

Glossary

Simulation refers to a system, model or device used in a healthcare education setting which imitates characteristics or behaviours of a patient, in part or as a whole, on a wide range of anatomical, physiological and pathological conditions.

Simulation is classified as:

Life Simulation — when real people act upon real people to simulate a condition or situation. In this case the simulator is a live person such as an actor.

Standardized patient is an individual who has been carefully trained to act as a real patient in order to simulate a set of symptoms or problems. A standardized patient presents an illness history as well as physical, emotional, and personality characteristics during physical-patient interactions. The standardized patients have been successfully used in medical education, evaluation (such as OSCE), and research.

Virtual Simulation- when real people from the real world act upon specific equipment to trigger a simulation process in a virtual environment. Today many of the workstations, workbenches, mannequins and other equipment available for medical training fall into this category and provide medical simulation in a virtual environment.

Constructive Simulation- when people act upon simulation equipment initially to perform a simulation in a virtual environment. These elements then act on other elements of the simulation to trigger another specific response. These internal elements can create a chain of infinite simulation environments for task performance and/or response to the command. In this type of simulation, once the simulation is started (by real people), one part of the machine/computer will act on other parts of the machine/computer and continue to initiate or maintain multiple specific tasks or conditions. A good example of this type of simulator in the medical field is the mannequin made by Medical Education Technologies Inc. (METI) and the interactive on-line software “CyberPatient”.

For section two of this survey, please indicate if you do any of these types of simulation activities.

Simulators can be classified by the nature of technology as:

PC- Based interactive multimedia training systems- A good example on line virtual environment, CyberPatient and Learning Objects. (Learning Objects- are online computer based virtual education tools that can be used and reused infinitely).

Digitally Enhanced Mannequins- Commercial-off-the-shelf technology, suitable for individual and team training. A good example of this type of Digitally Enhanced Mannequins may include- HPS and ECS made by METI, SimMan made by Laerdal, Harvey (a cardiopulmonary simulator) and others.

Virtual Reality workstations are computer-based simulators which represent visual or other realisms in response to the user's actions. Examples include *GI Mentor* for endoscopic and *SurgicalSim* for laparoscopic skills training.

Task-trainers refer to physical simulators designed to train specific tasks, such as plastic simulators for training skills of lumbar puncture, eye examination, IV injection, central line, surgical skills and other tasks for practice of healthcare delivery.

Basic Anatomical Models are non-interactive anatomical parts of the body or the whole body that is used for education. For the purpose of this survey basic models should not be considered as a simulator.

Total Immersion Virtual Reality (TIVR) - Evolving technology that provides realistic simulation for the entire environment in virtual space. This type of technology is under development and may not be applicable for your Institution.

Comprehensive Computational Models (Combining Function and Structure) - Integrated modeling of human systems, from molecular to system level; predicts problems, simulates responses to countermeasures or interventions. This type of technology is under development and may not be applicable for your Institution.

Simulators can be classified by the complexity of functionality and interactivity as:

Low-fidelity Simulators (low degree of realism and functionality) are physical models that are capable of passive display of a specific function and/or procedure but has no capacity to react automatically or have a precondition response. Good examples of this type of simulators are basic anatomical models, urology training or laparoscopic training boxes and others.

Medium-fidelity Simulators (some degree of realism and functionality) have an automatic preconditioned response to a limited number of physiological functions and procedures under the human body structure, which are controlled by a computer. For example, *SimMan* (Laerdal) or *ECS* (METI), GI mentor, Lap-mentor and others..

High-fidelity Simulators (high degree of realism and functionality) are real-time interactive simulators that simulate a variety of body functions and procedures, which can be altered automatically in response to drug injection oxygenation or other factors. The high-fidelity simulators can be programmed to create simulations of life-threatening emergencies. HPS (METI) and PediaSim (METI) are two examples.

Virtual patient refers to computer-based interactive patients simulating various illness conditions. Virtual patients provide opportunities for healthcare professionals to develop clinical skills such as making diagnoses and therapeutic decisions during patient interactions.

Expert systems are intelligent systems integrating experiences and rules from healthcare experts for diagnosis and treatment. Expert system provides a tool to improve the decision-making process of healthcare providers.

Simulation-based education in healthcare aims at teaching diagnostic and therapeutic procedures, medical concepts, and decision-making processes to healthcare professionals using simulators as a tool.

Simulation Course: a discreet curriculum developed to address a specific objective(s).

Simulation Centre: a physical structure that offers simulation courses and/or is the base of a simulation program.

Simulation Program: an organization that consolidates and organizes simulation courses under a common mission statement and goals.

Simulation Research: a systematic and/or academic approach to evaluating simulation courses for the purpose of validating the course/modality, improving the curriculum, advancing simulation science or addressing patient safety. This would include quality improvement/assurance.

Personnel: employees of the simulation program

Faculty/Instructors: primarily appointed to departments/institutions outside the simulation program and utilize the program for education and research

Instructional Design: how a course is developed and delivered using a variety of technologies teaching and learning strategies (including debriefing) that reflect the course learning objectives