The Significance of Evaluation Index System in Medical Education

Na WANG¹, Xue JIANG¹ and Jin-guo WANG²,*

¹Department of Anesthesiology, First Hospital of Jinlin University, Changchun, China
²Department of Urology, First Hospital of Jinlin University, Changchun, China

*Corresponding author

Keywords: Component, Formatting, Style.

Abstract. On the base of analysis of literature, the evaluation of teaching effect is mainly based on students' theoretical knowledge, operational skills and confidence level. The traditional teaching method has been influenced by intelligent simulation teaching method. Questionnaires are often distributed to the participating students after class to obtain students' feelings and recognition of simulation teaching. Due to the large clinical heterogeneity in the assessment content, an objective and comprehensive evaluation index system hasn’t been established in China. With the development of medical simulation education in recent years, some domestic scholars began to study the evaluation index system of clinical comprehensive ability of medical students and nursing students.

Introduction

Representatives of the American company produces the most high-end medical simulation training technology and physical driven simulator, namely physical simulated ECS drive smart. It forms a modern clinical skill training center with real ICU room environment, contains the real medical equipment (such as breathing machine, monitor, defibrillation apparatus, etc.), makes everything happen in the real. It the fundamental change of teaching methods [1]. The use of ECS to simulation system can make the teaching process more vivid and specific, which is conducive to students' systematic, complete and dynamic understanding of knowledge in books and their deep understanding of patients' feelings [2].

Problems Existing in the Use of High-end Intelligent Simulators

The Applied Research is in the Preliminary Stage

Seen from the current use of various higher medical colleges in China, most of them are simple use of intelligent simulators, which fail to give full play to the intelligent function of simulated humans, and their applications are generally concentrated in clinical professional courses [3]. The development of specialized basic courses is less, and the application scope needs to be further expanded. There is a big gap between such a large hardware input and actual use, which violates the original intention of each college to introduce such high-end equipment and wastes teaching resources [4].

Insufficient System Software Development

Although high-end intelligent simulator research and development company has developed some simulation tutorial software, it focuses on demonstrating the functions of its products and cannot meet the purpose and requirements of the actual teaching content [5]. The lack of system software is the bottleneck of the development of medical simulation teaching. The research and development of teaching system software needed to invest in a survey of the research and development status of simulated human medical record in 108 north American medical colleges and universities [6].

The Evaluation Index System of Simulation Teaching Needs to Be Improved

Of medical simulation education in China started relatively late in teacher training and academic exchanges, until 2008, the Chinese medical doctor association of career development was held in
southwest hospital organization "the first clinical skills training and medical simulation education advanced seminar", seminar hope that through the guidance of the government and industry association coordination services, improve clinical skills training and simulation education efficiency and level, to promote more effective cooperation and exchanges [7]. The first asia-pacific medical simulation conference in 2011 also made teacher training the first part of the conference. However, in general, the training of teachers is limited, and the intensity of training needs to be further strengthened. Although each analog sales company will organize operation training for users in the initial stage, it is only limited to the description of product functions and lacks guidance on the compilation and development of case software, which limits the improvement of users' subsequent use ability. Medical colleges and universities are basically in the stage of simple design and self-development, and lack of planned communication among colleges and universities, resulting in the overall simulation education level has not reached the ideal state [8].

Development Plan of High-end Intelligent Analog Human

Strengthen Teacher Training

With the development of medical simulation education, more and more medical colleges and universities are equipped with various high-end intelligent simulators. Therefore, it is necessary to strengthen teacher training to give full play to their advantages in medical education. Teachers who implement simulated human teaching should not only have solid professional knowledge, but also be familiar with various performance of simulated human, have certain basic knowledge of computer, master the programming of specific cases of simulated human, and be able to constantly adjust the program content according to teaching needs. Through the teaching of different diseases in different systems, through providing a close clinical environment, such as the supporting use of the simulated ward, students can have more intimate contact with the clinic as soon as possible, so as to prepare for the clinical practice and work [9-13].

Application of High-end Intelligent Simulators in Basic Medical Disciplines

Anesthesiology not only covers the basic physiology knowledge, but also intersperses many anesthesiology pharmacology, clinical anesthesia, critical medicine and other professional courses of anesthesiology knowledge. Traditional and single experimental teaching mode can only make students' thinking stay or solidify in the basic theoretical system, which is not conducive to the cultivation of students' clinical thinking [14]. With the help of ECS high-end simulated human system, some specific situations in the perianesthesia period are restored, and various physiological characteristics of patients and corresponding physiological responses to the use of drugs and treatment operations are simulated by simulated human, so as to create an interactive teaching situation [15]. In pharmacology teaching, the use of drugs in the module of ECS presets the pharmacokinetics and pharmacodynamics of clinical medicine program, through the simulation, observation on the monitor heart rate, blood pressure, oxygen saturation and blood drug concentration change, give students intuitive feeling, make the abstract, boring into the theory of ECS vivid performances, deepen their understanding of drug metabolism and therapeutic effects [16].

Application of High-end Intelligent Simulated Human in Clinical Comprehensive Ability Assessment

The traditional way to measure students' learning achievement is to use comprehensive theory written test and clinical practice test. In view of the lack of clinical practice opportunities, it is often unable to comprehensively evaluate the comprehensive ability of students. Relying on the ECS design OsCE (objective structured clinical examination) and the quantitative analysis with the simulation efficiency table, the comprehensive ability of students can be measured [17]. In the evaluation index system of clinical comprehensive ability of nursing research, using the ECS set clinical simulation cases, construct the comprehensive professional knowledge, comprehensive nursing skills operation quality,
cultural quality, terminal quality primary, secondary and tertiary indicators of clinical comprehensive
ability evaluation index system for future domestic standard, unified ECS evaluation of clinical
comprehensive ability of nursing have a very good reference.

Summary
Local function model, the system USES a variety of computer interactive model and virtual
simulation system such as science and technology, the simulation of analog man physiological and
pathological characteristics of patients, on the implementation of the operations of the corresponding
physiological reaction, and in the relevant monitoring devices shown in the corresponding
physiological data, creating interactive teaching, clinical treatment of the real scenario.

Acknowledgement
This research was financially supported by the First Hospital of Jilin University.

References
[1] Kenneth V. Iserson, John C. Moskop. Triage in Medicine, Part I: Concept, History, and Types. Annals of Emergency Medicine. 2007 (3)
[2] Viswanath Venkatesh, Fred D. Davis. A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science. 2000 (2)
[3] A Turing test for diagnosis: BMJ evaluates online symptom checkers; good Globe article. e-patients Dave. 2015
[4] Deborah Lupton, Annemarie Jutel. It’s like having a physician in your pocket! A critical analysis of self-diagnosis smartphone apps. Social Science & Medicine. 2015
[5] Roger Watson. Mapping the Higher Education Landscape: Toward a European Classification of Higher Education (review). The Review of Higher Education. 2010 (4)
[6] Viswanath Venkatesh, Fred D. Davis. A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science. 2000 (2)
[7] Semigran HL, Linder JA, Gidengil C, et al. Evaluation of symptom checkers for self-diagnosis and triage: audit study. British Medical Journal. 2015
[8] Elliot AJ, Kara EO, Loveridge P, et al. Internet-based remote health self-checker symptom data as an adjuvant to a national syndromic surveillance system. Epidemiology and Infection. 2015
[9] Fox S, Duggan M. Health Online 2013.Internet and American life project. 2013
[10] Parasuraman A, Zeithaml VA, Berry LL. A conceptual model of service quality and its implications for future research. Journal of Marketing. 1985
[11] Elliot AJ, Kara EO, Loveridge P. Internet-based remote health self-checker symptom data as an adjuvant to a national syndromic surveillance system. Epidemiology and Infection. 2015
[12] Poote AE, French DP, Dale J. A study of automated self-assessment in a primary care student health centre setting. Journal of Telemedicine and Telecare. 2014
[13] Powley L, Mcilroy G, Simons G, et al. Are online symptoms checkers useful for patients with inflammatory arthritis? BMC Musculoskeletal Disorders. 2016
[14] Gann B. Giving patients choice and control: health informatics on the patient journey. Yearbook of medical informatics. 2012
[15] Viswanath Venkatesh, Fred D. Davis. A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science. 2000 (2)

[16] M. Bernardotto, V. Singh. How good is Internet self-diagnosis of ENT symptoms using Boots WebMD symptom checker?. Clinical Otolaryngology. 2011