

Power Principles for eLearning Development*

Taken from an article written by Ruth Clark in the September 10, 2002 issue of the eLearning Developer's Journal

1. **Adding graphics to words can improve learning**
 - Mayer found an average gain of 89% on transfer tests for learners who studied lessons with text and graphics compared to learners whose lessons were limited to text alone
2. **Placing text near graphics improves learning**
 - In 5 out of 5 studies text near graphics yielded an average improvement of 68%
3. **Explaining graphics with audio improves learning**
 - When comparing animations explained with text to animations explained with audio, the narrated versions yielded an average improvement of 80%
 - Provide a “Replay” button as an option
4. **Explaining graphics with audio and redundant text can hurt learning**
 - Learners who experienced a graphic explained by audio alone had an average gain in learning of 79% when compared to those who experienced a graphic explained by a combination of text and narration that read the text (sensory overload)
 - Exception – in a **scientific explanation**, learning was significantly better with both narration and text combined
 - Words and text will benefit learning in the absence of a good illustration. Overload occurs during an animation in which learners have limited control over the pacing or during the presentation of complex new information.
5. **Using gratuitous visuals, text, and sounds can hurt learning**
 - In six of six experiments, learners who studied from a base lesson (void of extraneous text, video, background music, sounds), achieved an average gain in learning of 105%
 - Learners who studied an expanded explanation that used 500 words and several captioned illustrations with a lesson that used only the illustrations and their captions, achieved 69% more learning
 - Less is more
6. **Use conversational tone and pedagogical (instructional) agents to increase learning**
 - Based on the work of Reeves and Nass learning programs that engage the learner directly by using first and second person language yield better learning than the same programs using formal language
 - The use of a learning agent, such as a character moderator, can also improve learning
 - Learning was better when the agent’s words were presented in audio rather than in text and in a conversational style rather than a formal style
 - The agent did not need to be on screen to have a benefit – the voice alone was sufficient.
 - To be valid the agent needs to serve an instructionally valid role – not just appear as an on-screen character.