

Adaptive Learning

Category: Artificial Intelligence in Education

Adaptive learning is an approach in which a digital environment changes content, sequence, difficulty, pacing or support in response to evidence about a learner's interaction or performance. Adaptation may be rule-based or AI-driven and usually occurs during engagement with the system.

It differs from the broader idea of personalised learning: adaptation is the system's dynamic adjustment, whereas personalisation may also involve negotiated goals, learner choice and human guidance. An adaptive decision is a hypothesis about what should help next, not a definitive judgement about ability ([Brusilovsky, 2001](#)).

Adaptive Cycle

1. **Observe:** Collect proportionate evidence from relevant learner actions or responses.
2. **Infer:** Estimate current knowledge or need while representing uncertainty.
3. **Select:** Choose an appropriate task, pathway, explanation or level of support.
4. **Respond:** Present the adaptation clearly and preserve opportunities for learner choice.
5. **Update:** Use subsequent evidence to revise the model and audit unequal effects.

Examples in Practice

After a learner answers several anatomy questions correctly and explains the reasoning, a platform offers a more complex case. The learner can choose further practice instead, and the tutor can inspect or override the route. The profile changes as new evidence is gathered.

Why It Matters

Adaptation can keep challenge and support responsive across large cohorts. Yet inaccurate learner models may repeatedly narrow opportunity, especially when decisions are opaque; common standards, learner control and educator oversight help prevent a temporary difficulty becoming a fixed pathway. Evaluation should examine learning and equity, not engagement metrics alone, and whether learners understand and can challenge adaptations in practice ([OECD, 2021](#)).

Further Reading

6. Brusilovsky, P. (2001). [Adaptive hypermedia](#). User Modeling and User-Adapted Interaction, 11, 87–110.
7. OECD. (2021). [OECD Digital Education Outlook 2021](#). OECD Publishing.
8. Bayly-Castaneda, K., Ramirez-Montoya, M.-S., & Morita-Alexander, A. (2024). [Crafting personalized learning paths with AI](#). Frontiers in Education, 9, 1424386.

Related Terms: AI-Supported Personalised Learning | Intelligent Tutoring Systems | Differentiation | Learner Modelling