

The Virtual Patient Technology for Medical Education

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Dear Editor,

One of the most modern and effective methods of computer-assisted learning is the use of virtual patient technology. This technology is defined as the interactive computer simulation of the actual conditions of clinical scenarios for health, treatment, education, and measurement purposes. The virtual patient technology has become one of the most common types of problem-based learning in medical education [1].

This concept incorporates the interactive computer simulators that are used in medical education and their main focus is on simulating the clinical steps; including patient history, physical examination, laboratory tests, diagnosis, treatment prescription, and feedback [2].

When we speak of virtual patients, the students play the role of a health expert for the treatment of a computer-simulated patient. The virtual patient is used to train the clinical interviewing skills, bioethics, patient communication, patient history and clinical decision-making skills [3].

The learning process using the virtual patient technology is such that a virtual patient is processed on a computer screen and based on clinical scenarios, the computer provides patient responses and requests information. The learner also communicates with the patient through writing, selecting and in some cases talking to the patient [4].

As for the significance of applying the virtual patient technology in the process of medical education, it should be noted that there is lack of sufficient resources; such as training staff and educational opportunities for learners which is among one of the serious problems in medical education. Also, despite the increasing number of students, the number of teachers in many countries are limited [5].

Thus, application of the virtual patient technology has ability to solve many of the challenges in the field of medical education.

In this regard, the benefits of virtual patient technology are high effectiveness, interactivity, easy access, personalisation of the learning process, immediate feedback, improvement of clinical skills in experimental environments and increasing the learner's autonomy. However, the disadvantages of this technology include, a high cost of provision, difficulty of designing and integrating it into the curricula, limiting to pure technology, lack of attention to racial and cultural differences, and weakness in the assessment of cognitive complexed skill [6].

According to a study, despite many limitations in virtual patient technology, it is welcomed by students as an educational tool [7]. Research shows that medical student's knowledge and skills are involved in problem-solving processes when they meet patients, and most importantly, their knowledge and skills will increase as a result of receiving adequate feedback [8]. Moreover, the application

of virtual patient technology also increases student's flexibility, comfort, and communication skills at work [9].

Not to mention, the virtual patient, as one of e-learning tools, provides a groundwork for developing clinical skills in students. Based on the theory of situated learning, learners can acquire knowledge through engaging in tasks that are in line with real-world activities. Based on research, these engagement and challenges lead to their motivation and deep focus [10].

In addition, the application of virtual patient technology is increasing significantly in training healthcare professionals. Thereby providing learners with ample opportunities towards developing and evaluating the necessary diagnostic and therapeutic practices before facing patients in the real world [11].

It should be noted that despite all the benefits of this technology, it is not possible to completely replace the traditional education with the virtual patient because a major part of the learning-teaching process in medical education is the emotional and interactive human interactions between teachers and students, which cannot be simulated.

The application of any kind of new technology in teaching-learning processes requires compliance with some requirements and necessities, such as technological (infrastructural hardware and software facilities), pedagogical (instructional design and curriculum development) and organisational (organisational readiness, quality assurance) requirements [12]. Therefore, the effective utilisation of virtual patient technologies requires paying attention to these requirements prior to their design and implementation in teaching-learning processes.

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