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Simulation-based education (SBE) is an important modality for training a competent and safe healthcare workforce. It is also an important component of core training and continuing professional development for healthcare workers in the National Health Service (NHS) of the United Kingdom. A comprehensive review of SBE provision, led by NHS Health Education England (HEE), discovered many areas of good practice, but also identified inequalities in the access to and delivery of simulation. A framework was developed to help improve the quality, provision, and access to SBE. Case studies are provided in this chapter showcasing the different types of simulation which contributed to the good practice, how they are used in healthcare education, and how they link to the SBE framework. The chapter sets out some of the current challenges with equitable and high-quality provision, detailing plans to further enhance the education and training of the healthcare workforce through SBE through the delivery of a framework, strategic overview, and vision to support these plans.

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Students in radiographic science education programs must master both the didactic education and psychomotor skills necessary to perform radiographic examinations on patients in a clinical setting. Simulation is the most common method of helping radiographic science students prepare to perform such examinations. Simulation can be performed either in live or virtual environments. Recently there has been a trend to adopt virtual simulation in medical education because of the reduced adverse effects virtual simulation provides as opposed to live simulation and real-world practice. Though there is a paucity of literature available discussing virtual simulation's use in radiographic science education, recent studies in this field and related medical imaging modalities have shown the benefits of using virtual simulation. The purpose of this chapter is to discuss the current use of virtual simulation in radiographic science education and characteristics to consider when implementing a simulation program.

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Orthodontic education, which currently emphasizes a didactic and apprenticeship approach, is facing numerous pedagogical challenges that affect knowledge delivery and instruction. This chapter discusses the challenges and limiting factors that affect orthodontic training and proposes the use of mobile augmented reality (MAR) to create a platform for effective learning, visualization, deliberate practice, effective feedback, and a personalized learning environment. MAR, with its visually enriched clinical simulations and ubiquitous learning, can effectively reduce cognitive dissonance and improve overall retention and skill gain by students. However, MAR has its limitations, as the technology is still new and limited evidence is available

to back up the claims of knowledge and skill gain in the health professional’s education. This chapter also provides future directions for exploring and enabling MAR so that it can become an efficient tool for learning and instruction across all faculties of education.

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The purpose of this phenomenological study is to identify the types of ill-structured problems physical therapists face in the acute care setting for a computer simulation to train students in a professional physical therapist education program. Ten physical therapists who practiced in the acute care setting in four large urban Midwestern hospitals participated in semi-structured interviews. Results show that acute care physical therapists experience complex, ill-structured problems that encompass all direct and indirect patient care activities and are complicated by system factors outside of their control. Solving the problems described by the participants requires clear and accurate communication and an awareness of the role of physical therapy in the acute care setting. The use of these authentic challenges for a computer simulation can allow students in a professional physical therapist education program to develop better problem-solving skills.

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This chapter examines the experimental use of Cesim™ Global Challenge, a computer-based business simulation, in an undergraduate international business program in Bogota, Colombia. The authors analyzed the data from the simulation through the application of a nonparametric statistical analysis, in addition to the application of an ex-post survey instrument, in order to assess the relevance of using simulations in the acquisition of managerial skills among undergraduate students. Key findings include the observation of positive effects of computer simulations in learning environments, as they occur in the literature. The authors accepted the hypothesis that stated that more time spent in the simulation leads to better results in the default winning criteria. Finally, the survey instrument confirmed that the use of the simulation helped the students develop managerial soft skills.

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A new teaching approach is presented which integrates observational learning through field teaching of business processes and simulation modeling in order to increase students' learning outcomes and acceptance of computer simulation technology. The teaching method, called LOSI (learning by observing, simulating, and improving), was conducted at a Croatian high education institution. The efficiency of the LOSI approach was investigated by conducting a survey based on the technology acceptance model (TAM). The indicators of ease of use, usefulness, and enjoyment in participating in LOSI were collected along with students' grades and their intention to use this technology in future work and education. The inter-relations among variables were analyzed by statistical tests. The results revealed that students find LOSI easy to use, useful in achieving learning outcomes, and highly enjoyable, while the ease of use and enjoyment is positively associated to usefulness (i.e., learning outcomes).

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The purpose of this chapter is to design a Minecraft simulation game where players can learn a language by communicating and negotiating meaning with other players. To achieve this, Gagné's events of instruction and Schmitt's strategic experience modules were adopted as a theoretical lens for simulation building. After the simulation game was designed, it was implemented to test its feasibility. The result shows that the simulation game has both the intended features of knowledge co-construction and the negotiation of meaning, as well as enjoyment of the game. The test result, however, also suggests that the simulation game needs more conditionals and loops in order for players to repeat their simulation game at any place and time.

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The study presents results from the use of a 3D simulation for teaching functional skills to students with learning, attentional, behavioral, and emotional disabilities, attending regular schools. An A-B single-subject study design was applied. The participating students (eight eight-to-nine years old) explored the simulation (a virtual school), encountered situations in which they observed how they are expected to behave, and had to demonstrate what they have learned. Each student attended a total of four two-hour sessions. Data were collected by means of observations and semi-structured interviews. All students demonstrated improved functional skills both in terms of the number of behaviors they acquired and in terms of those that were retained and manifested in the real school environment. On the basis of the results, it can be argued that 3D simulations are a promising tool for teaching functional skills to students with disabilities.

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Creating positive learning outcomes regarding terrorism can be challenging. The nature of the topic offers several obstacles to learner understanding, not least of which is how to enable students to transcend their own cultural perspectives and develop deeper and more objective insights regarding the groups and causes that foster terrorism. Following an exploration of the growth in terrorism as an academic subject and the challenges posed to teaching in this area, this chapter presents a possible solution by describing an online role play exercise that has proven learning results over more than 25 years of usage. This tool, grounded in an experiential learning approach, can assist in easing some of the stresses faced by teachers and institutions, while also offering deeper and more insightful discoveries for participants.

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This chapter presents a hypothesized evaluation framework for measuring the effectiveness of simulations for learning, while indirectly providing an instructional design framework. The proposed framework was formulated using course design concepts, a newly emerged purpose-based simulation taxonomy, and a frame using

Kolb’s Experiential Learning Theory. To examine the untested taxonomy, which posited an alignment between purpose-based simulation categories to that of Bloom, an analysis reviewing literature within the last decade identified 80 articles. Correlation analysis indicated the area of application when compared to that of a modeling-based simulation type presented the strongest relationship. A summary section includes various domain examples to demonstrate an initial examination for fit to the newly proposed framework.

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