

Healthcare Simulation

Dictionary

Second Edition (2.1)



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Contributors

Editor

Lori Lioce
Society for Simulation in Healthcare

Founding Editor

Joseph O. Lopreiato MD, MPH, CHSE-A

Associate Editors

Mindi Anderson
Todd Chang

Desiree Diaz
Dayna Downing

Jamie Robertson
Andrew Spain

Terminology & Concepts Working Group

Guillaume Alinier
Heather Anderson
Krista Anderson
Zalim Balkizov
Melanie Barlow
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Terri Sullivan
Demian Szyld
Deb Tauber
Callum Thirkell
Kristina Thomas Dreifuerst
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John Todaro
Elena Tragni
Isabelle Van Herzeele
Karen Vergara
Sylvonne Ward
Doris Zhao

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Preamble

In January 2013, an international group of simulation experts gathered in Orlando, Florida, U.S.A., to form a working team whose mission was to create a dictionary of terms used in healthcare simulation. This group recognized a need to compile terms that had been completed by other groups in healthcare simulation and to add more terms. The document you see represents the work of many individuals and their societies to compile and refine the dictionary. The goal of this project is to enhance communication and clarity for healthcare simulationists in teaching, education, assessment, research, and systems integration activities. The Agency for Health care Research and Quality (AHRQ) has partnered with the Society for Simulation in Healthcare (SSH) and its many affiliates to produce this comprehensive Healthcare Simulation Dictionary and disseminate it widely as part of SSH and AHRQ's mission to improve patient safety, which includes simulation research.

Since the first edition of the dictionary in 2016, SSH and international affiliate member representatives have met at the International Meeting for Simulation in Healthcare annually to define the process for revision and to discuss advances in simulation research, expansion of terms used in research, simulation certification, practice analysis research, and simulation accreditation terminology. Since the first edition of the dictionary in 2016, SSH and international affiliate member representatives have met at the International Meeting for Simulation in Healthcare annually to define the process for revision and to discuss advances in simulation research, expansion of terms used in research, simulation certification, practice analysis research, and simulation accreditation terminology. By 2019, a clear need for updates and additions to the Dictionary were recommended to support the expanded terms used in healthcare simulation. Further, in 2020, there was a clear need identified to add terms specific to simulation taking place in ways other than in-person (e.g., in a simulation center). In the second edition (v2.1), the following changes can be found:

- A section on common abbreviations was added, and 27 abbreviations were included.
- 49 new terms were added.
- 13 terms were expanded with additional definitions as reflected in the literature.
- An additional referent of “consider also” was added for terms that are not currently in the dictionary, but would support understanding of defined terms.
- A new section titled “Terms No Longer Recommended for Use by SSH” was added.

This is a living document and represents the sum of the work at this moment. Terms and definitions will continue to change and be clarified, added, or deleted over time.

The intent was to be inclusive of the various definitions in use, not to exclude any definitions or areas of healthcare simulation.

The definitions show how the terms are being used in healthcare simulation. It is not intended to prescribe or dictate one particular definition over another.

This dictionary focuses on healthcare-simulation-specific terms and meanings. Many terms that are generally used in education (e.g., educational design) and healthcare (e.g., ventricular fibrillation or anxiety) are not defined. Please refer to standard dictionaries and resources for these definitions.

This list of terms is not a taxonomy, nor should it be used as such. It may inform taxonomical work.

Terms that have been identified as potentially controversial have been noted with a * prior to the word.

The terms and spellings are written in standard American English. This was to aid in reducing clutter and support translation to other languages.

The etymologies are sourced from etymologyonline.com and are provided to give insight into word origins.

To date, the first edition of the dictionary has been translated into several languages, including Chinese, Italian, Russian, and Spanish by volunteer translators. These translations may be found at the bottom of the webpage at www.ssih.org/dictionary. If you are interested in translating the dictionary into another language, please contact SSH at communications@ssih.org and specify your request.

As a living document, all are encouraged to submit feedback using the form located at www.ssih.org/dictionary. We realize there may be better insights into other terms or definitions, additional references, etc. Citations have been included wherever possible. Should you know of additional terms, definitions, and/or missing citations, please submit those as above via the Dictionary Feedback Form.

The Society for Simulation in Healthcare (SSH) acknowledges the participation and input of many individuals and also the International Societies they represent. Without you, this would not have been possible! Thank you for your time and efforts in the creation and revision of this dictionary over the last seven years. We look forward to your continued contributions.

Lori Lioce DNP, FNP-BC, CHSE-A, CHSOS, FAANP (editor, 2nd edition)

Joseph Lopreiato MD, MPH, CHSE-A, FAAP (founding editor)

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Common Abbreviations in Healthcare Simulation

AI: Artificial Intelligence

AR: Augmented Reality

CAVE: Cave Automated Virtual Environment

CHSE®: Certified Healthcare Simulation Educator®

CHSE-A®: Certified Healthcare Simulation Educator-Advanced®

CHSOS®: Certified Healthcare Simulation Operations Specialist®

CHSOS-A™: Certified Healthcare Simulation Operations Specialist-Advanced™

CONSORT: Consolidated Standards of Reporting Trials

GTA: Genitourinary Teaching Associates

HSTS: Healthcare Simulation Technology Specialist

IPE: Interprofessional Education

KSA: Knowledge, Skills, and Abilities (or attributes)

M&S: Modeling & Simulation

MUTA: Male Urogenital Teaching Associates

OS: Operations Specialist

OSCE: Objective Structured Clinical Examination

PETA (or PTA): Physical Exam Teaching Assistant

SBAR: Situation, Background, Assessment, and Recommendation

SBE: Simulation-based Education

SBME: Simulation-based Medical Education

SME: Subject Matter Expert

SP: Standardized Patient (or Simulated Patient)

TACSIM: Tactical Simulation

TTX: Tabletop Simulation

VR: Virtual Reality

WAVE: Wide Area Virtual Environment

XR (sometimes MR): Mixed Reality

A

***Actor** \ 'ak-tər \ *noun*

Etym. late 14c., “an overseer, guardian, steward,” from Latin *actor* “an agent or doer,” also “theatrical player,” from past participle stem of *agere*. Sense of “one who performs in plays” is 1580s, originally applied to both men and women.

Definition

- In health care simulation, professional and/or amateur people trained to reproduce the components of real clinical experience, especially involving communication between health professionals and patients or colleagues (Australian Society for Simulation in Healthcare).

See also: EMBEDDED PARTICIPANT, ROLE PLAYER, SIMULATED PATIENT, SIMULATED PERSON, STANDARDIZED PATIENT

Adaptive Learning \ ə-ˈdap-tiv \ 'lər-niŋ \ *noun*

Etym. Adapt (v.) early 15c. (implied in *adapted*) “to fit (something, for some purpose),” from Old French *adapter* (14c.), from Latin *adaptare* “adjust, fit to,” from *ad* “to” (see *ad-*) + *aptare* “to join,” from *aptus* “fitted” (see *apt*). Intransitive meaning “to undergo modification so as to fit new circumstances” is from 1956.

Etym. Learning (n.) Old English *leornung* “study, action of acquiring knowledge,” verbal noun from *leornian* (see *learn*). Meaning “knowledge acquired by systematic study, extensive literary and scientific culture” is from mid-14c. *Learning curve* attested by 1907.

Definition

- Adaptive learning incorporates a wide range of technologies and techniques that observes participants and adjusts the learning experience on demand to meet the unique needs of the participants and facilitate the individual/team members in meeting the identified objectives. (Akbulut & Cardak, 2012; Brusilovsky & Peylo, 2003; Pope, Gore, & Renfroe, 2012)

Advocacy and Inquiry \ad-və-kə-sē \ in-ˈkwī(-ə)r-e \ *noun*

Etym. advocate (n.) mid-14c., “one whose profession is to plead cases in a court of justice,” a technical term from Roman law. Also in Middle English as “one who intercedes for another,” and “protector, champion, patron.”

Etym. inquest (n.) mid-15c., enquiry, from *enquere* (see ‘inquire’). From Latin *methodus* “way of teaching or going,” from Greek *methodos* “scientific inquiry,” method of inquiry, investigation.

Definition

- A method of debriefing in which an observer states what was observed or performed in a simulation activity (*advocacy*) or shares critical or appreciative insights about it explicitly (*advocacy*) and then asks the learners for an explanation of their thoughts or actions (*inquiry*)(Rudolph et al, 2007).
- *Inquiry* seeks to learn what others think, know, want, or feel; whereas *advocacy* includes statements that communicate what an individual thinks, knows, wants or feels (Bolman & Deal, 2013).

Alpha and Beta Testing \ 'al-fə \ 'bā-tə \ 'te-stiŋ \ *noun*

Etym. alpha (adj.) c. 1300, from Latin *alpha*, from Greek *alpha*, from Hebrew or Phoenician *aleph* (see *aleph*). The Greeks added -a because Greek words cannot end in most consonants. Sense of “beginning of anything” is from late 14c., often paired with *omega* (the last letter in the Greek alphabet, representing “the end”); sense of “first in a sequence” is from 1620s.

Etym. beta (adj.) c. 1300, from Greek, from Hebrew/Phoenician *beth* (see *alphabet*); used to designate the second of many things.

Etym. test (v.) late 14c., the noun form “small vessel used in assaying precious metals,” from Old French *test*, from Latin *testum* “earthen pot,” related to *testa* “piece of burned clay, earthen pot, shell.” Sense of “trial or examination to determine the correctness of something” is recorded from 1590s. The connecting notion is “ascertaining the quality of a metal by melting it in a pot.” Testing as a verb came from 1748, “to examine the correctness of,” from the noun form.

Definition

- Alpha- early testing of a product by the developers or programmers, but not by potential users. The purpose of alpha-testing is to find and resolve as many ‘bugs’ or problems in the software that were unanticipated during the design and development. (Lee-Jayaram et al, 2019)
- Beta – early testing of a software, program, simulation, or game, by potential users. The purpose of beta-testing is identical to alpha-testing. (Lee-Jayaram et al, 2019)

See also: DRY RUN, PILOT TEST

*Term that has been identified as potentially controversial.

Artificial Intelligence (AI)

\ ˌär-tə-ˈfi-shəl \ in-ˈte-lə-jən(t)s \ *noun*

Etym. artificial (adj.) late 14c., “not natural or spontaneous,” from Old French *artificial*, from Latin *artificialis* “of or belonging to art,” from *artificium* “a work of art; skill; theory, system,” from *artifex* (genitive *artificis*) “craftsman, artist, master of an art” (music, acting, sculpting, etc.), from stem of *ars* “art” + *-fex* “maker,” from *facere* “to do, make”.

Etym. intelligence (n.) late 14c., “the highest faculty of the mind, capacity for comprehending general truths;” c. 1400, “faculty of understanding, comprehension,” from Old French *intelligence* (12c.) and directly from Latin *intelligentia, intellegentia* “understanding, knowledge, power of discerning; art, skill, taste,” from *intelligentem* (nominative *intelligens*) “discerning, appreciative,” present participle of *intelligere* “to understand, comprehend, come to know,” from assimilated form of *inter* “between” (see *inter-*) + *legere* “choose, pick out, read,” Artificial intelligence “the science and engineering of making intelligent machines” was coined in 1956.

Definition

- A system of computerized data-gathering and prediction that models human behavior and decision-making with minimal human intervention. In healthcare simulation, AI often refers to underlying programming that provides physiological or system-based algorithm changes based on inputs from users and learners. Often paired with *machine learning*, in which the software is programmed to alter algorithms and predictions based on observed data and results without human intervention. *Virtual patients* use artificial intelligence to react appropriately to the user or learner. (Bennett and Hauser, 2013)

See also: VIRTUAL PATIENT

Consider also: MACHINE LEARNING

*Assessment \ ə-ˈses-mənt \ *noun*

Etym. (n.) “1530s, “value of property for tax purposes,” from *assess* + *-ment*. Meaning “act of determining or adjusting of tax rate, charges, damages, etc., to be paid” is from 1540s (earlier in this sense was *assessment*, mid-15c.). General sense of “estimation” is recorded from 1620s; in education jargon from 1956.”

Definition

- Refers to processes that provide information about or feedback about individual participants, groups, or programs. Specifically, assessment refers to observations of progress related to knowledge, skills, and attitudes (KSA). Findings of assessment are used to improve future outcomes (Scheckel, 2016; INACSL Standards Committee, 2016c, pp. S39-S40).
- Involves measurement of the KSAs which can be recorded (Levine, DeMaria, Schwartz, & Sim, 2014).

- **Formative** - a type of assessment (sometimes called an evaluation) “wherein the facilitator’s focus is on the participant’s progress toward goal attainment through preset criteria; a process for an individual or group engaged in a simulation activity for the purpose of providing constructive feedback for that individual or group to improve (National League for Nursing Simulation Innovation Resource Center [NLN-SIRC], 2013; Scheckel, 2016)” (INACSL Standards Committee, 2016c, p.S41). Often completed at the same time as the instruction (Hamdorf & Davies, 2016), development of the individual is the focus for the simulation objectives/outcomes to be reached (INACSL Standards Committee, 2016c).
- **Summative** - a type of assessment (sometimes called an evaluation) “at the end of a learning period or at a discrete point in time in which participants are provided with feedback about their achievement of outcome through preset criteria; a process for determining the competence of a participant engaged in healthcare activity. The assessment of achievement of outcome criteria may be associated with an assigned grade (NLN-SIRC, 2013; Scheckel, 2016)” (INACSL Standards Committee, 2016c, p. S41). Performance of the individual is compared to a specific standard (Hamdorf & Davies, 2016).
- **High-stakes** - a type of assessment (sometimes called an evaluation) “associated with a simulation activity that has a major academic, educational, or employment consequence (such as a grading decision, including pass or fail implications; a decision regarding competency, merit pay, promotion, or certification) at a discrete point in time (Hidden curriculum, 2014)” (INACSL Standards Committee, 2016c, p. S41).

See also: OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE)

Compare: EVALUATION

Assessor \ ə-ˈse-sər \ *noun*

Etym. late 14c., from Old French *assessor* “assistant judge, assessor (in court)” (12c., Modern French *assesseur*) and directly from Latin *assessor* “an assistant, aid; an assistant judge.”

Definition

- A person who performs assessment of individuals according to pre-established criteria.
- Assessors must have specific and substantial training, expertise, and competency in assessment (Dictionary.com).

Augmented Reality \òg-'men-təd \ rē-'a-lə-tē \ noun

Etym. augment (v.) c. 1400, from Old French augmenter “increase, enhance” (14c.), from Late Latin augmentare “to increase,” from Latin augmentum “an increase,” from augere “to increase, make big, enlarge, enrich.” **Related:** Augmented; augmenting.

Etym. reality (n.) 1540s, “quality of being real,” from French réalité and directly Medieval Latin realitatem (nominative realitas); Meaning “real existence, all that is real.”

Definition

- A type of virtual reality in which synthetic stimuli are superimposed on real-world objects, usually to make information that is otherwise imperceptible to human senses perceptible (M&S Glossary).
- A technology that overlays digital computer-generated information on objects or places in the real world for the purpose of enhancing the user experience.
- The combination of reality and overlay of digital information designed to enhance the learning process.
- A spectrum of mixed-reality simulation that is part way between the real world and the virtual world.
- A form of virtual reality that includes head-mounted displays, overlays of computer screens, wearable computers, or displays projected onto humans and manikins (D.R. Berryman et al; M. Bajura et al; H. Fuchs et al).

Avatar \'a-və-, tär \ noun

Etym. 1784, “descent of a Hindu deity,” from Sanskrit. In computer use, it seems to trace to the novel “Snowcrash” (1992) by Neal Stephenson.

Definition

- A virtual object used to represent a physical object (e.g., a human) in a virtual world.
- A graphical representation, typically three-dimensional, of a person capable of relatively complex actions, including facial expressions and physical responses, while participating in a virtual simulation-based experience. The user controls the avatar through the use of a mouse, keyboard, or a type of joystick to move through the virtual simulation-based experience (Riley, 2008).
- Controlled avatars may be either 1st-person perspective or 3rd-person perspective in virtual simulations. A 3rd-person perspective places the view and camera so the user and learner can see the controlled avatar (e.g., the player). A 1st-person perspective places the camera such that the user and learner views the world through the eyes of the avatar (i.e., the controlled avatar is never visible on the screen). These perspectives only apply to screen-based simulations using a mouse, keyboard, or joystick. *Virtual Reality* simulations are almost always 1st-person. (Schuurink and Toet, 2010)

B

Back Story or Backstory or Back-story

\ 'bak \ 'stôr-ē \ *noun*

Etym. back (adj.) “being behind, away from the front, in a backward direction,” Middle English, from back (n.) and back (adv.); often difficult to distinguish from these when the word is used in combinations. Formerly with comparative backer (c. 1400), also *backmore*. To be *on the back burner* in the figurative sense is from 1960, from the image of a cook keeping a pot there to simmer while at work on another concoction at the front of the stove.” “to or toward the rear or the original starting place; in the past; behind in position,” literally or figuratively, late 14c., shortened from *abak*, from Old English on *bæc* “backwards, behind, aback” (see back (n.), and compare aback). To give (*something*) *back* is to give it again, to give it in the opposite direction to that in which it was formerly given. Adverbial phrase *back and forth* is attested by 1814.”

Etym. story (n.) :”connected account or narration of some happening,” c. 1200, originally “narrative of important events or celebrated persons of the past,” from Old French *estorie*, *estoire* “story, chronicle, history,” from Late Latin *storia*, shortened from Latin *historia* “history, account, tale, story” (see history). A story is by derivation a short history, and by development a narrative designed to interest and please. [Century Dictionary] Meaning “recital of true events” first recorded late 14c.; sense of “narrative of fictitious events meant to entertain” is from c. 1500. Not differentiated from *history* until 1500s. As a euphemism for “a lie” it dates from 1690s. Meaning “newspaper article” is from 1892. *Story-line* first attested 1941. *That’s another story* “that requires different treatment” is attested from 1818. *Story of my life* “sad truth” first recorded 1938, from typical title of an autobiography.”

Definition

- “A narrative, which provides a history and/or background and is created for a fictional character(s) and/or about a situation for a SBE (Backstory, n.d.)” (INACSL Standards Committee, 2016c, p.S40). (Ed note: this can include the back story provided to participants, standardized patients, and staff as required to support the simulation activity)
- A method, particularly in some game-based simulations, “for creating design prompts, dialogs, and interactions that contain realistic verbal behaviors and variability for multiple avatars or non-player characters (NPCs) . . .” (Zachary, Zachary, Cannon-Bowers, & Santarelli, 2016, p. 207).
- Something that is developed by an author in games for characters that gives them their characteristics and memories (Fairclough & Cunningham, 2004).

See also: BRIEF (BRIEFING)

Behavioral Skills \ bi- 'hā-vyə-rəl \ 'skils \ *noun*

Etym. behavior (n.) manner of behaving (whether good or bad), conduct, manners,” late 15c., essentially from behave, but with ending from Middle English *havour* “possession,” a word altered (by influence of have) from *aver*, noun use of Old French verb *avoir* “to have.”

Etym. skill (n.) late 12c., “power of discernment,” from Old Norse *skil* “distinction, ability to make out, discernment, adjustment,” related to *skilja* (v.) “to separate; discern, understand,” from Proto-Germanic **skaljo-* “divide, separate” (source also of Swedish *skäl* “reason,” Danish *skjel* “a separation, boundary, limit,” Middle Low German *schillen* “to differ,” Middle Low German, Middle Dutch *schele* “separation, discrimination;” from PIE root **skel-* (1) “to cut.” Sense of “ability, cleverness” first recorded early 13c.

Definition

- The range of activities encompassed within the category of interpersonal interaction, including bedside manner, interpersonal, teamwork, leadership and communications. (Murphy, Nestel, & Gormley, 2019)
- The decision-making and team interaction processes used during the team’s management of a situation. (Gaba et al, 1998)

Compare to: NONTECHNICAL SKILLS

Brief (Briefing) \ brēf \ *noun* (\ 'brē-fīŋ \ *verb*)

Note: this term is often not clearly distinguished from Orientation or Prebriefing

Etym. “fact or situation of giving preliminary instructions.” 1910

Definition

- An activity immediately preceding the start of a simulation activity where the participants receive essential information about the simulation scenario, such as background information, vital signs, instructions, or guidelines. For example, before beginning a session, faculty conduct a briefing about the scenario to review the information being provided to the participants.
- The information and guidelines given to faculty or simulated patients participating in a scenario to allow them to fully prepare for interactions with the participants. Briefing materials could include a handover, physician referral letter, or an ambulance call transcript. For example, at the start of the simulation scenario, participants receive a notification from ambulance personnel regarding a patient being transported to their facility with a gunshot wound. (Alinier, 2011; Husebø et al., 2012).

See also: BACK STORY, ORIENTATION, PREBRIEFING

C

Cave Automated Virtual Environment (CAVE)

\ 'kāv \ 'ō-tā-, mā-təd \ 'vər-chə-wəl \ in-'vī-rə(n)-mənt \ noun

Etym. cave (n.) “a hollow place in the earth, a natural cavity of considerable size and extending more or less horizontally,” early 13c., from Old French *cave* “a *cave*, vault, cellar” (12c.), from Latin *cavea* “hollow” (place)

Etym. automate (v.) “to convert to automatic operation,” 1954, back-formation from *automated* (q.v.). Ancient Greek verb *automatizein* meant “to act of oneself, to act unadvisedly.”

Etym. virtual (adj.) The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. environment (n.) sense of “the aggregate of the conditions in which a person or thing lives” is by 1827 (used by Carlyle to render German *Umgebung*); specialized ecology sense first recorded 1956.

Definition

- Large cube wall structure inside which a participant stands; the walls have projected images to simulate an immersive, virtual environment, including shadows cast by the participant. CAVE participants use specialized goggles for the illusion of stereoscopic depth when inside the CAVE. (Cruz-Neira et al, 1993).

Compare: WIDE AREA VIRTUAL ENVIRONMENT

Clinical Scenario \ kli-ni-kəl \ sə-'ner-ē-, ō \ noun

Etym. scenario (n.) 1868, “sketch of the plot of a play,” from Italian *scenario*, from Late Latin *scenarius* “of stage scenes,” from Latin *scena* “scene.”

Etym. clinical (adj.) 1780, “pertaining to hospital patients or hospital care,” from *clinic* + -al.

Definition

- The plan of an expected and potential course of events for a simulated clinical experience. A scenario usually includes the context for the simulation (hospital ward, emergency room, operating room, clinic, out of hospital, etc.). Scenarios can vary in length and complexity, depending on the learning objectives.

- A detailed outline of a clinical encounter that includes: the participants in the event, briefing notes, goals and learning objectives, participant instructions, patient information, environmental conditions, manikin or standardized patient preparation, related equipment, props, and tools or resources for assessing and managing the simulated experience.
- A progressive outline of a clinical encounter, including a beginning, an ending, a debriefing, and evaluation criteria (Meakim et al., 2013).

See also: SCENARIO, SCRIPT, SIMULATED-BASED LEARNING EXPERIENCE, SIMULATION ACTIVITY

Coaching \ kōch-ij \ verb

Etym. Meaning “to prepare (someone) for an exam.”

Related: Coached; coaching.

Definition

- To direct or instruct a person or group of people in order to achieve goals, develop specific skills, or develop competencies.

Cognitive Load \ 'käg-nə-tiv \ 'lōd \ noun

Etym. Cognitive (adv.) 1580s, “pertaining to cognition,” with -ive + Latin *cognit-*, past participle stem of *cognoscere* “to get to know, recognize,” from assimilated form of *com* “together” (see *co-*) + *gnoscere* “to know,” from PIE root **gno-* “to know.” Taken over by psychologists and sociologists after c. 1940. *Cognitive dissonance* “psychological distress caused by holding contradictory beliefs or values” (1957) apparently was coined by U.S. social psychologist Leon Festinger, who developed the concept. Related: *Cognitively*.

Etym, Load (n.) c. 1200, *lode, lade* “that which is laid upon a person or beast, burden,” a sense extension from Old English *lad* “a way, a course, a carrying; a street, watercourse; maintenance, support,” from Proto-Germanic **laitho* (source also of Old High German *leita*, German *leite*, Old Norse *leið* “way, road, course”), from PIE root **leit-* (2) “to go forth” (see *lead* (v.1)).

It seems to have expanded its range of senses in early Middle English, supplanting words based on *lade* (v.), to which it is not etymologically connected. The older senses went with the spelling *lode*(q.v.). The spelling is modern. Meaning “amount customarily loaded at one time” is from c. 1300; meaning “a quantity of strong drink taken” is from 1590s. Meaning “the charge of a firearm” is from 1690s.

Definition

- The amount of information the working memory of the participant and/or facilitator can manage at any given point. The definition is based on the Cognitive Load Theory (CLT) proposed by Sweller et al. (1998) based on the working memory model introduced by Baddeley (1992).

Computer-Based Simulation

\ kəm-ˈpyü-tər \ bäst \ sim-yuh-ley-shuh n \ noun

Etym. computer (n.) 1640s, “one who calculates,” agent noun from compute (v.). Meaning “calculating machine” (of any type) is from 1897; in modern use, “programmable digital electronic computer” (1945 under this name; theoretical from 1937, as Turing machine). ENIAC (1946) usually is considered the first.

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- The modeling of real-life processes with inputs and outputs exclusively confined to a computer, usually associated with a monitor and a keyboard or other simple assistive device (Textbook of Simulation). Subsets of computer-based simulation include virtual patients, virtual reality task trainers, and immersive virtual reality simulation (ibid).

See also: SCREEN-BASED SIMULATION, SIMULATOR

Conceptual Fidelity \ kən-ˈsep-chə-wəl \ fə-ˈde-lə-tē, fī- \ noun

Etym. conceptual (adj.) 1820, “pertaining to mental conception” (there is an isolated use from 1662), from Medieval Latin conceptualis, from Latin conceptus “a collecting, gathering, conceiving,” past participle of concipere. **Related:** Conceptualism; conceptualist.

Etym. fidelity (n.) early 15c., “faithfulness, devotion,” from Middle French fidélité (15c.), from Latin fidelitatem (nominative fidelitas) “faithfulness, adherence.”

Definition

- In health care simulation, ensures that all elements of the scenario relate to each other in a realistic way so that the case makes sense as a whole to the learner(s) (*For example: Vital signs are consistent with the diagnosis*). To maximize conceptual fidelity, cases or scenarios should be reviewed by subject matter expert(s) and pilot-tested prior to use with learners (Rudolph et al., 2007; Dieckmann et al., 2007).

CONSORT (Consolidated Standards of Reporting Trials) \ ˈkän-,sört \ noun

Etym. consolidated (adj.) “made firm, solid, hard, or compact,” 1736, past-participle adjective from **consolidate**.

Etym. standards (adj.) 1620s, “serving as a standard,” from standard (adj.). Earlier it meant “upright” (1530s). *Standard-bred* “bred up to some agreed-upon standard of excellence” is from 1888.

Etym. report (n.) late 14c., “to make known, tell, relate,” from Old French *reporter* “to tell, relate; bring back, carry away, hand over,” from Latin *reportare* “carry back, bear back, bring back,” figuratively “report,” in Medieval Latin “write (an account) for information or record,” from re- “back” (see re-) + *portare* “to carry” (from PIE root *per- (2) “to lead, pass over”).

Etym. trial (n.) mid-15c., “act or process of testing, a putting to proof by examination, experiment, etc.,” from Anglo-French *trial*, noun formed from *triet* “to try” (see **try** (v.)). Sense of “examining and deciding of the issues between parties in a court of law” is first recorded 1570s; extended to any ordeal by 1590s.

Definition

- CONSORT is a guideline that standardizes the reporting for any randomized control trials. First developed for clinical trials, the guideline has been adopted by the simulation research community. (Cheng et al, 2016)

Cue/Cueing \ kyü – iŋ \ verb/noun

Etym. cue (n.) “stage direction,” 1550s, from Q, which was used 16c., 17c. in stage plays to indicate actors’ entrances, probably as an abbreviation of Latin quando “when” or a similar Latin adverb.

Definition

- To provide information during the simulation that helps the participant progress through the activity to achieve stated objectives (modified from National League for Nursing - Simulation Innovation Resource Center, 2013).
- Information provided to help the learner reach the learning objectives (conceptual cues), or to help the learner interpret or clarify the simulated reality (reality cues). Conceptual cues help the learner reach instructional objectives through programmable equipment, the environment, or through responses from the simulated patient or role player. Reality cues to help the learner interpret or clarify simulated reality through information delivered during the simulation (modified from Paige & Morin, 2013).

See also: PROMPT

D

Debrief (Debriefing) \ dē'brēf \ noun (\ dē 'brē-fīŋ \ verb)

Etym. debrief “obtain information (from someone) at the end of a mission,” 1945, from de- + brief (v.). **Related:** Debriefed; debriefing.

Definition

- (noun) A formal, collaborative, reflective process within the simulation learning activity.
- An activity that follows a simulation experience and led by a facilitator.
- (verb) To conduct a session after a simulation event where educators/instructors/facilitators and learners re-examine the simulation experience for the purpose of moving toward assimilation and accommodation of learning to future situations (Johnson-Russell & Bailey, 2010; National League for Nursing - Simulation Innovation Resource Center, 2013); debriefing should foster the development of clinical judgment and critical thinking skills (Johnson-Russell & Bailey, 2010).
- To encourage participants’ reflective thinking and provide feedback about their performance, while various aspects of the completed simulation are discussed.
- To explore with participants their emotions and to question, reflect, and provide feedback to one another (i.e., *guided reflection*).

Compare: ADVOCACY AND INQUIRY, FEEDBACK, GUIDED REFLECTION

Debriefer \ dē-'brēf - ur \ noun

Etym. debrief “obtain information (from someone) at the end of a mission,” 1945, from de- + brief (v.). **Related:** Debriefed; debriefing.

Definition

- The individual who facilitates a debriefing session and is knowledgeable and skilled in performing appropriate, structured, and psychologically safe debriefing sessions (Fanning & Gaba, 2007).
- The person who leads participants through the debriefing. Debriefing by competent instructors and subject matter experts is considered important to maximize the opportunities arising from simulation (Raemer et al, 2011).

Compare: FACILITATOR, SIMULATIONIST

Deliberate Practice \di-'li-bə-rāt\ 'prak-təs \ noun

Etym. deliberate (adj.) 15th century Middle English, from Latin *deliberatus*, past participle of *deliberare* to consider carefully, perhaps alteration of **delibrare*, from *de-* + *libra* scale, pound.

Etym. practice (n.) 14th century Middle English *practisen*, from Middle French *practiser*; from Medieval Latin *practizare*, alteration of *practicare*, from *practica* practice, noun, from Late Latin *practice*, from Greek *praktikē*, from feminine of *praktikos*.

Definition

- A theory of general psychology that states the differences between expert performers and normal adults reflect a life-long period of deliberate effort to improve performance in a specific domain. (Ericsson, K. A).
- A systematically designed activity that has been created specifically to improve an individual’s performance in a given domain (Ericsson, Krampe, & Tesch-Römer, 1993).

Compare: MASTERY LEARNING

Deterministic \ di-'tər-mə- ,ni- stik \ adj

Etym. determinism (n.) 1876 in general sense of “doctrine that everything happens by a necessary causation,” from French *déterminisme*; deterministic (*adj.*) 1874, from determinist (see determinism) + -ic.

Definition

- Pertaining to a process, model, or variable whose outcome, result, or value does not depend on chance (Department of Defense Modeling and Simulation Glossary).

Compare: STOCHASTIC

**Term that has been identified as potentially controversial.*

Discrete Simulation (Discrete-Event Simulation)

\ dis-'krēt \ sim-yuh-ley-shuh n \ noun

Etym. discrete (adj.) mid-14c., “morally discerning, prudent, circumspect,” from Old French *discret* “discreet, sensible, intelligent, wise,” from Latin *discretus* “separated, distinct;” in Medieval Latin, “discerning, careful;” past participle of *discernere* “distinguish.” Meaning “separate, distinct” in English is late 14c.

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A simulation that relies on variables changed only at a countable number of points in time; discrete event simulation (DES) is the process of codifying the behavior of a complex system as an ordered sequence of well-defined events.
- The operation of a system as a discrete sequence of events in time. Each event occurs at a particular instant in time and marks a change of state in the system. Between consecutive events, no change in the system is assumed to occur; thus the simulation can directly jump in time from one event to the next (Robinson, 2004).
- One or more variables that completely describe a system at any given moment in time (Sokolowski & Banks, 2011).

Compare: DURATIONAL SIMULATION, SEQUENTIAL SIMULATION

Distance Simulation \ dis-tuhns \ sim-yuh-ley-shuh n \ noun

Etym. distance (adj.) Meaning “remoteness of space, extent of space between two objects or places” is from late 14c. Also “an interval of time” (late 14c., originally *distauce* of times). Meaning “remote part of a field of vision” is by 1813. The figurative sense of “aloofness, remoteness in personal intercourse” (1590s) is the same as in *stand-offish*.

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- Implementing a simulation or training at a physical distance from the participant(s) (LeFlore et al., 2014; von Lubitz et al., 2003). This may include operating a simulator via some type of remote access where the operator remotes into a simulator stationed where the participants are located; otherwise known as remote-controlled (LeFlore et al., 2014). Or, it could be where the participants remote into something like the cameras during a simulation where the simulator is stationed at a different site, which may be called “distance-based high-fidelity human patient simulation training” (von Lubitz et al., 2003, p. 379). Advantages of this method are being able to use experts to run the simulator (LeFlore et al., 2014) or to instruct (von Lubitz et al., 2003) if not currently available at the site where the participants are located.

Compare: REMOTE SIMULATION, TELESIMULATION

Distributed Simulation

\ di-'stri-byüt \ sim-yuh-ley-shuh n \ noun

Etym. distribute (v.) early 15c., “to deal out or apportion,” from Latin *distributus*, past participle of *distribuere* “to divide, distribute.” **Related:** Distributable; distributed; distributing.

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- The concept of simulation on-demand, made widely available wherever and whenever it is required; DS provides an easily transportable, self-contained ‘set’ for creating simulated environments, at a fraction of the cost of dedicated, static simulation facilities (Kneebone et al, 2010).
- A set of simulations operating in a common environment and distributed to learners; a distributed simulation may be composed of any of the three modes of simulation: live, virtual, and constructive, and are seamlessly integrated within a single exercise (Department of Defense Modeling and Simulation Glossary).

Durational Simulation \ dū-rā'shūn-āl \ sim"u-la'shun \ noun

Etym. duration (n.) Late 14c. *duracioun*, from Old French *duration*, from Medieval Latin *durationem* (nominative *duratio*), noun of action from past-participle stem of Latin *durare* “to harden,” from *durus* “hard,” from PIE **dru-ro-*, suffixed variant form of root.

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- Multiple simulations that build off of one another. This can include a simulation that focuses on an initial assessment of a simulated or standardized patient portraying a patient role and the subsequent simulations are the follow-up visit (e.g., initial visit, one-month visit and six-month visit, etc.).
- A Durational Simulation is the opposite of a Discrete Simulation in that changes occur in the system between simulations.

Compare: DISCRETE SIMULATION, SEQUENTIAL SIMULATION

Dryrun \ 'drī \ 'rən \ *noun*

Etym. *“dry run”* (n): “walk-through (n.) also *walkthrough*, 1944, “an easy part” (in a theatrical production), from walk (v.) + through. Meaning “dry run, full rehearsal” is from 1959, from the notion of “walking (someone) through” something.”

Definition

- A “planning meeting with standardized learners” is used to reveal un-intentional problems within the scenario. A designated time to explore the possibility of errors. (Boilat et al, 2012)
- A verification period prior to live encounters to ensure a “safe and therapeutic” environment. (Greswell et al, 2018)

See also: ALPHA and BETA TEST, PILOT TEST

Consider also: DRESS REHEARSAL, RUN THROUGH, SIMULATION VALIDATION, WALK THROUGH

E

Educator (Simulation Educator) \ 'e-jə-, kā-tər \ noun

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like”. Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. educator (n.) “one who trains or instructs,” 1670s.

Definition

- Person who uses the modality of simulation to educate learners, utilizing evidence-based strategies.
- Person who supports healthcare professionals who are learning to manage clinical situations and provide care that is safe, effective, efficient, timely, patient-centered, and equitable. May teach an individual learner or a group of learners practicing to work as a team (Lindell, Poindexter, & Hagler, 2016).

See also: FACILITATOR, SIMULATIONIST

Embedded Participant \ im-'bed \ id \ pār-'ti-sə-pənt \ noun

Etym. embed (v.) 1778, “to lay in a bed (of surrounding matter),” from *em-* (1) + *bed* (n.). Originally a geological term, in reference to fossils in rock; figurative sense is by 1835; meaning “place (a journalist) within a military unit at war” is from 2003 and the Iraq war. **Related:** Embedded; embedding.

Etym. participant (n.) 1560s, from Middle French *participant*, from Latin *participātem*, present participle of *participare* “to share in, partake of” from *particeps* “sharing, partaking.”

Definition

- An individual who is trained or scripted to play a role in a simulation encounter in order to guide the scenario, and may be known or unknown to the participants; guidance may be positive or negative, or a distractor based on the objectives, level of the participants, and the needs of the scenario.
- A role assigned in a simulation encounter to help guide the scenario.
- The embedded participant’s role is part of the situation. However, the underlying purpose of the role may not be revealed to the participants in the scenario or simulation (INACSL, 2013).

See also: ACTOR, ROLE PLAYER, SIMULATED PATIENT, SIMULATED PERSON, STANDARDIZED PATIENT

Environmental Fidelity

\ en - vī-rə(n) - 'men-tə- l \ fə- 'de-lə-tē \ noun

Etym. environmental (adj.) 1887, “environing, surrounding,” from *environment* + *-al* (1). Ecological sense by 1967.

Related: Environmentally.

Etym. fidelity (n.) early 15c., “faithfulness, devotion,” from Middle French *fidélité* (15c.), from Latin *fidelitatem* (nominative *fidelitas*) “faithfulness, adherence, trustiness,” from *fidelis* “faithful, true, trusty, sincere,” from *fides* “faith.” From 1530s as “faithful adherence to truth or reality;” specifically of sound reproduction from 1878.

Definition

- The degree to which the simulated environment (manikin, room, tools, equipment, moulage, and sensory props) replicates reality and appearance of the real environment.

See also: FIDELITY, HIGH FIDELITY SIMULATION, PHYSICAL FIDELITY, REALISM

Evaluation \ i-, val-yə- 'wā-shən \ noun

Etym. (n.) 1755, “action of appraising or valuing,” from French *évaluation*, noun of action from *évaluer* “to find the value of,” from *é-* “out” (see *ex-*) + *valuer*, from Latin *valere* “be strong, be well; be of value, be worth” (from PIE root **wal-* “to be strong”). Meaning “job performance review” attested by 1947.

Definition

- Determination of the value, nature, character, or quality of something or someone (Merriam Webster)
- A broad term for appraising data or placing a value on data gathered through one or more measurements. It involves rendering a judgment, including strengths and weaknesses. Evaluation measures quality and productivity against a standard of performance. Evaluation may be formative, summative, high stakes, or related to the simulation program or process. (INACSL Standards Committee, Glossary, 2016c)

Compare: ASSESSMENT

Event \ i- 'vent \ *noun*

Etym. 1570s, “the consequence of anything” (as in in the event that); 1580s, “that which happens;” from Middle French event, from Latin eventus “occurrence, accident, event, fortune, fate, lot, issue,” from past participle stem of evenire “to come out, happen, result,” from assimilated form of ex- “out” + venire “to come.” Meaning “a contest or single proceeding in a public sport” is from 1865. Events as “the course of events” is attested from 1842.

Definition

- The occurrences that cause variation or changes in the state of a system (Sokolowski and Banks, 2009); in health care simulation, this term is common when programming manikins and often refers to learner actions.
- An event is described by the time it occurs and event lists can be created to drive changes in a simulation.

See also: STATE/STATES

F

Facilitator (Simulation Facilitator) \fə-'si-lə-, tã-tər\ *noun*

Etym. 1806, agent noun in Latin form from facilitate.

Definition

- An individual who is involved in the implementation and/or delivery of simulation activities. *For example, faculty, educators, etc.*
- An individual that helps to bring about an outcome (such as learning, productivity, or communication) by providing indirect or unobtrusive assistance, guidance, or supervision. *For example: The debriefing facilitator kept the discussion flowing smoothly.*

Compare: DEBRIEFER, SIMULATIONIST

Feedback \fēd-, bak\ *noun*

Etym. 1920, in the electronics sense, “the return of a fraction of an output signal to the input of an earlier stage,” from verbal phrase, from feed (v.) + back (adv.). Transferred use, “information about the results of a process” is attested by 1955.

Definition

- An activity where information is relayed back to a learner; feedback should be constructive, address specific aspects of the learner’s performance, and be focused on the learning objectives (Society for Simulation in Healthcare).
- Information transferred between participants, facilitator, simulator, or peer with the intention of improving the understanding of concepts or aspects of performance (INACSL 2013). Feedback can be delivered by an instructor, a machine, a computer, a patient (or a simulated person), or by other learners as long as it is part of the learning process.

Compare: ADVOCACY AND INQUIRY, DEBRIEF/DEBRIEFING, GUIDED REFLECTION

Fiction Contract \'fik-shən\ 'kän-, trakt\ *noun*

Etym. fiction (n.) something that is not true; something invented by the imagination or feigned; an assumption of a possibility as a fact irrespective of the question of its truth; a useful illusion or pretense; the action of feigning or of creating with the imagination.

Etym. contract (n.) a binding agreement between two or more persons or parties.

Definition

- A concept which implies that an engagement in simulation is a contract between the instructor and the learner: each has to do his or her part to make the simulation worthwhile (Rudolph, Dieckmann, et al.).
- The degree of engagement that healthcare trainees are willing to give the simulated event. Also known as the “suspension of disbelief”, it is a literary and theatrical concept that encourages participants to put aside their disbelief and accept the simulated exercise as being real for the duration of the scenario.

*Fidelity \fə-'de-lə-tē\ *adj*

Etym. (n.) early 15c., “faithfulness, devotion,” from Middle French *fidélité* (15c.), from Latin *fidelitatem* (nominative *fidelitas*) “faithfulness, adherence, trustiness,” from *fidelis* “faithful, true, trusty, sincere,” from *fides* “faith.” From 1530s as “faithful adherence to truth or reality;” specifically of sound reproduction from 1878.

Definition

- The degree to which the simulation replicates the real event and/or workplace; this includes physical, psychological, and environmental elements.
- The ability of the simulation to reproduce the reactions, interactions, and responses of the real-world counterpart. It is not constrained to a certain type of simulation modality, and higher levels of fidelity are not required for a simulation to be successful.
- The level of realism associated with a particular simulation activity; fidelity can involve a variety of dimensions, including (a) physical factors such as environment, equipment, and related tools; (b) psychological factors such as emotions, beliefs, and self-awareness of participants; (c) social factors such as participant and instructor motivation and goals; (d) culture of the group; and (e) degree of openness and trust, as well as participants’ modes of thinking (INACSL, 2013);

See also: ENVIRONMENTAL FIDELITY, FUNCTIONAL FIDELITY, HIGH FIDELITY, HIGH FIDELITY SIMULATION, IMMERSIVE SIMULATION, LOW FIDELITY, PHYSICAL FIDELITY, PSYCHOLOGICAL FIDELITY, REALISM, SIMULATION FIDELITY

Fixation Error \ fik-'sā-shən \ er-ər \ noun

Etym. fixation (n.) late 14c., fixation, an alchemical word, “action of reducing a volatile substance to a permanent bodily form,” from Medieval Latin fixationem (nominative fixatio), noun of action from past participle stem of Latin fixare, frequentative of figere “to fix.” Meaning “condition of being fixed” is from 1630s. Used in the Freudian sense since 1910.

Etym. error (n.) also, through 18c., error; c. 1300, “a deviation from truth made through ignorance or inadvertence, a mistake.” From late 14c. as “deviation from what is normal; abnormality, aberration.” From 1726 as “difference between observed value and true value.”

Definition

- A principle of crisis resource management wherein humans fail to revise a situation assessment in risky and dynamic systems or events (Decker, 2011).
- The persistent failure to revise a diagnosis or plan in the face of readily available evidence suggesting that a revision is necessary.

Compare: SITUATIONAL AWARENESS

Frame(s) \ frāmz \ noun

Etym. From 1660s in the meaning “particular state” (as in Frame of mind, 1711). Frame of reference is 1897.

Definition

- The perspectives through which individuals interpret new information and experiences for the purpose of decision-making.
- Frames are formed through previous experiences and can be based on knowledge, attitudes, feelings, goals, rules, and/or perceptions.
- The mindset of the internal participant or facilitator; their knowledge, thoughts, feelings, actions (speech/body language), attitudes (verbal/non-verbal), and perceptions (adapted from Rudolph, J.W. et al, 2007, 2008).

Functional Fidelity \ fən(k)-shnəl, -shə-nəl \ fə-'de-lə-tē \ noun

Etym. functional (adj.) 1630s, “pertaining to function or office,” from function (n.) + -al (1), or from Medieval Latin functionalis. Meaning “utilitarian” is by 1864. **Related:** Functionally; functionality.

Etym. fidelity (n) early 15c., “faithfulness, devotion,” from Middle French fidélité (15c.), from Latin fidelitatem (nominative fidelitas) “faithfulness, adherence, trustiness,” from fidelis “faithful, true, trusty, sincere,” from fides “faith” (see faith). From 1530s as “faithful adherence to truth or reality.”

Definition

- The degree in which the equipment used in the simulation responds to the participant’s actions; e.g., a static ventilator would offer low functional fidelity compared to a working ventilator in a simulation requiring a ventilator alarm.

See also: FIDELITY, HIGHT FIDELITY SIMULATOR, REALISM

G

Gamification \ gā-mə-fə-'kā-shən \ noun [U]

Etym. game (n.) c. 1200, from Old English gamen “joy, fun; game, amusement,” common Germanic (cognates: Old Frisian game “joy, glee,” Old Norse gaman “game, sport; pleasure, amusement,” Old Saxon gaman, Old High German gaman “sport, merriment,” Danish gamen, Swedish gamman “merriment”), said to be identical with Gothic gaman “participation, communion,” from Proto-Germanic *ga- collective prefix + *mann “person,” giving a sense of “people together.” The -en was lost perhaps through being mistaken for a suffix. Meaning “contest for success or superiority played according to rules” is first attested c. 1200 (of athletic contests, chess, backgammon).

Definition

- The application of game design elements (conceptual building blocks integral to building successful games) to traditionally non-game contexts (Rutledge et al, 2018).
- The application of the characteristics and benefits of games to real-world processes or problems. “Gamification differs from serious games in terms of the design intention, with gamification interventions involving the application of game elements with a utilitarian purpose...” (Gentry et al, 2019).

Compare: SERIOUS GAMES

Consider also: GAME-BASED LEARNING

Guided Reflection \ gīd – id \ ri-'flek-shən \ noun

Etym. guide (v.) late 14c., “to lead, direct, conduct,” from Old French guider “to guide, lead, conduct” (14c.), earlier guier, from Frankish *witan “show the way” or a similar Germanic source.

Etym. reflection (n.) Of the mind, from 1670s. Meaning “remark made after turning back one’s thought on some subject” is from 1640s.

Definition

- The process encouraged by the instructor during debriefing that reinforces the critical aspects of the experience and encourages insightful learning, allowing the participant to link theory with practice and research (INACSL, 2013).
- The facilitated intellectual and affective activities that allow individuals to explore their experience in order to lead to new understanding and appreciations (adapted from Boud et al, 1985).

- A mentor-facilitated process that allows the learner to “integrate the understanding gained into one’s experience in order to enable better choices or actions in the future, as well as enhance one’s overall effectiveness” (Rogers, 2001).

Compare: ADVOCACY AND INQUIRY, DEBRIEF/DEBRIEFING, FEEDBACK

See also: REFLECTIVE THINKING

Gynecological / Genitourinary Teaching Associate (GTA, GUTA, MUTA) \,je-nə-tō-'yūr-ə-,ner-ē \ 'tēch ng \ə-'sō-shē-,āt, -sē-\ noun

Etym. genitourinary (adj.) of or relating to the genital and urinary organs or functions. genitals (n.) “reproductive organs,” especially the external sexual organs, late 14c. Compare Genitalia.

Definition

- A Genitourinary Teaching Associate (GUTA) is an individual trained to teach the techniques and protocol for performing the gender-specific physical examination to learners, using himself or herself as a demonstration and practice model.
- A Gynecological Teaching Associate (GTA) is a female specifically trained to teach, assess, and provide feedback to learners about accurate pelvic, rectal and/or breast examination techniques. They also address the communication skills needed to provide a comfortable exam in a standardized manner, while using their bodies as teaching tools in a supportive, non-threatening environment (ASPE).
- A Male Urogenital Teaching Associates (MUTA) is a male specifically trained to teach, assess, and provide feedback to learners about accurate urogenital and rectal examination techniques. They also address the communication skills needed to provide a comfortable exam in a standardized manner, while using their bodies as teaching tools in a supportive, non-threatening environment (ASPE).

H

Haptic (Haptics) \ˈhap-tik \ *adj*

Etym. (adj.) “pertaining to the sense of touch,” 1890, from Greek *haptikos* “able to come into contact with,” from *haptein* “to fasten.”

Definition

- In health care simulation, refers to devices that providing tactile feedback to the user. Haptics can be used to simulate touching, palpating an organ, or body part, and the cutting, tearing, or traction on a tissue.
- Devices that capture and record a trainee’s ‘touch’ in terms of location and depth of pressure at specific anatomical sites (McGaghie et al, 2010; Jackson et al).

Health Care Simulation

\ helth \ ker \ sim-yuh-ley-shuh n \ *noun*

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A technique that creates a situation or environment to allow persons to experience a representation of a real health care event for the purpose of practice, learning, evaluation, testing, or to gain understanding of systems or human actions (Society for Simulation in Healthcare).
- The application of a simulation activity to training, assessment, research, or systems integration toward patient safety (Society for Simulation in Healthcare).

See also: SIMULATION

High-Fidelity Simulator

\ hī \ fə-ˈde-lə-tē \ ˈsim-yə-, lā-tər \ *noun*

Etym. fidelity (n.) early 15c., “faithfulness, devotion,” from Middle French *fidélité* (15c.), from Latin *fidelitatem* (nominative *fidelitas*) “faithfulness, adherence, trustiness,” from *fidelis* “faithful, true, trusty, sincere,” from *fides* “faith.” From 1530s as “faithful adherence to truth or reality;” specifically of sound reproduction from 1878.

Etym. simulator (n.) 1835, of persons, from Latin *simulator* “a copier, feigner,” agent noun from *simulare* “imitate,” from stem of *similis* “like.” In reference to training devices for complex systems, from 1947 (flight simulator). *simulated* (adj.) 1620s, “feigned,” past participle adjective from *simulate* (v.). Meaning “imitative for purposes of experiment or training” is from 1966 (agent noun *simulator* in the related sense dates from 1947. In commercial jargon, “artificial, imitation” by 1942.

Definition

- A term often used to refer to the broad range of full-body manikins that have the ability to mimic, at a very high level, human body functions.
- Also known as a high-complexity simulator. Other types of simulators can also be considered high-fidelity, and that fidelity (realism) has other characteristics beyond a particular type of simulator.

See also: FIDELITY, FUNCTIONAL FIDELITY, REALISM SIMULATION FIDELITY

High-Fidelity Simulation

\ hī \ fə-ˈde-lə-tē \ sim-yuh-ley-shuh n \ *noun*

Etym. fidelity (n.) early 15c., “faithfulness, devotion,” from Middle French *fidélité* (15c.), from Latin *fidelitatem* (nominative *fidelitas*) “faithfulness, adherence, trustiness,” from *fidelis* “faithful, true, trusty, sincere,” from *fides* “faith.” From 1530s as “faithful adherence to truth or reality;” specifically of sound reproduction from 1878.

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- In health care simulation, high-fidelity refers to simulation experiences that are extremely realistic and provide a high level of interactivity and realism for the learner (International Nursing Association for Clinical Simulation and Learning, 2013). It can apply to any mode or method of simulation; *for example: human, manikin, task trainer, or virtual reality.*

See also: ENVIRONMENTAL FIDELITY, FIDELITY, REALISM

Human Factors \ hyü-mən \ fak-tərz \ noun

Etym. factor (n.) Sense of “circumstance producing a result” is attested by 1816, from the mathematical sense.

Definition

- The discipline or science of studying the interaction between humans and systems and technology; it includes, but is not limited to, principles and applications in the areas of human engineering, personnel selection, training, life support, job performance aids, and human performance evaluation (M&S Glossary).
- The psychological, cultural, behavioral, and other human attributes that influence decisionmaking, the flow of information, and the interpretation of information by individuals or groups (Department of Defense Modeling and Simulation Glossary).

Hybrid Simulation \ hī-brəd \ sim-yuh-ley-shuh n \ noun

Etym. hybrid (n.) “a product of two heterogeneous things” emerged c. 1850.

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- The union of two or more modalities of simulation with the aim of providing a more realistic experience.
- In health care simulation, hybrid simulation is most commonly applied to the situation where a part task trainer (e.g., a urinary catheter model) is realistically affixed to a standardized/simulated patient, allowing for the teaching and assessment of technical and communication skills in an integrated fashion (Kneebone, Kidd et al, 2002).
- The use of two or more simulation modalities in the same simulation activity (Zulkepli et al, 2012).

Compare: MIXED SIMULATION/MIXED METHODS SIMULATION, MULTIPLE MODALITY SIMULATION

I

Immersion \i-'mər-zhən \ *noun*

Etym. (n.) c. 1500, from Late Latin *immersio* (nominative *immersio*), noun of action from past participle stem of *immergere* “to plunge in, dip into, sink, submerge,” from assimilated form of *in-* “into, in, on, upon” (see *in-* (2)) + Latin *mergere* “plunge, dip” (see *merge*). Meaning “absorption in some interest or situation” is from 1640s.

Definition

- Describes the level to which the learner becomes involved in the simulation; a high degree of immersion indicates that the learner is treating the simulation as if it was a real-life (or very close to real-life) event (Society for Simulation in Healthcare).
- A state (or situation) in which trainees dedicate most of their time doing something related to or thinking about a simulation, and becomes involved in it; the level of immersion might vary, where a high degree indicates that the trainee is fully involved; *for example: realistic environments facilitate a participant’s full immersion in the simulation.*
- The placing of a human in a synthetic environment through physical and/or emotional means. (M&S Glossary)

See also: IMMERSIVE SIMULATION

Immersive Simulation \ i' mɜ: sɪv \ sim-yuh-ley-shuh n \ *adj* (*immersive*); *n* (*simulation*)

Etym. immersion. (n.) c. 1500, from Late Latin *immersio*, noun of action from past participle stem of *immergere* “to plunge in, dip into, sink, submerge,” from assimilated form of *in-* “into, in, on, upon” (see *in-* (2)) + Latin *mergere* “plunge, dip” (see *merge*). Meaning “absorption in some interest or situation” is from 1640s.

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- *adj*: A real-life situation that deeply involves the participants’ senses, emotions, thinking, and behavior; creating an immersive simulation depends on the alignment with learning objectives, the fidelity of the simulation (physical, conceptual, and emotional), and participant’s perception of realism.

- *noun*: A simulation session influenced by participants’ characteristics, experiences, level of training, and preparation for the case or task. The perceived physical, conceptual and emotional fidelity, the appropriate level of challenge, and the simulators and actors can all affect the simulation experience (Hamstra et al, 2014; Rudolph et al, 2007).

See also: FIDELITY, IMMERSION, REALISM

Incognito Standardized Patient \ in-,käg-'nē- \ stan-dər-,dīzd \ pā-shənt \ *noun*

Etym. incognito (*adj./adv.*) 1640s as both adjective (“disguised under an assumed name and character”) and adverb (“unknown, with concealed identity”), from Italian *incognito* “unknown,” especially in connection with traveling, from Latin *incognitus* “unknown, not investigated.”

Etym. standard “authoritative or recognized exemplar of quality or correctness” (late 15c.). Meaning “rule, principal or means of judgment” is from 1560s. That of “definite level of attainment” is attested from 1711 (as in *standard of living*, 1903).

Etym. patient (n.) “suffering or sick person under medical treatment,” late 14c.

Definition

- A person who plays a role as a patient in real health care situations, while the health care workers in those situations are unaware of the fact that the person is not a real patient (Rethans et al., 2007).

Consider also: UNANNOUNCED STANDARDIZED PATIENTS, STEALTH PATIENTS, SECRET SHOPPER

In Silico \ in-'si-li-,kō \ *adj or adv.*

Etym. 1980s: Latin, literally ‘in silicon’ (with reference to the use of silicon chips in computer systems); on the pattern of *in vitro* and *in vivo*.

Definition

- Performed on computer or via computer simulation; the phrase was coined in 1989 as an analogy to the Latin phrases *in vivo*, *in vitro*, and *in situ* (Sieburg, 1990).

Compare: IN SITU

In Situ/In Situ Simulation

\ in 'sitju \ sim-yuh-ley-shuh n \ adj

Etym. *in situ* 1740, Latin, literally “in its (original) place or position,” from ablative of *situs* “site.”

Etym. *simulation* (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- Taking place in the actual patient care setting/environment in an effort to achieve a high level of fidelity and realism; this training is particularly suitable for difficult work environments, due to space constraints or noise. *For example, an ambulance, a small aircraft, a dentist's chair, a catheterization lab* (Kyle & Murray, 2008). This training is valuable to assess, troubleshoot, or develop new system processes.

Compare: IN SILICO

Interactive Model or Simulation

\ in-ter- 'ak-tiv \ mä-dəl \ or \ sim-yuh-ley-shuh n \ adj

Etym. *simulation* (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- Simulating a situation in which the outcome varies depending on human participation (Thomas). This allows humans to practice different sets of actions in order to learn the correct response to an event.
- Modeling that requires human participation (Australian Department of Defense, 2011).

Interdisciplinary

\ in-ter-'dis-uh-pluh-ner-ee \ adj

Etym. *discipline* (n.) directly from Latin *disciplina* “instruction given, teaching, learning, knowledge,” also “object of instruction, knowledge, science, military discipline,” from *discipulus*. Meaning “branch of instruction or education” is first recorded late 14c. Meaning “military training” is from late 15c.; that of “orderly conduct as a result of training” is from c. 1500.

Definition

- Involving two or more academic, scientific, or artistic disciplines (Merriam-Webster.com).
- The combining of two or more academic disciplines, fields of study, professions, technologies or departments (dictionary.reference.com).
- Of or relating to more than one branch of knowledge (oxforddictionaries.com).

See also: MULTIDISCIPLINARY

Interdisciplinary / Interdisciplinary Learning

\ in-ter -'di-sə-plə-,ner-ē \ lərn-ing \ noun / adj

Etym. *discipline* (n.) directly from Latin *disciplina* “instruction given, teaching, learning, knowledge,” also “object of instruction, knowledge, science, military discipline,” from *discipulus*. Meaning “branch of instruction or education” is first recorded late 14c. Meaning “military training” is from late 15c.; that of “orderly conduct as a result of training” is from c. 1500.

Etym. *learning* (n.) Old English *leornung* “learning, study,” from *leornian*.

Definition

- *noun*: The academic disciplines, such as psychology, or subspecialties within professions. For example, within the profession of medicine, anesthesia or cardiology (Barr, Koppel, Reeves, et al., 2005).
- *adj*: Working jointly, but address issues from their individual discipline’s perspective (Gray & Connolly, 2008).
- Integrating the perspective of professionals from two or more professions by organizing the education around a specific discipline, where each discipline examines the basis of their knowledge” (Bray & Howkins, 2008).

See also: INTERPROFESSIONAL EDUCATION/TRAINING/LEARNING

Interprofessional

\ in-ter - \ prə-'fesh-nəl \ adj

Etym. *professional* (n.) “one who does it for a living,” 1798, from *professional* (adj.). *professional* (adj.) 1747 of careers (especially of the skilled or learned trades from c. 1793). **Related:** profession.

Definition

- Collaborating as a team with a shared purpose, goal, and mutual respect to deliver safe, quality healthcare (Freeth, Hammick, Reeves, Koppel, & Barr, 2005; World Health Organization [WHO], 2010).
- Interprofessional is a more contemporary term describing a team effort in healthcare from two or more professions whose members learn about, from, and with each other to improve health outcomes (Nester, 2016).

Consider also: PROFESSION

**Term that has been identified as potentially controversial.*

Interprofessional Education /Training/Learning

\ in-ter - prə- 'fesh-nəl \ e-jə- 'kā-shən\ trā-niŋ \ lərn-ing\ *noun*

Etym. professional (n.) “one who does it for a living,” 1798, from professional (adj.).professional (adj.) 1747 of careers (especially of the skilled or learned trades from c. 1793). **Related:** profession.

Etym. education (n.) 1530s, “childrearing,” also “the training of animals,” from Middle French education (14c.) and directly from Latin educationem (nominative educatio) “a rearing, training,” noun of action from past participle stem of educare. Originally of instruction in social codes and manners; meaning “systematic schooling and training for work” is from 1610s.

Etym. training (n.) From 1540s as “discipline and instruction to develop powers or skills;” 1786 as “exercise to improve bodily vigor.”

Definition

- An educational environment where students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes (World Health Organization Interprofessional Education and Collaborative Expert Panel, 2011).
- An initiative to secure learning, and promote gains through interprofessional collaboration in professional practice (Freeth, Hammick, Reeves, et al., 2008).

See also: INTERDISCIPLINARY LEARNING

Interprofessionalism \ in-ter - \ prə- 'fesh-nəl \ ' i-zəm\ *noun*

Etym. professional (n.) “one who does it for a living,” 1798, from professional (adj.).professional (adj.) 1747 of careers (especially of the skilled or learned trades from c. 1793). **Related:** profession.

Definition

- The effective integration of professionals through mutual respect, trust, and support, from various professions, who share a common purpose to mold their separate skills and knowledge into collective responsibility and awareness that can be achieved through learned processes for communication, problem solving, conflict resolution, and conduct.

Consider also: PROFESSION

J

Just-in-Time Simulation

\jəst \ 'in \ tīm \ sim-yuh-ley-shuh n \ noun

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A method of training that is conducted directly prior to a potential intervention (Palaganas, Maxworthy, Epps, & Mancini, 2015). The training that is utilized is “*just in time*” at the “*place near the site of the potential intervention*” (Palaganas, Maxworthy, Epps, and Mancini, 2014).
- A learning approach that meets the learner’s needs during or just before it is needed to maximize an educational outcome (Barnes, 1998).
- A cost-reduction method that is derived originally from the Japanese car manufacturing industry where it was a strategy that was utilized to reduce flow times in both production and response time costs (Ohno, 1978).

**Term that has been identified as potentially controversial.*

L

Learning Goal \ 'lær-niŋ \ 'gōl \ noun

Etym. learning (n.) Old English *leornung* “study, action of acquiring knowledge,” verbal noun from *leornian* (see learn). Meaning “knowledge acquired by systematic study, extensive literary and scientific culture” is from mid-14c. Learning curve attested by 1907.

Etym. goal (n.) 1530s, “end point of a race,” of uncertain origin. It appears once before this (as *gol*), in a poem from early 14c. and with an apparent sense of “boundary, limit.” Perhaps from Old English **gal* “obstacle, barrier,” a word implied by *gælan* “to hinder” and also found in compounds (*singal*, *widgal*).

Definition

- Higher order ambitions for the learners.
- Broad, general statements of what is desired for students to learn, and provide direction, focus, and cohesion.

Compare: LEARNING OBJECTIVES; LEARNING OUTCOMES

Learning Objective \ 'lær-niŋ \ əb-'jek-tiv \ noun

Etym. learning (n.) Old English *leornung* “study, action of acquiring knowledge,” verbal noun from *leornian* (see learn). Meaning “knowledge acquired by systematic study, extensive literary and scientific culture” is from mid-14c. *Learning curve* attested by 1907.

Etym. objective (n.) 1738, “something objective to the mind,” from objective (adj.). Meaning “goal, aim” (1881) is from military term *objective point* (1852), reflecting a sense evolution in French.

Definition

- Expected goal of a curriculum, course, lesson or activity in terms of demonstrable skills or knowledge that will be acquired by a student as a result of instruction.
- Measurable results which can be knowledge, skills, or attitudes (KSAs). (INACSL Standards Committee, 2016c, December).
- A learning objective guides the debrief activity by supporting what content should be covered or avoided (Szyld & Rudolph, 2014).

Compare: LEARNING GOALS; LEARNING OUTCOME

Learning Outcome \ 'lær-niŋ \ 'aüt-,kəm \ noun

Etym. learning (n.) Old English *leornung* “study, action of acquiring knowledge,” verbal noun from *leornian* (see **learn**). Meaning “knowledge acquired by systematic study, extensive literary and scientific culture” is from mid-14c. *Learning curve* attested by 1907.

Etym. outcome (n.) 1788, “that which results from something,” originally Scottish, from the verbal phrase; see **out** (adv.) + **come** (v.). Popularized in English by Carlyle (c. 1830s). It was used in Middle English in sense of “an emergence, act or fact of coming out” (c. 1200), and the gerund, *outcoming*, was used as “an issue, a result.” Old English had *utancumen* (n.) “stranger, foreigner.”

Definition

- A result of an activity the learners demonstrate by the end of an educational activity in terms of knowledge, skills, and attributes (KSAs) acquired.
- “Measurable results of the participants’ progress toward meeting a set of objectives.” (INACSL Standards Committee, 2016c, December).
- “Outcomes include: knowledge, skill performance, learner satisfaction, critical thinking and self-confidence” (Ironsides, Jeffries, & Martin, 2009, p.333)
- Outcomes are a measurable judgement (Cooke, Stroup, & Harrington, 2019).
- Learning outcomes “measure the effect on learning: psychomotor, affective and cognitive skills” (Cant & Cooper, 2017, p.69).

Compare: LEARNING GOALS; LEARNING OBJECTIVES

Live, virtual, and constructed (LVC) simulation

\ˈlɪv\ˈvər-çə-wəl, -chəl; ˈvɜrch-wəl\kən-ˈstræk-tɪv\ *noun*

Etym. live 1540s, “having life,” later (1610s) “burning, glowing,” a shortening of *alive*. Meaning “in-person” (of performance) is first attested 1934.

Etym. virtual The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. constructed early 15c., “derived by interpretation,” from Middle French *constructif* or from Medieval Latin *constructivus*, from Latin *construct-*, past participle stem of *construere* “to heap up.”

Definition

- A broadly used taxonomy describing a mixture of simulation modalities; a live simulation involves real people operating real systems; a virtual simulation is where a real person operates simulated systems; and a constructed simulation does not involve real people or real systems, but instead consists of computer programs that create an environment. (Sokolowski & Banks, 2011).

Logistics \ lō-ˈji-stiks \ *noun*

Etym. (n.) “art of moving, quartering, and supplying troops,” 1846, from French (l’art) *logistique* “(art) of quartering troops,” which apparently is from Middle French *logis* “lodging” (from Old French *logeiz* “shelter for an army, encampment,” from *loge*; see *lodge* (n.)) + Greek-derived suffix *-istique* (see *-istic*). The form in French was influenced by *logistique*, from the Latin source of English **logistic**.
Related: *Logistical*.

Definition

- Details of an entire process. (Merriam Webster)
- Ensuring the details, in simulation-based education, such as scheduling of learners, facilitators, moulage, props, scenario preparation and design are all complete.

Low-Fidelity \ ˈlō \ fə-ˈde-lə-tē \ *adj*

Etym. fidelity (n.) early 15c., “faithfulness, devotion,” from Middle French *fidélité* (15c.), from Latin *fidelitatem* (nominative *fidelitas*) “faithfulness, adherence, trustiness,” from *fidelis* “faithful, true, trusty, sincere,” from *fides* “faith.” From 1530s as “faithful adherence to truth or reality;” specifically of sound reproduction from 1878.

Definition

- Not needing to be controlled or programmed externally for the learner to participate (Palaganas, Maxworthy, Epps, & Mancini, 2015); examples include *case studies, role playing, or task trainers used to support students or professionals in learning a clinical situation or practice* (Adapted from National League for Nursing - Simulation Innovation Resource Center, 2013).

See also: FIDELITY

M

***Manikin** \ ma-ni-kən\ (also Mannequin) *noun*

Etym. 1560s, “jointed figure used by artists,” from Dutch manneken, literally “little man,” diminutive of Middle Dutch man.

Definition

- A life-sized human like simulator representing a patient for health care simulation and education (Palaganas, Maxworthy, Epps, & Mancini, 2015).
- Full or partial body representation of a patient for practice.
- Full or partial body simulators that can have varying levels of physiologic function and fidelity.

See also: SIMULATOR

Manikin-based Simulation \ ma-ni-kən \ bāst \ sim-yuh-ley-shuh n \ *noun*

Etym. manikin. 1560s, “jointed figure used by artists,” from Dutch manneken, literally “little man,” diminutive of Middle Dutch man.

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- The use of manikins to represent a patient using heart and lung sounds, palpable pulses, voice interaction, movement (e.g., seizures, eye blinking), bleeding, and other human capabilities that may be controlled by a simulationist using computers and software.
- The life-like aspects of people and situations generated by a manikin.

***Mannequin** \ ma-ni-kən\ (also Manikin) *noun*

Etym. 1902, “model to display clothes,” from French mannequin. A French form of the same word that yielded manikin, and sometimes mannequin was used in English in a sense “artificial man” (especially in translations of Hugo). Originally of persons, in a sense where we might use “model.”

See: MANIKIN

See also: SIMULATOR

Manual Input \ 'man-yə-wəl \ 'in- püt\ *noun*

Etym. manual (adj.) c. 1400, from Latin manualis “of or belonging to the hand; that can be thrown by hand,” from manus “hand, strength, power over; armed force; handwriting.”

Etym. input Middle English verb (late 14c.) meaning “to put in, place, set.”

Definition

- The method of operation in which an operator inputs a value to a given parameter regardless of how it would affect any other parameter. The input of the parameter does not adjust the variables in any physiological manner (Palaganas, Maxworthy, Epps, & Mancini, 2015).

Compare: PHYSIOLOGIC MODELING, PREPACKAGE SCENARIO, “RUNNING ON THE FLY”

Mastery Learning \ 'mas-t(ə)-rē\ \ 'lɜrn- ij\ *noun*

Etym. mastery (adj.) early 13c., mesterie, “condition of being a master,” also “superiority, victory;” from Old French maistrie, from maistre “master” (n.). Meaning “intellectual command” (of a topic, etc.) is from 1660s.

Etym. learning (n.) Old English leornung “learning, study,” from leornian.

Definition

- An instructional philosophy originally proposed by Benjamin Bloom that stated a student must first practice and study to meet the predetermined level criteria (>90%) through the formative assessment of a prerequisite domain prior to advancing in subject matter. If the learner does not achieve the level of mastery, information from the test is used to diagnose areas of deficiency necessary for additional prescriptive support. The student is later tested again. This cycle of feedback and corrective procedures is repeated until mastery is achieved, at which point the student will move on to the next level (Guskey, 2010).
- An instructional philosophy that highlights individualized feedback and adequate time, allowing the learner to progress through the subject in a customized manner, generally in smaller units, to master the subject matter. This concept states that nearly all learners can achieve subject or skill mastery utilizing this method (Palaganas, Maxworthy, Epps, & Mancini, 2015).

Compare: DELIBERATE PRACTICE

Mental Simulation \ 'men-tl \ n sim-yuh-ley-shuh n \ noun

Etym. mental (adj.) early 15c., “in, of, or pertaining to the mind; characteristic of the intellect,” from Late Latin *mentalis* “of the mind,” from Latin *mens* (genitive *mentis*) “mind,” from PIE root ***men-** (1) “to think.”

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like”. Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- Mentally rehearsing an action to enhance performance. (Van Meer P., 2009).
- Cognitive rehearsal of a task in the absence of overt physical movement that can be used to learn cognitive, kinesthetic, psychomotor, or technical skills. (Driskell, 1994 and Rao, 2015).
- Activities that take place in the brain such as “mental imagery, imagination, thought flow, narrative transportation, fantasizing, and counterfactual thinking.” These are “specific processes that occur in the brain when an individual is mentally simulating an action or forming a mental image,” or are “focused on the consequences of mental simulation processes for affect, cognition, motivation, and behavior” (Markman, Klein, & Suhr, 2009).

Mixed Reality (XR) \ 'mikst \ rē-'a-lə-tē \ noun [U]

Etym. mixed (adj.) mid-15c., also *mixte*, “consisting of different elements or parts,” from Latin *mixtus*, past participle of *miscēre* “to mix, mingle, blend”

Etym. reality (n.) 1540s, “quality of being real,” from French *réalité* and directly Medieval Latin *realitatem* (nominative *realitas*), from Late Latin *realis* (see *real* (adj.)). Meaning “real existence, all that is real” is from 1640s; that of “the real state (of something)” is from 1680s.

Definition

- A category that encompasses the hybrid combination of virtual reality environments and reality (e.g., real environment, standardized patient, normal manikin simulator). Often encompasses the definition of Augmented Reality (AR), but has more virtual features than typical AR. The blend of what is physically present to what is 100% computer-generated is expressed in this continuum: Reality—— Augmented Reality—— Mixed Reality—— Virtual Reality (Hsieh and Lee, 2017).
- A simulator that combines virtual and physical components (Robinson et al, 2014).

See also: AUGMENTED REALITY, VIRTUAL REALITY

Mixed Reality Human \ mikst \ rē-'a-lə-tē \ hyü-mən \ noun

Etym. mixed (adj.) mid-15c., also *mixte*, “consisting of different elements or parts,” from Latin *mixtus*, past participle of *miscēre* “to mix, mingle, blend”

Etym. reality (n.) 1540s, “quality of being real,” from French *réalité* and directly Medieval Latin *realitatem* (nominative *realitas*), from Late Latin *realis*. Meaning “real existence, all that is real” is from 1640s; that of “the real state (of something)” is from 1680s.

Definition

- The use of a technology such as video, augmented reality, or virtual reality in conjunction with a physical manikin to simulate a human. (Costanza, Kunz, and Fjeld, 2009); for example, in *team-based training, using TV monitors in portrait mode with interactive videos as a stand-in for a real team member* (Palaganas, Maxworthy, Epps, & Mancini, 2015).

Mixed Simulation (Mixed Methods Simulation)

\ mikst \ sim-yuh-ley-shuh n \ noun

Etym. mixed (adj.) mid-15c., also *mixte*, “consisting of different elements or parts,” from Latin *mixtus*, past participle of *miscēre* “to mix, mingle, blend”

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. method (n.) early 15c., “regular, systematic treatment of disease,” from Latin *methodus* “way of teaching or going,” from Greek *methodos* “scientific inquiry, method of inquiry, investigation,” originally “pursuit, a following after.” Meaning “way of doing anything” is from 1580s; that of “orderliness, regularity” is from 1610s.

Definition

- The use of a variety of different simulation modalities; this is differentiated from hybrid simulation in that it is not characterized by the combining of one type of simulation to enhance another, but rather the use of multiple types of simulation in the same scenario or place. For example, a standardized patient (SP) and a mannequin are used in a scenario or a task trainer paired with an SP for venipuncture, etc. (SSH).

See also: MULTIPLE MODALITY SIMULATION

Compare: HYBRID SIMULATION

**Term that has been identified as potentially controversial.*

Mobile Simulation/Mobile Simulator

\ 'mō-bəl \ sim-yuh-ley-shuh n \ *noun*

Etym. mobile (adj.) late 15c., from Middle French *mobile* (14c.), from Latin *mobilis* “movable, easy to move; loose, not firm,” “pliable, flexible. contraction of **movibilis*, from *movere* “to move.”

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A simulator that can be transported relatively easily. Often refers to digital simulations with minimal equipment, without manikins (Mladenovic et al, 2019).

See also: PORTABLE SIMULATOR

***Modality** \ mō-'da-lə-tē \ *noun*

Etym. 1610s, from Old French *modalité* or directly from Medieval Latin *modalitatem* (nominative *modalitas*) “a being modal,” from *modalis*. 1560s, term in logic, from Middle French *modal* and directly from Medieval Latin *modalis* “of or pertaining to a mode,” from Latin *modus* “measure, manner, mode.”

Definition

- A term used to refer to the type(s) of simulation being used as part of the simulation activity, for example, task trainers, manikin-based, standardized/simulated patients, computer-based, virtual reality, and hybrid (SSH).
- A selected type or types of simulation equipment, concept, or technique that constitutes a method of simulation use (Rutherford-Hemming et al, 2019).
- Broad description of the simulation experience, consisting of one or more of the following: Computer- or Digital-based simulation; Simulated Patient (SP); Simulated clinical immersion; Procedural simulation (Chiniara et al, 2013).

See also: SIMULATED/SYNTHETIC LEARNING METHODS, TYPOLOGY

Model (as in Modeling and Simulation)

\ mā-dəl \ *noun*

Etym. Sense of “thing or person to be imitated” is 1630s.

Definition

- A representation of an object, concept, event, or system; models can be physical models, computational models, or theories of function (Sokolowski, 2011).

Modeling and Simulation (M&S) (also Modeling and Simulation)

\ 'mä-dəl – ij \ and \ sim-yuh-ley-shuh n \ *noun*

Etym model sense of “thing or person to be imitated” is 1630s.

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- The terms modeling and simulation are often used interchangeably.
- An academic discipline focused on the study, development, and use of live, virtual, and constructive models, including simulators, emulators, and prototypes to investigate, understand, or provide data.
- The use of models, including emulators, prototypes, simulators, and stimulators, to develop data as a basis for making managerial or technical decisions.

Monte Carlo Simulation

\ män-tē-'kär-(,)lō \ sim-yuh-ley-shuh n \ *noun*

Etym. Monte Carlo fallacy 1957, named for resort in Monaco famous for its gambling casinos. The fallacy of thinking that the probability of a particular outcome rises with the successive number of opposite outcomes.

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A simulation in which random statistical sampling techniques are employed such that the result determines estimates for unknown values (Department of Defense Modeling and Simulation Glossary).
- A mathematical model using probability distributions to calculate the possible outcomes for a given choice of action. Such a simulation involves many calculations and re-calculations to yield a range of possible outcomes.

Mouflage \mü-'läzh\ *noun*

Etym. (n.) From the French: casting/moulding.

Definition

- The makeup and molds applied to humans or manikins used to portray lesions, skin findings, bleeding, and traumatized areas (Levine et al).
- The application of makeup and molds to a human or simulator's limbs, chest, head, etc. to provide elements of realism (such as blood, vomitus, open fractures, etc.) to the training simulation.
- Techniques used to simulate injury, disease, aging, and other physical characteristics specific to a scenario; mouflage supports the sensory perceptions of participants and supports the fidelity of the simulation scenario through the use of makeup, attachable artifacts (e.g. penetrating objects), and smells (INACSL, 2013).

- A mixture of textual, audio, and visual modes in combination with media and materiality with the aim of enhancing the realism of the simulation encounter (Lutkewitte).

See also: MIXED SIMULATION/MIXED METHODS SIMULATION

Compare: HYBRID SIMULATION

Multidisciplinary \ mʌltɪ \ di-sə-plə-,ner-ē \ *noun*

Etym. discipline (n.) directly from Latin disciplina “instruction given, teaching, learning, knowledge,” also “object of instruction, knowledge, science, military discipline,” from discipulus. The Latin word is glossed in Old English by þeodscipe. Meaning “branch of instruction or education” is first recorded late 14c. Meaning “military training” is from late 15c.; that of “orderly conduct as a result of training” is from c. 1500.

Definition

- The combining of professionals with different perspectives to provide a wider understanding of a particular problem (Bray & Hawkins, 2008).

Compare: INTERPROFESSIONAL

See also: INTERDISCIPLINARY

***Multiple Modality (Multi-modal) Simulation**

\'mʌltɪpl \ moʊ'dæləti \ sim-yuh-ley-shuh n \ *noun*

Etym. modality. 1610s, from Old French modalité or directly from Medieval Latin modalitatem (nominative modalitas) “a being modal,” from modalis. 1560s, term in logic, from Middle French modal and directly from Medieval Latin modalis “of or pertaining to a mode,” from Latin modus “measure, manner, mode.”

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- The use of multiple modalities of simulation in the same simulation activity; differentiated from hybrid simulation in that it is not characterized by the combining of one type of simulation to enhance another, but rather the use of multiple types of simulation in the same scenario or place, e.g., SP and manikin used in a scenario or a task trainer paired with an SP for venipuncture, etc. (SSH).

N

Negative Learning \ 'ne-gə-tiv \ 'lær-niŋ \ noun

Etym. (adj.) c. 1400, *negatif*, “expressing denial” (a sense now rare or obsolete), from Anglo-French *negatif* (early 14c.), Old French *negatif* (13c.) and directly from Latin *negativus* “that which denies,” from *negat-*, past-participle stem of *negare* “deny, say no” (see **deny**).

Etym. (adj.) Old English *leornung* “study, action of acquiring knowledge,” verbal noun from *leornian* (see **learn**). Meaning “knowledge acquired by systematic study, extensive literary and scientific culture” is from mid-14c. *Learning curve* attested by 1907.

Definition

- “When stress among students occurs, and when knowledge and abilities are not properly developed” (Dormann, Demerouti, & Bakker, 2017).
- “The acquisition of erroneous conceptual and procedural knowledge and understanding from unwarranted information, which leads to faulty mental models and reasoning...” (Zlatkin-Troitschanskaia, & Brückner, 2017).

Compare to: TRAINING SCARS

Never Event \ 'ne-vər \ i-'vent \ noun

Etym. never (adv.) “Middle English never, from Old English *næfre* “not ever, at no time,” a compound of *ne* “not, no” (from PIE root **ne-* “not”) + *æfre* “ever” (see **ever**). Early used as an emphatic form of not (as still in *never mind*). Old English, unlike its modern descendant, had the useful custom of attaching *ne* to words to create their negatives, as in *nabban* for *na habban* “not to have.” “Italian *giammai*, French *jamais*, Spanish *jamás* are from Latin *iam* “already” + *magis* “more;” thus literally “at any time, ever,” originally with a negative, but this has been so thoroughly absorbed in sense as to be formally omitted.”

Etym. event (n.) “1570s, “the consequence of anything” (as in *in the event that*); 1580s, “that which happens;” from Middle French *event*, from Latin *eventus* “occurrence, accident, event, fortune, fate, lot, issue;” from past participle stem of *evenire* “to come out, happen, result,” from assimilated form of *ex-* “out” (see **ex-**) + *venire* “to come,” from a suffixed form of PIE root **gwa-* “to go, come.” “Meaning “a contest or single proceeding in a public sport” is from 1865. *Events* as “the course of events” is attested from 1842. *Event horizon* in astrophysics is from 1969.”

Definition

- “A serious and costly” error “in the provision of healthcare services that should never happen” (Centers for Medicare & Medicaid Services [CMS], 2006); an example is when the wrong

body part is operated on (Agency for Healthcare Research and Quality [AHRQ], 2019; CMS, 2006).

- The term has expanded to mean other serious and most often, preventable errors (AHRQ, 2019).
- In relation to simulation-based education, avoidance of such errors is the basis for training and/or assessment.

Consider also: ADVERSE EVENT, ERROR, NEAR MISS

Non-technical Skills \ non \ 'tek-ni-kəl \ skilz \ noun

Etym. techno word-forming element meaning “art, craft, skill,” later “technical, technology;” from Latinized form of Greek *tekhno-*, combining form of *tekhne* “art, skill, craft in work; method, system, an art, a system or method of making or doing.”

Etym. skill (n.) late 12c., “power of discernment,” from Old Norse *skil* “distinction, ability to make out, discernment, adjustment,” related to *skilja* (v.) “to separate; discern, understand,” from Proto-Germanic **skaljo*. Sense of “ability, cleverness” first recorded early 13c.

Definition

- In the healthcare field, the skills of communication, (patient-provider, team) leadership, teamwork, situational awareness, decision-making, resource management, safe practice, adverse event minimization/mitigation, and professionalism; also known as behavioral skills or teamwork skills (ASSH).
- Interpersonal skills that include: communication skills; leadership skills; teamwork skills; decision-making skills; and situation-awareness skills (Australian Radiation Protection and Nuclear Safety Agency, n.d.)
- Social, cognitive and personal skills that can enhance the way you or your staff carry out technical skills, tasks, and procedures. By developing these skills, people in safety-critical roles can learn how to deal with a range of different situations (Rail Safety and Standards Board, 2019).
- Non-technical skills are the cognitive (decision-making, situation awareness) and interpersonal (communication, teamwork, leadership) skills that underpin technical proficiency, and are considered particularly important for preventing errors. Non-technical skills include communication, leadership and followership, decision-making, situation awareness, and task-management (Pires et al., 2017).

Compare: BEHAVIORAL SKILLS



Objective Structured Clinical Examination (OSCE)

\ əb- 'jɛk-tiv \ stræk-chərd \ kli-ni-kəl \ ɪg-,zə-mə-'nā-shən \ noun

Etym. objective (n.) 1738, “something **objective** to the mind,” from objective (adj.). Meaning “goal, aim” (1881) is from military term *objective point* (1852), reflecting a sense evolution in French.

Etym. structured (adj.) 1810, past-participle adjective from structure (v.). Meaning “organized so as to produce results” is from 1959.

Etym. clinical (adj.) 1780, “pertaining to hospital patients or hospital care,” from clinic + -al.

Etym. examination (n.) late 14c., “action of testing or judging; judicial inquiry,” from Old French *examinacion*, from Latin *examinationem* (nominative *examinatio*), noun of action from past-participle stem of *examinare* “to weigh; to ponder, consider” (see **examine**). Sense of “test of knowledge” is attested from 1610s.

Definition

- An approach to the assessment of clinical or professional competence in which the components of competence are assessed in a planned or structured way with attention being paid to the objectivity of the examination (Harden, 1988).
- A station or series of stations designed to assess performance competency in individual clinical or other professional skills. Learners are evaluated via direct observation, checklists, learner presentation, or written follow-up exercises. The examinations may be formative and offer feedback or summative and be used for making high stakes educational decisions (Lewis et al, 2017).
- A method of assessment where learners perform specific skills and behaviors in a simulated work environment.

Online Simulation

on-lahyn \ sim-yuh-ley-shx n \ noun

Etym. online (adj.) also on-line, in reference to computers, “directly connected to a peripheral device,” 1950; see on+ line (n.).

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like”. Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- Interactive simulation experience offered through an online platform that connects participants with other learners in a virtual world to complete assessment, diagnosis, and treatment tasks for virtual patients (Dikshit et al., 2005; Duff et al., 2016).
- Online, often multiplayer, simulation exercises involving care for a single patient or multiple patients. Often utilizes gamification concepts to engage and incentivize learners (Evans et al., 2015; Kusumoto et al., 2007).

Operations Specialist

\ ɒp-uh-rey-shuh nz \ spesh-uh-list \ noun

Etym. operation (n.) late 14c., “action, performance, work,” also “the performance of some science or art,” from Old French *operacion* “operation, working, proceedings,” from Latin *operationem* (nominative *operatio*) “a working, operation,” from past participle stem of *operari* “to work, labor.” Military sense of “series of movements and acts” is from 1749.

Etym. specialty (n.) From early 15c. as unusual, or extraordinary thing; specialized branch of learning; peculiar quality, distinctive characteristic.

Definition

- An individual whose primary role is the implementation and delivery of a simulation activity through the application of simulation technologies such as, computers, audio-visual (AV), or networking technologies.
- An inclusive “umbrella” term that embodies many different roles within health care simulation operations, including simulation technician, simulation technology specialist, simulation specialist, simulation coordinator, and simulation AV specialist. While many of these individuals also design simulation activities, this term refers to the functional role related to the implementation of the simulation activities (SSH).

See also: SIMULATIONIST, SIMULATION TECHNOLOGY SPECIALIST

Orientation

\ ɔr-ē-ən-'tā-shən,-,en- \ noun

Etym. (n.) 1839, originally “arrangement of a building, etc., to face east or any other specified direction,” noun of action from orient (v.). Sense of “action of determining one’s bearings” is from 1868. Meaning “introduction to a situation” is from 1942.

Definition

- The process of giving participants information prior to a simulation event to familiarize them with a simulation activity or environment, such as center rules, timing, and how the simulation modalities work, with the intent of preparing the participants.
- An activity that occurs prior to a simulation activity in order to prepare the faculty/instructors or learners; for example, a *PowerPoint presentation that all participants must review to understand how the center operates, or how the activity is being conducted.*

See also: BRIEF/BRIEFING, PREBRIEF/PREBRIEFING

P

Participant \ pahr-tis-uh-puh nt \ noun

Etym. 1560s, from Middle French participant, from Latin participantem (nominative participans), present participle of participare “to share in, partake of” from particeps “sharing, partaking.”

Definition

- In health care simulation, a person who engages in a simulation activity for the purpose of gaining or demonstrating mastery of knowledge, skills, and/or attitudes of professional practice (INACSL, 2013).
- A person engaged in a simulation activity or event and for those involved in simulation research.

Patient Simulator \ pey-shuh nt \ sim-yuh-ley-ter \ noun

Etym. patient (n.) “suffering or sick person under medical treatment,” late 14c.

Etym. simulator (n.) 1835, of persons, from Latin simulator “a copier, feigner,” agent noun from simulare “imitate,” from stem of similis “like”. In reference to training devices for complex systems, from 1947 (flight simulator). simulated (adj.) 1620s, “feigned,” past participle adjective from simulate (v.). Meaning “imitative for purposes of experiment or training” is from 1966 (agent noun simulator in the related sense dates from 1947. In commercial jargon, “artificial, imitation” by 1942.

Definition

- Life-like, anatomically correct, computer-driven manikin with physiologic responses that mimic real patients (Ober, 2009).
- High- or low-fidelity full-body manikins controlled by instructors to create a structured learning environment in a clinically realistic setting where learning can take precedence over patient care (Good, 2003).
- Ed note: while these definitions are manikin-oriented, the reader should consider other simulators as meeting the concepts of these definitions.

See also: MANIKIN, SIMULATOR

Physical Examination Teaching Associates (PETAs or PTAs)

\ 'fi-zi-kəl \ ig-, za-mə-'nā-shən \ 'tē-chij \ ə-'sō-shē-, āt-sē- \ noun

Etym. physical (n.) (adj.)

n. ““a physical examination,” by 1934, from physical (adj.).”
adj. “early 15c., “of or pertaining to material nature” (in medicine, opposed to *surgical*), from Medieval Latin *physicalis* “of nature, natural,” from Latin *physica* “study of nature” (see *physic*). Meaning “pertaining to matter” is from 1590s; meaning “having to do with the body, corporeal” is attested from 1780. Meaning “characterized by bodily attributes or activities” is attested from 1970. *Physical education* first recorded 1838; abbreviated form *phys ed* is from 1955. *Physical therapy* is from 1922. Related: *Physically*

Etym. examination (n.) “late 14c., “action of testing or judging; judicial inquiry,” from Old French *examinacion*, from Latin *examinationem* (nominative *examinatio*), noun of action from past-participle stem of *examinare* “to weigh; to ponder, consider” (see **examine**). Sense of “test of knowledge” is attested from 1610s.”

Etym. teaching (n.) “Old English *tecunge* “act of teaching,” verbal noun from **teach** (v.). As “that which is taught” from c. 1300.”

Etym. associates (n.) associate “1530s, “a partner in interest or business,” from **associate** (adj.). Meaning “one admitted to a subordinate degree of membership” is from 1812.”

Definition

- Standardized patients who are specifically trained to teach, assess, and provide feedback to learners about physical examination techniques. They also address the communication skills needed to provide a comfortable exam in a standardized manner, while using their bodies to instruct in a supportive, non-threatening environment (Lewis et al, 2017).
- An individual who is trained to teach and provide feedback on basic physical exam techniques and process; serves as coach and as a model (is the instructor and patient) (The John Hopkins University, 2019).
- The person may also serve in the role as evaluator and is considered under the larger category of simulated participants (Lewis et al., 2017).
- Also referred to at some institutions as PTA (Physical Training Assistants) or PI (Patient Instructors) (East Carolina University, 2019).

Physical Fidelity \ 'fi-zi-kəl\ fə-'de-lə-tē, fī-\ *noun*

Etym. physical early 15c., “of or pertaining to material nature” (in medicine, opposed to surgical), from Medieval Latin *physicalis* “of nature, natural,” from Latin *physica* “study of nature” (see *physic*). Meaning “pertaining to matter” is from 1590s; meaning “having to do with the body, corporeal” is attested from 1780. Meaning “characterized by bodily attributes or activities” is attested from 1970. Physical education first recorded 1838; abbreviated form *phys ed* is from 1955. Physical therapy is from 1922. **Related:** Physically.

Etym. fidelity early 15c., “faithfulness, devotion,” from Middle French *fidélité* (15c.), from Latin *fidelitatem* (nominative *fidelitas*) “faithfulness, adherence, trustiness,” from *fidelis* “faithful, true, trusty, sincere,” from *fides* “faith” (see *faith*). From 1530s as “faithful adherence to truth or reality;” specifically of sound reproduction from 1878.

Definition

- A level of realism associated with a particular simulation activity.
- The degree to which the simulation looks, sounds, and feels like the actual task (Alexander, Brunyé, Sidman, & Weil, 2005).

See also: ENVIRONMENTAL FIDELITY, FIDELITY, REALISM

Physiologic Modeling \ fiz-ee-uh-loj-i-k \ mod-l-ing \ *noun*

Etym. physiology (n.) 1560s, “study and description of natural objects,” from Middle French *physiologie* or directly from Latin *physiologia* “natural science, study of nature,” from Greek *physiologia* “natural science, inquiry into nature,” from *physio-* “nature” + *logia* “study.” Meaning “science of the normal function of living things” is attested from 1610s. **Related:** Physiologic; physiologist.

Etym. model. Sense of “thing or person to be imitated” is 1630s.

Definition

- The mathematical computer models governing complex human physiology in a simulated patient case so that reasonable responses occur automatically to events inputted into the program. *For example: a pharmacodynamic model could predict effects of drugs on heart rate, cardiac output, or blood pressure and display them on a simulated clinical monitor.* (Howard Schwid, Rosen, 2013).
- A computer model that allows for a method of operation in which an operator inputs a value to a given parameter, and it automatically adjusts the other variables in a physiologically realistic manner (Palaganas, Maxworthy, Epps, and Mancini, 2015).

Compare: MANUAL INPUT, PREPACKAGED SCENARIO, “RUNNING ON THE FLY”

Pilot Test \ 'pī-lət \ 'test\ *verb*

Etym. pilot (v.) 1640s, “to guide, lead;” 1690s, “to conduct as a pilot,” from *pilot* (n.) or from French *piloter*.

Etym. test (v.) 1748, “to examine the correctness of,” from *test* (n.), on the notion of “put to the proof.” Earlier “assay gold or silver” in a test (c. 1600). Meaning “to administer a test” is from 1939; sense of “undergo a test” is from 1934.

Definition

- A small-scale, short-term effort designed to provide data about the feasibility of a simulation prior to large-scale implementation.
- Trial of simulation operations, scenarios, procedures, and teaching methods on a smaller scale to determine acceptability, identify feasibility concerns, and refine processes prior to full implementation.
- A phase that includes review of the scenario to gain “clarification from experts and participants” (Rizzolo, 2014, p .114).
- Explores the feasibility of the proposed application pertaining to such things as: recruitment, methods, and procedures (Leon, Davis, & Kraemer, 2010).
- An assessment of the feasibility and acceptability of the proposed design and procedure (Feeley et al, 2009).

See also: ALPHA and BETA TESTING, DRY RUN

Consider also: DRESS REHEARSAL, RUN THROUGH, SIMULATION VALIDATION, WALK THROUGH

Portable Simulator \pawr-tuh-buh l \ sim-yuh-ley-ter \ *noun*

Etym. portable (adj.) Early 15c., from French *portable* “that can be carried,” from Late Latin *portabilis* “that can be carried,” from Latin *portare* “to carry.” **Related:** Portability.

Etym. simulator (n.) 1835, of persons, from Latin *simulator* “a copier, feigner,” agent noun from *simulare* “imitate,” from stem of *similis* “like.” In reference to training devices for complex systems, from 1947 (flight simulator); simulated (adj.) 1620s, “feigned,” past participle adjective from *simulate* (v.). Meaning “imitative for purposes of experiment or training” is from 1966 (agent noun simulator in the related sense dates from 1947). In commercial jargon, “artificial, imitation” by 1942.

Definition

- A simulator that has the capabilities of being moved, and may also be able to operate independently of tethers such as power cords or communication cables.

See also: MOBILE SIMULATOR

***Prebrief (Prebriefing)** \ pri'brēf \ *noun* (\pri'brē-fīŋ\ *verb*)

Etym. brief “fact or situation of giving preliminary instructions,” 1910 (but popularized by World War II pre-flight conferences).

Definition

- An information or orientation session held prior to the start of a simulation activity in which instructions or preparatory information is given to the participants. The purpose of the prebriefing is to set the stage for a scenario, and assist participants in achieving scenario objectives.
- The time used by educators, researchers, facilitators, or staff to plan their roles prior to the simulation. Suggested activities in a prebriefing include an orientation to the equipment, environment, manikin, roles, time allotment, objectives, and patient situation. *For example: Before starting the simulation session, there is a prebriefing where the equipment and its capabilities are reviewed and they are reminded of the equipment available to them in the room* (INACSL, 2013).
- The collaboration and planning of co-facilitators/co-debriefers prior to the simulation activity.

See also: BACK STORY, BRIEF/BRIEFING, ORIENTATION

Prepackaged / Preprogrammed Scenario \ pree - pak-ijd \ si-nair-ee-oh \ *noun*

Etym. scenario (n.) 1868, “sketch of the plot of a play,” from Italian scenario, from Late Latin scenarius “of stage scenes,” from Latin scena “scene.” Meaning “imagined situation” is first recorded 1960, in reference to hypothetical nuclear wars.

Definition

- A method of operation in which the simulator is programmed to be in one state and to respond to an input and transition to another state based on a script or algorithm.
- A scenario where a script will assign initial values (such as heart rate, blood pressure, emotional state, or concern) at the start of the scenario that will require specific actions by the participant or certain time frames, for the scenario to transition to the next state (Palaganas, Maxworthy, Epps, and Mancini, 2015).

Compare: MANUAL INPUT, PHYSIOLOGIC MODELING, “RUNNING ON THE FLY”

Procedural Simulation

\ pruh-see-je-uh l \ sim-yuh-ley-shuh n \ *noun*

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- The use of a simulation modality (for example, task trainer, manikin, computer) to assist in the process of learning to complete a technical skill(s), or a procedure, which is a series of steps taken to accomplish an end (INACSL).

- A simulation that incorporates cognitive knowledge and technical skill into a precise sequence of actions that are safe and efficient, targeting any level of learner (Palaganas, Maxworthy, Epps, & Mancini, 2015).

Compare: PROCESS-ORIENTED SIMULATION

Process-Oriented Simulation \ pros-es \ awr-ee-uh nt-id \ sim-yuh-ley-shuh n \ *noun*

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A simulation in which the process is considered more important than the outcome. *For example, a model of a radar system in which the objective is to replicate exactly the radar’s operation, and duplication of its results is a lesser concern* (M&S Glossary).
- In health care, the use of simulation to examine the process of care rather than the outcome of care. *For example: using simulation to re-create an emergency in a patient area to see what latent safety threats exist, such as poor availability of patient equipment, inadequate emergency call buttons, or unsafe obstacles.*

Compare: PROCEDURAL SIMULATION

Prompt \ prām(p)t \ *noun*

Etym: (n.) mid-14c., *prompten*, from Latin *promptus*, past participle of promere “to bring forth,” from *pro* “forward” (from PIE root **per-* (1) “forward”) + *emere* “to take” (from PIE root **em-* “to take, distribute”). Theatrical sense of “to assist a speaker with lines” is first recorded early 15c. **Related:** *Prompted; prompting.*

Definition

- (*noun*) A cue given to a participant in a scenario (Meakim et al 2013).
- (*noun*) A word or phrase spoken as a reminder to an actor of a forgotten word or line (Dictionary.com).
- (*verb*) (of an event or fact) cause or bring about (an action or feeling) (Dictionary.com).
- (*verb*) Assist or encourage (a hesitating speaker) to say something (Dictionary.com).

See also: CUE/CUEING

Prop \ prop \ noun

Etym. prop (n.) “object used in a play,” 1898, from props (1841), shortened form of properties (which was in theatrical use from early 15c.).

Definition

- In simulation, an element or accessory used in a given scenario to enhance realism, or to provide a cue to learners.
- A physical object used as an interface to a virtual world; a prop may be embodied by a virtual object and might have physical controllers mounted on it (Australian Department of Defense).

Psychological Fidelity

\ sahy-kuh-loj-i-kuh l \ fə-ˈde-lə-tē \ noun

Etym. psychology (n.) 1650s, “study of the soul,” from Modern Latin *psychologia*, probably coined mid-16c. in Germany by Melanchthon from Latinized form of Greek *psyche*- “breath, spirit, soul” + *logia* “study of.” Meaning “study of the mind” first recorded 1748, from Christian Wolff’s “*Psychologia empirica*” (1732); main modern behavioral sense is from early 1890s.

Etym. fidelity (n.) early 15c., “faithfulness, devotion,” from Middle French *fidélité* (15c.), from Latin *fidelitatem* (nominative *fidelitas*) “faithfulness, adherence, trustiness,” from *fidelis* “faithful, true, trusty, sincere,” from *fides* “faith.” From 1530s as “faithful adherence to truth or reality;” specifically of sound reproduction from 1878.

Definition

- A level of realism associated with a particular simulation activity.
- The extent to which the simulated environment evokes the underlying psychological processes necessary in the real-world setting (Dieckmann et al., 2008).
- The degree of perceived realism, including psychological factors such as emotions, beliefs, and self-awareness of participants in simulation scenarios (Dieckmann et al., 2008).

See also: FIDELITY, REALISM

Psychological Risk \ sahy-kuh-loj-i-kuh l \ ˈrisk \ noun

Etym. psychological (adj.) “1680s; see psychology + -ical. Related: *Psychologically*. *Psychological warfare* recorded from 1940. *Psychological moment* was in vogue from 1871, from French *moment psychologique* “moment of immediate expectation of something about to happen.””
“The original German phrase, misinterpreted by the French & imported together with its false sense into English, meant the psychic factor, the mental effect, the influence exerted by a state of mind, & not a point of time at all, das Moment in German corresponding to our *momentum*, not our *moment*. [Fowler]”

Etym. risk (n.) “1660s, *risque*, from French *risque* (16c.), from Italian *risco*, *rischio* (modern *rischio*), from *risicare* “run into danger,” of uncertain origin. The Englished spelling first recorded 1728. Spanish *riesgo* and German *Risiko* are Italian loan-words. With *run* (v.) from 1660s. *Risk aversion* is recorded from 1942; *risk factor* from 1906; *risk management* from 1963; *risk taker* from 1892.”

Definition

- A perceived or actual feeling of mental threat as a result of participation in a simulation which can mean feeling unsafe. Examples include feelings of shame or humiliation (Rudolph et al., 2014).

Compare: PSYCHOLOGICAL SAFETY

Psychological Safety \ sahy-kuh-loj-i-kuh l \ seyf-tee \ noun

Etym. psychology (n.) 1650s, “study of the soul,” from Modern Latin *psychologia*, probably coined mid-16c. in Germany by Melanchthon from Latinized form of Greek *psyche*- “breath, spirit, soul” + *logia* “study of.” Meaning “study of the mind” first recorded 1748, from Christian Wolff’s “*Psychologia empirica*” (1732); main modern behavioral sense is from early 1890s.

Etym. safety (n.) early 14c., from Old French *saufete* “safety, safeguard; salvation; security, surety,” earlier *salvetet* (11c., Modern French *saufeté*), from Medieval Latin *salvitatem* (nominative *salvitas*) “safety,” from Latin *salvus*.

Definition

- A feeling (explicit or implicit) within a simulation-based activity that participants are comfortable participating, speaking up, sharing thoughts, and asking for help as needed without concern for retribution or embarrassment.
- The perception of members of the team that the team is safe for risk taking, and mistakes will be considered learning opportunities rather than there being embarrassment or punitive consequences (Edmondson, 1999; Higgins et al, 2012).

See also: SAFE LEARNING ENVIRONMENT, SIMULATION ENVIRONMENT

Compare: PSYCHOLOGICAL RISK

R

Realism \ rēə, lizəm \ noun

Note: this term often used synonymously with fidelity but not all agree these are the same

Etym. realism (n.) 1794, from real (adj.) + -ism; after French réalisme or German Realismus; from Late Latin realis “real.” Meaning “close resemblance to the scene” (in art, literature, etc., often with reference to unpleasant details) is attested from 1856.

Definition

- The ability to impart the suspension of disbelief to the learner by creating an environment that mimics that of the learner’s work environment; realism includes the environment, simulated patient, and activities of the educators, assessors, and/or facilitators (SSH).
- A statement about the similarity of something (a ‘copy’) to something else (the ‘original’) (Dieckmann, Gaba, & Rall, 2007).
- The quality or fact of representing a person, thing, or situation accurately in a way true to life; this enables participants to act “as if” the situation or problem was real.
- Refers to the physical characteristics of the activity, semantical aspects of the activity (theories and conceptual relations – if A happens then B occurs), and/or the phenomenal aspects of the activity (emotions, beliefs, and thoughts experienced).

See also: FIDELITY, FUNCTIONAL FIDELITY, HIGH FIDELITY SIMULATION, HIGH FIDELITY SIMULATOR, IMMERSIVE SIMULATION, PHYSICAL FIDELITY, PSYCHOLOGICAL FIDELITY, SIMULATION FIDELITY

Reflective Thinking \ ri-flek-tiv \ thing-king \ noun

Etym. reflection (n.) Of the mind, from 1670s. Meaning “remark made after turning back one’s thought on some subject” is from 1640s.

Definition

- The engagement of self-monitoring that occurs during or after a simulation experience; this self-monitoring is performed by participants during or after a simulation experience.
- A process to assist learners in identifying their knowledge gaps and demonstrating the areas in which they may need further improvement; it requires active involvement in the simulation and facilitator guidance to aid in this process (Rodgers, 2002; Decker et al., 2008; Kuiper & Pesut, 2004).

- The conscious consideration of the meanings and implications of the events of the simulation; this process allows participants to make meaning out of the experience, to identify questions generated by the experience, and ultimately, to assimilate the knowledge, skills, and attitudes uncovered through the experience with pre-existing knowledge.
- A process to assist learners in identifying their knowledge gaps and demonstrating the areas in which they may need further improvement; this reflection requires conscious self-evaluation to deal with unique patient situations (INACSL, 2013).

See also: GUIDED REFLECTION

Reliability \ ri-lahy-uh-bil-i-tee \ noun

See: SIMULATION RELIABILITY

Remote Simulation \ ri-moht \ sim-yuh-ley-shuh n \ noun

Etym. remote (adj.) mid-15c., from Middle French *remot* or directly from Latin *remotus* “afar off, remote, distant in place,” past participle of *removere* “move back or away, take away, put out of view, subtract,” from re- “back, away” (see re-) + *movere* “to move” (from PIE root *meue- “to push away”)

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like”. Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- Simulation performed with either the facilitator, learners, or both in an offsite location separate from other members to complete educational or assessment activities (Laurent et al., 2014; Shao et al., 2018). Facilitation and assessment can be performed either synchronously or asynchronously using video or web conferencing tools.

Compare: DISTANCE SIMULATION, TELESIMULATION

Remote-controlled Simulation (also Remote-facilitated simulation) \ ri-moht \ kuh n-trohld \ sim-yuh-ley-shuh n \ noun

Etym. remote (adj.) mid-15c., from Middle French *remot* or directly from Latin *remotus* “afar off, remote, distant in place,” past participle of *removere* “move back or away, take away, put out of view, subtract,” from re- “back, away” (see re-) + *movere* “to move” (from PIE root **meue-* “to push away”)

Etym. controlled (adj.) “held in check, restrained,” 1580s, past-participle adjective from **control** (v.). Of rent, from 1930.

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like”. Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- Simulation sessions conducted by an instructor who is in a location separate from the learners for a given session. The remote facilitator introduces the simulation environment and session, runs scenarios and debriefs with (Ohta et al., 2017) or without an onsite facilitator (Ikeyama et al., 2012; Shao et al., 2018).
- A simulation-based session where mannequins are operated by remote control and instructors facilitate in real time via Web or videoconferencing, as an alternative method to face-to-face simulation-based training (Christensen et al., 2015).

Risk Management \ 'risk \ 'ma-nij-mənt \ noun

Etym. risk (n.) 1660s, *risque*, from French *risque* (16c.), from Italian *risco*, *riscio* (modern *rischio*), from *riscare* “run into danger,” of uncertain origin. The Englished spelling first recorded 1728. Spanish *riesgo* and German *Risiko* are Italian loan-words. With *run* (v.) from 1660s. *Risk aversion* is recorded from 1942; *risk factor* from 1906; *risk management* from 1963; *risk taker* from 1892.

Etym. management (n.) 1590s, “act of managing by direction or manipulation,” from manage + -ment. Sense of “act of man aging by physical manipulation” is from 1670s. Meaning “governing body, directors of an undertaking collectively” (originally of a theater) is from 1739.

Definition

- “Proactive management of risk” that increases the rate of successful implementation. (Zakari et al, 2017).
- Managing factors that can result in success or loss within a project. (Sonchan & Ramingwong, 2015).

Role Player \ rohl-pley- r \ noun

Etym. role (n.) “part or character one takes,” c. 1600, from French *rôle* “part played by a person in life,” literally “roll (of paper) on which an actor’s part is written,” from Old French *rolle*.

Etym. player (n.) Old English *plegere*, agent noun from *play* (v.). Stage sense is from mid-15c.

Definition

- One who assumes the attitudes, actions, and discourse of (another), especially in a make-believe situation, in an effort to understand a differing point of view or social interaction. *For example: Nursing students were given a chance to role play a patient or a surgeon.* This term is sometimes used interchangeably with the terms ‘simulated’ and ‘standardized patient’ and may include medical, nursing, or other health professionals. (Victorian Simulated Patient Network).

See also: ACTOR, EMBEDDED PARTICIPANT, SIMULATED PATIENT, SIMULATED PERSON, STANDARDIZED PATIENT.

“Running on the Fly” \ ruh-n-ing \ on \ th uh \ flahy \ noun

Definition

- The method of operation for running a simulation whereby the operator changes the parameters of the scene, the standardized patient, or the simulator as the scenario unfolds; the changes are dependent on the observations and knowledge of the instructor or the operator, which is based on the actions of the participant.
- Running a simulation with minimal planning and preparation; a more impromptu type of simulation experience.

Compare to: MANUAL INPUT, PHYSIOLOGIC MODELING, PREPACKAGE SCENARIO

S

Safe Learning Environment

\ˈsɑːf \ ˈlɔːnɪŋ\ en·vi·ron·ment \in-ˈvī-rə(n)-mənt \ *noun*

Etym. safe (adj.) not able or likely to be hurt or harmed in any way; not in danger.

Etym. environment (n.) the conditions that surround someone or something; the conditions and influences that affect the growth, health, progress, etc., of someone or something.

Definition

- A learning environment where it is clarified that learners feel physically and psychologically safe to make decisions, take actions, and interact in the simulation.
- A learning environment of mutual respect, support, and respectful communication among leaders and learners; open communication and mutual respect for thought and action encouraged and practiced.

See also: PSYCHOLOGICAL SAFETY

Scenario \si-nair-ee-oh \ *noun*

Etym. (n.) 1868, “sketch of the plot of a play,” from Italian scenario, from Late Latin scenarius “of stage scenes,” from Latin scena “scene.” Meaning “imagined situation” is first recorded 1960, in reference to hypothetical nuclear wars.

Definition

- In healthcare simulation, a description of a simulation that includes the goals, objectives, debriefing points, narrative description of the clinical simulation, staff requirements, simulation room set up, simulators, props, simulator operation, and instructions for standardized patients (Alinier, 2011).
- The scripts, stories, or algorithms created for instructing the participants, including the simulators (human or robotic), on how to interact with the students.
- The description of an exercise (including initial conditions) of events for a simulation that includes details for everyone taking part.
- An initial set of conditions and timeline of significant events imposed on trainees or systems to achieve exercise objectives (M&S Glossary).

See also: CLINICAL SCENARIO, SCRIPT SIMULATED-BASED LEARNING EXPERIENCE, SIMULATION ACTIVITY

Screen - based Simulation / Screen - based Simulator

\skreen \ bāst \ sim-yuh-ley-shuh n \ *noun*

Etym. screen (n.) Meaning “flat vertical surface for reception of projected images” is from 1810, originally in reference to magic lantern shows; later of movies. Related **screenshot** (n.) by 1991, from (computer) screen (n.) + shot (n.) in the photograph sense.

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. simulator (n.) 1835, of persons, from Latin simulator “a copier, feigner,” agent noun from simulare “imitate,” from stem of similis “like.” In reference to training devices for complex systems, from 1947 (flight simulator); simulated (adj.) 1620s, “feigned,” past participle adjective from simulate (v.). Meaning “imitative for purposes of experiment or training” is from 1966 (agent noun simulator in the related sense dates from 1947). In commercial jargon, “artificial, imitation” by 1942.

Definition

- A simulation presented on a computer screen using graphical images and text, similar to popular gaming format, where the operator interacts with the interface using keyboard, mouse, joystick, or other input device.
- The programs can provide feedback to, and track actions of learners for assessment, eliminating the need for an instructor (Ventre & Schwid, in Levine Chapter 14).
- A computer-generated video game simulator that can create scenarios that require real-time decisionmaking (Bonnetain, Biese, et al., 2009).

See also: COMPUTER-BASED SIMULATION, SIMULATOR

Scribe / Scribing \ˈskɪrb\ *noun / verb* \ˈskɪrɪbɪŋ\

Etym. special use of Latin scriba “keeper of accounts, secretary, writer,” from past participle stem of scribere “to write.” Sense “one who writes, official or public writer” in English is from late 14c.

Definition

- The act of making notes about a scenario and documenting the actions taken or not taken.

Script | skript | noun

Etym. (n.) late 14c., “something written.” Meaning “handwriting” is recorded from 1860. Theatrical use, short for manuscript, is attested from 1884.

Definition

- The written plan for a simulation event that includes various sets of topics, subtopics, skills, and triggers that will create the situation to induce the desired observable behaviors by the participant(s).
- A preordained series of actions based on the time and sequence of specific events.
- A written set of instructions providing a detailed plan of action for a simulation case; similar to a theatrical play.
- The lines to be spoken by operators, embedded actors, or simulated patients during a simulation event.
- A computer script is a list of commands that are executed by a certain program or scripting engine. Scripts may be used to automate processes on a local computer or to generate web pages on the Web. (<https://techterms.com/definition/script>)

See also: CLINICAL SCENARIO, SCENARIO SIMULATED-BASED LEARNING EXPERIENCE, SIMULATION ACTIVITY

Sequential Simulation

\ si- 'kwen(t)-shəl \ sim-yuh-ley-shuh n \ noun

Etym. sequential (adj.) “1816, from Late Latin *sequentia* (see *sequence*) + -al (1). Related: *Sequentially*.”

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like”. Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A concept defined as “physically simulated trajectories of care” (Weldon, Kneebone, & Bello, 2016, p. 78); in this type of simulation, “elements of a patient’s care pathway” are incorporated “into a scenario-based simulation using real clinicians and simulated patients in order to create a simulated experience from a patient’s perspective” (Weldon, Kneebone, & Bello, 2016, p. 78-79).
- Where the different components of care are re-created; may include transitions of time and different scenes (Weil et al, 2018). The focus is on the patient’s journey and the effect of the care on the patient (Weil et al, 2018).

Compare: DISCRETE SIMULATION, DURATIONAL SIMULATION

Serious Games | seer-ee-uh s \ geymz \ noun

Etym. serious (adj.) mid-15c., “expressing earnest purpose or thought” (of persons), from Middle French *sérieux* “grave, earnest” (14c.), from Late Latin *seriosus*, from Latin *serius* “weighty, important, grave.” Gothic”honed, esteemed,” literally “weighty.” Meaning “attended with danger” is from 1800.

Etym. games (n.) 1200, from Old English *gamen* “joy, fun; game, amusement,” “participation, communion.” “contest for success or superiority played according to rules” is first attested c. 1200 (of athletic contests, chess, backgammon).

Definition

- A mental contest played with a computer in accordance with specific rules, which uses entertainment to further training, education, health, public policy, and strategic communication objectives (Zyda, 2005).
- A game designed for a primary purpose other than pure entertainment. Serious games have an explicit and carefully thought out educational purpose, and are not intended to be played primarily for amusement (Michael and Chen, 2006). Serious games are simulations of real-world events, or processes designed for the purpose of solving a problem.
- In the defense context, serious games are used to rehearse, train, or explore military options in a simulation of real-world events or processes (Australian Dept. of Defense).
- The “serious” adjective is generally appended to refer to products used by industries like defense, education, scientific exploration, healthcare, emergency management, city planning, engineering, religion, and politics.

See also: GAMEIFICATION, SIMULATOR

Shared Mental Model | shaird \ men-tl] \ mod-l] \ noun

Etym. share (n.) (v.) 1580s, “to apportion to someone as his share; to apportion out to others; to enjoy or suffer (something) with others,” from *share*. Meaning “to divide one’s own and give part to others” is recorded from 1590s. **Related:** Shared, sharer, sharing

Etym. mental (adj.) early 15c., “pertaining to the mind,” from Middle French *mental*, from Late Latin *mentalis* “of the mind,” from Latin *mens* (genitive *mentis*) “mind;” cognates: Sanskrit *matih* “thought, mind;” Old English *gemynd* “memory, remembrance.”

Etym. model. Sense of “thing or person to be imitated” is 1630s.

Definition

- A means of describing that each participant in a simulation has a shared understanding of the purpose and process of the simulation activity and participants’ roles.
- The knowledge framework of the relationships between the task the team is engaged in and how the team members will interact. *For example: this framework facilitates a team’s ability to predict what team members will do when faced with a task, and what they will need to do it.*

- A framework whereby an individual team member develops a perception of the situation, it is shared, allowing the team to reflect on the information and revise their situational awareness and their own mental model based on new information. *For example: Sharing can be done by vocalizing observations, calling out information, using a structured time-out to communicate new information, and thinking out loud to allow others to relate and appreciate the associations, assessments, and plans.* Shared mental models facilitate collaboration, and are crucial when team communication in a situation is difficult (due to time pressure, etc.).

Compare: SITUATIONAL AWARENESS

Simulated-Based Learning Experience

\ sim-yuh-leyt -id \ bäst \ lur-ning \ ik-speer-ee-uh ns \ noun

Etym. simulated (adj.) 1620s, “feigned,” past participle adjective from simulate (v.). Meaning “imitative for purposes of experiment or training” is from 1966; commercial jargon, “artificial, imitation” by 1942.

Etym. learning (n.) Old English leornung “learning, study,” from leornian. Learning curve attested by 1907.

Etym. experience (v.) 1530s, “to test, try, learn by practical trial or proof;” (n.). Sense of “feel, undergo” first recorded 1580s. **Related:** Experienced; experiences; experiencing.

Etym. experience (n.) late 14c., “observation as the source of knowledge; actual observation; an event which has affected one,” from Old French esperience “experiment, proof, experience” (13c.), from Latin experientia “a trial, proof, experiment; knowledge gained by repeated trials;” Meaning “state of having done something and gotten handy at it” is from late 15c.

Definition

- An array of structured activities that represent actual or potential situations in education and practice. These activities allow participants to develop or enhance their knowledge, skills, and attitudes, or to analyze and respond to realistic situations in a simulated environment. (Pilcher, Goodall, Jensen, et al., 2012).

See also: CLINICAL SCENARIO, SCENARIO, SIMULATION ACTIVITY

Simulated Patient (SP) \ sim-yuh-leyt -id \ pey-shuh nt \ noun

Note: this term is often synonymous with Standardized Patient

Etym. simulated (adj.) 1620s, “feigned,” past participle adjective from simulate (v.). Meaning “imitative for purposes of experiment or training” is from 1966; commercial jargon, “artificial, imitation” by 1942.

Etym. patient (n.) “suffering or sick person under medical treatment,” late 14c., from Old French pacient (n.), from the adjective, from Latin patientem.

Definition

- A person who has been carefully coached to simulate an actual patient so accurately that the simulation cannot be detected by a skilled clinician. In performing the simulation, the SP presents the gestalt of the patient being simulated; not just the history, but the body language, the physical findings, and the emotional and personality characteristics as well (Barrows, 1987). Often used interchangeably with standardized patients in the USA and Canada, but in other countries simulated patient is considered a broader term than standardized patient, because the simulated patient scenario can be designed to vary the SP role in order to meet the needs of the learner.
- An individual who is trained to portray a real patient in order to simulate a set of symptoms or problems used for health care education, evaluation, and research (Society for Simulation in Healthcare).

- SPs can be used for teaching and assessment of learners, including but not limited to history/consultation, physical examination, and other clinical skills in simulated clinical environments. SPs can also be used to give feedback and evaluate learner performance (Lewis et al, 2017).

See also: ACTOR, EMBEDDED PARTICIPANT, ROLE PLAYER, SIMULATED PERSON, STANDARDIZED PATIENT.

Simulated Person \ sim-yuh-leyt -id \ pur-suh n \ noun

Etym. simulated (adj.) 1620s, “feigned,” past participle adjective from simulate (v.). Meaning “imitative for purposes of experiment or training” is from 1966; commercial jargon, “artificial, imitation” by 1942.

Definition

- A person who portrays a patient (simulated patient), family member, or health care provider in order to meet the objectives of the simulation; a simulated person may also be referred to as a standardized patient/family/health care provider if they have been formally trained to act as real patients in order to simulate a set of symptoms or problems used for health care education, evaluation, and research. Simulated persons often engage in assessment by providing feedback to the learner (Palaganas, et al., 2012).

See also: EMBEDDED PARTICIPANT, ROLE PLAYER, SIMULATED PATIENT, STANDARDIZED PATIENT, STANDARDIZED/SIMULATED PARTICIPANT

Simulated/Synthetic Learning Methods

\ sim-yuh-leyt -id \ sin-thet-ik \ lur-ning \ meth-uh dz noun

Etym. simulated (adj.) 1620s, “feigned,” past participle adjective from simulate (v.). Meaning “imitative for purposes of experiment or training” is from 1966; commercial jargon, “artificial, imitation” by 1942.

Etym. synthetic (adj.) 1690s, as a term in logic, “deductive,” from French synthétique (17c.) and directly from Modern Latin syntheticus, from Greek synthetikos “skilled in putting

together, constructive,” from *synthetos* “put together, constructed, compounded,” past participle of *syntithenai* “to put together” (see *synthesis*). **Related:** *Synthetical* (1620s in logic).

Etym. learning (n.) Old English *leornung* “learning, study,” from *leornian*.

Etym. method (n.) from Latin *methodus* “way of teaching or going,” from Greek *methodos* “scientific inquiry, method of inquiry, investigation,” originally “pursuit, a following after,” from *meta-* “after” + *hodos* “a traveling, way.” Meaning “way of doing anything” is from 1580s; that of “orderliness, regularity” is from 1610s.

Definition

The principles, pedagogies, and educational strategies used in health care simulation. They include:

- **Case-based learning** - written and oral presentations used to present and review clinical scenarios but do not involve hands-on learning, e.g., table-top simulation.
- **Computer simulation** – see Computer Simulation.
- **Procedural or Partial Task Training** - see Part-task Trainer or Task Trainer.
- **Hybrid Simulation**- see Hybrid Simulation.
- **Integrated procedural training (psychomotor focus)** - Combines a series of discrete tasks that are conducted simultaneously or in sequence to form a complex clinical task (e.g., endotracheal intubation and cervical spine immobilization in a trauma patient).
- **Integrated procedural training (whole procedure)** - Integrates task training with role play (actors) to enable procedural and communication tasks to be practiced simultaneously.
- **Mixed simulation**- see Mixed Simulation.
- **Simulation / Scenario-based learning** - Learners interact with people, simulators, computers, or task trainers to accomplish learning goals that are representative of the learner’s real-world responsibilities. The environment may resemble the workplace. Depending on the learning objectives, realism can be built into the equipment or the environment.
- **Standardized/Simulated Patient** - see Standardized/Simulated Patient. **Role play** - see Role Play.
- **Debriefing** – see Debriefing.
- **Multimodal formats** – see Multiple Modality.

See also: MODALITY, TYPOLOGY

Simulation \ sim-yuh-ley-shuh n \ noun

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A technique that creates a situation or environment to allow persons to experience a representation of a real event for the

purpose of practice, learning, evaluation, testing, or to gain understanding of systems or human actions.

- An educational technique that replaces or amplifies real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner (Gaba, 2004).
- A pedagogy using one or more typologies to promote, improve, or validate a participant’s progression from novice to expert (INACSL, 2013).
- The application of a simulator to training and/or assessment (SSH).
- A method for implementing a model over time.

See also: HEALTHCARE SIMULATION

Simulation Activity \ sim-yuh-ley-shuh n \ ak-tiv-i-tee \ noun

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- The entire set of actions and events from initiation to termination of an individual simulation event; in the learning setting, this is often considered to begin with the briefing (prebriefing) and end with the debriefing.
- All the elements in a simulation session, including the design and setup required.

See also: CLINICAL SCENARIO, SCENARIO SIMULATED-BASED LEARNING EXPERIENCE

Simulation-Enhanced Interprofessional Education / (Sim-IPE)

\ sim-yuh-ley-shuh n \ in-'han(t)st \ in-'tər\ prə-'fesh-nəl \ e-jə-'kā-shən\ noun

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. education (n.) the action or process of teaching someone especially in a school, college, or university; the knowledge, skill, and understanding that you get from attending a school, college, or university; a field of study that deals with the methods and problems of teaching.

Definition

- The education of health care professionals with different but complementary knowledge and skills in a simulation environment that promotes a collaborative team approach. Simulation-enhanced interprofessional education (Sim-IPE) occurs when participants and facilitators from two or more professions are engaged in a simulated health care experience to achieve shared or linked objectives and outcomes (Decker, et al., 2015). It is designed for the individuals involved to “learn about, from and

with each other to enable effective collaboration and improve health outcomes” (WHO, 2010, p.13).

- A collaborative educational approach that brings together health care professionals of varying specialties in a simulation environment engaging learners in an interprofessional teamwork model (Decker et al., 2008).
- A simulation environment of equal and mutual respect and recognition of each team member’s knowledge and skills.

Simulation Environment / Simulation Learning Environment / Synthetic Learning Environment (SLE)

\ sim-yuh-ley-shuh n \ lur-ning \ en-vahy-ruh n-muh nt
\ sin-'the-tik \ 'lørn-ing \ in-'vī-rə(n)-mənt \ noun

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. synthetic (adj.) 1690s, as a term in logic, “deductive,” from French *synthétique* (17c.) and directly from Modern Latin *syntheticus*, from Greek *synthetikos* “skilled in putting together, constructive,” from *synthetos* “put together, constructed, compounded,” past participle of *synthēnai* “to put together” (see *synthesis*). **Related:** *Synthetical* (1620s in logic).

Etym. learning (n.) Old English *leornung* “learning, study,” from *leornian*.

Etym. environment (n.) 1887, “environing, surrounding,” Ecological sense by 1967.

Definition

- The physical setting where simulation activities may take place, inclusive of the people and equipment that form part of the simulation experience.
- A location where a simulation-based learning experience takes place, and where a safe atmosphere is created by the facilitator to foster sharing and discussion of participant experiences without negative consequences.
- A context for learning that consists of a controlled and shielded representation of real-world situations, and a set of educational methods and procedures in which trainees feel simultaneously challenged and psychologically safe to practice and reflect on their performance (Rudolph et al., 2007).
- An atmosphere that is created by the facilitator to allow for sharing and discussion of participant experiences without fear of humiliation or punitive action.
- A setting, surrounding, or conditions that reproduce components or aspects of the real-world environment, for the purpose of learning and related activities, and/or research (ASSH).

See also: PSYCHOLOGICAL SAFETY

Simulation Ethics \ sim-yuh-ley-shuh n \ 'e-thiks \ noun

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like”. Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. ethic (n.) character or pertaining to the character, from Latin (*ethica*), and is from the Ancient Greek (*êthicos*). “late 14c., *ethik* “study of morals,” from Old French *etique* “ethics, moral philosophy” (13c.), from Late Latin *ethica*, from Greek *êthike philosophia* “moral philosophy,” fem. of *êthikos* “ethical, pertaining to character,” from *êthos* “moral character,” related to *êthos* “custom” (see *ethos*). Meaning “moral principles of a person or group” is attested from 1650s.” **ethics** (n.) “the science of morals,” c. 1600, plural of Middle English *ethik* “study of morals” (see *ethic*). The word also traces to *Ta Ethika*, title of Aristotle’s work. **Related:** *Ethicist*.

Definition

- A self-imposed formalized code for all simulationists that includes the following values: “Integrity, Transparency, Mutual Respect, Professionalism, Accountability, and Results Orientation” (Park, Murphy, & Code of Ethics Working Group, 2018).
- Is applicable for both simulation facilitators and the participants (learners); based on frameworks and values; includes one’s behaviors and conduct during a simulation-based experience (Lioce, Graham, & Young, 2018).
- A basis for simulations which is to promote patient safety and engage learners/participants (Pinar & Peksoy, 2016).

Simulation Fidelity \ sim-yuh-ley-shuh n \ fə-'de-lə-tē \ noun

Note: the term fidelity is often used synonymously with realism but not all agree these are the same

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. fidelity (n.) early 15c., “faithfulness, devotion,” from Middle French *fidélité* (15c.), from Latin *fidelitatem* (nominative *fidélitas*) “faithfulness, adherence, trustiness,” from *fidelis* “faithful, true, trusty, sincere,” from *fides* “faith”. From 1530s as “faithful adherence to truth or reality;” specifically of sound reproduction from 1878.

Definition

- The level of realism associated with a particular simulation activity.
- The physical, semantic, emotional, and experiential accuracy that allows persons to experience a simulation as if they were operating in an actual activity (SSH).
- The believability, or the degree to which a simulated experience approaches reality. Fidelity can involve a variety of dimensions, including (a) physical factors such as environment, equipment, and related tools; (b) psychological factors such as emotions, beliefs, and self-awareness of participants; (c) social factors such as participant and instructor motivation and goals; (d) culture of the group; and (e) degree of openness and trust, as well as participants’ modes of thinking (Rudolph et al., 2007).

See also: FIDELITY

Simulation Guideline

\ sim-yuh-ley-shuh n \ gahyd-lahyn \ *noun*

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. guideline (n.) 1785, “line marked on a surface before cutting,” from *guide* + *line* (n.). Meaning “rope for steering a hot-air balloon” is from 1846. In figurative use by 1948.

Definition

- A recommendation of the qualities for simulation fidelity, simulation validity, simulation program, or for formative or summative evaluation (SSH).
- A set of procedures or principles that are recommended to assist in meeting standards. Guidelines are not necessarily comprehensive. They provide a framework for developing policies and procedures based on best practice.
- A set of recommendations, incorporating currently known best practice, based on research and/or expert opinion.

Compare: SIMULATION STANDARD

Simulationist

\ sim-yuh-ley-shuh n - ist \ *noun*

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A modeling and simulation professional (Tucker, 2010).
- A person “who is involved, full-time or part-time, in modeling or simulation activities,” for example, develops models to be used for simulation purposes; performs simulation studies; develops simulation software; manages simulation projects; advertises and/or markets simulation products and/or services; maintains simulation products and/or services; promotes simulation-based solutions to important problems; advances simulation technology; and advances simulation methodology and/or theory (Ören, 2000).
- A term used to describe “professionals involved in providing simulation activities, products, and services” (Kardong-Edgren, 2013, p. e561). This can include simulated patient educators, trainers, and standardized or simulated patients (SPs).
- A term for “professionals involved in modelling and simulation activities and/or with providing modelling and simulation products and/or services” (Ören, Elzas, Smit, & Birta, 2002).

Compare: DEBRIEFER, FACILITATOR OPERATIONS SPECIALIST, SIMULATION TECHNOLOGY SPECIALIST

Simulation Operations

\ sim-yuh-ley-shuh n \ op-uh-rey-shuh nz \ *noun*

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. operations (n.) only singular form (operation) - “late 14c., “action, performance, work,” also “the performance of some science or art,” from Old French *operacion* “operation, working, proceedings,” from Latin *operationem* (nominative *operatio*) “a working, operation,” noun of action from past-participle stem of *operari* “to work, labor” (in Late Latin “to have effect, be active, cause”), from *opera* “work, effort,” related to *opus* (genitive *operis*) “a work” (from PIE root **op-* “to work, produce in abundance”).”

Definition

- “The infrastructure, people, and processes necessary for implementation of an effective and efficient simulation-based education (SBE) program” (The INACSL Standards Committee, 2017, p. 681).
- A term that encompasses “the job duties related to the overall management, delivery, and function of simulation-based education” (Crawford, Bailey, & Steer, 2019, p. 148).

Simulation Reliability

\ sim-yuh-ley-shuh n \ ri-lahy-uh-bil-i-tee \ *noun*

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. reliable (adj.) 1560s, *raliabil*, Scottish; see *rely* + *-able*.

Definition

- The consistency of a simulation activity, or the degree to which a simulation activity measures in the same way each time it is used under the same conditions with the same participants.
- “Consistency of performance” under the same conditions with similar participants. (Scalese & Hatala, 2014).
- The consistency is “tested by interrater, test-retest, and intra-instrument” (Adamson, 2014, p. 155).

Compare: SIMULATION VALIDITY

Simulation Standard

\ sim-yuh-ley-shuh n \ stan-derd \ *noun*

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A statement of the minimum requirements for simulation fidelity, validity, formative or summative evaluation, or any other element related to a simulation activity or program (SSH).

Compare: SIMULATION GUIDELINE

Simulation Technology Specialist \ sim-yuh-ley-shuh n \ tek-'nä-lə-jē \ spesh-uh-list \ *noun*

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Etym. technology (n.) “1610s, “a discourse or treatise on an art or the arts,” from Greek *tekhologia* “systematic treatment of an art, craft, or technique,” originally referring to grammar, from *tekhnō-*, combining form of *tekhnē* “art, skill, craft in work; method, system, an art, a system or method of making or doing,” from PIE **teks-na-* “craft” (of weaving or fabricating), from suffixed form of root **teks-* “to weave,” also “to fabricate.” For ending, see **-logy**.” “The meaning “study of mechanical and industrial arts” (Century Dictionary, 1895, gives as example “spinning, metal-working, or brewing”) is recorded by 1859. *High technology* attested from 1964; short form *high-tech* is from 1972.”

Etym. specialist (n.) “1852 (originally in the medical sense and much scorned by the GPs); see **special** (adj.) + **-ist**. Perhaps immediately from French *spécialiste* (1842). In general use in English by 1862.

Related: Specialism.

Definition

- A person, defined as someone “with a diverse set of skills and expertise both technical and administrative related to the operation, support, and delivery of healthcare simulation” (Crawford, Bailey, & Steer, 2019, p. 148).
- A person, also known as a “Sim Tech” or Simulation Technician who functions as a technician for healthcare simulation technology (Baily, 2014; Crawford, Bailey, & Steer, 2019). In addition to technical support, job duties may vary and include such duties as preparing for simulations (mannequin programming, set-up), running of equipment during simulations (simulator, audiovisual), equipment maintenance/repair, and education of others concerning simulation technologies (UW Health, 2017).
- An individual who provides technological expertise, instructional support, and advocacy in healthcare simulation.

See also: OPERATIONS SPECIALIST, SIMULATIONIST

Simulation Testing Environment \ sim-yuh-ley-shuh n \ tee-ching \ en-vahy-ruh n-muh nt \ *noun*

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A context for formative or summative evaluation of an individual’s or team’s performance. The goals of the simulation testing environment are to create an equivalent activity for all participants in order to test their knowledge, skills, and abilities in a simulated setting (INACSL, 2013).

Simulation Time \ sim-yuh-ley-shuh n \ tahym \ *noun*

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A simulation’s internal representation of time; simulation time may accumulate faster, slower, or at the same pace as real time.
- A time established by the simulation educator before the start of the simulation exercise, irrespective of the actual real time (Hancock et al, 2008).

Simulation Tool \ sim-yuh-ley-shuh n \ 'tül \ *noun*

Etym. simulation (n.) mid-14c., “a false show, false profession,” from Old French *simulation* “pretence” and directly from Latin *simulationem* (nominative *simulatio*) “an imitating, feigning, false show, hypocrisy,” noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like, resembling, of the same kind” (see **similar**). Meaning “a model or mock-up for purposes of experiment or training” is from 1954.”

Etym. tool (n.) “Old English *tol* “instrument, implement used by a craftsman or laborer, weapon,” from Proto-Germanic **tōwalan* “implement” (source also of Old Norse *tol*), from a verb stem represented by Old English *tawian* “prepare” (see *taw*). The ending is the instrumental suffix *-el* (1). Figurative sense of “person used by another for his own ends” is recorded from 1660s.”

Definition

- A model or mock-up for purposes of experiment or training.
- A device, including lower and higher simulation technologies, that can be used to promote participant learning (Yale University, n.d.). Examples include task trainers, mannequins (manikins) and immersive environments (i.e., virtual reality). The specific simulation tool should be chosen based on the predetermined objectives and outcomes (INACSL Standards Committee, 2016b; Yale University, n.d.).
- The modality or “the platform for the experience” (INACSL Standards Committee, 2016b, S7).
- A description of what healthcare simulation is; known as “an effective tool, technique, or method” (Barjis, 2011, p. 2).
- An instrument used to assess/evaluate in a simulation.

See also: MODALITY

Simulation Validity \sim-yuh-ley-shuh n \ vuh-lid-i-tee\ noun

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- The degree to which a model or simulation accurately represents or measures what it intends to measure. (Scalese and Hatala, 2014).
- In health care simulation, the quality of a simulation or simulation program that demonstrates that the relationship between the process and its intended purpose is specific, sensitive, reliable, and reproducible (Dieckmann, 2009; SSH).
- “The degree to which a test or evaluation tool accurately measures the intended concept of interest” (INACSL Standards Committee, 2016).
- “How well the data measures the construct it is intended to measure” (Adamson, 2014,p.155).

Compare: SIMULATION RELIABILITY

Simulator \ sim-yuh-ley-ter \ noun

Etym. simulator (n.) 1835, of persons, from Latin simulator “a copier, feigner,” agent noun from simulare “imitate,” from stem of similis “like”. In reference to training devices for complex systems, from 1947 (flight simulator). simulated (adj.) 1620s, “feigned,” past participle adjective from simulate (v.). Meaning “imitative for purposes of experiment or training” is from 1966 (agent noun simulator in the related sense dates from 1947. In commercial jargon, “artificial, imitation” by 1942.

Definition

- A setting, device, computer program or system that performs simulation (Hancock et al, 2008).
- Any object or representation used during training or assessment that behaves or operates like a given system and responds to the user’s actions (SSH).
- A device that duplicates the essential features of a task situation. A simulator generally has three elements – a modelled process which represents, emulates, or otherwise simulates a real-world system; a control system; and a human-machine interface which is representative of the inputs found in the real-world system (Australian Department of Defense). Examples include manikins and part-task trainers.

See also: COMPUTER-BASED SIMULATION, MANIKIN, SERIOUS GAMES, SCREEN-BASED SIMULATION, SIMULATED PATIENT, STANDARDIZED PATIENT, TASK TRAINER, VIRTUAL REALITY

Situated Learning \sich-oo-ey-tid \ lur-ning \ noun

Etym. situate (v.) early 15c., “to place in a particular state or condition,” from Medieval Latin situatus, past participle of situare “to place, locate,” from Latin situs “a place, position” (see site). **Related:** Situated; situating, situation (n.).

Etym. learning (n.) Old English leornung “learning, study,” from leornian (see learn). Learning curve attested by 1907.

Definition

- A theory that posits that learning occurs within authentic activity, context, and culture. Social interaction and collaboration are considered essential components (Lave and Wenger, 2008). This is opposed to a classroom learning activity that is abstract and out of context.

Situational Awareness

\sich-oo-ey-shuh n-ul \ ə-‘wer-nis\ noun

Etym. situate (v.) early 15c., “to place in a particular state or condition,” from Medieval Latin situatus, past participle of situare “to place, locate,” from Latin situs “a place, position” (see site). **Related:** Situated; situating, situation (n.).

Etym. awareness (n.) 1828, from aware + -ness. Late Old English gewær, “wary, cautious.”

Definition

- Situation awareness (SA) is the perception of environmental elements within time and space, and a perception of their meaning; it involves being aware of what is happening around you to understand how information, events, and your own actions impact the outcomes and objectives.
- A field of study concerned with understanding of the environment critical to decisionmakers in complex, dynamic areas; situational awareness refers to the degree to which one’s perception of a situation matches reality.
- The awareness of fatigue and stress among team members (including oneself), environmental threats to safety, immediate goals, information sharing, and the deteriorating status of the crisis or patient. Most commonly used in the context of crisis resource management training (Hancock et al, 2008).

Compare: SHARED MENTAL MODEL

Contrast with: FIXATION ERROR

Standardized Patient (SP) \ stan-dər- ,dīz-d \ pā-shənt \ noun

[Note: this term is often synonymous with Simulated Patient]

Etym. standard - “authoritative or recognized exemplar of quality or correctness” (late 15c.). Meaning “rule, principal or means of judgment” is from 1560s. That of “definite level of attainment” is attested from 1711 (as in standard of living, 1903).

Etym. patient – (n.) “suffering or sick person under medical treatment,” late 14c.

Definition

- A person who has been carefully coached to simulate an actual patient so accurately that the simulation cannot be detected by a skilled clinician. In performing the simulation, the SP presents the gestalt of the patient being simulated; not just the history, but the body language, the physical findings, and the emotional and personality characteristics as well (Barrows, 1993).
- An individual trained to portray a patient with a specific condition in a realistic, standardized, and repeatable way and where portrayal/presentation varies based only on learner performance; this strict standardization of performance in a simulated session is what can distinguish standardized patients from simulated patients.
- SPs can be used for teaching and assessment of learners, including but not limited to history/consultation, physical examination, and other clinical skills in simulated clinical environments Association of Standardized Patient Educators (ASPE). SPs can also be used to give feedback and evaluate learner performance (ASPE).
- An individual who is trained to portray a real patient in order to simulate a set of symptoms or problems used for healthcare education, evaluation, and research (SSH).
- More commonly used in the USA and Canada in large part because SPs participate in high stakes assessments in which SP responses to the learner were standardized. In recent years as SPs have been included in more formative teaching scenarios, its meaning has become interchangeable with the term simulated patient.

See also: ACTOR, EMBEDDED PARTICIPANT, ROLE PLAYER, SIMULATED OR STANDARDIZED PATIENT OR PARTICIPANT, SIMULATED PERSON.

Standardized Patient Simulation \ stan-dər-, dīz-d \ pā-shənt \ sim-yuh-ley-shuh n \ noun

Note: the term Standardized Patient is often synonymous with Simulated Patient

Etym. standard (n.) “authoritative or recognized exemplar of quality or correctness” (late 15c.). Meaning “rule, principal or means of judgment” is from 1560s. That of “definite level of attainment” is attested from 1711 (as in standard of living, 1903).

Etym. patient (n.) “suffering or sick person under medical treatment,” late 14c.

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A simulation using a person or persons trained to portray a patient scenario or actual patient(s) for health care education (SSH).
- A modality used for the purpose of practice, learning, assessment, or to gain an understanding of systems or human actions in which standardized (or simulated) patients play a central role.

Standardized/Simulated Participant \ stan-dər-, dīz-d \ sim-yə-, lāt-id \ pā-r-'ti-sə-pənt \ noun

See: SIMULATED PATIENT, STANDARDIZED PATIENT

State/States \ stāt \ noun

Etym. Meaning “physical condition as regards form or structure” is attested from late 13c. Meaning “mental or emotional condition” is attested from 1530s (phrase state of mind first attested 1749).

Definition

- A term used when programming manikins; state variables may include vital signs, monitor readings, body sounds, and verbalizations made by the simulator.
- [plural] A sequence of events that change over time. (Sokolowski & Banks, 2011). This may include psychosocial behaviors in the simulation activities.

Compare to: EVENT

See also: TRIGGER

Stochastic \ stə-'kas-tik \ adj

Etym. (adj.) 1660s, “pertaining to conjecture,” from Greek stokhastikos “able to guess, conjecturing,” from stokhos “a guess, aim, target, mark,” literally “pointed stick set up for archers to shoot at;” the sense of “randomly determined” is from 1934, from German stochastik (1917).

Definition

- Pertaining to a process, model, or variable whose outcome, result, or value depends on chance (M&S Glossary).

Contrast with: DETERMINISTIC

Synthetic Learning Technologies \ sin-'the-tik \ 'lɔrn-ɪŋ \ tek-'nä-lə-jē-z \ noun

Etym. synthetic (adj.) 1690s, as a term in logic, “deductive,” from French synthétique (17c.) and directly from Modern Latin syntheticus, from Greek synthetikos “skilled in putting together, constructive,” from synthetos “put together, constructed, compounded,” past participle of syntithenai “to put together” (see synthesis). **Related:** Synthetical (1620s in logic).

Etym. learning (n.) Old English leornung “learning, study,” from leornian.

Etym. techno - word-forming element meaning “art, craft, skill,” later “technical, technology,” from Latinized form of Greek tekhnō-, combining form of tekhnē “art, skill, craft in work; method, system, an art, a system or method of making or doing.”

Definition

- The technologies used in synthetic or simulated learning environments, including manikin; computer-based virtual reality; haptics; actors; simulated patients; part-task / task trainers; hybrid; and video (ASSH).

Systems Integration 'sis-təmz \ , in-tə-'grā-shən\ *noun*

Etym. system - (n.) 1610s, “the whole creation, the universe,” from Late Latin *systema* “an arrangement, system,” from Greek *systema* “organized whole, a whole compounded of parts,” from stem of *synistanai* “to place together, organize, form in order,” from *syn-* “together.” Meaning “set of correlated principles, facts, ideas, etc.” first recorded 1630s.

Etym. integration (n.) 1610s, from French *intégration* and directly from Latin *integrationem* (nominative *integratio*) “renewal, restoration.” **Integrate** - Meaning “to put together parts or elements and combine them into a whole” is from 1802. **Related:** Integrated; integrating.

Definition

- An engineering term meaning to bring together the component subsystems into one system that functions together. In health care, the ability to improve the quality of care and patient outcomes through re-engineering of care delivery processes.
- A category of simulation program accreditation that recognizes programs that demonstrate consistent, planned, collaborative, integrated, and iterative application of simulation-based assessment, research, and teaching activities with systems engineering and risk management principles to achieve excellent bedside clinical care, enhanced patient safety, and improved outcome metrics across the health care system(s) (SSH).

T

Tabletop Simulation (TTX)

\ 'tā-bəl-, tṑp \ sim-yuh-ley-shuh n \ noun

Etym. tabletop (adj.) table- late 12c., “board, slab, plate,” from Old French table “board, square panel, plank; writing table; picture; food, fare” (11c.), and late Old English tabelle “writing tablet, gaming table,” from Germanic *tabal
top (adj.) “being at the top, 1590s. or (n.) highest point,” Old English top “summit, crest, tuft,”

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like”. Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- An educational tool intended to provide students/learners an opportunity to apply knowledge through formal discussion of a described scenario (Lehtola, 2007).
- In the context of tabletop exercise, involves key personnel discussing simulated scenarios in an informal setting. Can be used to assess plans, policies, and procedures (California Hospital Association, 2017).

Take-home Simulation

\ teyk \ hohm \ sim-yuh-ley-shuhn \ noun

Etym. take (v.) late Old English tacan “to take, seize,” from a Scandinavian source (such as Old Norse taka “take, grasp, lay hold,” past tense tok, past participle tekinn; Swedish ta, past participle tagit), from Proto-Germanic *takan- (source also of Middle Low German tacken, Middle Dutch taken, Gothic tekan “to touch”), from Germanic root *tak- “to take,” of uncertain origin, perhaps originally meaning “to touch.”

Etym. home (n.) Old English ham “dwelling place, house, abode, fixed residence; estate; village; region, country,” from Proto-Germanic *haimaz “home” (source also of Old Frisian hem “home, village,” Old Norse heimr “residence, world,” heima “home,” Danish hjem, Middle Dutch heem, German heim “home,” Gothic haims “village”).

Etym. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like”. Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A combination of devices (e.g., laparoscopic box trainer), software, tasks, instructional videos, target performance levels, log sheets, and program overview materials that are provided to participants for use at in-home or other similar locations for completing simulation activities (Wilson et al., 2019).

Take-home Simulators

\ teyk \ hohm \ sim-yuh-ley-ters \ noun

Etym. take (v.) late Old English tacan “to take, seize,” from a Scandinavian source (such as Old Norse taka “take, grasp, lay hold,” past tense tok, past participle tekinn; Swedish ta, past participle tagit), from Proto-Germanic *takan- (source also of Middle Low German tacken, Middle Dutch taken, Gothic tekan “to touch”), from Germanic root *tak- “to take,” of uncertain origin, perhaps originally meaning “to touch.”

Etym. home (n.) Old English ham “dwelling place, house, abode, fixed residence; estate; village; region, country,” from Proto-Germanic *haimaz “home” (source also of Old Frisian hem “home, village,” Old Norse heimr “residence, world,” heima “home,” Danish hjem, Middle Dutch heem, German heim “home,” Gothic haims “village”).

Etym. simulator (n.) 1835, of persons, from Latin simulator “a copier, feigner,” agent noun from simulare “imitate,” from stem of similis “like”. In reference to training devices for complex systems, from 1947 (flight simulator). simulated (adj.) 1620s, “feigned,” past participle adjective from simulate (v.). Meaning “imitative for purposes of experiment or training” is from 1966 (agent noun simulator in the related sense dates from 1947. In commercial jargon, “artificial, imitation” by 1942.

Definition

- Simulators that can be taken home or used in other locations (e.g., call room). (Bokhari et al., 2010).

Task Trainer / Part-Task Trainer / Partial Task Trainer

\ təhsk \ trey-ner \ noun

Etym. task (n.) early 14c., “a quantity of labor imposed as a duty,” from Old North French *tasque* (12c., Old French *tasche*, Modern French *tâche*). General sense of “any piece of work that has to be done” is first recorded 1590s.

Etym. trainer (n.) c. 1600, “one who educates or instructs,” agent noun from *train* (v.). Meaning “one who prepares another for feats requiring physical fitness” is from 1823, originally of horse trainers.

Definition

- A device designed to train in just the key elements of the procedure or skill being learned, such as lumbar puncture, chest tube insertion, central line insertion or part of a total system, *for example, ECG simulator* (Center for Immersive and Simulation Based Learning [CISL] & Levine et al).
- A model that represents a part or region of the human body such as an arm, or an abdomen. Such devices may use mechanical or electronic interfaces to teach and give feedback on manual skills such as IV insertion, ultrasound scanning, suturing, etc. Generally used to support procedural skills training; however they can be used in conjunction with other learning technologies to create integrated clinical situations (Australian Society for Simulation in Healthcare).

See also: PROCEDURAL SIMULATION, SIMULATOR

Team-based Learning

\ 'tēm \ 'bāst \ 'lārn-ing \ noun

Etym. team (n.) applied in Old English to groups of persons working together for some purpose, especially “group of people acting together to bring suit;” modern sense of “persons associated in some joint action” is from 1520s. Team spirit is recorded from 1928. Team player attested from 1886, originally in baseball.

Etym. learning (n.) Old English *leornung* “learning, study,” from *leornian*.

Definition

- A learning method that makes use of small group discussion and collaborative, self-directed study to foster new learning as opposed to imparting information. After a period of preliminary individual accountability, teams of learners compete with each other to learn information and solve problems, This is in distinction to traditional learning in which information is imparted from teacher to learner.
- A learning method with many similarities to Problem Based Learning (PBL). Unlike PBL, where a complex, open-ended, case is given without the information to solve it, team-based learning capitalizes on the use of carefully chosen learning activities based on reading assignments (Michaelson, Parmelee, & McMahon, 2008).

Technical skills

\ 'tek-ni-kəl \ 'skil \ noun

Etym. technical (adj.) 1610s, “skilled in a particular art or subject,” formed in English from *technic* + *al* (1), or in part from Greek *tekhnikos* “of art; systematic,” in reference to persons “skillful, artistic,” from *tekhne* “art, skill, craft.” The sense narrowed to “having to do with the mechanical arts” (1727).

Etym. skills (n.) late 12c., “power of discernment,” from Old Norse *skil* “distinction, ability to make out, discernment, adjustment,” related to *skilja* (v.) “to separate; discern, understand,” from Proto-Germanic **skaljo-* “divide, separate” (cognates: Swedish *skäl* “reason,” Danish *skjel* “a separation, boundary, limit,” Middle Low German *schillen* “to differ,” Middle Low German, Middle Dutch *schele* “separation, discrimination;” Sense of “ability, cleverness” first recorded early 13c.

Definition

- A skill that is required for the accomplishment of a specific task.
- In health care, the knowledge, skill, and ability to accomplish a specific medical task; for example, inserting a chest tube or performing a physical examination.

Technology-Enhanced Health care Simulation (encompasses high-and low-technology health care simulation)

\ tek-'nā-lə-jē \ in-'han(t)s \ 'helth \ 'ker \ sim-yuh-ley-shuh n \ noun

Etym. techno - word-forming element meaning “art, craft, skill,” later “technical, technology,” from Latinized form of Greek *tekhno-*, combining form of *tekhne* “art, skill, craft in work; method, system, an art, a system or method of making or doing.”

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A group of materials and devices created or adapted to train health care professionals in a simulated environment. Examples include such diverse products as computer-based virtual reality simulators, high-fidelity and static mannequins, plastic models, live animals, inert animal products, and human cadavers (Cook et al., 2011).
- An educational tool or device with which the learner physically interacts to mimic an aspect of clinical care for the purpose of teaching or assessment.

Telepresence \ 'tɛlɪ,prɛzəns\ *noun*

Ety. tele (adj.) before vowels tel-, word-forming element meaning “far, far off, operating over distance” (also, since c. 1940, “television”), from Greek tele “far off, afar, at or to a distance,” related to teleos (genitive telos) “end, goal, completion, result,” from PIE root *kwel- (2) “far” in space or time.”

Ety. presence (n.): mid-14c., “fact of being present,” from Old French presence (12c., Modern French présence), from Latin praesentia “a being present,” from praesentem (see present (n.)). Present c. 1300, “existing at the time,” from Old French present “evident, at hand, within reach;” as a noun, “the present time” (11c., Modern French présent) and directly from Latin praesentem (nominative praesens) “present, at hand, in sight; immediate; prompt, instant; contemporary,” from present participle of praesens “be before (someone or something), Meaning “being there” is from mid-14c. in English.

Definition

- Telepresence is the bridging of geographical separation using technology that enables interaction and communication approximate to being actually present. Work-from-home meeting software, like Cisco WebEx, Zoom, etc., is telepresence. The environment you see through the webcam of your colleague is a real, non-computer generated environment (e.g., their office or home). Manikin-based simulations with a debriefer who is geographically separated but uses a telepresence robot would be telepresence, but not virtual presence (Shaw et al., 2018).

Compare: VIRTUAL PRESENCE

Telesimulation \ (Tele-OSCE) \ 'tɛlɪ, \ sim-yuh-ley-shuh n \ *noun*

Ety. tele (adj.) before vowels tel-, word-forming element meaning “far, far off, operating over distance” (also, since c. 1940, “television”), from Greek tele “far off, afar, at or to a distance,” related to teleos (genitive telos) “end, goal, completion, result,” from PIE root *kwel- (2) “far” in space or time.”

Ety. simulation (n.) noun of action from past participle stem of simulare “imitate,” from stem of similis “like”. Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- “A telesimulation platform utilizes communications technology to provide mannequin-based simulation education between learners and instructors located remotely from one another. Specifically, the instructor controls the mannequin and moderates the debriefing remotely. During these sessions, the instructor observes the learners in real time and provides immediate feedback during the debriefing. This platform obviates the need to have instructors, learners, and mannequins in the same place at the same time, potentially allowing simulation-based educational sessions to occur with greater frequency for institutions not located proximate to formal simulation centers. Additionally, the telesimulation platform enables an experienced simulation instructor to observe and directly help new simulation instructors at remote simulation locations. Readily available Web-conferencing, screen-sharing software, microphones, and webcams

makes telesimulation possible. Mannequin-based telesimulation is relatively new and not well represented in the literature, but could facilitate systems changes, providing educational experiences to healthcare professionals in locations not currently benefiting from mannequin-based simulation opportunities. Several research questions need to be addressed in future studies to better develop this educational approach, including technical feasibility, logistic issues, a comparison of telesimulation to other simulation approaches, and assessing limitations of the telesimulation platform” (Hayden et al., 2018, p. 144).

- “Telesimulation (TS) is a novel concept that uses the internet to link simulators between an instructor and a trainee in different locations” (Okraïnec et al., 2010, p. 417). “Telesimulation uses the Internet to link simulators between an instructor and trainee in different locations” (Okraïnec et al., 2010, p. 417). “Using two simulators, multiple computers, a series of webcams, and basic video conferencing software, the instructor and trainee can see within each other’s simulators as well as see and speak to each other” (Okraïnec et al., 2010, p. 418). Telesimulation differs from “telementoring or teleconferencing because it actually connects two simulators in different physical locations,” allowing teacher and student to see, but not control, what the other is doing in real time (Okraïnec et al., 2010, p. 418). “Telesimulation is a novel, practical, inexpensive, effective, and well-received method for teaching appropriate procedural skills” (Mikrogiannakis et al., 2011, p. 427).

Compare: DISTANCE SIMULATION, REMOTE SIMULATION

Training Scars \ 'trā-niŋ \ 'skār \ *noun*

Ety. training (adj.) mid-15c., “protraction, delay,” verbal noun from train (v.). From 1540s as “discipline and instruction to develop powers or skills;” 1786 as “exercise to improve bodily vigor.” *Training wheels* as an attachment to a bicycle is from 1953.

Ety. scar (n.) late 14c., from Old French *escare* “scab” (Modern French *escarre*), from Late Latin *eschara*, from Greek *eskhara* “scab formed after a burn,” literally “hearth, fireplace,” of unknown origin. English sense probably influenced by Middle English *skar* (late 14c.) “crack, cut, incision,” from Old Norse *skarð*, related to **score** (n.). Figurative sense attested from 1580s.

Definition

- A bad habit, practice, or procedure that is taught, can result from errors of commission or errors of omission in teaching.
- The unintentional bad habits acquired during the course of training.
- The creation of obvious or latent errors in behaviors that typically appear under certain conditions, especially when under stress or in stressful situations.
- Methods in which learners have been trained that do not directly apply to practice or operations and are not based in reality (Ellefriz, 2019; Grossman, 2008).

Compare: NEGATIVE LEARNING

Consider also: STRESS INNOCULATION

Trigger(s) \ˈtri-gər \ noun

Etym. trigger (n.) “device by means of which a catch or spring is released and a mechanism set in action.”

Definition

- An event or events that move the simulation from one state to another.
- Anything, as an act or event, that serves as a stimulus and initiates or precipitates a reaction (dictionary.com).

See also: STATE/STATES

Typology \tī-ˈpä-lə-jē \ noun

Etym. typology (n.) “doctrine of symbols,” 1845, from Greek typos.

Related: Typological; typologically.

Definition

- The classification of different educational methods or equipment; for example, 3-dimensional models, computer software, standardized patients, partial-task trainers, or high-fidelity patient simulators (INACSL, 2013).

See also: MODALITY, SIMULATED/SYNTHETIC LEARNING METHOD



Validity \ vuh-lid-i-tee\ noun

See: SIMULATION VALIDITY

Virtual Environment \ 'vər-chə-wəl \ in-'vī-rə(n)-mənt \ noun [C]

Etym. virtual (adj.) The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. environment (n.) sense of “the aggregate of the conditions in which a person or thing lives” is by 1827 (used by Carlyle to render German *Umgebung*); specialized ecology sense first recorded 1956.

Definition

- A simulated environment rendered by a computer, mobile device, or virtual reality / augmented reality / mixed reality device (Schwabel, Severson, & He, 2017).

Compare: VIRTUAL WORLD

See also: VIRTUAL REALITY

Virtual Patient \ 'vər-chə-wəl \ pā-shənt \ noun

Etym. virtual (adj.) The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. patient (n.) “suffering or sick person under medical treatment,” late 14c.

Definition

- A representation of an actual patient. Virtual patients can take many forms such as software-based physiological simulators, simulated patients, physical manikins, and simulators, (Ellaway, Poulton, Fors et al., 2008).
- A computer program that simulates real-life clinical scenarios in which the learner acts as a health care provider obtaining a history and physical exam, and making diagnostic and therapeutic decisions (ASSH).

See also: ARTIFICIAL INTELLIGENCE

Compare: STANDARDIZED PATIENT, SIMULATED PATIENT

Virtual Presence \ \vur-choo-uhl \ prēzəns \ noun

Etym. virtual (adj.) The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. Presence (n.): mid-14c., “fact of being present,” from Old French *presence* (12c., Modern French *présence*), from Latin *praesentia* “a being present,” from *praesentem* (see *present* (n.)). Present c. 1300, “existing at the time,” from Old French *present* “evident, at hand, within reach;” as a noun, “the present time” (11c., Modern French *présent*) and directly from Latin *praesentem* (nominative *praesens*) “present, at hand, in sight; immediate; prompt, instant; contemporary,” from present participle of *praesense* “be before (someone or something),” Meaning “being there” is from mid-14c. in English.

Definitions

- The “sense of being physically present with visual, auditory, or force displays generated by a computer” and is similar but distinct from *Telepresence*, the “sense of being physically present with virtual object(s) at the remote teleoperator site” (Sheridan, 1992).
- Virtual presence refers to the degree to which individuals experience a computer-generated environment rather than the physical locale (Samosorn et al., 2019).

Compare: TELEPRESENCE

Virtual Reality \ 'vər-chə-wəl \ mṛē-'a-lə-tē \ noun

Etym. virtual (adj.) The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. reality (n.) 1540s, “quality of being real,” from French *réalité* and directly Medieval Latin *realitatem* (nominative *realitas*), from Late Latin *realis*. Meaning “real existence, all that is real” is from 1640s; that of “the real state (of something)” is from 1680s. Sometimes 17c.-18c. also meaning “sincerity.” Reality-based attested from 1960.

Definition

- The use of computer technology to create an interactive three-dimensional world in which the objects have a sense of spatial presence; virtual environment and virtual world are synonyms for virtual reality (M&S Glossary).
- A computer-generated three-dimensional environment that gives an immersion effect.

- Often refers to the three-dimensional (3D) Head-mounted Display VR (HMD VR) in which the Virtual World is projected using a head-mounted display (e.g. Oculus Rift, HTC Vive Pro). (Chang and Weiner, 2016)
- A shorthand of the HMD VR hardware, which always uses a Virtual World. In that way, it is not necessarily synonymous with Virtual Environment and Virtual World, but a synecdoche / metonymy.

See also: SIMULATOR

Virtual Reality Environment \ˈvər-çə-wəl ˈrē-ˈa-lə-tē \ in-ˈvī-rə(n)-mənt \ noun

Etym. virtual (adj.) The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. reality (n.) 1540s, “quality of being real,” from French *réalité* and directly Medieval Latin *realitatem* (nominative *realitas*), from Late Latin *realis*. Meaning “real existence, all that is real” is from 1640s; that of “the real state (of something)” is from 1680s. Sometimes 17c.-18c. also meaning “sincerity.” Reality-based attested from 1960.

Definition

- A wide variety of computer-based applications commonly associated with immersive, highly visual, 3D characteristics, that allow the participant to look about and navigate within a seemingly real or physical world. It is generally defined based on the type of technology being used, such as head-mounted displays, stereoscopic capability, input devices, and the number of sensory systems stimulated (ASSH).

Virtual Reality Simulation \ˈvər-çə-wəl ˈmrē-ˈa-lə-tē \ sim-yuh-ley-shuh n \ noun

Etym. virtual (adj.) The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. reality (n.) 1540s, “quality of being real,” from French *réalité* and directly Medieval Latin *realitatem* (nominative *realitas*), from Late Latin *realis*. Meaning “real existence, all that is real” is from 1640s; that of “the real state (of something)” is from 1680s. Sometimes 17c.-18c. also meaning “sincerity.” Reality-based attested from 1960.

Definition

- Simulations that use a variety of immersive, highly visual, 3D characteristics to replicate real-life situations and/or health care procedures; virtual reality simulation is distinguished from computer-based simulation in that it generally incorporates physical or other interfaces such as a computer keyboard, a mouse, speech and voice recognition, motion sensors, or haptic devices (ASSH).

Virtual Simulation \ˈvər-çə-wəl ˌsim-yuh-ley-shuh n \ noun

Etym. virtual (adj.) The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. simulation (n.) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- The recreation of reality depicted on a computer screen (McGovern, 1994).
- A simulation involving real people operating simulated systems. Virtual simulations may include surgical simulators that are used for on-screen procedural training and are usually integrated with haptic device(s) (McGovern, 1994; Robles-De La Torre, 2011).
- A type of simulation that injects humans in a central role by exercising motor control skills (*for example, flying an airplane*), decision skills (*committing fire control resources to action*), or communication skills (*as members of an air traffic control team*) (Hancock et al, 2008).

Virtual World \ˈvər-çə-wəl ˌwɜrld \ noun [C]

Etym. virtual (adj.) The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. world (n.) Originally “life on earth, this world (as opposed to the afterlife),” sense extended to “the known world,” then to “the physical world in the broadest sense, the universe” (c. 1200). In Old English gospels, the commonest word for “the physical world,” was *Middangeard* (Old Norse *Midgard*), literally “the middle enclosure” (see yard (n.1)), which is rooted in Germanic cosmology. Greek *kosmos* in its ecclesiastical sense of “world of people” sometimes was rendered in Gothic as *manaseps*, literally “seed of man.” The usual Old Norse word was *heimr*, literally “abode” (see home). Words for “world” in some other Indo-European languages derive from the root for “bottom, foundation” (such as Irish *domun*, Old Church Slavonic *duno*, related to English deep); the Lithuanian word is *pasaulis*, from *pa-* “under” + *saulė* “sun.”

Definition

- Similar to Virtual Environment, though implies multiple characters, learners, or participants and potentially, a larger scale than a virtual environment. (Chang and Weiner, 2016).
- A virtual world or massively multiplayer online world (MMOW) in a computer-based simulated environment (Change et al, 2016).

Compare: VIRTUAL ENVIRONMENT

See also: VIRTUAL REALITY

W

Wide-Area Virtual Environment (WAVE)

\ 'wīd \ 'ā-rē-ə \ 'vər-chə-wəl \ in-'vī-rə(n)-mənt \ *noun*

Etym. wide (adj.) “Old English *wid* “vast, broad, long,” also used of time, from Proto-Germanic **widaz* (source also of Old Saxon, Old Frisian *wid*, Old Norse *viðr*, Dutch *wijd*, Old High German *wit*, German *weit*), perhaps from PIE **wi-ito-*, from root **wi-* “apart, away, in half.”

Etym. area (n.) “1530s, “vacant piece of ground,” from Latin *area* “level ground, open space,” used of building sites, playgrounds, threshing floors, etc.; which is of uncertain origin. Perhaps an irregular derivation from *arere* “to become dry” (see **arid**), on notion of “bare space cleared by burning.” The generic sense of “any particular amount of surface (whether open or not) contained within any set of limits” is from 1560s. *Area code* in the North American telephone systems is attested from 1959.

Etym. virtual (adj.) The meaning “being something in essence or effect, though not actually or in fact” is from mid-15c., probably via sense of “capable of producing a certain effect” (early 15c.). Computer sense of “not physically existing but made to appear by software” is attested from 1959.

Etym. environment (n.) “c. 1600, “state of being environed” (see **environ** (v.) + **-ment**); sense of “the aggregate of the conditions in which a person or thing lives” is by 1827 (used by Carlyle to render German **Umgebung**); specialized ecology sense first recorded 1956.”

Definition

- First used in the military, the Wide Area Virtual Environment is a non-proprietary term similar to a CAVE, in which participant(s) undergo a simulation within an area enclosed by walls with projected images. Specialized goggles are not required for WAVEs.
- WAVEs can be very large, almost 8,000 square feet (745 square meters) with multiple chambers, corridors, and sections. The walls act as large movie screens with continued projected images, and sound systems enable participants to echolocate ambient noises.

Compare: CAVE AUTOMATED VIRTUAL ENVIRONMENT

Appendix

TERMS NO LONGER RECOMMENDED FOR USE BY SSH

Confederate \ kən- 'fē-d(ə-)rət \ *noun*

Etym. late 14c., from Late Latin confoederatus “leagued together,” past participle of confoederare “to unite by a league,” from com- “with, together”.

Definition

- An individual(s) who, during the course of the clinical scenario, provides assistance locating and/or troubleshooting equipment. This individual(s) may provide support for participants in the form of ‘help available’, e.g., ‘nurse in charge’, and/or to provide information about the manikin that is not available in other ways, e.g., temperature, color change, and/or to provide additional realism by playing the role of a relative or a staff member (ASSH).
- An individual other than the patient who is scripted in a simulation to provide realism, additional challenges or additional information for the learner e.g., paramedic, receptionist, family member, laboratory technician (Victorian Simulated Patient Network).

Instead, use one of the following as best fits: ACTOR, EMBEDDED PARTICIPANT, SIMULATED PATIENT, SIMULATED PERSON, STANDARDIZED PATIENT

References

1. Agency for Healthcare Research and Quality. (2019, September). Never events. Retrieved from <https://psnet.ahrq.gov/primer/never-events>
2. Adamson K. Evaluation tools and metrics for simulation. In PR Jeffries (Ed.), *Clinical simulations in nursing education: Advanced concepts, trends, and opportunities* (pp.44-57). Philadelphia, PA: Wolters Kluwer; 2014.
3. Akbulut Y, Cardak CS. Adaptive educational hypermedia accommodating learning styles: A content analysis of publications from 2000 to 2011. *Computers & Education* 2012; 58(2): 835–842. <http://dx.doi.org/10.1016/j.compedu.2011.10.008>
4. Alexander AL, Brunye T, Sidman J, Weil, SA. (2005). From gaming to training: A review of studies on fidelity, immersion, presence, and buy-in and their effects on transfer in pc-based simulations and games (DARWARS technical report). Retrieved from <http://www.darwars.com/downloads/DARWARS%2520Paper%252012205.pdf>
5. Alinier, G. Developing high fidelity health care simulation scenarios: A guide for educators and professionals. *Simulation Gaming* 2011; 42:9-26.
6. Alinier, G. A typology of educationally focused medical simulation tools. *Medical Teacher* 2007; 29:e243-250. doi:10.1080/01421590701551185
7. Australian Radiation Protection and Nuclear Safety Agency. (2017, July 27). Non-technical Skills. Retrieved October 16, 2019, from <https://www.arpsa.gov.au/regulation-and-licensing/safety-security-transport/holistic-safety/non-technical-skills>
8. Baddeley A. Working memory. *Science* 1992; 255:556–559. doi:10.1126/science.1736359
9. Baily L. (2014, September 9). The ultimate job guide to healthcare simulation technology specialists. Retrieved from healthsimulation.com/6195/the-ultimate-job-guide-to-healthcare-simulation-technology-specialists/
10. Balci O. (1997, December). Verification validation and accreditation of simulation models. In *Proceedings of the 29th Conference on Winter Simulation* (pp. 135-141). IEEE Computer Society.
11. Bajura M, Fuchs H, Ohbuchi R. Merging virtual objects with the real world: Seeing ultrasound imagery within the patient. In *ACM SIGGRAPH Computer Graphics* 1992; 26(2): 203-210.
12. Barjis J. Healthcare simulation and its potential areas and future trends. *SCS M&S Magazine* 2011; 1:1-6. Retrieved from <http://www.scs.org/wp-content/uploads/2016/12/2011-01-Issue05-4.pdf>
13. Barnes BE. Creating the practice-learning environment using information technology to support a new model of continuing medical education. *Academic Medicine* 1998; 73: 278-281.
14. Barrows HS. An overview of the uses of standardized patients for teaching and evaluating clinical skills. *AAMC. Academic Medicine* 1993; 68(6): 443-451.
15. Beaubien J, Baker DP. The use of simulation for training teamwork skills in healthcare: How low can you go? *Quality Safety Health Care* 2004; 13(Suppl 1): i51-i56. doi:10.1136/qshc.2005.009845
16. Bennett CC, Hauser K. Artificial intelligence framework for simulating clinical decision-making: A Markov decision process approach. *Artificial Intelligence in Medicine* 2013; 57(1):9-19.
17. Berryman DR. Augmented reality: A review. *Medical Reference Services Quarterly* 2012; 31(2):212-218.
18. Boillat M, Bethune C, Ohle E, et al. Twelve tips for using the objective structured teaching exercise for faculty development. *Medical Teacher* 2012; 34(4):269-273.
19. Bolman LG, Deal TE. *Reframing Organizations: Artistry, Choice, and Leadership*. San Francisco: Jossey-Bass; 2013.

20. Bokhari R, Bollman-McGregor J, Kahoi K, et al. Design, development, and validation of a take-home simulator for fundamental laparoscopic skills: using Nintendo Wii for surgical training. *The American Surgeon* 2010;76(6), 583–586.
21. Bonnetain E, Boucheix J-M, Hamet M, Freysz M. Benefits of computer screen-based simulation in learning cardiac arrest procedures. *Medical Education* 2010; 44:716–722. doi: 10.1111/j.13652923.2010.03708.x
22. Boud D, Walker D, Keogh R. Promoting reflection in learning: a model. In Boud, Walker, Keogh (eds). *Reflection: Turning Experience into Learning*. London, England: Kogan; 1985, pp. 3, 18-40.
23. Boyd EM, Fales AW. Reflective learning key to learning from experience. *Journal of Humanistic Psychology* 1983; 23(2):99-117.
24. Bray J, Howkins E. Facilitating interprofessional learning in the workplace: A research project using the Delphi technique. *Work Based Learning in Primary Care* 2006; 4(3): 223-235.
25. Brusilovsky P, Peyl C. Adaptive and intelligent web-based educational systems. *International Journal of Artificial Intelligence in Education* 2003; 13(2): 159–172. IOS Press. Retrieved from: <http://www2.sis.pitt.edu/~peterb/papers/AIWBES.pdf>
26. California Hospital Association. (2017). What is the difference between a tabletop exercise, a drill, a functional exercise, and a full-scale exercise? Retrieved October 16, 2019, from <https://www.calhospitalprepare.org/post/what-difference-between-tabletop-exercise-drill-functional-exercise-and-full-scale-exercise>.
27. Cant RP, Cooper SJ. Use of simulation-based learning in undergraduate nurse education: An umbrella systematic review. *Nurse Education Today*, 2017; 49:63-71.
28. Centers for Medicare & Medicaid Services (CMS). (2006, May 18). Eliminating serious, preventable, and costly medical errors – Never events. Retrieved from <https://www.cms.gov/newsroom/fact-sheets/eliminating-serious-preventable-and-costly-medical-errors-never-events>
29. Chang T, Gerard J, Pusic M. Screen-based simulation, virtual reality, and haptic simulators. In: Grant V, Cheng A (eds). *Comprehensive Healthcare Simulation: Pediatrics*. Comprehensive Healthcare Simulation. Champaign, IL: Springer; 2016.
30. Chang TP, Weiner D. Screen-based simulation and virtual reality for pediatric emergency medicine. *Clinical Pediatric Emergency Medicine* 2016; 17.3: 224-230.
31. Cheng A, Kessler D, Mackinnon R, et al. Reporting guidelines for health care simulation research: Extensions to the CONSORT and STROBE statements. *Adv Simul* 2016; 1(25). doi:10.1186/s41077-016-0025-y
32. Chiniara G, Cole G, Brisbin K, et al. Simulation in healthcare: A taxonomy and a conceptual framework for instructional design and media selection. *Med Teach*, 2013; 35(8):e1380-95.
33. Christensen MD, Rieger K, Tan S et al. Remotely versus locally facilitated simulation-based training in management of the deteriorating patient by newly graduated health professionals: a controlled trial. *Simulation in Healthcare* 2015;10(6), 352-359.
34. CISL (Center for Immersive and Simulation-based Learning). (2014). Part-Task Trainers. Retrieved from http://cisl.stanford.edu/what_is/sim_modalities/phys_trainers.html.
35. Cook DA, Hatala R, Brydges R, et al. Technology-enhanced simulation for health professions education: A systematic review and meta-analysis. *JAMA* 2011; 306(9):978-988.
36. Cook DA, Brydges R, Hamstra SJ, et al. Comparative effectiveness of technology-enhanced simulation versus other instructional methods: A systematic review and meta-analysis. *Simulation in Healthcare* 2012; 7(5):308-320.
37. Cooke L, Strou C, Harrington C. Operationalizing the concept of critical thinking for student learning outcome development. *Journal of Nursing Education* 2019; 58(4):214-220. doi:<http://dx.doi.org.ezproxy.net.ucf.edu/10.3928/01484834-20190321-05>
38. Cooper MD. Towards a model of safety culture. *Safety Science* 2000; 36(2):111-136.
39. Cowie N, Premkumar K, Bowen A, et al. *Teamwork and Communication in Acute Care: A Teaching Resource for Health Practitioners*. MedEdPORTAL Publications; 2012. Available from: <https://www.mededportal.org/publication/9109>
40. Cram RS, Sime JA. Improving Safety Culture Understanding Using a Computerized Learning Environment. *Achieving Sustainable Construction Health and Safety*. *Professional Safety* 2014:52-61

41. Crawford SB, Bailey R, Steer K. Healthcare simulation technology specialists. In SB Crawford, LW Baily, SM, Monks (Eds). *Comprehensive Healthcare Simulation: Operations, Technology, and Innovative Practice* (pp. 147-157). Cham, Switzerland: Springer; 2019. https://doi.org/10.1007/978-3-030-15378-6_10
42. Cruz-Neira C, Snadlin DJ, DeFanti TA. Surround-screen projection-based virtual reality: The design and implementation of the CAVE. *Proceedings of the 20th Annual Conference on Computer Graphics and Interactive Techniques*, 1993. ACM.
43. D'amour D, Oandasan I. Interprofessionality as the field of interprofessional practice and interprofessional education: An emerging concept. *Journal of Interprofessional Care* 2005; 19(S1): 8-20.
44. Decker S, Sportsman S, Puetz L, Billings L. The evolution of simulation and its contribution to competency. *Journal of Continuing Education in Nursing*, 2008; 39(2): 74-80.
45. De Freitas S, Oliver M. How can exploratory learning with games and simulations within the curriculum be most effectively evaluated? *Computers & Education*, 2006; 46(3):249-264.
46. Dictionary-Complete, C E. (1979). Unabridged 10th Edition 2009© William Collins Sons & Co. Ltd. Retrieved from <http://dictionary.reference.com/browse/>
47. Dictionary.com. Lexico LLC, 2002.
48. Dictionaries O. (2010). *Oxford dictionaries*. Oxford University Press. Retrieved from <http://oxforddictionaries.com/definition/english/VAR>
49. Dieckmann P, Rall M. Designing a scenario as a simulated clinical experience: The TuPASS scenario script. *Clinical Simulation: Operations, Engineering, and Management*, 2008:541-550..
50. Dieckmann P, Gaba D, Rall M. Deepening the theoretical foundations of patient simulation as social practice. *Simulation in Healthcare* 2007; 2(3): 183-193.
51. Dieckmann P, Friis SM, Lippert A, Østergaard D. Goals, success factors, and barriers for simulation-based learning: A qualitative interview study in health care. *Simulation & Gaming*, 2012; 43(5): 627-647. doi: 10.1177/1046878112439649
52. Dieckmann P, Phero JC, Issenberg SB, et al. The first Research Consensus Summit of the Society for Simulation in Healthcare: conduction and a synthesis of the results. *Simulation in Healthcare*, 2011; 6(7):S1-S9.
53. Dieckmann P, Molin Friis S, Lippert A, Østergaard D. The art and science of debriefing in simulation: Ideal and practice. *Medical Teacher* 2009; 31(7):e287-e294.
54. Dikshit A, Wu D, Wu C & Zhao W. An online interactive simulation system for medical imaging education. *Computerized Medical Imaging and Graphics* 2005;29(6), 395-404.
55. Dormann C, Demerouti E, Bakker A. A model of positive and negative learning: Learning demands and resources, learning engagement, critical thinking, and fake news detection. In O Zlatkin-Troitschanskaia , G Wittum, A Dengel (Eds). *Positive Learning in the Age of Information : A Blessing or a Curse?* (pp. 315-346). Dordrecht: Springer; 2018. https://doi.org/10.1007/978-3-658-19567-0_19
56. Dreifuerst, Horton-Deutsch, Henao, 2014, p.47 in *Jeffries Clinical Simulations in Nursing Education*.
57. Drews FA, Bakdash JZ. Simulation training in health care. *Reviews of Human Factors and Ergonomics*, 2013; 8(1):191-234.
58. Driskell JE, Copper C, Moran A. Does mental practice enhance performance? *J Appl Psychol* 1994;79(4):481-492.
59. Duff E, Miller L, & Bruce J. Online virtual simulation and diagnostic reasoning: A scoping review. *Clinical Simulation in Nursing* 2016;12(9), 377-384.
60. East Carolina University, Office of Clinical Skills and Assessment. (n.d.). (2019). Physical training assistants. Retrieved from <https://clinicalskills.ecu.edu>
61. Edmondson AC. Psychological safety and learning behavior in work teams. *Administrative Science Quarterly* 1999; 44:350-383.
62. Ellaway R, Poulton T, Fors U, et al. Building a virtual patient commons. *Medical Teacher* 2008; 30(2), 170-4.

63. Ellefritz G. (2019). Training Scars. Retrieved from <http://www.activeresponsetraining.net/training-scars>
64. Endsley M. Toward a theory of situation awareness in dynamic systems. *Human Factors and Ergonomics Society* 1995; 37(1):32-64.
65. Evans KH, Daines W, Tsui J, et al. Septris: a novel, mobile, online, simulation game that improves sepsis recognition and management. *Academic Medicine*, 2015; 90(2), 180.
66. Fairclough CR, Cunningham P. (2004). AI structuralist storytelling in computer games. *Proceedings of the International Conference on Computer Games: Artificial Intelligence, Design and Education*. Reading, UK: University of Wolverhampton Press. Retrieved from <https://scss.tcd.ie/publications/tech-reports/reports.04/TCD-CS-2004-43.pdf>
67. Fanning RM, Gaba DM. The role of debriefing in simulation-based learning. *Simulation in Healthcare* 2007; 2(2):115-125.
68. Feeley N, Cossette S, Cote J, et al. The importance of piloting an RCT intervention. *Canadian Journal of Nursing Research* 2009;41(2):85-99. Retrieved from <https://journals.sagepub.com/home/cjn>
69. Feliciano M, Kelsey N. (2017). Faculty development: A blended learning approach. Retrieved from <https://search.ebscohost.com/login.aspx?direct=true&db=edsbas&AN=edsbas.C736FA09&site=eds-live&scope=site>
70. Freeth DS, Hammick M, Reeves S, et al. *Effective Interprofessional Education: Development, Delivery, and Evaluation*. John Wiley & Sons; 2008.
71. Fuchs H, State A, Pisanp E, et al. Towards performing ultrasound guided needle biopsies from within a head-mounted display. *Proceedings of the Fourth International Conference on Visualization in Biomedical Computing (VBC)*; 1996, 591-600.
72. Gaba DM. The future vision of simulation in health care. *Quality and Safety in Health Care* 2004; 13(suppl 1): i2-i10.
73. Gaba DM, Howard SK, Flanagan B, et al. Assessment of clinical performance during simulated crises using both technical and behavioral ratings. *Anesthesiology: The Journal of the American Society of Anesthesiologists* 1998; 89(1):8-18.
74. Gentry SV, Gauthier A, L'Estrade Ehrstrom B, et al. Serious gaming and gamification education in health professions: Systematic review. *J Med Internet Res* 2019; 21(3):e12994.
75. Good ML. Patient simulation for training basic and advanced clinical skills. *Medical Education* 2003; 37:14-21.
76. Goolsby C, Vest R, Goodwin T. New Wide Area Virtual Environment (WAVE) medical education. *Mil Med* 2014; 179(1):38-41.
77. Gresswell S, Renz P, Hasan S, et al. Determining the impact of pre-radiation treatment verification simulation/dry run by analyzing intradepartmental reported incidents and surveying staff and patients. *Practical Radiation Oncology* 2018; 8(6):468-474. <https://doi.org/10.1016/j.prro.2018.05.007>
78. Grossman D. *On Combat: The Psychology and Physiology of Deadly Conflict in War and in Peace*, 3rd edition. Warrior Science Publications; 2008.
79. Hamdorf JM, Davies, R. Teaching a clinical skill. In RH Riley (Ed.), *Manual of Simulation in Healthcare*, 2nd edition. Oxford: Oxford University Press; 2016:78-88.
80. Hamet P, Tremblay J. Artificial intelligence in medicine. *Metabolism* 2017; 69: S36-S40.
81. Hamstra SJ, Brydges R, Hatala R, et al. Reconsidering Fidelity in Simulation-Based Training. *Academic Medicine* 2014; 89(3): 387-392.
82. Hancock PA, Vincenzi DA, Wise JA, Mouloua M (Eds.). *Human Factors in Simulation and Training*. Aldershot: CRC Press; 2008.
83. Harden RM. What is an OSCE? *Medical Teacher* 1988; 10(1):19-22.
84. Harper D. (2007). Online etymology dictionary. Available from: www.etymonline.com/index.php.
85. Hayasaka Y, et al. Expectations for the next generation of simulated patients born from thoughtful anticipation of artificial intelligence-equipped robot. *J Nippon Med Sch* 2018; 85(6):347-349.

86. Hayden JK, Smiley, RA, Alexander, MA, et al. (2014). The NCSBN National Simulation Study: A longitudinal, randomized, controlled study replacing clinical hours with simulation in prelicensure nursing education. *Journal of Nursing Regulation* 2014; 5(2):S3-S40. doi:10.1016/S2155-8256(15)30062-4
87. Hidden Curriculum. (2014). In S Abbott (Ed.), *The glossary of education reform*. Retrieved from <http://edglossary.org/hidden-curriculum>
88. Higgins M, Ishimaru A, Holcombe R, Fowler A. Examining organizational learning in schools: The role of psychological safety, experimentation, and leadership that reinforces learning. *Journal of Educational Change* 2012; 13(1):67-94.
89. Hsieh MC, Lee JJ. Preliminary study of VR and AR applications in medical and healthcare education. *J Nurs Health Studies* 2017; 3(1):1.
90. Husebø SE, Friberg F, Søreide E, Rystedt H. (2012). Instructional problems in briefings: How to prepare nursing students for simulation-based cardiopulmonary resuscitation training. *Clinical Simulation in Nursing* 2012; 8:307-318.
91. Ikeyama T, Shimizu N, & Ohta, K. Low-cost and ready-to-go remote-facilitated simulation-based learning. *Simulation in Healthcare* 2012;7(1), 35-39.
92. INACSL Standards Committee. INACSL standards of best practice: SimulationSM: Operations. *Clinical Simulation in Nursing* 2017; 13(12):681-687. <https://doi.org/10.1016/j.ecns.2017.10.005>
93. INACSL Standards Committee. INACSL standards of best practice: SimulationSM Participant evaluation. *Clinical Simulation in Nursing* 2016a; 12(S):S26-S29. <http://dx.doi.org/10.1016/j.ecns.2016.09.009>
94. INACSL Standards Committee. INACSL standards of best practice: SimulationSMSimulation design. *Clinical Simulation in Nursing* 2016b; 12(S):S5-S12. <http://dx.doi.org/10.1016/j.ecns.2016.09.005>
95. INACSL Standards Committee. INACSL standards of best practice: SimulationSM Simulation glossary. *Clinical Simulation in Nursing* 2016c; 12(S):S39-S47. <http://dx.doi.org/10.1016/j.ecns.2016.09.012>.
96. Interprofessional Education Collaborative. *Team-based competencies: Building a shared foundation for education and clinical practice*. Washington, DC: Interprofessional Education Collaborative; 2011.
97. Interprofessional Education Collaborative Expert Panel. *Core Competencies for Interprofessional Collaborative Practice: Report of an Expert Panel*. Washington, DC: Interprofessional Education Collaborative; 2011.
98. Ironside PM, Jeffries PR, Martin A. Fostering patient safety competencies using multiple-patient simulation experiences. *Nursing Outlook* 2009; 57(6), 332-337. doi:10.1016/j.outlook.2009.07.010
99. Issenberg SB, Ringsted C, Østergaard D, Dieckmann P. Setting a research agenda for simulation-based healthcare education: A synthesis of the outcome from an Utstein style meeting. *Simulation in Healthcare* 2011; 6(3): 155-167.
100. The John Hopkins University. (2019). Physical Exam Teaching Associates. Retrieved from https://www.hopkinsmedicine.org/simulation_center/training/teaching_programs/physical_exam_teaching_associates.html
101. Johnson-Russell J, Bailey C. Facilitated debriefing. In Nehring W, Lashley FR (Eds.). *High-Fidelity Patient Simulation in Nursing Education*. Boston: Jones and Bartlett; 2010:369-385.
102. Jovanović J, Chiong R. (Eds). *Technological and Social Environments for Interactive Learning*. Santa Rosa, CA: Informing Science Press; 2014.
103. Jovanovic J, Chion R. Introduction to the special section on game-based learning: Design and applications. *Interdisciplinary Journal of Information, Knowledge and Management* 2012; 7:201.
104. Kang SJ, Min HY. Psychological safety in nursing simulation. *Nurse Educator* 2019; 44(2): E6-E9. doi:10.1097/NNE.0000000000000571
105. Kardong-Edgren S. Is simulationist a word? *Clinical Simulation in Nursing* 2013; 9(12):e561. <https://doi.org/10.1016/j.ecns.2013.10.001>
106. King HB, Battles J, Baker DP. (2008, August). TeamSTEPPS: Team Strategies and Tools to Enhance Performance and Patient Safety. *Advances in Patient Safety: New Directions and Alternative Approaches* 2008;August3.

107. Kneebone R, Arora S, King D, et al. Distributed simulation-accessible immersive training. *Medical Teacher* 2010; 32(1):65-70.
108. Kneebone R, Kidd J, Nestel D, et al. An innovative model for teaching and learning clinical procedures. *Medical Education* 2002; 36(7):628-634.
109. Kuiper RA, Pesut DJ. Promoting cognitive and metacognitive reflective reasoning skills in nursing practice: Self-regulated learning theory. *Journal of Advanced Nursing* 2004; 45(4):381-391.
110. Kusumoto L, Heinrichs WL, Dev P, & Youngblood P. Avatars alive! The integration of physiology models and computer generated avatars in a multiplayer online simulation. In January 2007 MMVR (pp. 256-258).
111. Kyle R, Murray WB. *Clinical Simulation*. Cambridge, MA: Academic Press; 2010.
112. Laurent DA, Niazi AU, Cunningham MS, et al. A valid and reliable assessment tool for remote simulation-based ultrasound-guided regional anesthesia. *Regional Anesthesia & Pain Medicine* 2014;39(6), 496-501.
113. Lave J. Situating learning in communities of practice. In Resnick LB, Levine JM, Teasley SD. (Eds.). *Perspectives on Socially Shared Cognition*. Washington, D.C.: American Psychological Association; 1991, pp. 63-82.
114. Lehtola CJ. Developing and using table-top simulations as a teaching tool. *Journal of Extension* 2007; 45(4). Retrieved from <https://www.joe.org/joe/2007august/tt4.php>
115. Lee-Jayaram JJ, et al. Alpha and beta testing during a faculty development course. *Simulation in Healthcare* 2019; 14(1):43-50.
116. LeFlore JL, Sansoucie DA, Cason CL, et al. Remote-controlled distance simulation assessing neonatal provider competence: A feasibility testing. *Clin Simul Nurs* 2014;10(8):419-424.
117. Lehtola CJ. Developing and using table-top simulations as a teaching tool. *Tools of the Trade* 2007; 45(4). Retrieved from <https://www.joe.org/joe/2007august/tt4.php>
118. Lekalakala-Mokgele E, Du Rand PP. A model for facilitation in nursing education. *Curationis* 2005; 28(2); 22-29.
119. Lekalakala-Mokgele E, Du Rand PP. Facilitation as a teaching strategy: The experiences of nursing students. *Curationis* 2005; 28(4):5-11.
120. Leon AC, Davis L, Kraemer HC. The role and interpretation of pilot studies in clinical research. *Journal of Psychiatric Research* 2011; 45(5):626-629. doi:10.1016/j.jpsychires.2010.10.008
121. Levine AI, DeMaria Jr S, Schwartz AD, Sim AJ. *the Comprehensive Textbook of Healthcare Simulation*. Springer Science & Business Media; 2013.
122. Lewis KL, Bohnert CA, Gammon WL, et al. The Association of Standardized Patient Educators (ASPE) Standards of Best Practice (SOBP). *Advances in Simulation* 2017; 2(10). doi:10.1186/s41077-017-0043-4
123. Lindell D, Poindexter K, Hagler D. Consider a career as a healthcare simulation educator. *American Nurse Today* 2016; 11(5):58-59. Retrieved from <https://www.americannursetoday.com/>
124. Lioce L. New validation for simulation education. *American Nurse* 2014; 46(4):7. Retrieved from <https://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=99133605&site=eds-live&scope=site>
125. Lioce L, Graham L, Young HM. Developing the team: Simulation educators, technical, and support personnel in simulation. In: C Foisy-Doll, K Leighton (Eds.). *Simulation Champions: Fostering Courage, Caring, and Connection* (pp. 429-444). Philadelphia: Wolters Kluwer; 2018, pp. 429-444.
126. Markman KD, Klein WM, & Suhr A. *Handbook of Imagination and Mental Simulation*. Psychology Press, 2009.
127. Mathieu JE, Heffner TS, Goodwin GF, et al. The influence of shared mental models on team process and performance. *Journal of Applied Psychology* 2000; 85(2):273.
128. McComb S, Simpson V. The concept of shared mental models in healthcare collaboration. *Journal of Advanced Nursing* 2014; 70(7):1479-1488.
129. McGaghie WC, Issenberg B, Petrusa ER, Scalese RJ. A Critical review of simulation-based medical education research: 2003-2009. *Medical Education* 2010; 44(1):50-63.

130. McGovern KT. Applications of virtual reality to surgery. *BMJ: British Medical Journal* 1994; 308(6936):1054.
131. Meads G, Ashcroft J, Barr H, et al. The case for interprofessional collaboration. In: *Health and Social Care*. Malden, MA: Blackwell Publishing, Ltd.; 2008.
132. Meakim C, Boese T, Decker S, et al. Standards of best practice: Simulation standard I: Terminology. *Clinical Simulation in Nursing* 2013; 9(6):S3-S11.
133. Merriam Webster Dictionary. (2019). Found at <https://www.merriam-webster.com>.
134. Michael DR, Chen SL. (2005). *Serious games: Games that educate, train, and inform*. Thomson Course Technology.
135. Michaelsen LK, Parmelee DX, McMahon KK. *Team-Based Learning for Health Professions Education: A Guide to Using Small Groups for Improving Learning*. Sterling, VA: Stylus Publishing, LLC; 2008.
136. Mladenovic R, Pereira LAP, Mladenovic K, et al. Effectiveness of augmented reality mobile simulator in teaching local anesthesia of inferior alveolar nerve block. *J Dent Edu* 2019; 83(4):423-428.
137. Modeling and Simulation (M&S) Glossary. (2019). Retrieved from <https://www.msco.mil/MSReferences/Glossary/MSGlossary.aspx>
138. Muhanna MA. Virtual reality and the CAVE: Taxonomy, interaction challenges, and research directions. *Journal of King Saud University-Computer and Information Sciences* 2015; 27(3):344-361.
139. Murphy P, Nestel D, Gormley GJ. Words matter: Towards a new lexicon for nontechnical skills training. *Advances in Simulation*, 2019; 4(8). doi:10.1186/s41077-019-0098-5
140. Murray J. *Composing multimodality. Multimodal Composition: A Critical Sourcebook*. Boston: Bedford/St. Martin's; 2013.
141. National League for Nursing Simulation Innovation Resource Center (NLN-SIRC). (2013). Retrieved from <http://sirc.nln.org/mod/glossary/view.php?id¼183>
142. Nestel D, Watson MO, Bearman ML, et al. Strategic approaches to simulation-based education: A case study from Australia. *Journal of Health Specialties* 2013; 1(1), 4.
143. Nester J. The importance of interprofessional practice and education in the era of accountable care. *North Carolina Medical J* 2016; 77(2):128-132.
144. Nieva VF, Sorra J. Safety culture assessment: A tool for improving patient safety in healthcare organizations. *Quality and Safety in Health Care* 2003; 12(suppl 2):ii17-ii23.
145. Ober JK. (2009). Student Nurses' Experience of Learning with Human Patient Simulation. <https://doi.org/10.13028/98b4-cw76>
146. Ohta K, Kurosawa H, Shiima Y, et al. The effectiveness of remote facilitation in simulation-based pediatric resuscitation training for medical students. *Pediatric Emergency Care* 2017;33(8), 564-569.
147. Oren TI, Elzas MS, Smit I, Birt, LG. Code of professional ethics for simulationists. In *Summer Computer Simulation Conference 2002*, July: 434-435. Society for Computer Simulation International.
148. Ören TI. Responsibility, ethics, and simulation. *Transactions* 2000; 17(4).
149. Paige JB, Morin KH. Simulation fidelity and cueing: A systematic review of the literature. *Clinical Simulation in Nursing* 2013; 9(11):e481-e489.
150. Palaganas JC, Maxworthy JC, Epps CA, Mancini ME. (Eds.). *Defining Excellence in Simulation Programs*. China: Wolters Kluwer; 2014.
151. Park CS, Murphy TF, and the Code of Ethics Working Group. (2018). *Healthcare Simulationist Code of Ethics*. Retrieved from <http://www.ssih.org/Code-of-Ethics>
152. Pazarci H. (2015). *Online Etymology Dictionary*. Review of the Faculty of Divinity University of Süleyman Demirel, 100(6 S 21), 177.
153. Pinar G, Peksoy S. Simulation-based learning in healthcare ethics education. *Scientific Research* 2016; 7(1). Retrieved from <https://m.scirp.org/papers/63167>

154. Pires S, Monteiro S, Pereira, A, et al. Non-technical skills assessment for prelicensure nursing students: An integrative review. *Nurse Education Today* 2017; 58:19–24. doi: 10.1016/j.nedt.2017.07.015
155. Pope WS, Gore T, Renfro, KC. Innovative teaching strategy for promoting academic integrity in simulation. *Journal of Nursing Education and Practice* 2012; 3(7):30-35. DOI: 10.5430/jnep.v3n7p30
156. Practice: Simulation Standard I: Terminology. *Clinical Simulation in Nursing* 2013; 9(6S):S3-S11. <http://dx.doi.org/10.1016/j.ecns.2013.04.001>.
157. Proctor MD, Campbell-Wynn L. Effectiveness, usability, and acceptability of haptic-enabled virtual reality and mannequin modality simulators for surgical cricothyroidotomy. *Military Medicine* 2014; 179(3):260-264.
158. Rail Safety and Standards Board. (2019, October 5). Non-technical skills. Retrieved October 16, 2019, from <https://www.rssb.co.uk/standards-and-safety/improving-safety-health-wellbeing/understanding-human-factors/non-technical-skills>.
159. Raemer D, Anderson M, Cheng A, et al. Research regarding debriefing as part of the learning process. *Simulation in Healthcare* 2011; 6(7):S52-S57.
160. Rao A, Tait I, Alijani A. Systematic review and meta-analysis of the role of mental training in the acquisition of technical skills in surgery. *The American Journal of Surgery* 2015; 210(3):545-553.
161. Reeves S, Zwarenstein M, Goldman J, et al. (2010). The Geneva World Health Organization WHO (2010) Framework for Action on Interprofessional Education and Collaborative Practice.
162. Rethans JJ, Gorter S, Bokken L, Morrison L. Unannounced standardised patients in real practice: A systematic literature review. *Medical Education* 2007; 41(6):537-549.
163. Richter T, Pawlowski JM. (2007, October). The need for standardization of context metadata for e-learning environments. In: Proc. of e-ASEM Conference, Seoul, Korea.
164. Riley RH. *Manual of Simulation in Healthcare*. Oxford University Press; 2008.
165. Rizzolo. Fostering patient safety competencies using multiple-patient simulation experiences. *Nursing Outlook* 2014; 57(6):332-337.
166. Robinson AR, Gravenstein N, Cooper LA, et al. A mixed-reality part-task trainer for subclavian venous access. *Simulation in Healthcare*, 2014; 9(1):56-64.
167. Robinson S. *Simulation: The Practice of Model Development and Use*. London: Palgrave Macmillan; 2014.
168. Robinson-Smith G, Bradley P, Meakim C. Evaluating the use of standardized patients in undergraduate psychiatric nursing experiences. *Clinical Simulation in Nursing* 2009; 5(6):e203-e211. doi: 10.1016/j.ecns.2009.07.001.
169. Robles-De-La-Torre G. Principles of haptic perception in virtual environments in: *Human Haptic Perception: Basics and Applications*. Basel, Switzerland: Birkhäuser; 2008, pp. 363-379.
170. Robles-De-La-Torre G. The importance of the sense of touch in virtual and real environments. *Ieee Multimedia*. 2006; 1(3):24-30.
171. Rodgers C. Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record* 2002; 104(4):842-866.
172. Rogers R. Reflection in higher education: A concept analysis. *Innovative Higher Education* 2001; 26(1): 37-57.
173. Rudolph JW, Raemer DB, Simon R. Establishing a safe container for learning in simulation: The role of the presimulation briefing. *Simulation in Healthcare* 2014; 9(6):339-349.
174. Rudolph JW, Simon R, Dufresne RL, Raemer DB. There's no such thing as "nonjudgmental" debriefing: A theory and method for debriefing with good judgment. *Simulation in Healthcare* 2006; 1(1):49-55.
175. Rudolph JW, Simon R, Raemer D. Which reality matters? Questions on the path to high engagement in healthcare simulation. *Simulation in Healthcare* 2007; 2(3):161-163.
176. Rudolph JW, Simon R, Raemer DB, Eppich WJ. Debriefing as formative assessment: Closing performance gaps in medical education. *Academic Emergency Medicine*, 2008; 15(11):1010-1016.

177. Rudolph JW, Simon R, Rivard P, et al. Debriefing with good judgment: Combining rigorous feedback with genuine inquiry. *Anesthesiology Clinics* 2007; 25(2):361-376.
178. Rutherford-Hemming T, Alfes CM, Breymer TL. A systematic review of the use of standardized patients as a simulation modality in nursing education. *Nurs Educ Perspect*, 2019; 40(2):84-90.
179. Rutledge C, Walsh CM, Swinger N, et al. Gamification in action: Theoretical and practical considerations for medical educators. *Academic Medicine* 2018; 93(7):1014-1020.
180. Samosorn AB, Gilbert GE, Bauman EB, et al. Teaching airway insertion skills to nursing faculty and students using virtual reality: A pilot study. *Clinical Simulation in Nursing* 2019;39(Feb). 18-26. Doi: <https://doi.org/10.1016/j.ecns.2019.10.004>
181. Satava RM. Future of modeling and simulation in the medical and health sciences. In Sokolowski JA, and Banks CM. (Eds.). *Modeling and Simulation in the Medical and Health Sciences*. Hoboken, NJ: John Wiley & Sons, Inc.; 2011, pp. 175-194.
182. Satava RM. Surgical education and surgical simulation. *World Journal of Surgery* 2001; 25(11):1484-1489.
183. Satava RM, Morgan K, Sieburg HB. (Eds.). *Interactive Technology and the New Paradigm for Healthcare* (Vol. 18). IOS Press; 1995.
184. Scalese and Hatala in: Levine AI, DeMaria S Jr, Schwartz AD, Sim AJ. (Eds). *The Comprehensive Textbook of Healthcare Simulation*. New York: Springer; 2014.
185. Scheckel M. Designing courses and learning experiences. In: D Billings and J Halstead (Eds.), *Teaching in Nursing: A Guide for Faculty*, 5th edition. St. Louis: Elsevier; 2016, pp. 159-185.
186. Schön DA. *The Reflective Practitioner: How Professionals Think in Action* (Vol. 5126). New York, NY: Basic Books; 1983.
187. Schuurink EL, Toet A. Effects of third person perspective on affective appraisal and engagement: Findings from SECOND LIFE. *Simulation & Gaming* 2010; 41(5):724-742.
188. Schwebel DC, Severson J, He Y. Using smartphone technology to deliver a virtual pedestrian environment: usability and validation. *Virtual Reality*, 2017; 21(3):145-152.
189. Shao M, Kashyap R, Niven A, et al. Feasibility of an international remote simulation training program in critical care delivery: a pilot study. *Mayo Clinic Proceedings: Innovations, Quality & Outcomes* 2018;2(3), 229-233.
190. Shaw RJ, Molloy M, Vaughn J, & Crego N. Telepresence robots for pediatric clinical simulations: Feasibility and acceptability. 2018.
191. Sheridan TB. Musings on telepresence and virtual presence. *Presence Teleoperators & Virtual Environments*. 1992;1(1):120-126.
192. Sieburg HB. Physiological studies in silico. *Studies in the Science of Complexity*, 1990; 12(2):321-342.
193. Smith-Stoner M. Using moulage to enhance educational instruction. *Nurse Educator* 2011; 36:21-24.
194. Sokolowski JA, Banks CM. (Eds.). *Principles of Modeling and Simulation: A Multidisciplinary Approach*. Hoboken, NJ: John Wiley & Sons; 2011.
195. Sonchan P, Ramingwong S. (2015). ARM 2.0: An online risk management simulation. 2015 12th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON). IEEE. <https://doi.org/10.1109/ECTICon.2015.7207043>
196. Sundar E, Sundar S, Pawlowski J, et al. Crew resource management and team training. *Anesthesiology Clinics*, 2007; 25(2):361-376.
197. Sweller J. Cognitive load during problem solving: Effects on learning. *Cognitive Science* 1988; 12:257-285 [https://www.ncbi.nlm.nih.gov/pubmed/?term=Cognitive+Load+Theory+for+the+Design+of+Medical+ Simulations](https://www.ncbi.nlm.nih.gov/pubmed/?term=Cognitive+Load+Theory+for+the+Design+of+Medical+Simulations)
198. Sweller J, van Merriënboer JJ, Paas FG. Cognitive architecture and instructional design. *Educ. Psychol. Rev.* 1998; 10:251–296. 10.1023/A:1022193728205
199. Szyld and Rudolph in: Levine AI, DeMaria S Jr, Schwartz AD, and Sim AJ. (Eds). *The Comprehensive Textbook of Healthcare Simulation*. New York: Springer; 2014.

200. TEL Thesaurus and Dictionary meta-project (<http://www.tel-thesaurus.net>)
201. Thistlethwaite J, Moran M. Learning outcomes for interprofessional education (IPE): Literature review and synthesis. *Journal of Interprofessional Care* 2010; 24(5):503-513.
202. Thomas CM, Sievers LD, Kellgren M, et al. Developing a theory-based simulation educator resource. *Nursing Education Perspectives* 2015; 36(5):340-342. doi:10.5480/15-1673
203. Thomas R (2003). The JeLSIM Perspective. Retrieved from <http://www.simulationfirst.com/s1.html>
204. Thompson DV, Hamilton RW, Petrova PK. When mental simulation hinders behavior: The effects of process-oriented thinking on decision difficulty and performance. *Journal of Consumer Research* 2009; 36(4):562-574.
205. Tolk A, Turnits, CD, Diallo SY, Winters LS. Composable M&S web services for net-centric applications. *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology* 2006; 3(1):27-44.
206. Tsuda ST, Scott DJ, Jones DB. (Eds.). *Textbook of Simulation: Skills & Team Training*. Ciné-Med Pub.; 2012.
207. Tucker B. (2010). The M&S Workforce Profession. Retrieved from http://www.scs.org/magazines/2010-04/index_file/Files/Tucker.pdf
208. Tulane University. (2019). Standardized patient program. Retrieved from <https://medicine.tulane.edu/standardized-patient>
209. UW Health. (2017, August). UW Health job description: Simulation specialist. Retrieved from uwhealth.org/files-directory/position-descriptions/other-non-clinical/simulation.specialist.540027.pdf
210. Uys LR, Van Rhyn LL, Gwele, NS, et al. Problem-solving competency of nursing graduates. *Journal of Advanced Nursing* 2004; 48(5):500-509.
211. Van de Ridder JM, Stokking KM, McGaghie WC, Ten Cate OTJ. What is feedback in clinical education? *Medical Education* 2008; 42(2):189-197.
212. Van Meer P, Theunissen NCM. Prospective educational applications of mental simulation: A meta-review. *Educational Psychology Review* 2009; 21:93-112.
213. von Lubitz D, Carrasco B, Gabbrielli F, & Ludwig T. Transatlantic medical education: preliminary data on distance-based high fidelity human patient simulation training. *Medicine Meets Virtual Reality (J. Westwood et al., EDs) 2003*.
214. Waldner MH, Olson JK. Taking the patient to the classroom: Applying theoretical frameworks to simulation in nursing education. *International Journal of Nursing Education Scholarship* 2007; 4(1).
215. Watson K, Wright A, Morris N, et al. Can simulation replace part of clinical time? Two parallel randomized controlled trials. *Medical Education* 2012; 46(7):657-667.
216. Weil A, Weldon SM, Kronfli M, et al. A new approach to multi-professional end-of-life care training using a sequential simulation (SqS Simulation™) design: A mixed methods study. *Nurse Education Today* 2018; 71:26-33. <https://doi.org/10.1016/j.nedt.2018.08.022>
217. Weldon S-M, Kneebone R, Bello F. Collaborative healthcare remodeling through sequential simulation (SqS): A patient and front-line staff perspective. *BMJ Simulation & Technology*, 2016; 2(3):78-86. <http://dx.doi.org/10.1136/bmjstel-2016-000113>
218. Westli HK, Johnsen BH, Eid J, et al. Teamwork skills, shared mental models, and performance in simulated trauma teams: An independent group design. *Scandinavian Journal of Trauma, Resuscitation, and Emergency Medicine* 2010; 18(1):47-54.
219. WHO Study Group on Interprofessional Education and Collaborative Practice. World Health Organization, Geneva. (http://www.who.int/hrh/resources/framework_action/en/index.html. Accessed 8 October 2012)
220. Wier GS, Tree R, Nusr R. Training effectiveness of a wide area virtual environment in medical simulation. *Simulation in Healthcare* 2017; 12(1):28-40.
221. Wilson E, Jolly B, Beckmann M, et al. Take-home laparoscopic simulators to develop surgical skills: Analyzing attitudes to, and barriers and enablers of, their use in gynaecology training. *Focus on Health Professional Education* 2019;20(3).

222. Yale University. (2019). Instructional tools. Retrieved from <https://poorvucenter.yale.edu/FacultyResources/Instructional-Tools>
223. Zachary DA, Zachary W, Cannon-Bowers J, Santarelli T. Backstory elaboration: A method for creating realistic and individually varied cultural avatars. In: S Schatz and M Hoffman (Eds.), *Advances in Cross-Cultural Decision Making: Advances in Intelligent Systems and Computing*, VI. 480. Champaign, IL: Springer; 2017. <https://doi.org/10.1007/978-3-319-41636-6>
224. Zakari T, Emes M, Smith A. Implementation of a risk management simulation tool. *Procedia Computer Science* 2017; 121:218-223. <https://doi.org/10.1016/j.procs.2017.11.030>
225. Zlatkin-Troitschanskaia O, Brückner S. *Modeling and Measuring Competencies in Higher Education, Approaches to Challenges in Higher Education Policy and Practice*. Springer Fachmedien Wiesbaden; 2017.
226. Zulkepli J, Eldabi T, Mustafee N. (2012, December). Hybrid simulation for modelling large systems: An example of integrated care model. In *Simulation Conference (WSC), Proceedings of the 2012 Winter* (pp. 1-12). IEEE.
227. Zyda M. From visual simulation to virtual reality to games. *Computer*, 2005; 38(9):25-32.

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