Worked Examples

PRACTICES THAT FOSTER EFFECTIVE LEARNING

DESCRIPTION

Worked examples provide novice learners with an expert's solution to a problem. Typically, the solution is presented as a step-by-step problem-solving process that can be applied to similar future problems. Worked examples consist of a problem formulation, solution steps, and the final solution itself. The Worked Examples LDP presents research by Atkinson, Ward, & Sweller, and others, to demonstrate why worked examples are important and design principles should be used when creating worked examples.

Cognitive load theory (CLT) suggests that all people have a limited capacity for processing real-time information. Thus, instructional design should focus learners' attention and avoid overburdening learners with unnecessary information. Worked examples is an instructional method that reduces cognitive load, and makes complex problem-solving activities more accessible to novice learners. Worked examples are especially suited to complex problem-solving activities that can be broken down into steps to achieve a series of goals or subgoals.

Recommendations include:

- Optimize intra-example features, inter-example features, and individual differences to enhance the effectiveness of worked examples.
- Minimize any split attention effects and reduce cognitive load by integrating modalities into a unified experience and presenting material in simple and intuitive ways.
- Use variability effectively by providing a limited range of different types of examples and problems.
- Consider the audience carefully, since novices benefit greatly from worked examples, whereas experienced/expert learners may not need them at all.

LEARNER IMPACTS

- Behavior
- Motivation
- Self-regulation

CAPABILITIES

- Assessment: Worked examples
- Instruction: Scaffolded worked examples
- Cognitive Tools: Asynchronous social learning: item based

SAMPLE DESIGN IMPLEMENTATIONS

- Robust Technology: Formation of declarative knowledge structures
- Simple Technology: Formation of early schema

Pearson

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SELF-ASSESSMENT INSTRUMENT

Principle Criteria	Integration (4-5 points)	Exploration (2-3 points)	Consideration (1 point)	Not Applicable (0 Points)	Total Points
Definition	Strong choice of context that requires complex problem-solving to justify the use of worked examples Strong presentation of expert knowledge through a step-by-step problem-solving process	Some choice of context that requires complex problem-solving to justify the use of worked examples Some presentation of expert knowledge through a step-by-step problem-solving process	Poor choice of context that requires complex problem-solving to justify the use of worked examples Poor presentation of expert knowledge through a step-by-step problem-solving process	Does NOT qualify as a worked example	= _____
Model	Strong integration of information to reduce split attention Strong focus that avoids overwhelming learners with too many sources of information	Some integration of information to reduce split attention Some focus that avoids overwhelming learners with too many sources of information	Poor integration of information to reduce split attention Poor focus that avoids overwhelming learners with too many sources of information	Does NOT address design from a cognitive load theory perspective	= _____
Design	Strong coupling of modalities (text, audio, visual, etc.) into a unified experience to reduce cognitive load Strong breakdown of steps or goals to meaningfully represent salient chunks in the worked process Strong emphasis on identifying and applying the structure of successful problem-solving processes	Some coupling of modalities (text, audio, visual, etc.) into a unified experience to reduce cognitive load Some breakdown of steps or goals to meaningfully represent salient chunks in the worked process Some emphasis on identifying and applying the structure of successful problem-solving processes	Poor coupling of modalities (text, audio, visual, etc.) into a unified experience to reduce cognitive load Poor breakdown of steps or goals to meaningfully represent salient chunks in the worked process Poor emphasis on identifying and applying the structure of successful problem-solving processes	Does NOT use design effectively	= _____
Assessment	Strong consideration of prior knowledge to appropriately match activities to abilities Strong consideration of individual differences to appropriately match activities to abilities	Some consideration of prior knowledge to appropriately match activities to abilities Some consideration of individual differences to appropriately match activities to abilities	Poor consideration of prior knowledge to appropriately match activities to abilities Poor consideration of individual differences to appropriately match activities to abilities	Does NOT assess effectively or not an assessment-based activity	= _____