The digitization of medical knowledge

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Researchers from Charité – Universitätsmedizin Berlin have challenged traditional teaching and learning concepts employed in medical training. A comparison with conventional learning methods led them to conclude that tablet-based, multimedia-enhanced training improves medical examination results. Their study, which has been published in the journal *PLOS ONE*, clearly shows that an integrated program of tablet-based theoretical training and clinical practice enhances medical training.

The use of digital media forms an integral part of both clinical practice and biomedical research, with resources ranging from multidimensional imaging data of the human body to video animations of human physiological processes. However, traditional teaching and learning concepts fail to utilize the full potential of information technologies.

"Ideally, medical training should be taking place at the patient's bedside rather than in lecture halls," explains Prof. Dr. Daniel C. Baumgart, from Charité's Hepatology and Gastroenterology unit on Campus Virchow-Klinikum. "Communication devices, such as tablet computers, digital assistants and smartphones, make medical data and learning materials available anywhere and anytime. Therefore, our aim was to study the impact of a systematic integration of such devices into medical teaching and training." The multimedia package trialled included the Mobile Medical EducatorSM software package (developed in-house) as well as other multimedia learning materials, such as eBooks, eJournals, slide kits, podcasts, videos, animations, image data, and the American College of Physicians' validated self-assessment software.

The participants, who were made up of medical students on their final year rotation and residents, had to complete exams at the beginning and the end of their training rotations. While the control group had access to all conventional learning resources available at Charité, the multimedia group also had access to a tablet computer throughout the duration of their participation. Results showed that the multimedia-enhanced training package had a significant impact on results in US-style medical examinations, which were based on official American Board of Internal Medicine exams. "We were able to show improvements in internal medicine exam results, which were independent of socio-demographic factors. Participant feedback was particularly positive in relation to an integrated, fully-digitized workflow for clinical practice and training," reports Prof. Baumgart. According to this study, medical journals (accessed via the US National Library of Medicine (NLM), PubMed and others) were the most frequently-used resource for clinical practice-based problem-solving.

More information: Daniel C. Baumgart et al, Tablet computer enhanced training improves internal medicine exam performance, *PLOS ONE* (2017). DOI: 10.1371/journal.pone.0172827

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