Taking PowerPoint to the Next Level

by Leslie Harper and Kayleen Grage

Tales from the Field, a monthly column, consists of reports of evidence-based performance improvement practice and advice, presented by graduate students, alumni, and faculty of Boise State University's Instructional and Performance Technology department.

The Situation: What's Happening and Why?
In September 2008, a team of instructional designers (IDs) was asked to update a training program provided to welders at a U.S. forklift manufacturer. Welders are expected to meet established quality assurance (QA) specifications on all welds. The problem was that the company's 66 welders were producing too many welds that did not meet these specifications. Based on client data (surveys, focus groups, and weld defect statistics), the IDs determined welders did not know how to use the specifications to assess the quality of a specific weld.

The existing training program consisted of a PowerPoint presentation given by a veteran welder. The PowerPoint slides used a variety of colors, fonts, animations, and clipart. Some slides listed only topics while others included difficult-to-read screen shots, and still others showed content from a quality assurance document that was readily available to all welders. The trainer said that, "I don't teach; I do familiarization training."

The Solution: What Should Be Done?
To remedy this situation, the IDs decided to shift the focus of the training program from *familiarization* to *application*. Rather than simply informing the welders of the quality assurance specifications, the goal of the updated training program was to teach welders how to use those specifications to evaluate the quality of their own welds. This would help them prevent defective welds, which would reduce waste and improve product quality.

To accomplish this, the IDs used Merrill's (2002) "first principles of instruction." Merrill suggests that we can improve learning by incorporating five principles:

1. *Problem-centered*. Engage learners in solving real-world "problems," defined by Merrill as whole tasks representing something the learners will encounter outside of the training program.
2. *Activation*. Use existing knowledge as a foundation for new knowledge.
3. *Demonstration*. Show the new skill to the learners.
4. *Application*. Provide learners with opportunities to practice the new skill.
5. *Integration*. Help the learners transfer the new skill to their on-the-job work.

The IDs created 2 lessons, each highlighting a different category of welding defects. Lesson 1 highlighted defects that require measuring tools. Lesson 2 highlighted defects

that can be seen with the naked eye. Each lesson incorporated Merrill's principles, as shown in the following table.

Merrill's principle	Application within this training program
1. Problem-centered	Throughout the training program, the focus was on the "problem" of evaluating weld quality.
2. Activation	The training program began with a review of common welding terminology.
3. Demonstration	For each type of welding defect, the instructor showed a set of side-by-side examples explicitly comparing a "good" weld with a "bad" weld.
4. Application	Welders were given a series of practice activities in which they were asked to use established QA specifications to assess the quality of specific welds: Practice 1: Welders were asked to choose a weld with a known defect and accurately measure that defect. This was repeated 5 times. Practice 2: Welders were asked to choose a weld with an unknown defect and determine the measurable defects, if any, in that weld. This was repeated 5 times. Practice 3: Welders were asked to examine a set of welds and identify 1 example of each type of visible defect. Practice 4: Welders were asked to play the role of QA inspector and determine whether a specific weld passed or failed. This was repeated 5 times.
5. Integration	Welders were assigned a weld and asked to (1) determine the defect (or defects), if any, that were present and (2) explain how they made that determination. Each determination was reviewed by the group.

By the time they finished the new training program, each welder had evaluated at least 20 welds and received feedback on their evaluations. This emphasis on application ensured that the welders achieved the goal of using established quality assurance specifications to evaluate weld quality.

IPT-Grounded Advice
Effective instruction is much more than content presentation. It should include systematic steps to facilitate application of knowledge and produce desired performance outcomes. To do this, IDs should:

- Determine the specific skills to be learned and concentrate on the application of those skills
- Provide ample opportunities for learners to practice solving relevant real-world problems.

- Gradually reduce the amount of coaching provided to the learners in order to increase their confidence and allow self-evaluation/correction of their performance.

References

Merrill, M. D. (2002). First Principles of Instruction. *Educational Technology Research & Development, 50*(3), 43-59.

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