# AI Effects on Learning

## Summary by Bauer et al., (2025)

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This conceptual paper critiques simplistic narratives about AI in education—whether overly optimistic or overly fearful. The authors propose the ISAR model, which classifies how AI affects learning:

• **Inversion** (learning worsens due to shortcuts)

• **Substitution** (AI replaces an existing method)

• **Augmentation** (AI enhances cognitive processing)

• **Redefinition** (AI enables previously impossible learning tasks)

Drawing on decades of instructional psychology, the authors argue that AI's impact depends on design quality, cognitive alignment and classroom implementation. Poorly designed AI may reduce deep thinking, while well-aligned systems can provide adaptive support, personalized feedback and richer forms of inquiry.

They advocate focusing on learning processes, not technologies: AI must be evaluated on how it shapes attention, engagement, problem-solving and metacognition. Without strong instructional design and evidence-based evaluation, AI risks becoming hype rather than genuine improvement.

## Implications for Practice

1. Evaluate classroom AI tools using the ISAR framework.

2. Prioritize designs that increase cognitive effort and reflection.

3. Train teachers in evidence-based AI integration.

4. Continuously monitor student dependence on AI.

## Table 2.23.5

| Item | Details |
|------|---------|
| Context | Global |
| Design | Conceptual |
| Focus | AI & learning |
| Contribution | ISAR model |

## Reference

Bauer, E., Greiff, S., Graesser, A. C., Scheiter, K., & Sailer, M. (2025). Looking beyond the hype: Understanding the effects of AI on learning. *Educational Psychology Review, 37*, Article 45. https://doi.org/10.1007/s10648-025-10020-8

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