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PERSPECTIVES OF MODERN TECHNOLOGY IN TEACHING MEDICAL TERMS

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ABSTRACT

Medical education is rapidly changing, influenced by many factors including the changing health care environment, the changing role of the physician, altered societal expectations, rapidly changing medical science, and the diversity of pedagogical techniques. Changes in societal expectations put patient safety in the forefront, and raises the ethical issues of learning interactions and procedures on live patients, with the long-standing teaching method of "see one, do one, teach one" no longer acceptable. The educational goals of using technology in medical education include facilitating basic knowledge acquisition, improving decision making, enhancement of perceptual variation, improving skill coordination, practicing for rare or critical events, learning team training, and improving psychomotor skills. Different technologies can address these goals.

Keywords: *physician, societal expectations, enhancement of perceptual variation, improving skill coordination*

INTRODUCTION

The use of technology in medical education has been developing over many years. The trend in the use of technology has primarily developed in response to the challenges facing medical education. These challenges to medical education are numerous. The changing healthcare environment, with the movement of medical care from the traditional hospital setting to ambulatory medicine, has necessitated the ability to provide care in a much shorter period of time and requires changes in documentation with all information, including both health knowledge and medical records, becoming digital. Emphasis on cost-containment and evidence-based use of resources is a national imperative. There are changes in societal expectations so that patient safety is a focus at all levels of medical education. This has also raised the

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ethical issues of learning interactions and procedures on live patients, with the long-standing teaching method of "see one, do one, teach one" no longer being acceptable.

The educational goals of using technology in medical education include facilitating basic knowledge acquisition, improving decision making, enhancement of perceptual variation, improving skill coordination, practicing for rare or critical events, learning team training, and improving psychomotor skills. Different technologies can address these goals. The task of medical educators is to use these new technologies effectively to transform learning into a more collaborative, personalized, and empowering experience. Bonk captures the essence of this new age of technology tools for education by stating "Anyone can learn anything from anyone at any time" [Bonk CJ. 2009.p234]

DISCUSSION AND RESULTS

Education of undergraduate medical students can be enhanced through the use of computer-assisted learning. One example is the use of "flipped classrooms" in which students review an online lecture before the lecture session, and come to the classroom to have an interactive session with the teacher. This time can now be spent on further exploring complex issues or discussing and solving questions in a more personalized guidance and interaction with students, instead of lecturing. Research in this area has not been extensive. Although randomized trials in education suffer due to difficulty with standardization, contamination between two arms, inability to blind the participants, and difficulty measuring outcomes, a few randomized trials have been conducted asking outcome questions about flipped classrooms with some success. These studies showed a positive effect in the areas of student involvement, satisfaction, and knowledge acquisition. Bridge et al conducted a 5-year retrospective study of streaming video use at Wayne State.

University School of Medicine and found the student response to be overwhelmingly positive, with just a small percentage of students reporting that they rarely or never used streaming video of lectures.

Personal digital assistants (PDAs) are routinely used by students for medical questions, patient management, and treatment decisions. Medical apps for iPhones and Android devices are numerous. Although many focus on anatomy and physiology, some address medical problem solving, diagnosis, and treatment.[www.iMedicalApps.com]

The application of digital games for training medical professionals is on the rise. The so-called "serious" games provide training tools that provide challenging

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stimulating environments, and are often used for training for future surgeons. Use of serious games for surgical training improves eye-hand coordination and reflex times. At Florida State University College of Medicine, students in geriatric clerkships play Elder Quest, a role playing game in which players work to locate the Gray Sage, a powerful wizard in poor health that each player must nurse back to health. One published assessment of this tool was used to teach geriatric house calls to medical students. The investigators found that this method provided medical students with a fun and structured experience that had an effect not only on their learning, but also on their understanding of the particular needs of the elderly population.

The aim of simulation is to imitate real patients, anatomic regions, or clinical tasks, and/or mirror the real-life circumstances in which medical services are rendered. Simulations can fulfill a number of educational goals. A qualitative, systematic review by Issenberg et al, spanning 34 years and 670 peer-reviewed journal articles, found that the weight of the best available evidence suggests that high-fidelity medical simulations facilitate learning under the right conditions. The learning characteristics identified included providing feedback, repetitive practice, curriculum integrations, range of difficulty levels, multiple learning strategies, capture of clinical variation, individual learning, and the ability to define outcomes or benchmarks. Issenberg et al concluded that although research in this field needs improvement in terms of rigor and quality, high-fidelity medical simulations are educationally effective and simulation-based education complements medical education in patient care settings. Bradley has published a review on the history of simulation and Lane et al, a comprehensive review of simulation in medical education.

Medical education is rapidly changing, influenced by many factors including the changing healthcare environment, the changing role of the physician, altered societal expectations, rapidly changing medical science, and the diversity of pedagogical techniques. Societal influences and the changing healthcare environment are influenced by the internet, globalization, cost containment, aging of society, increasing public accountability, a medically informed public, demands of personalized care, population diversity, expansion of healthcare delivery by non-physicians, and changing boundaries between health and healthcare. Physicians now work in teams, are salaried, part of a complex organization, and must be highly accountable. Challenges of preparing the future doctor involve emphasis and standardization of competencies and learning outcomes, integration of formal

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knowledge and clinical experience, patient-centered care, population health, cost-conscious−high value care, and understanding the organization of health services.[Elderquest. 2013. p.56]

Use of technologies for undergraduate, postgraduate, and continuing medical education has become increasingly prevalent. There are a number of educational advantages. These modalities facilitate knowledge acquisition, improve decision making, enhance perceptual variation, improve skill coordination, and provide an educational environment that engages the learner and allows learning that does not endanger the patient. Use of computer technologies has the additional benefit of being able to assess competencies and milestones, and provide the student, at any level, with the tools to continue to access the medical knowledge necessary to deliver quality care and be a life-long learner.

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