Online resources for health care simulation

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The uses of medical simulations have become pervasive in medical education. Educators, doctors and researchers spend hours to search and identify simulations that are appropriate and could be integrated into a curriculum. This short list provides three categories of websites that include a variety of simulation resources, materials and educational products. Online simulation is a dynamic field in which new developments and resources appear virtually every month. Consequently, this list is not intended to be a comprehensive set of resources but rather to provide a sample of resources that can be accessed easily and integrated into learning activities in a practical and expedient manner. Please note that some resources require a paid membership for full access.

**ORGANIZATIONAL RESOURCES**

**Center for Simulation, Safety and Advanced Learning Technology (University of Florida)¹**

The centre provides access to its online Virtual Anesthesia Machine (VAM) and other educational resources, such as videos and faculty community.

**Health Education Assets Library (HEAL) – International Association of Medical Science Educators (IAMSE)²**

HEAL is a digital repository that allows medical educators to access over 22,000 medical education resources. HEAL is supported by the IAMSE. Resources include: images, video clips, animations, presentations and audio files.

**International Nursing Association for Clinical Simulation and Learning (INACSL)³**

INACSL promotes research and the dissemination of evidence-based practice standards for clinical simulation methodologies and learning environments. Resources available to members include: tools for managing a simulation centre, instructions for setting up labs, teaching strategies and simulation scenarios.

**MedBiquitous Consortium⁴**

According to the information on their website ‘MedBiquitous creates technology standards to advance healthcare education and competence assessment’. Resources include: standards and specifications for learning activities, assessment and virtual patients.

**MedEdPORTAL – Association of American Medical Colleges (AAMC)⁵**

MedEdPORTAL is a free online peer-reviewed publication service provided by the AAMC in partnership with the American Dental Education Association (ADEA). Resources include: tutorials, virtual patients, simulation cases, lab guides, videos, podcasts and assessment tools.

Society in Europe for Simulation Applied to Medicine (SESAM)\textsuperscript{6}

The SESAM website describes the organisation as ‘a rich source of information for simulation enthusiasts from all over the world and from different professions and disciplines’. Resources include: lists of recommended articles and books, meeting notices and a simulations LISTSERV.

Society for Simulation in Healthcare (SSH)\textsuperscript{7}

According to the information on their website, ‘SSH promotes improvements in simulation technology, educational methods, practitioner assessment and patient safety that promote better patient care and can improve patient outcome’. Resources include: simulation centre listings, tricks of the trade, videos and more.

COMMERCIAL RESOURCES

DxR Development Group\textsuperscript{8}

DxR products include performance-based testing tools, problem-based learning software and virtual patient software.

CAE Healthcare (CAE)\textsuperscript{9}

Formerly known as Medical Education Technologies, Inc. (METI), this company markets physical simulators as well as tools for the development, sharing and implementation of patient cases and courses for those working with simulation.

Laerdal\textsuperscript{10}

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RESOURCES FOR SIMULATION IN VIRTUAL ENVIRONMENTS

Screen-based virtual environments provide a platform in which health care simulations can be created that allow multiple participants to be involved in interactive clinical training scenarios from disparate locations using widely available technology resources. Some of the more commonly used platforms include Open Simulator\textsuperscript{©}, Second Life\textsuperscript{©} and Unity\textsuperscript{©}.\textsuperscript{11-13} The following interest groups and directories can be useful resources for those interested in the development of simulation in virtual environments.

Applied Research in Virtual Environments for Learning (ARVEL) SIG\textsuperscript{14}

An American Education Research Association Special Interest Group for those interested in the use of virtual environments for teaching and learning.

Games & Simulation for Healthcare\textsuperscript{15}

This website hosted at the University of Wisconsin provides a searchable database of simulations and simulation resources available on the web or in virtual environments.

Serious Games and Virtual Environment Interest Group\textsuperscript{16}

A Society for Simulation in Healthcare group for individuals interested in promoting the use of game technologies and virtual environments in health care professions education.

GETTING STARTED

Integrating simulation into one’s educational programmes can be daunting to those new to the process. It is a good idea to start with a small project. Look for gaps in the experiences of your learners. Is there a condition that is hard to identify because it occurs so rarely that newly qualified doctors simply have no experience with it? Perhaps this is an opportunity to create a self-directed interactive virtual patient exercise in which the learner must diagnose and propose treatment for such a condition. Would you like to conduct more interprofessional learning activities but conflicting schedules and scattered locations just don’t allow for such activities? When you plan a team exercise in a virtual environment it won’t matter if the participants are across campus or across the globe. They can participate in real time in an immersive environment in which they will truly ‘feel’ present to one another. What about bio and chemical hazards? Conducting a bioterrorism drill in real life is costly and time consuming. Creating a similar drill in a hybrid environment using a combination of physical simulators and screen-based tools can allow you to conduct such an exercise in an economical and efficient way, with increased data collection as a likely bonus.

Many of the skills you teach and assess may be just too important and too critical to allow your learners to learn the ropes and practise on real patients. In addition to the resources we have already shared with you, guidance can be found in ‘Innovative Simulation for Assessing Professional Competence: From Paper and Pencil to Virtual Reality’ regarding the use of simulation in the assessment of professional competence.\textsuperscript{17} Not every procedure can be learned online or through simulation, but if you search the repositories we have listed in this guide,
you may be surprised at the creative solutions and resources you can find. Many of the resources we have identified include mailing lists or other types of community forums.

When you find a topic that interests you, join the forum. The members are busy professionals like you, but you will find them sharing wonderful and creative ideas that will help you get your own project off the ground. Good luck. We hope you will soon find yourself with your own success stories to share.

REFERENCES

11. http://opensimulator.org
15. http://Healthcaregames.wisc.edu

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