

Worked Examples Effect

Theory

The worked examples effect was first introduced in 1985¹⁾ suggesting positive effects of providing a learner with an **example of the problem solution** before requiring him to solve one on his own.

This suggestion is contrary to many **constructivist discovery learning** methods which suggest a learner should try to solve the problem by himself. **Cognitive load theory** on the other hand suggests that searching for the problem solution places unnecessary load on the learner's mind preventing him from learning. A worked example will remove the load of searching for a solution and enable easier acquisition of basic steps leading to the solution.

Practice

$$\begin{aligned}
 1. \quad x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\
 2x^2 - 8x - 24 &= 0 \\
 x &= ? \\
 x &= \frac{-(-8) \pm \sqrt{(-8)^2 - 4(2)(-24)}}{2(2)} \\
 x &= \frac{8 \pm \sqrt{64 - (-192)}}{4} \\
 x &= \frac{8 \pm \sqrt{256}}{4} \\
 x &= \frac{8 \pm 16}{4} = 2 \pm 4 \\
 x &= 6, -2
 \end{aligned}$$

Learners should be presented with a worked example of the procedure they're expected to learn **prior to trying to solve a problem** which requires that procedure. For example, when teaching learners the formula for calculating roots of a quadratic formula, learners should first be provided with a worked example of using the formula, and then try to solve a problem on their own.

Still, it should be noted that under some conditions

- “*worked examples are no more effective, and possibly less effective, than solving problems.*”²⁾

This is due to the fact that even **worked examples can be badly designed** and not follow the **principles and effects** of proper instructional design (especially see: **expertise reversal effect**).

Research status

A recent research has systematically compared usage of worked examples, example-problem pairs, problem-example pairs and problem-solving, demonstrating that

- “*example study only and example-problem pairs were more effective and efficient than problem solving only and problem-example pairs.*”³⁾

¹⁾

Sweller, John, and Graham Cooper. *The Use of Worked Examples as a Substitute for Problem Solving*

in Learning Algebra. Cognition and Instruction 2: 59-89, 1985.

2)

Ward, Mark, and John Sweller. Structuring Effective Worked Examples. Cognition and Instruction 7: 1-39, 1990.

3)

van Gog, Tamara, Liesbeth Kester, and Fred Paas. Effects of worked examples, example-problem, and problem-example pairs on novice learning. Contemporary Educational Psychology 36, no. 3: 212-218, July 2011.

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Last update: **2023/06/19 15:49**

