How Do We Learn?

Simulation professionals need to master new processes and tools that are fundamentally transforming the profession. With the explosion in the amount of simulations, including new engineering methods that companies are predicting going forward, engineers simply have to become better prepared. For many mid-career professionals, coming out the other end of this tunnel is not without a bit of hesitation. Why? Perhaps the process of learning can explain.

Learning is a basic, adaptive function of humans. People are generally flexible learners and are active in acquiring knowledge and skills. Much of what people learn occurs without formal instruction, but highly systematic and organized information systems—reading, mathematics, the sciences, literature, and the history of a society require formal training. Over time, many subjects have posed new problems for learning because of their growing volume and increasing complexity. Learning to use software applications, no matter how much the software emphasizes ease of learning and ease of use, is no exception.

The younger you are, the easier it is to learn. Why is that? Kids are more flexible, adaptable, eager and less afraid to make mistakes. There is a certain freedom to learn that comes with being young that regrettably, we lose the older we get. In their article, “30 things we know for sure about adult learning”, Ron and Susan Zemke had some interesting observations:

- **By doing** – Adults have a need for application of “how to” as the primary reason to begin a learning project. Regardless of media, straightforward how-to is the preferred content orientation.

- **Focus** - Adults prefer single concept, single theory courses that focus heavily on the application of the concept to relevant problems.

- **Avoiding embarrassment** - Adults have a lot more to lose in a classroom setting because of self esteem and ego. Making mistakes in front of peers is just not comfortable.

- **Precision** - Adults compensate for being slower by making fewer mistakes.

- **My time** - Adults prefer self-pace over group learning led by a professional. They select more than one medium for learning and they desire to control the pace and the start/stop times.

Toyota is consistently one of the largest, most profitable and most valuable brand car companies in the world. They are also the best at training their employees. They spend 5X the industry average on training. Some of the key principles of Toyota’s elaborate system for constantly developing its employees are:

- **Learn by doing**
- **Learn in small chunks**
- **People learn gradually**

Toyota is most proud that through its comprehensive training, it gets “extraordinary results out of ordinary people”.

With these concepts in mind, we set out to help our professional users learn the latest work methods and techniques with innovative voice led, self paced interactive learning for MSC’s new Apex product line. Our core concepts were that the learning has to be:

- Free and instantly available.
- Voice led to hold the learner’s attention and more easily convey the concepts.
- Inside of MSC Apex, so it is guided learning within the application.
- Structured so that the person doing the exercises instantly experiences success.
- Focused on practical techniques that engineers can utilize immediately in their everyday work.

For MSC Apex Arctic Wolf, we are introducing 7 Interactive Tutorial videos. These include:

- **MSC Apex Introduction** - Introduces the MSC Apex User Interface and demonstrates new innovative ways to interact with your model.
• **MSC Apex Model Browser**
  - Organizes and gives you easy access to the individual components of your model. This video shows you how to zoom, color, show/hide and filter objects in your model.

• **Direct Modeling Capability**
  - A tutorial that demonstrates solid modeling cleanup and repair. You can also see how geometry changes affect your mesh in real time.

• **Surface Geometry Repair**
  - Demonstrates how MSC Apex can be used to remove gaps, slivers, cracks, unwanted geometry, holes and other features that would adversely affect your mesh.

• **Midsurface Creation**
  - Demonstrates creation of midsurfaces to allow the use of a two dimensional mesh to represent solid geometry. MSC Apex makes this process very simple, and the resulting surfaces can be modified to ensure that they are positioned exactly as you desire to properly represent the original solid geometry.

• **Midsurface Geometry Repair**
  - As more complex solids are modeled with two-dimensional elements, the midsurfaces require more cleanup. Using MSC Apex's direct modeling techniques, this process can be completed in a matter of minutes, not days.

• **Feature Based Meshing**
  - Applying mesh patterns to recognized geometric features results in a better mesh. This video shows both conventional and feature based meshing techniques on a real world part.

The interactive tutorial videos have been constructed so that they focus on processes that otherwise would be difficult and time consuming. Being able to accomplish these tasks quickly and easily adds a “fun” aspect to the learning process. Geometry files are provided with narrated movie clips that explain exactly what you need to do so that your work will be smooth and easy. There is no need to waste time figuring out the steps.

Also included in MSC Apex Modeler are over 80 short videos that demonstrate specific features in two minutes or less. These movies are accessible directly from the tools in the application. They are also organized in a navigational tree in a movie selector that starts with the application and can be accessed at any time.

Some of the secrets for an addictive user experience reside in the design of a few key features of the user interface.

A strong driver for our design team was to reduce the overall number of tools in the application, maximize canvas area, and minimize the use of menus and windows. By making tools both contextual and versatile, we believe we have reduced the overall count by one order of magnitude as compared to existing solutions.

Finally, we also support the user with at-mouse and workflow instructions so the user at all times knows what to do next, and has a detailed information of the tool shortcuts, and selection/execution paradigm. These are both again contextual and interactive.

Although we can’t promise that you can learn as if you were 16 again, these tutorials will provide you with a focused, engaging and hands on way to learn by doing according to your own pace and time schedule and in bite size lessons. We welcome people of any age to explore this material. Remember, it is about doing and then learning will come.◆