ADVANCED DESIGN FOR ADVANCED TECHNOLOGY

The Future of Maintenance Training 2011

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How to ensure training technology design practices produce desired results.

Instructional Systems Design expert Ian Gaither sat down with us to address some of the most common questions asked when incorporating advanced technologies in training programs

FMT: Can advanced training technologies fulfill all training needs?

IG: New technologies have changed what is possible. Carefully applied, they can act like performance power-tools by enabling students to engage in the tasks and thinking-processes that they will actually use on the job.

To be effective, these technologies must be applied as part of a strategy to achieve specific goals, both for the individual learner and the larger training/operations organization.

Currently, many training organizations are trying to:

- provide job-ready graduates in less time;
- increase problem-solving and practical skills of students;
- develop these skills with minimal access to "hard" training aids;
- reduce the number of qualified technicians required to support schools; and
- provide access to learning/ performance support throughout the career of the technician.

Interactive 3D simulation is one tool that helps to meet these objectives by providing students with access to realistic learning opportunities — anytime and anywhere the student is connected. Depending on the context, these tools can be applied as pre-rehearsal, refresher or continuation training.

During the initial phases of training, students need to develop good skills and safe shop practices. For them, using virtual trainers for pre-rehearsal can go a long way to preparing them for their time in the shop and on a hard-trainer. By using interactive 3D simulations, instructors can provide supervision and real-time feedback as the student practices tasks on a computer which reduces the need for instructor-led teaching.

A student can feasibly build the majority of their system-specific skills in a distributed, self-paced, instructor-facilitated environment, before arriving onsite for a brief period of guided hands-on-metal practice (for the few specific skills that are identified as requiring true hands-on practice). Final evaluation can then be provided in both a virtual and real environment.

FMT: Can we use legacy design methods to create technology-centric performance solutions?

IG: Without revisiting legacy design practices we risk missing opportunities to use advanced technology to achieve better performance.

Most interactive training technology is built to enhance or replace parts of an existing instructor-led program. These programs are typically defined and bounded by the available training aids (aircraft, hard trainers, test equipment, etc.), the proficiency of the instructors, and the legacy training design that guides the instructional events.

Because of logistical constraints, theory and practice are often designed and developed in their own silos, with theory left to be determined by an instructor's own knowledge and the time allotted to a teaching point. The selection of practical tasks is too frequently determined by the set of things that can be done to the training aid without putting it out of service for too long.

The practice of converting instructor-led courses into an electronic format may seem

like a "no-brainer", but we risk re-creating and concretizing the wrong things if we aren't careful.

For example, in one program, a 45 minute detailed wiring diagram discussion had been converted to a 45 minute narrated, animated walk-through. A casual check with the operational community revealed that the level of detail was far beyond what most expert technicians would ever need.

Here we have an example where the technology reduced the burden of using an instructor to deliver content, but probably did very little to create a more able technician. So, it is important to keep the broader goals in mind.

The increased accessibility to advanced learning technology through the Internet

should allow us to stop designing "one stop shop" courses where we attempt to teach every student everything they will ever need to know. Now, we can build upon their knowledge as needed because they will have access to learning and support materials throughout their career.

We serve students (and their employers) much better by giving them lots of experience doing the things they will do in the first few months of work, then adding on just-in-time modules later as they need, are ready for them.

Well-designed interactive training technologies should allow us to blow through some of these legacy limitations and figure out innovative ways of transporting the learner into realistic and relevant aspects of their jobs, whether they are troubleshooting problems using scenarios and electronic technical manuals, or actually manipulating parts and pieces in a 3D environment.

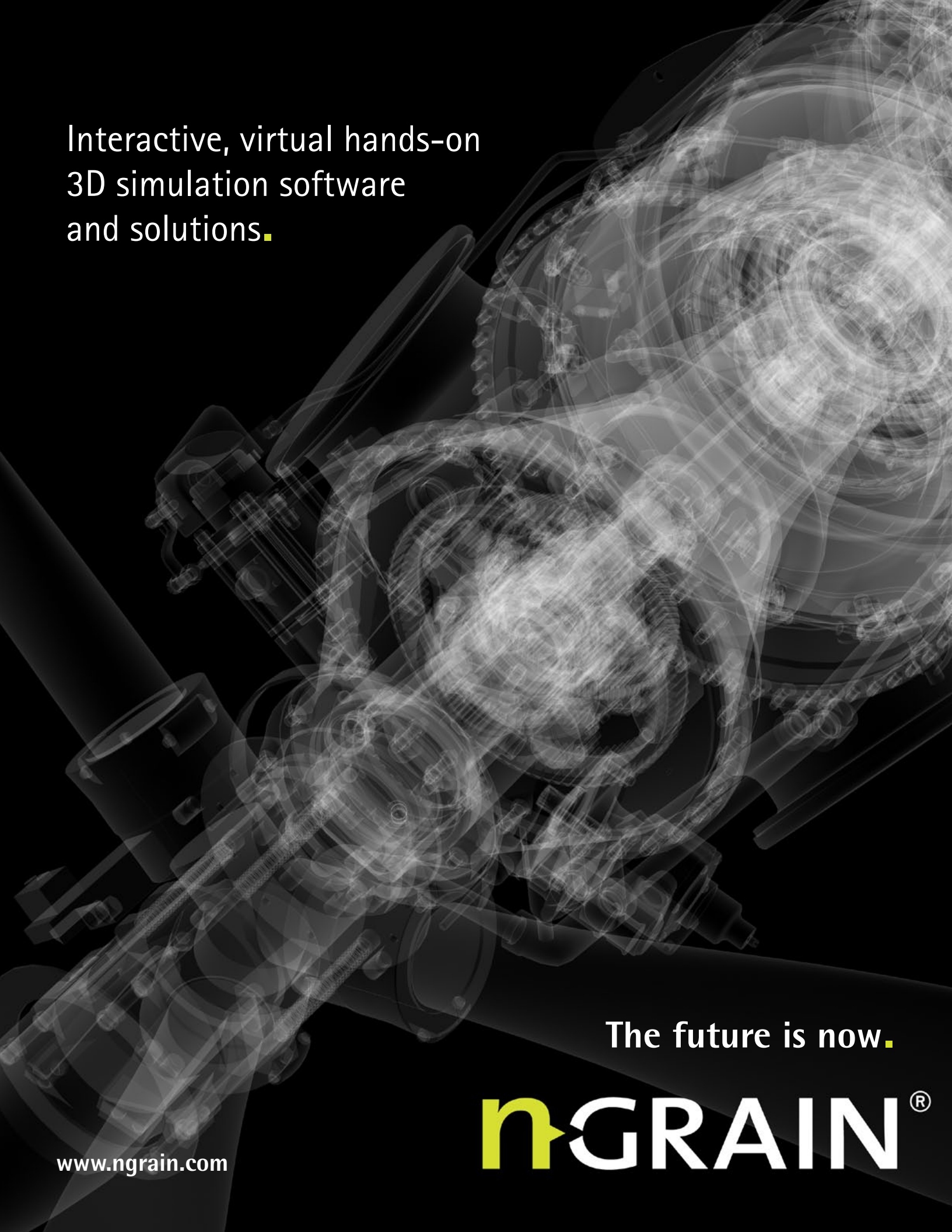
FMT: What are the characteristics of an advanced design method?

IG: Good instructional designs share common characteristics in that they consider and provide guidance in order to achieve a desired result - both for the individual performer and the organizations they work in.

- RELEVANT: Every training system serves an operations community. Staying connected to that community will help ensure that the training system targets actual gaps. Use questionnaires and interviews with the operations clientele to identify the specific problems that need solving.
- PRIORITIZED: Not all problems are created equal. Upgrades to equipment, emergent problems in aging fleets, and changes to missions can create needs that should be addressed sooner rather than later. It is important that these challenges are addressed according to their importance so that limited budgets and resources don't get spent solving the wrong problems.
- ACTION-ORIENTED: Once the performance gaps are identified and prioritized, we need to figure out what activities can support development of the desired skills. Learning is an action verb: it occurs when we are engaged in realistic challenges and given timely, meaningful feedback about our work. Advanced technologies provide the opportunity to spend the majority of learning time in guided application rather than in passive reception. We need to take advantage of this capability by matching the desired activity to the available technology and leave any information that does not support skill development on the cutting-room floor.
- SPECIFIED: Designing technology solutions requires the input of many different people with a variety of skill sets. Much of the design task itself will involve translating the desired activity into language, imagery that graphic artists and programmers can understand act upon. It is important that nothing is lost in translation.
- HOLISTIC: Many excellent technologies fail to deliver their promised impact because they are introduced into a system that is not ready for them. Shifting roles, responsibilities and realities create a need for thoughtful change management. Simple steps, such as the creation of good instructor guides, can ease the acceptance and support the future effectiveness of the intervention.

In reality, good design for advanced technology resembles good design for traditional technology. To achieve the goal of creating a better technician faster, we must ensure that designs align with organizational needs, surpass legacy constraints, and actively engage learners in the real-world challenges that they will encounter on the job.

Ian Gaither is founder of Instructio, which provides performance consulting, and training program design and development. www.instructio.com.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