Integration of Technology into Nursing Education: A Collaboration between College of Nursing and University Research Center

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Abstract : This paper presents the integration of technologies into nursing education. The collaborative effort includes the College of Nursing (CoN) at the University of Alabama in Huntsville (UAH) and the UAH Systems Management and Production Center (SMAP). The faculty at the CoN conducts needs assessments to identify education and training requirements. A team of CoN faculty and SMAP engineers then prioritize these requirements and establish improvement/development teams. The development teams consist of nurses to evaluate the models and to provide feedback and of undergraduate engineering students and their senior staff mentors from SMAP. The SMAP engineering staff develops and creates the physical models using 3D printing, silicone molds and specialized molding mixtures and techniques. The collaboration has focused on developing teaching and training, or clinical, simulators. In addition, the onset of the Covid-19 pandemic has intensified this relationship, as 3D modeling shifted to supplied personal protection equipment (PPE) to local health care providers. A secondary collaboration has been introducing students to clinical benchmarking through the UAH Center for Management and Economic Research. As a result of these successful collaborations the Model Exchange & Development of Nursing & Engineering Technology (MEDNET) has been established. MEDNET seeks to extend and expand the linkage between engineering and nursing to K-12 schools, technical schools and medical facilities in the region to the resources available from the CoN and SMAP. As an example, stereolithography (STL) files of the 3D printed models, along with the specifications to fabricate models, are available on the MEDNET website. Ten 3D printed models have been developed and are currently in use by the CoN. The following additional training simulators are currently under development:1) suture pads, 2) gelatin wound models and 3) printed wound tattoos. Specification sheets have been written for these simulations that describe the use, fabrication procedures and parts list. These specifications are available for viewing and download on MEDNET. Included in this paper are 1) descriptions of CoN, SMAP and MEDNET, 2) collaborative process used in product improvement/development, 3) 3D printed models of training and teaching simulators, 4) training simulators under development with specification sheets, 5) family care practice benchmarking, 6) integrating the simulators into the nursing curriculum, 7) utilizing MEDNET as a pandemic response, and 8) conclusions and lessons learned.