Chapter 12 – Does Practice Make Perfect?

**What is practice in e-learning?**
Practice events in e-learning are called *interactions*. They may include selected response questions (multiple choice, true/false, etc.), short answer, drag-and-drop, or simulations. (p. 253)

Effective practice exercises fall into the upper right quadrant of the engagement matrix with both high psychological and behavioral activity. (p. 254)

Practice is a *necessary but not sufficient condition* to reach high levels of competence. *Deliberate practice*, which includes five basic elements, is needed to build expertise. Those elements include:
1. Effortful exertion to improve performance
2. Intrinsic motivation to engage in the task
3. Carefully tailored practice tasks that focus on areas of weakness
4. Feedback that provides knowledge of results, and
5. Continued repetition over a number of years (p. 256)

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**Practice Principle 1: Add Sufficient Practice Interactions to e-Learning to Achieve the Learning Goal**
To decide how much practice your e-learning courses should include, consider the nature of the job task and criticality of job performance and include more practice for highly critical skills. (p. 262)

- Interactivity improves learning. Only one form of interaction (either selecting a correct answer OR explaining a correct solution chosen by the instructional agent) is sufficient.
- Practice benefits diminish rapidly (the power law of practice). The job of the designer is to consider how much practice is needed to ensure the learner has an acceptable level of job proficiency.
- Adjust the amount of practice based on task criticality.

- There are limited benefits of over-learning (see Figure 12.6). Three or four problems relating to each new concept should be sufficient. Assignments should err slightly in the direction of too much practice.

**Practice Principle 2: Mirror the Job**

In order to facilitate better transfer, interactions should require learners to respond in a job-realistic context.

- Try to avoid simple recall level interactions that only require regurgitation of information presented in the training.

- “Begin with a job and task analysis in order to define the specific cognitive and physical processing required in the work environment. Then create transfer appropriate interactions – activities that require learners to respond in similar ways during the training as in the work environment.” (p. 262)

**Practice Principle 3: Provide Effective Feedback**

- After the learner responds to a question, provide feedback that tells the learner whether the answer is correct or incorrect and provide a succinct explanation.
  - “A missed question is a teachable moment. The learner is open to a brief instructional explanation that will help build the right mental model.” (p. 263)

- Focus the explanation in the feedback on either the task itself or on the process involved in completing the task.

- Avoid feedback such as “Well Done!” that draws attention to the ego and away from the learning.

- Likewise, avoid normative feedback such as grades that encourage learners to compare themselves with others.

- Emphasize progress feedback in which attention is focused on improvement over time.

- Position the feedback so that the learner can see the question, his or her response to the question, and the feedback in close physical approximation to minimize split attention.

- For multi-step problems for which steps are interdependent, provide step-by-step feedback.

- For a question with multiple answers, show the correct answers next to the learner’s answers and include an explanation for the correct answers.
Practice Principle 4: Distribute and Mix Practice among Learning Events

Distribute practice throughout the learning environment to promote better long-term retention. (see Figure 12.10)

- Incorporate review practice exercises among the various lessons in your course and within a lesson distribute practice throughout the lesson rather than all in one place.

- When your goal is to teach discrimination among different problem types, mix types together during practice rather than segregating them by type. Research shows that this may lead to poorer practice scores, but will pay-off in better learning on a test given a day later. (see Figure 12.11)

Practice Principle 5: Apply Multimedia Principles

Multimedia Principle:
- Include relevant visuals as part of your interaction design.

Modality and Redundancy Principles:
- Any instructions or information learners need in order to answer a question should remain in text on the screen while the learner formulates a response.
- Feedback should also be presented in text so that learners can review the explanations at their own pace.
- Do not narrate on-screen directions, practice questions, or feedback.

Contiguity Principle:
- Clearly distinguish response areas by placement, color, or font and place them adjacent to the question.
- Align directions, practice questions, and feedback in on-screen text so that learners can easily see all the important elements in one location.
- In multiple-choice or multiple-select items, use color or bolding to show the correct options as part of the feedback.
- Minimize split attention in behavioral response required by using on-screen rather than keyboard input modes.
Coherence Principle:
- Exclude stories and graphics added for entertainment value, complex graphics, background music and sounds, and detailed textual descriptions. *Less is usually more.*
- During virtual classroom synchronous sessions, the instructor should maintain a period of silence during practice events.

**Practice Principle 6: Transition from Examples to Practice Gradually**
Start with a full worked example and gradually increase the amount of work the learner must perform, ending with a full practice assignment, as described in Chapter 11.

**Additional Reading:**


