It can be provided by instructors, learning systems, or peers.

Feedback is an important factor in closing the gap between what a learner's current level and what they ideally need to know or be able to do.

Over time, the understanding of feedback has changed. Instead of a way to evaluate learning, it is now seen as a way to support learning; a way to provide learners with information to correct their errors and improve their understanding.

The best feedback is:

- **actionable:** it gives learners opportunities to reflect, self-regulate, and make changes
- **specific:** it is individualized, and provides information about learners' current understanding and/or performance
- **descriptive:** it avoids praise and comparison, instead conveying targeted information about ways to overcome challenges and improve in regard to task, process, and/or self-regulation
- **understandable:** it is clear and concise

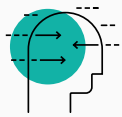
Why it matters

Feedback plays a pivotal role in helping learners achieve their goals. It supports learning by providing learners, instructors, and other stakeholders with timely, specific information about learners' understanding and performance at meaningful points during the learning experience.

Feedback has been widely studied, and the research shows a large positive effect on learner outcomes across various domains. High quality feedback, delivered appropriately, has a positive impact on learning, retention, comprehension, metacognitive skills, and overall achievement.

The effectiveness of feedback can depend on a few factors, which are useful to keep in mind when designing learning content and tools:

- content, source, and delivery of feedback
- prior knowledge and working memory of learners

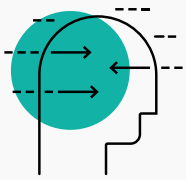


See this Learning Design Principle:
Developing Understanding

Impact

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

- learners experience feedback as helpful and supportive because it's task-focused rather than person-focused
- learners persist through difficulty because they have the support and information they need to improve
- learners use feedback to revise or correct their understanding because it is specific, descriptive, and timely
- learners provide constructive feedback to peers because they are trained and provided with models of high-quality feedback
- learners take responsibility for regulating their own learning, because they have been given the time and space to reflect on their performance and know what makes feedback effective
- learners become proficient and can transfer their knowledge to new contexts, because they have had the opportunity to practice and refine their skills



Feedback for Learning

The big ideas

1

When providing feedback, it's important to determine when the learner will best be able to utilize it to improve their learning. This may mean feedback is best provided sooner or later in the learning process.

Now that I know, I'll use this to revise my thinking.

I'm not being judged.

2

Feedback should be provided in a way that learners see as non-judgmental. It is important for feedback to be perceived as helpful and supportive.

I know what I can do to improve.

3

Feedback should help learners reflect on where they are currently and where they want to be in their learning goals, with specific steps to get there. There is such a thing as too much or too little feedback.

4

There are many ways to deliver feedback, through instructors, peers, learning systems or agents. They all have their place, so it is important to consider what makes each one effective.

I get feedback in lots of ways.

I can give myself feedback.

5

Feedback is information learners use to regulate their own learning. Self-regulated learning interventions that incorporate feedback can improve learning, self-regulated learning, and motivation.

Big Idea 1

Timely feedback

When providing feedback, it's important to determine when the learner will best be able to utilize it to improve their learning. This may mean feedback is best provided sooner or later in the learning process.

What it feels like for learners

Now that I know, I'll use this to revise my thinking.

Giving feedback in time for a learner to use it in a revision cycle is important.

Immediate feedback is better for initial learning, lower-order learning outcomes, more challenging tasks, and learners with less prior understanding.

Pros

- Guides learners during learning, easing frustration
- Allows in-the-moment error correction
- Helps learners gain proficiency in the task at hand
- Info in the feedback remembered along with problem solving
- Learning is fast and efficient
- Learners prefer it

Cons

- Does not support learning transfer
- Does not support self-regulated learning skills

Delayed feedback is better for later learning, higher-order learning outcomes, less challenging tasks, and learners with high prior understanding.

Pros

- Supports the development of self-regulated learning skills
- Delay allows learners to forget their initial error and remember the correct one
- Helps learners transfer their understanding to different types of tasks
- Provides two opportunities to study the learning content

Cons

- May not help struggling learners who need immediate support
- Still needs to be given soon enough for learning revision
- May require more time

Immediate or delayed, what makes the biggest difference is that learners use the feedback in a revision cycle. Feedback should be provided at the best moment for learners to incorporate it into their understanding.

See this Learning Design Principle: Desirable Difficulty & Scaffolding

What it means for designing learning experiences

- Timing of feedback should be based on learners' prior understanding, when learning is taking place, and learning goals
- The context of the classroom and learning domain can guide when feedback should be provided
- Provide opportunities for learners to use the feedback in a revision cycle
- Allocate instructional time to process feedback

Big Idea 2

Non-threatening feedback

Feedback should be provided in a way that learners see as non-judgmental. It is important for feedback to be perceived as helpful and supportive.

What it feels like for learners

> *I'm not being judged.*

Learners can take feedback as a critique of themselves, instead of their current performance of the task. When they find feedback threatening, learners are likely to reject the information or internalize it in a harmful way.

Therefore, feedback should be task-focused, avoiding criticism and any reference to the learner themselves.

- **Positive feedback** that includes praise can have both positive and negative impacts. It can increase intrinsic motivation, and learners see it as more helpful. If it is person-focused (not task-focused), counterintuitively, it can damage motivation and learning. If it does not provide enough information, it may not be enough to facilitate change.
- **Negative feedback** can affect learners in various ways, but the impact can be improved if learners are first told that struggling is a normal part of the process. If the feedback focuses on what the learner has done wrong, it can damage their self-esteem, resulting in them feeling defensive and ignoring the feedback.

Whether feedback is positive or negative, it needs to be straight to the point and rich with information that lets learners know how they can improve.

- **Create a supportive, psychologically safe environment**
  A psychologically safe environment helps learners be receptive to feedback. Trust between the learner and the person providing the feedback is key. Affirming that a learner is capable of achieving, and framing feedback as helping them achieve what they are truly capable of, go a long way in creating this environment.

See these Learning Design Principles:
Motivation & Mindset
Social & Collaborative Learning

What it means for designing learning experiences

- Deliver feedback in a non-threatening, supportive way
- Focus feedback on task and performance instead of learners themselves
- Use praise sparingly
- Make feedback meaningful and helpful for learners to improve learning
- Set norms for psychological safety
- Frame feedback as supportive information to help learners reach their full potential
- Reminder learners that struggle is part of the learning process
- When providing praise, cite specific task- and performance-based reasons, such as their effort, self-regulation, or engagement

Big Idea 3

Information for learning

Feedback should help learners reflect on where they are currently and where they want to be in their learning goals, with specific steps to get there. There is such a thing as too much or too little feedback.

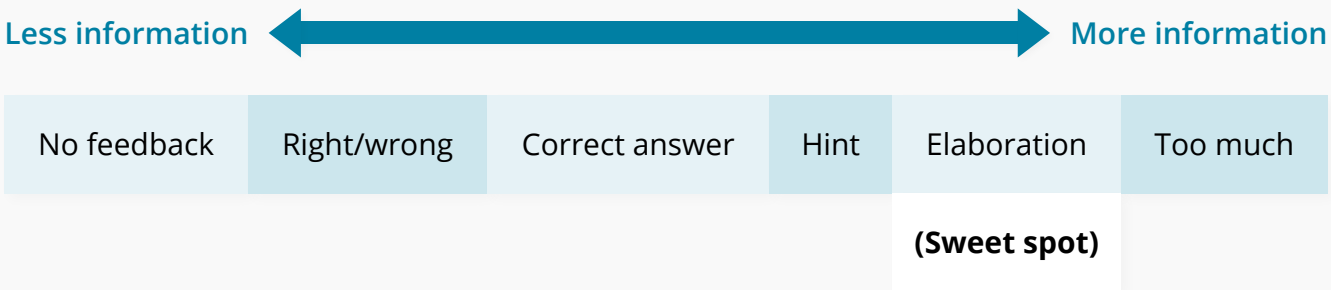
What it feels like for learners

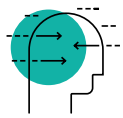
I know what I can do to improve.

- **Include actionable next steps**
  To reduce learners' uncertainty and improve learning, feedback should focus on concise, consistent, and actionable steps. In addition, providing plenty of opportunities to implement the feedback makes it more likely learners will improve their performance.
- **Provide just enough information**
  Providing no feedback at all is ineffective, because it provides no help to the learner. On the other hand, too much feedback can overwhelm learners.

Elaborated feedback explains in detail why an answer was right or wrong. It is the sweet spot because it gives learners the information they need to address their errors. It can almost be thought of as a type of supplemental instruction.

- It works better for higher-order learning outcomes, but can also be effective for lower-order outcomes
- It is most effective for learners with lower prior domain knowledge
- Learners with higher domain knowledge may find it repetitive. They can benefit from simplistic feedback that includes the correct answer
- Providing too much elaborated feedback on complex learning tasks can overwhelm learners
- Give learners ample time to create their own feedback and process what they are learning before providing feedback





See these Learning Design Principles:
Desirable Difficulty & Scaffolding
Attention & Cognitive Load

What it means for designing learning experiences

- Include multiple opportunities to assess learning with objective-aligned formative assessment items and practice activities
- Provide actionable, specific, descriptive, and understandable feedback
- Use feedback to guide learners towards next productive steps
- Provide success criteria so learners know what they are aiming for
- Highlight misconceptions through feedback and provide opportunities for (self) remediation
- Apply feedback approach based on learners' current understanding
    - Provide neither too much nor too little information
    - Give elaborated feedback when appropriate, considering learner knowledge level and cognitive load
- Support self-regulation by giving learners time reflect on their learning before providing feedback

Big Idea 4

Feedback channels

There are many ways to deliver feedback, through instructors, peers, learning systems or agents. They all have their place, so it is important to consider what makes each one effective.

What it feels like for learners

> *I get feedback in lots of ways.*

Peer feedback feels less threatening than feedback from an authority figure. It is also a great learning opportunity for the learner providing the feedback. There are some limitations, including that the feedback may be ineffective if the peer does not know how to address errors. Peer feedback may lead to better learning outcomes, but learners are more likely to implement feedback from teachers.

The effectiveness of peer feedback is influenced by:

- whether the peer has received training — feedback is more effective when the peer is adequately trained
- types of feedback — providing both comments and grades is beneficial
- ability level — can influence whether feedback is positive or negative; feedback is most effective when the learner and peer are at the same level
- accountability — feedback is better when the peer feels the usefulness of their feedback will be graded

Pedagogical agents are digital characters that instruct learners. When well designed, they can be as effective as one-on-one or small group tutoring with humans. Feedback from pedagogical agents may improve motivation, but the findings about their effectiveness have been mixed.

When implementing pedagogical agents, consider:

- learners prefer knowledgeable and kind agents, which increases motivation
- interacting with two agents leads to better learning and motivation
- learners prefer working with an agent that is more like a peer than an authority figure

Feedback from computers is just as effective as feedback from an instructor, and learners are more likely to ask for feedback from a computer than a person.

On the other hand, learners feel that feedback from instructors is more accurate and helpful, and prompts from instructors are associated with better performance.

See these Learning Design Principles:
Social & Collaborative Learning

What it means for designing learning experiences

Peer feedback

- Provide training on how to craft and deliver feedback
- Use a scoring rubric to support peer training
- Match peers by ability level
- Make sure giving feedback is a learning experience, too

Pedagogical agent feedback

- Use the same principles as you would for instructor or peer feedback
- Consider framing the agent as a peer
- Allow the learner to ask for help

Big Idea 5

Developing self-regulation

Feedback is information learners use to regulate their own learning. Self-regulated learning interventions that incorporate feedback can improve learning, self-regulated learning, and motivation.

What it feels like for learners

> *I can give myself feedback.*

Self-regulated learning is when learners are able to effectively take ownership of their learning and process feedback outside of the influence of an instructor.

Receiving feedback can help learners learn how to provide feedback for themselves. External feedback helps learners assess their own performance and determine if they need to adjust their goals and strategies. Learners that are better at monitoring their own progress are better at using the feedback they receive to achieve their goals.

Self-regulated learning can be disrupted by:

- not knowing the effective strategies to solve problems, or utilizing inappropriate strategies
- not enough motivation or time for learning
- not enough mental resources
- poor metacognitive skills, leading to difficulty analyzing performance

See these Learning Design Principles:
Self-regulated learning and metacognition

What it means for designing learning experiences

- Provide clear learning goals
- Support self-regulation by giving learners time reflect on their learning before providing feedback
- Encourage learners to practice self-monitoring skills
- Model quality feedback often and consistently
- Provide direct instruction on how to craft effective feedback
- Encourage teacher and peer dialogue
- Collect usage and performance data on formative assessments to support progress tracking and communicating strengths and weaknesses

Authors

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Amanda Grenell is a postdoctoral fellow at Indiana University. She earned her Ph.D. in Developmental Psychology from the Institute of Child Development at the University of Minnesota. Her research focuses on self-regulation, learning, and pretend play in early childhood. In her current research, she examines how individual differences in cognition may influence the effectiveness of specific instructional strategies and materials to optimize math and science learning.

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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.

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