Web Courseworks is a learning technologies and consulting company. We help associations leverage technology and drive highly successful education initiatives that push them to be the leading provider of education in their field. Our innovation is unmatched because learning technology is all we do. We believe in channeling association learning efforts to deliver on the promise of revolutionary, performance improvement.
WHY DO EXPERTS USE VP SCENARIOS?

**Custom Design Possibilities**

The flexibility and interactivity of eLearning platforms allow for complex clinical cases to develop organically in the mind of the learner through the use of dynamic conversations and exploratory decision branching techniques. Information can be presented in an intuitive, conversational format to mimic real-life clinical encounters with patients. Simulations and scenarios can easily be altered to accommodate everything from basic situations designed to reinforce formative points of knowledge, to complex summative assessments of knowledge and skill.

Virtual Patient Scenario Authoring | Tips and Guidelines

ACCESSIBILITY & RELIABILITY

Learners used to only experience clinical-type encounters through the use of mock patients or static textbook examples, but the ability to integrate interactive items like X-Ray images, audio heart sounds, patient charts and test results in VP scenarios means the core experience is now accessible to learners anytime and anywhere. Educators and examiners gain the ability to “sit in” on every experience thanks to decision-tracking and unique feedback methods available in the eLearning environment. Each learner can encounter the same virtual patient but still approach the scenario in their own way, so results and feedback will provide a reliable basis for evaluations.

The use of VP simulations online also opens up opportunities to deal with CE requirements that require evidence of performance improvement (PICME). In some ways, eLearning actually brings educators and learners closer together than some traditional assessment methods do.

WHAT IS A VIRTUAL PATIENT SCENARIO?

A Virtual Patient (VP) scenario is an interactive, computer-based learning activity designed in a narrative format that mimics a real-life clinical situation. VP scenarios are created for the purpose of medical training, education and assessment. Information comes alive for learners when a virtual medical case is embedded with decision-making tools and interactive multimedia components. Learners can experience dynamic clinical processes as they assume the role of a health care professional within a safe and controlled virtual environment. Medical education experts have started to gravitate towards VP scenarios because the framework allows instructors to build authentic opportunities for learners to manage complex clinical situations, and practice making important diagnoses and other treatment decisions.
**Models for Virtual Patient Scenarios**

<table>
<thead>
<tr>
<th>Models</th>
<th>Description</th>
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<tbody>
<tr>
<td>Self-directed learning</td>
<td>A freestanding case accessed by individual learners and completed with limited interaction with the case author, educators or experts.</td>
</tr>
<tr>
<td>Problem-based learning</td>
<td>Small group learning with a facilitator where students access and engage as a group with the VP case.</td>
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<tr>
<td>Distance learning</td>
<td>A learner independently accesses an online VP case but has remote synchronous (chat) or asynchronous (discussion board/email) access to the expert/author.</td>
</tr>
<tr>
<td>Sequenced or blended learning</td>
<td>The learner engages with a VP case in conjunction with supportive didactic instruction, small group discussion or other simulation exercises.</td>
</tr>
<tr>
<td>Assessment</td>
<td>Learner is assigned a VP case for formative or summative assessment of clinical skills.</td>
</tr>
</tbody>
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**Cutting-Edge Content Creation**

VP models should integrate interactive items designed to closely mimic a medical practice environment (as noted above), but the decision on whether course content should originate from a real clinical case or an imagined scenario is something left to the authors and experts behind VP courses. Actual clinical cases can provide realistic backdrops for learners, but patient privacy and confidentiality issues arise when transplanting real cases into a VP course.

Original content creation can eliminate ethical issues of consent and privacy, but the process will require more effort and creative uses of multimedia. An advantage under any VP scenario is that new clinical approaches and treatment methods can be added to update course content and keep curriculums on the cutting-edge of medical advancements.

**Conceptual Designs for Cases**

- **Linear Cases** with limited navigational autonomy that guide learners through material to illustrate a particular approach or highlight a specific piece of information.
- **Exploratory Cases** with increased navigational autonomy that allow learners to determine a differential diagnosis and make decisions that carry positive or negative consequences.
- **Branching Cases** with complete navigational freedom that test the highest levels of diagnostic reasoning and clinical decision-making skills among learners.

**Tips for Authoring Virtual Patient Scenarios**

“Manage case complexity and match it to the case objectives”

Because virtual patient cases can provide a powerful way to teach students to obtain meaningful information from realistic situations, it is necessary to determine the level of case complexity. Four details can help determine this case complexity: (1) the level of the target learner, (2) the content or story of the patient case, (3) the knowledge area that is required in order to find the resolution and (4) the cognitive load that is associated with the case.

“Manage case complexity and match it to the case objectives”

It is important that the content of the virtual patient case captures the interest of the learner while also including an ample amount of information “to encourage the learner to truly identify with people, their problems and situation” (Posel, N., Fleiszer, D., & Shore, B.M., 2009, p. 702). While linear cases guarantee that all learners review the same material and should be used for beginning students, the most advanced case type, branching cases, are most realistic (Posel et al., 2009, 701-703).
Dr. James B. McGee (2012) of the University of Pittsburgh School of Medicine has suggested that authors and experts should follow a series of steps when creating virtual patient scenarios like that shown below.

- **List Learning Outcomes**
  Create an explicit, measurable goal for the learning module. What are you trying to teach?

- **Define the Audience**
  Identify target-audience-based factors like level of training, healthcare discipline and learning environment.

- **Assess Environment**
  Recognize potential barriers to learning, such as technological limitations and time requirements.

- **Select a Scenario Model**
  Decide which learning model best fits the needs of the target audience.

- **Design a Compelling Story**
  Engage learners by crafting a scenario with a natural narrative arc.

- **Create Ideal Decision Path**
  Set up the correct path where learners make all of the best decisions in the scenario.

- **Add Branching Decisions**
  Create additional, sub-optimal branching choices that deviate from the ideal path.

- **Add Adaptive Feedback and Multimedia Elements**
  Develop the desired interactive elements and feedback methods for the scenario.
The final step of the process described by Dr. McGee (see the sidebar) highlights the importance of adopting an integrated and sequential approach to scenario creation. The multitude of interactive feedback and multimedia elements available to authors makes the early identification of learning objectives and narrative arcs even more important. The VP model presents a variety of options for how feedback can manifest on-screen, so authors must have a solid grasp on the needs of their audience and the desired learning objectives before attempting to incorporate high-level interactivity features.

Dr. McGee has identified seven basic options for delivering feedback:

- **Narrator-based, didactic comments** made by the narrator after branching decisions
- **Patient-based, conversational feedback** made by the VP after branching decisions
- **On-screen scoring** provided for diagnostic decisions at key points in the simulation
- **Clinical outcomes** that provide assessments by tapping into the narrative structure
- **Face-to-face facilitator comments** provided by on-site experts
- **Group discussions** that occur in online chat rooms, via email or in live interactions
- **Linked or embedded external resources** like journal articles, cases or support tools

**THE CHALLENGE OF ENGAGING EXPERTS FOR COLLABORATION**

The fundamental challenge to creating a great virtual patient scenario revolves around finding ways to tap into the tacit knowledge of subject-matter experts and communicate those key points to learners. The tacit knowledge of experts is often embedded in real-life experiences and intertwined with specialized spaces – in this case it could be the laboratory, clinic, operating room, etc. – which is why it can be difficult to convey those insights didactically (Aleckson & Ralston-Berg, 2011). The narrative structure of virtual patient scenarios creates opportunities for experts to contextualize and communicate their knowledge under more natural circumstances, but the process of engaging experts can still be challenging.

In academic settings where experts often double as trained instructors, the sharing of viable scenarios and choices can be easy, but in association settings where experts may not have experience with virtual scenarios there is a risk that content can turn trite. A narrative structure provides some value on its own, but the role of an expert is to ensure that the narrative is both convincing and designed to meet specific educational objectives. After all, the purpose of a narrative in the virtual patient context is to immerse...
ABOUT WEB COURSEWORKS


Web Courseworks has designed and developed a robust branching authoring tool within its CourseCreate product. Narrative decision-making tools from its scenario building engine can accommodate simulations of any level of complexity. Its decision tracking system is capable of delivering targeted information to learners and educators, while the integration of multimedia components like video, audio and photos takes just a few clicks. Most importantly, the expert staff at Web Courseworks is always available to provide teachers and experts with support at every stage of the creation process. Visit www.webcourseworks.com for more information.

REFERENCES


learners in the mind of the medical expert and provide insights on the best clinical problem-solving processes and techniques.

Quality web-based authoring software can improve micro-collaboration with experts by allowing them to access course content anywhere at any time. When comments and corrections can be made by experts inside a course, there is suddenly space for clear in-context communication. This high-end level of collaboration can make efficient use of an expert’s time and lead to better sharing of the tacit knowledge that should underpin any VP scenario.

MORE TIPS FOR AUTHORING VIRTUAL PATIENT SCENARIOS

“Use your virtual patient case to encourage collaboration and collaborative learning”

It is important to research each authoring tool and software company, learn of its resources and skills, and assess its willingness to support the teachers through the process. The number of eLearning software producers has grown in recent years, and each offers different advantages to users. Some companies offer open source or “free” software packages, while others offer more refined software packages and the added advantage of more robust training and support (Posel et al., 2009, p. 704-707).