

Innovations and Technology

IT-1	<p>INNOVATIONS IN MEDICAL EDUCATION IN MONGOLIA <i>Tserendulam Dashsuren, M.D.,MSc.*</i>, <i>Lkhagvasuren Tserenkhuu, M.D.,DSc.</i>, <i>Dungerdorj Densmaa, M.D.,DSc.</i>, <i>Altantsetseg Togoo, M.D., Ph.D.</i>, <i>National Medical University of Mongolia, Ulaanbaatar 210648, MONGOLIA</i></p> <p>Located in the center of the Asian continent, Mongolia covers an area of 1,566.5 sq.km (604,650 sq.miles). According to the 2000 census, the population of Mongolia totals 2,375,500. Access to health care services is a major problem for the small population inhabiting such a vast territory. Since the 1990s Mongolia's new political, social, and economic environment has created both new opportunities and challenges for the medical education system. Also, advances in international medical education are forcing us to rethink our role in health care, whether we like it or not, the current educational system is outstripping both our financial and conceptual ability to deal with the demands on our resources.</p> <p>The National Medical University of Mongolia (NMUM) is the only major and accredited medical university in our country. More than ten thousand Mongolian medical doctors and professionals were trained by the Russian-styled medical education system from 1942–1990s. The NMUM takes responsibility for continually providing the national medical schools with new technologies to build a better educational system, and works for better management of the educational processes.</p> <p>Since 1999, the main challenge in medical education in the NMUM is the proper formulation and application of an Integrated Block System (IBS) as implemented in the Netherlands. According to the IBS, we are changing our educational curriculum from the Russian (Eastern European) educational system with forcing, idealist, teacher-centered training and a subjective–dependent evaluation method; to the problem-based and student- centered training. Many departments need to combine functionally for related disciplines. The NMUM has sought to develop postgraduate activities, not only within disciplines, but also at the interfaces between traditional disciplines. This interdisciplinary approach will also bring clinical research closer to research being done in the basic sciences. The NMUM's policy is to strengthen the fundamental or basic science departments for the development of a successful IBS.</p> <p>This poster presentation will describe how the IBS program has changed the medical education system at the National Medical University of Mongolia and thus will affect all new physicians being trained in our country.</p>
IT-2	<p>ANATOMY OF THE CENTRAL NERVOUS SYSTEM: A MULTIMEDIA COURSE <i>Douglas J. Gould, Ph.D.</i>, <i>Department of Anatomy and Neurobiology, University of Kentucky College of Medicine, Lexington, KY 40536-0298 U.S.A.</i></p> <p>The objective of the present project is to create and evaluate the first phase of a multimedia software package that will provide an interactive programmed-learning experience covering the structural and functional interrelationships of the CNS using an approach that emphasizes nervous system interconnectivity. Users can follow set lesson-plans as if an instructor was leading them through a particular topic area by following a programmed linearly-arranged set of modules. After each block of material, users are prompted to answer questions on the content they have just worked through, much as an actual instructor might using a quiz prior to moving on to the next topic. Student and faculty surveys were used to assess what areas of nervous system study would benefit most from the application of more sophisticated multimedia elements. The appropriate use of multimedia technologies, which include 3-D modeling, Quick Time Virtual Reality (QTVR) objects, animations, illustrations and component dissection are all designed to increase the interactivity that transforms users into active learners. After the user completes the set of lesson plans, they are prompted to complete a comprehensive exam, elements of which include, multiple choice and fill-in-the blank questions, diagram labeling and the reconstruction of individual elements of disassembled pathways that encourage them to integrate all elements of the nervous system from sensation through perception to response. The first module covers the limbic system, selected both for its high level of difficulty in teaching/learning and for its massive interconnectivity to other brain regions. The evaluation of the prototype is currently underway, the data will be ready for publication by this summer. The project is supported by N.I.H. grant #1R41NS40588-01A1.</p>

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IT-3	<p>EVALUATION OF DOCS 'N DRUGS: A COMPUTER ANIMATED, CASED BASED LEARNING PROGRAM, WHICH IS INTEGRATED IN THE MEDICAL CURRICULUM AT ULM UNIVERSITY <i>Bettina Kessler, BSc*</i>, Harald Traue, Professor, Russell Deighton Dr., Matthias Dannenberg Dipl. Inf.; Department of Health Psychology, University of Ulm, 89081 Ulm GERMANY</p> <p>To aid optimization of the curriculum of medical students, a internet-based computer animated program called Docs 'n Drugs was designed at the University of Ulm, Germany. In order to test the use and applicability of this learning platform, the program is currently being evaluated. Since summer 2002, medical students at the University of Ulm participated in the computer based learning courses Docs 'n Drugs. The initiated evaluation was asking the students via an online questionnaire about their opinion, acceptance, knowledge, expectance and restrictions towards computers and web based training. 126 students third-semester participated. The currently ongoing second part of the evaluation describes how up to 12 individual participants employ their medical and technical knowledge and expertise when using the program. Under consideration of verbal and nonverbal reactions the intuitive usability of the program will be assessed. Furthermore, it will be examined whether learner apply their existing medical knowledge in the individual patient's cases. It is investigated whether the teaching program supports the medical students in transferring the inductively acquired medical knowledge into a complex patient-case within Docs 'n Drugs, hence enforcing deductive medical thinking and application of strategies. The methodological approach is that participants are expected to verbalize learning and thinking strategies through guided inspection by a trained examiner. Focus of this part of the evaluation is to gain information about each step a user takes when working through the program. Subsequently, participants are asked several questions about their knowledge transfer. Finally, the participant group will be given time to discuss and evaluate their individual learning strategy in the medical course, and the gained experience of learning with a computer program and/or a book. Initial results show that students positively but critically evaluated this new tool in medical education. It is more positively perceived in comparison to other problem based learning scenarios or traditional textbook-based learning. Preliminary conclusions are that Docs 'n Drugs is being accepted by the students and that increased implementation in the curriculum, as well as becoming more exam relevant, is resulting in increased acceptance. Long-term target is to test the intuitive usability of the program as well the efficiency of knowledge transfer and performance as compared with the traditional method.</p>
IT-4	<p>A PARADIGM FOR ONLINE MEDICAL EDUCATION Pinar Kondu, M.S.¹, Marek Skrzypek, Ph.D.¹, Zev Leifer, Ph.D.*² and Robert Gore-Langton, Ph.D.³ ¹ Incyte Genomics, Beverly, MA 01915 U.S.A., ² New York College of Podiatric Medicine, New York, NY 10035 U.S.A. ³ EMMES Corp., Rockville, MD 20850 U.S.A.</p> <p>New models in medical education are emerging. Classroom didactic presentation is being supplemented with small group instruction and wet labs are being supplemented or replaced by simulations or models. Online education, too, has a potential role, for supplemental (honors) courses, remediation, continuing medical education or for the student unable to travel to the campus. The authors, members of Internet Biologists, have presented a course entitled "Perl for Biologists" (www.ib-perl.org). This course, intended in the short term, as a training medium for professionals (e.g., faculty) doing research in genomics, can serve as a model for a medical course, as described above. The model contains the following elements: 1) Text assignments; 2) Lessons, on the internet; 3) Exercises, followed by solutions on the internet; 4) intergroup discussions via email; 5) listserv-like group communication via Yahoogroups, with archiving of all communications; 5) most uniquely, weekly meetings of all students and faculty (in this case, in multiple states and countries) in a virtual classroom in "Diversity University (DU)", using the MOO platform, where all could talk (by typing) in real time. This is in conjunction with a PowerPoint presentation by the lecturer, i.e. one window open for slides and one for talk; 6) logging of the DU group discussions, with archiving on the website and the listserv; 7) exams, with group discussion of the answers; 8) password protection, so that intellectual property is protected and access is limited to registered students. It is proposed that the combination of these elements provides a paradigm for online medical education that could be widely applied to address particular needs for distance learning.</p>

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IT-5	<p>USING VIRTUAL LECTURES TO TEACH THE BASIC MEDICAL SCIENCES <i>Frank Slaby, Ph.D., Department of Anatomy & Cell Biology, School of Medicine, George Washington University, Washington, DC 20037 U.S.A.</i></p> <p>The development of user-friendly authoring programs has made it possible for medical school instructors to prepare computer-based programs that present animated illustrations synchronized with audio tracks. I have used Macromedia's Flash and Director authoring programs to prepare virtual lectures on the histology of the digestive system. Virtual lectures in histology offer several advantages: (1) Students can see how a tissue's chief cells and microvasculature are assembled to construct the architecture of a tissue. For example, in the virtual lecture on the liver, Flash animations are used to construct a classic liver lobule, starting with the hepatocytes and then sequentially introducing the student to hepatocyte cell plates, sinusoids, Kupffer cells, fat-storing cells, the radial arrangement of sinusoids and hepatocyte cell plates, central veins, and finally the portal tracts. (2) Students can see in action cell biological processes, such as transcytosis, and physiological mechanisms, such as the direct and indirect mechanisms by which gastrin stimulates gastric acid secretion. (3) Students comprehend better and remember longer what they learn because the animations provide a second dimension by which to understand the material being discussed. (4) The animations have a modicum of entertainment value. This feature helps maintain student attention and interest. (5) Because a lecturer's remarks are tightly coordinated with animations, material is presented not only more clearly but also more quickly. A 40-minute virtual lecture can deliver the same content as a 60-minute live lecture. (6) Finally, and perhaps most importantly from a student's perspective, the student chooses the time and place to 'attend' a virtual lecture. Because each virtual lecture is divided into 20 to 30 scenes, each of which lasts from 1 to 3 minutes, students can determine the pace best for them to go through a virtual lecture. In our histology course, the virtual lectures were available for review in the school's library; all students also received a verbatim transcript of the virtual lectures. Feedback was very positive; many students commented that the virtual lectures and verbatim transcripts were an especially effective combination of study tools. Because of their convenience, accessibility, and learner-friendly features, virtual lectures are an effective and efficient tool for teaching the basic medical sciences.</p>
IT-6	<p>STUDENTS ON THE MOVE, THE IMPACT OF MOBILE TECHNOLOGY ON MEDICAL EDUCATION <i>Dr. Jack Kues*, Professor of Family Medicine and Assistant Dean for Continuing Medical Education, University of Cincinnati College of Medicine, Cincinnati, OH 45267-0567 U.S.A., and Tom Cochran, ArcStream Solutions, Watertown MA 02472 U.S.A.</i></p> <p>Forward-looking medical schools are leading the way in the deployment of mobile and wireless technologies to improve course management, enhance student-faculty communications and better monitor performance and programs. If you're looking for ways to effectively enhance medical education, come and hear a specific case study from the University of Cincinnati College of Medicine and see a live demonstration of their application, Students on the Move. Learn how mobile solutions can address the common educational challenges medical schools face. Find out what benefits institutions can expect from mobile solutions, as well as the keys to successful implementation. And most importantly, hear first-hand why now is the right time to go mobile.</p>

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IT-7	<p>INTERACTIVE MULTIMEDIA WITHOUT PROGRAMMING: USING POWERPOINT TO CREATE COMPUTER-ASSISTED LEARNING MODULES <i>Rakesh K. Kumar, M.B., B.S., Ph.D.*</i>, Gary M. Velan, M.B., B.S., Ph.D., and Mark Dziegielewski, BSc, M.B., B.S., Ph.D., Department of Pathology, School of Medical Sciences, The University of New South Wales, Sydney, 2052 AUSTRALIA</p> <p>Creating effective computer-assisted learning (CAL) modules is usually assumed to require mastery of authoring or programming tools. We developed a novel approach to creating CAL modules for teaching Pathology to medical students in Year 4 of a six-year program, based on the use of "Browsed at a kiosk" shows in Microsoft PowerPoint? . Using PowerPoint makes it relatively straightforward to hyperlink text and diagrams, photographic images, embedded video clips and spoken commentary, as well as to provide external links to sites on the World-Wide Web. Although less powerful than an authoring environment or a scripting language, PowerPoint offers an easy and familiar setting, allowing the educator to concentrate on content and structure, while facilitating the production of fully functional modules without the need for specialist technical assistance. To achieve a professional-quality product, we did eventually convert most of the Year 4 Pathology CAL modules using Macromedia Authorware? . However, completing the prototypes within PowerPoint simplified testing and comparing alternative approaches before undertaking the translation. Medical students have consistently rated these modules highly, although they expressed a strong preference for using CAL modules as an adjunct to face-to-face tutorials, rather than as a replacement for them.</p>
IT-8	<p>TELE-ILLUSTRATION: A NOVEL TOOL TO ENHANCE TEACHING <i>Mark F. Seifert, Ph.D.*</i>, and Ronald L. Shew, Ph.D., Department of Anatomy & Cell Biology, Indiana University School of Medicine, Indianapolis, IN 46202 U.S.A.</p> <p>Teaching can be affected using a variety of approaches and supportive technologies. Predominant among these currently is the use of computer presentations with PowerPoint slides to convey course material. One goal of effective teaching, especially in a large class size environment, is to engage students having different learning styles, e.g., visual, auditory, kinesthetic. Recent advances in LCD touch-sensitive panels, electromagnetic stylus pens, projection devices, and presentation software provide novel opportunities for maximizing engagement of students during lecture. This demonstration utilizes a 15" Wacom Technologies LCD panel, serving both as a monitor and as a drawing tablet, that is supported by Hitachi Starboard Presentation Suite software and coupled to a PC laptop computer. PowerPoint slide shows are executed by the ShareWizard Show program, which produces a small on-screen toolbar from which the user can access an electronic pen or highlighter with several choices of color and line thickness. Projected images can be annotated or modified through use of the pen on the drawing tablet. The pen also allows the instructor to write additional text information or make "on-the-fly" diagrams during a presentation. It even has eraser capabilities should a mistake be made. Any information added to these projections can be saved for archival purposes. In summary, these novel tools are now available to benefit instruction and student learning. The Wacom tablet and Hitachi software allow an instructor to: 1.) take full advantage of the powerful, creativity features of PowerPoint, and 2.) preserve the pedagogic effectiveness of a presentation style that fosters teacher-student interaction. Combined, these features enhance our opportunities to engage students having different learning styles and increase our teaching effectiveness.</p>

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IT-9	<p>THE EYEPATHOLOGIST: A WEB BASED PROGRAM TO HELP FULFILL THE INTERNATIONAL SHORTAGE OF INDIVIDUALS WITH EXPERTISE IN OPHTHALMIC PATHOLOGY <i>Gordon K. Klintworth, M.D, Ph.D*</i>, <i>Anthony N. Benson, M.A.</i>, and <i>Ann L. Bushyhead, M.Ed.</i> <i>Departments of Pathology and Ophthalmology and Educational Media Services, Duke University Medical Center, Durham, NC 27710 U.S.A.</i></p> <p>The EyePathologist www.EyePathologist.com is a web-based, instructional environment on the anatomy and pathology of the eye designed to emulate one-to-one interaction with an expert eye pathologist. It is designed for use by a wide range of health professionals from first-year medical students to ophthalmic pathologists as a teaching and reference tool. A searchable database of almost 5,000 diseases that affect vision and the eye as well as other tissues, includes dynamic links to a glossary of over 3,500 definitions. Diseases are lavishly illustrated with over 3,000 high quality images. The anatomy and pathology of each part of the eye and its adnexa are considered separately with links between the two. For the novice, introductory material in the Pathology section focuses on the common and important diseases. More experienced users can probe for details about specific diseases through links or via the search engine. The Pathology section includes: Introduction; Developmental anomalies; Aging, Tissue reactions, Inflammation; Infection; Trauma; Inherited disorders; Metabolic disorders; Systemic disorders, Tumors; Cysts; Therapeutic procedures, Surgical pathology and Artifacts. The text and high quality images have been contributed by over 400 experts. Additional features include: illustrative links to diseases; a database of references with links to PubMed of the National Library of Medicine and a capability to regularly update the text as new information becomes available. Future growth will include a section and database of questions that can be accessed for evaluating user progress and Continuing Medical Education credits.</p>
IT-10	<p>DEVELOPMENT OF A WEB-BASED SELF-ASSESSMENT PROGRAM SUITABLE FOR USE IN MULTIPLE COURSES AND CONTEXTS <i>Raziel Hakim Ph.D.*</i>, and <i>David Hakim Program Engineer, Department of Anatomy, Howard University College of Medicine, Washington D.C. 20059 U.S.A.</i></p> <p>There are many times when students benefit from the feedback that comes from testing oneself using old exam questions or questions from the back of a text. These assessments build confidence, focus attention on areas needing further study, clarify objectives, provide reinforcement and sometimes, provide new insights into course materials. Here we describe use of a web-based self-assessment program, capable of storing an unlimited number of questions, for presenting questions to students in an easy to use way.</p> <p>In self-test the students go to www.self-test.net which lists lectures and laboratory exercises associated with different courses. After clicking on (choosing) a lecture, students are shown a list of topics associated with that lecture and the number of questions in each. By selecting the number and difficulty levels of question in one to all topics, a quiz is randomly chosen from the question set and presented on screen, one at a time. Once completed the student is shown the results, given the opportunity to review any question and where included given additional explanatory information or a link to further information.</p> <p>Statistics on aggregate student performance, date taken, scores on individual quizzes and the list of questions given in any quiz is available to the instructor, as is aggregate data on all responses given to any question. As set up students do not have to register, and so may take quizzes anonymously.</p> <p>Data is accumulating that use of this bank helps improve student grades. To date, medical and dental students are very positive about the self-test experience. New approaches are also being evaluated using this program. In one, students are told they can take quizzes repeatedly on a predetermined topic during a defined time-frame. To get credit they must obtain at least an 80% score on at least a 10 question quiz. This approach of learning to proficiency with this program too appears to be very successful.</p>