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By Eileen Smith
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Learning should not be a matter of stuffing a person's head full of facts, but rather a process of lighting a fire in people so they have the confidence to successfully learn and become motivated to take charge of their educational journey.

As Albert Einstein said: "Imagination is more important than knowledge." His point was that a vivid imagination is essential to the pursuit of knowledge.

One of the best ways educators can accommodate this is to engage a student's imagination through simulation. Failure is absolutely a possibility, however, and that is one thing that makes interactive simulations exciting as a learning tool.

Simulation, at its most basic stage, is imitation – of roles, processes, or conditions.

We have been doing simulation for centuries, if not millennia, starting with storytellers recreating a past event and leading us on an imaginative journey.

Simulation technology had its beginnings in the 1930s when Edwin Link created his Link Trainer to reduce the cost of training pilots. His machine was a skills trainer that helped pilots fly using only instrumentation, and became invaluable during World War II for training. This set the stage for the widespread application of simulation training in the aviation industry.

That begs the question, however, of whether simulation should be the only way in the future that people learn? No, no and no.

The use of simulation is not always the best solution for instruction; the best training/learning regime combines the appropriate technology for the educational situation. If you want to help someone understand the basic interaction of oil and water,

for goodness sake you don't need simulation! Just pour water in a clear glass, add some oil, and swish it around. The direct learning experience of the glass and visible interaction between the oil and water are all that is needed.

However, if you want to explore time or scale, for instance, simulation is a valuable tool.

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If you want to explore prehistoric Florida, I can use a simulation to take learners back 65 million years ago to the Cretaceous Period. If you want to teach students about nanotechnology, I can create simulations changing the scale of the particles so they can be more easily manipulated.

Interactive simulation – a blend of content, technology, processes and objectives – all revolve around the most important person in the learning picture: the learner. And more learning takes place in interactive environments than in passive ones.

Interactive simulations are designed to put learners into a dynamic situation where they seize ownership of the scenario from the simulation designers. As opposed to a training video – where the developers decide what information to present, what order to present it, and what factors drive the events – in an interactive simulation the learner drives their experience.

Rather than passive learning, active learning is taking place with shared control of the outcome. As decisions are made by the learner, the simulation reacts with good or bad results toward the end goal.

Failure is a powerful learning experience; we arguably learn more from our failures than our successes.

That is especially true if we can systematically examine our failures to explore why we failed. We can capture with the computer every move a learner makes, when they make that movement, and track their decisions over time. So the "what" and "when" questions are answered objectively by the computer.

This allows the human trainer/educator to focus on what computers do not do well: examine the "why."

That makes the computer and the human instructor a compelling team, and jointly, a powerful tool for learner success.

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