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CS6460 – Educational Technology
Qualifier Question

The technological advancement of the health field has caused constant improvement and personal learning for all individuals in such fields. What types of learnings are most popular among health professionals? What type of learnings are taught the most? Why? Is the increase of newer EdTech strategies and tooling changing the teaching and learning fields of Health Tech?

Today, people aiming to enter the medical field in the United States can expect a very long journey ahead of them, taking 11 or more years depending on the field and how specialized they aim to be. This journey typically begins with a 3 to 4-year bachelor's degree in a related science, often biology or chemistry, and recently biomedical engineering or others. From there, if qualified and accepted, students will move on to a medical school program, where they then begin to dive into generals of the medical field for another 4-years, including clinical rotations at teaching hospitals. After completing medical school and required rotations, an individual can typically become licensed in General Medicine and begin work; however, most will likely continue their training into medical specialties and spend between 3-7 years in residencies and even more time in Fellowships, depending on their ultimate goals (Doctor of medicine profession (MD), 2018, February 7).

From this short summary of the medical profession, you can infer the variety of types of learning that are necessary for an aspiring doctor to experience. The lecture format of education is still the most used during both the pre-medical stage and medical school, where memorization and understanding of field basics is key to laying a foundation of scientific knowledge and discipline. Later stages emphasize experiential learning and interactive learning in the form of clerkships, internships, and rotations – all important to build an intuition for real-world social interactions with patients and fellow healthcare professionals (Franco, K., 2015, January 6). These last two forms of learning are much more critical to the formation of a medical student than it may be for other professions as the student needs and is expected to be ready to speak and understand the needs of patients with a significant amount of confidence once they have their medical license for practice. They must also be able to learn and understand the use of complex tools – not only tools to treat patients, but also the software for tracking and updating patient records as well as for housekeeping in most healthcare facilities.

Since the dawn of modern commercial computing, technology has pushed the limits of medical education forward, with many experimental tools also becoming crucial parts of Health Information Technology today. One of the biggest advances in educational technology for medical school training has been in the use and evolution of simulation learning. Traditionally, medical students would need to train with real patients through their clinical apprenticeships and residencies, which greatly increased the risk to the patient and the concern of the students and their instructors in ensuring procedures are completed correctly. Furthermore, very complex or unique procedures cannot be easily trained without great risk or if the condition it helped improve is very rare. The first medical mannequin patient simulators originated in the 1960s and were originally relatively simple in their features and too expensive to be widely adopted by medical schools easily. However, while the technological concept was too advanced for its time, the advantages of an artificial patient simulator were clear to doctors and educators and the development of improved medical mannequins continued through both academia and private companies in the healthcare sector (Cooper, J. B., & Taqueti, V. R., 2004, October 01). Today, there are companies that specialize in the development and sale of medical simulators for medical training with varying degrees of realism, procedural focus, and reusability. The future opportunities in this method of learning are vast as robotics and artificial intelligence develop, as more sensors and tactile feedback systems can improve the realism

and artificial intelligence in the simulation program could help create more realistic and randomized scenarios for medical students to experience.

The developments over the past 10 years in mobile computing and always-on connectivity to powerful computing in the cloud are also changing how medical students experience computer-assisted learning. Lectures can be re-watched or enhanced with additional material delivered online by professors and the opportunity exists to build interactive lectures through these always-connected devices. Teaching medical students to learn how to use modern healthcare tools on mobile devices, such as patient record tools and telemedicine applications, is also important to keep them relevant with technological progress and the tools that they are likely to encounter in the future as technology continues evolving (Guze, P. A., 2015). Patient record applications, clinic and hospital management systems, and digital clinical decision support tools are all relatively new developments with great promise that will likely be commonplace in the future as technology makes them possible.

However, computer-assisted learning is not only limited to enhancing current paradigms of learning or training on a new generation of tools. The advances in technology will likely make concepts that were ahead of their time, and often the thing of science fiction, a real possibility in the future. Going back to the benefits of simulation learning in medical education, with today's advances in Virtual and Augmented Reality, we can look forward to a possible future where learning with Virtual Patients and Human Patient Simulation can be made much more cost effective to institutions and individuals (Candler, C., 2007). Today's medical dolls are mechanical simulations and limited in their level of fidelity. The use of real medical instruments on artificial skin limit the reusability of tools, whereas a doll built for reusability can be limited in its simulation. In the future, it is possible for a combination of a physical doll and augmented reality with high-resolution graphics to become the norm in computer-assisted training of medical students.

In summary, the nature of the medical practice has lead to education that relies on traditional lecture-based education in combination with hands-on experiential learning and practice. The dawn of computing, however, brought forward many promising computer-assisted education concepts that were often ahead of their time. Technology today is reaching a level of advancement where many of these decades-old concepts could be brought to fruition beyond basic form.

References:

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