CATEGORY: Instructional Methods Abstract ID: 10-103

MEDICAL STUDENTS' USE OF A LECTURE RECORDING SYSTEM DURING RECOVERY FROM HURRICANE IKE.

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PURPOSE

In September , 2008, Galveston, Texas was hit by hurricane Ike. The city, including the University of Texas Medical Branch, was flooded by a storm surge that caused significant damage and loss of basic services. Although we were able to restart classes after 5 weeks, students had to deal with issues such as replacing personal items and finding suitable housing. To help alleviate anxiety and to acquire adequate mastery of curriculum content, we provided a lecture recording system (LRS) within two months of restarting classes so the students could conveniently review lectures. This abstract describes the students' attitudes toward LRS and the effect on perceived acquisition of course content.

METHODS

Data reports provided by the LRS software were used to determine the frequency of use of the system in 8 courses. In 6 of the courses, end of course surveys asked for student feedback on how effective LRS was in helping manage time. To determine whether the storm adversely affected student learning, end of course surveys asked students how useful the lectures were in helping master the course material, and examination scores were compared to scores in the immediate pre-storm year.

RESULTS

Most (85.5 ± 15.0%) of the students used the LRS. In response to the end of course survey, 81.5±8.6% (n=6 courses) agreed that LRS helped managed their time. In the courses using LRS, 79.8±13.5 % (n=8 courses) of the students agreed that the lectures were useful in mastering the material. This compares to 68.1±13.8 % (n=8 courses) agreeing in the previous iteration (pre-storm) of the course when LRS was not available (p=0.01). Mean examination scores were 82 ± 2.9 (n=11) and 82.3 ± 4.1 (n=11) pre- and post-storm recovery (difference ns).

CONCLUSIONS

Most students used the LRS and they felt that it helped them manage their time. With the LRS available, more students felt that the lectures helped them master the course material. Because examination scores were not significantly different than pre-storm examinations, LRS may have helped the students master the course material under adverse conditions.

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CATEGORY: Instructional Methods eDemo Abstract ID: 10-104

TEACHING STYLE OF ACADEMIC MEMBERS IN RAFSANJAN MEDICAL UNIVERSITY

Bakhshi Aliabad, Hamid* (Acdemic Member of Medical Education Department). Razeghinegad Mohammadhosien (Orthodontist, Academic Member of Dental School).

PURPOSE

Teaching styles and learning are behaviors of that teachers and students show in learning process. Identifying teaching styles and personal charactristics of the academic members can be useful for their instructional patterns and students achivement, because of different effective challenge and opportunity for learning. So this study were designed and porformed with the aim of determining the teaching styles of academic members of Rafsanjan university of medical sciences. Method & materials: This descriptive study was carried out on 100 academic members of RUMs in faculties and educational and therapeutical centers, by non random sampling method .After the pilot study on 10 samples and determination of reliability and validity of translated Grasha's quosionnaire , the main study was carried out. The questionnaires were delivered to the academic members ;after completing them ,their datum were analysed by the SPSS software. Analysing datum were performed based on Grasha's scoring key and its norms. Data were analysed with descreptive and analytical statistical test.(t test, chi square test).The variables of the questionnaire are expert,delegator, facilitator,formal authority and personal teaching styles and demographic variables.

RESULTS

Results showed that primarily preferred teaching styles of academic members are expert, delegator and secondry styles are formal authority, personal model and facilitator style. Primary styles for MSc, Ph.D. staff and medical specialists were expert and for under-graduated staff (liscance degree) were delegator and facilitator style. In faculty of medicine, teaching style were expert and delegator but in faculty of dentistry it was delegator. Expert, formal authority and facilitator and delegator are primary styles in nursing faculty and academic members of educational and therapeutical centers had all teaching styles, that the difference between teaching styles and site of employment was statistically significant ($P<0.05$). conclusion: According to the preffered teaching style (expert and delegator) of the academic members attention and using effective teaching methods such as contractive teaching, classroom symposium, independent study, discussion and small group for facilitating students' learning are suggested. Key word: Teaching styles, Academic members, Rafsanjan, Iran.

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CATEGORY: Instructional Methods eDemo Abstract ID: 10-106

PLAY-DOH™ IS A SIMPLE AND EFFECTIVE MEDIUM FOR TEACHING EMBRYOLOGY

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PURPOSE

The Educational Affairs Committee of the Am. Assoc. of Clinical Anatomists said, "An understanding of human developmental anatomy provides a fundamental framework for the accurate diagnosis and proper treatment of patients with congenital clinical entities, a significant population of any medical practice". Like most embryology instructors, I have searched perennially for effective strategies to instill students with a basic understanding of embryology. Play-Doh™ provides a simple and effective medium to convey this information.

METHODS

I use Play-Doh™ to: 1) Construct crude sculptures of embryos or organs at various stages of development. These are digitally recorded with a voice-over explanation and made available online as short movies (<5 minutes); 2) Construct the same sculptures and project them to an overhead screen during classroom lectures; and 3) Divide students into collaborative groups to construct the same sculptures during class. The effectiveness is evaluated with student satisfaction surveys and by their abilities to answer difficult USMLE-style questions.

RESULTS

Students report a high level of satisfaction regarding the ease with which they are able to learn embryology from Play-Doh™. They like having access to the online videos for pre-class preparation and pre-exam study. While no case-control studies have been done, more students seem to be able to correctly answer difficult questions following instruction with Play-Doh™.

CONCLUSION

Play-Doh™ (or any such sculpture medium) provides an inexpensive and simple approach to teaching embryology. Moreover, student satisfaction surveys suggest that these simple and crude sculptures may be more effective that computer animations in teaching embryology.

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CATEGORY: Instructional Methods Abstract ID: 10-107

FACTORS INFLUENCING NEUROSCIENCE GRADES OF MEDICAL STUDENTS

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PURPOSE Neuroscience has rapidly become an integral part of living and society. This growth necessitates a greater understanding and simplification of subject. New approaches (1)to medical education need to be incorporated into the curriculum to enable students to meet its evolving dimensions. These approaches must target not only the physical constructs of the material but also the bio-psychosocial components of both the learner and the educator. As described earlier by Bloom (2), but still fundamental to education today, learning should involve knowledge (cognition), attitude (affective) and skills (psychomotor). In other words, not only the head but also the heart and hand of our students need to be considered. The aim of this study was therefore to determine whether students' prior knowledge, attitude or study practice influenced their Neuroscience grades.

METHODS A cross-sectional survey was conducted using an electronic self-administered questionnaire via Survey Monkey. The instrument was designed to gain information from third semester students that had previously done the Neuroscience course. Self-reported information on students' prior knowledge (MCAT scores), attitude and study practices towards Neuroscience and their final grades was collected. The data was collected during the months of June – August 2008. The study was conducted in collaboration with members from the Anatomy and Introduction to Clinical Medicine departments. Anonymity and confidentiality was maintained because names and identification were not requested and responses were not directly linked to addresses. Data was analyzed using correlation where $p < 0.05$ was determined as significant.

RESULTS Students who spent more hours reviewing lectures on media site were more likely to have higher Neuroscience grades ($p=0.04$). Furthermore, students who entered medical school with higher MCAT scores were also more likely to have higher Neuroscience scores ($p=0.03$). However students' attitude did not affect their grades ($p=0.29$).

CONCLUSIONS Media site is an effective learning resource for Neuroscience students. This method of delivery of the curriculum is apt for medical students who normally have arduous schedules. Furthermore MCAT score is a predictor of Neuroscience grades. References 1) Howe A, Campion P, Searle J, Smith H. (2004). Learning in Practice. New perspectives—approaches to medical education at four new UK medical schools. British Medical Journal, 329, pp. 327-331 (7 August), doi:10.1136/bmj.329.7461.327 2) Bloom BS (Ed). (1956) Susan Fauer Company, Inc.. Taxonomy of Educational Objectives. The classification of educational goals, pp. 201-207.

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CATEGORY: Instructional Methods eDemo Abstract ID: 10-116

A BIOMEDICAL RESEARCH COMPETENCIES EDUCATION PROGRAM FOR MEDICAL STUDENTS

des Anges Cruser*, Ph.D., MPA and Sarah K. Brown, DrPH. University of North Texas Health Science Center

PURPOSE

A novel curriculum increasing early career exposure to biomedical research for medical students has been developed and tested at the University of North Texas Health Science Center. The primary aim of the curriculum is to increase foundational competencies in clinical and translational research as a component of critical thinking in evidence-based medicine

METHODS

This poster displays the model used to integrate basic biomedical research competencies into the medical school curriculum, and reports the learning outcomes.

RESULTS

A regression model based on self-efficacy theory, identifying factors predicting learning outcomes is presented. In the electronic demonstration component of this presentation we illustrate the differences between this curriculum model and a traditional medical statistics course with vignettes from the lectures, on-line web-based resources, and students' critical reviews of research articles.

CONCLUSIONS

A consortium of medical schools is collaborating to test this curriculum in multiple venues. This research education consortium is developing innovative approaches to measuring outcomes of the curriculum.

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CATEGORY: Instructional Methods Abstract ID: 10-118

INNOVATIVE USE OF AN AUDIENCE RESPONSE SYSTEM IN MEDICAL EDUCATION

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PURPOSE

Electronic voting is an interesting audience response technology for classroom use. Using on-the-spot voting changes one-way interaction of a standard presentation into a two-way communication process that motivates and involves the audience to active participation and provides the teacher with immediate feedback on the students' level of understanding or their opinions. In the Medical Schools of the Leiden University Medical Center and the Academic Medical Center Amsterdam, wireless electronic voting has been implemented in the medical curriculum as a standard educational tool.

METHODS

Teachers use several applications for using voting in their lectures. Scenarios include basic knowledge tests at the start or end of a lecture to assess the students level of knowledge, screening tests to determine those topics students know less about, panel discussion tools to determine the audience's opinion and interactive lectures in which students have direct influence on the content to be presented.

RESULTS

Basic tests are generally used to find out the knowledge level of the students. If students perform poor on the test, the teacher can immediately adjust the lecture to fill in the gaps detected. In combination with a posttest, the actual increase of knowledge can be measured. Many teachers also use tests in the middle of their lecture. Using the technique at a moment where concentration may decrease helps students to stay focused and to increase retention time of information. Screening tests are used to deliver tailor made lectures. First, the teacher presents a test of about 20 questions. Based on the results, only the top-5 items with the least understanding will be discussed in class. This makes education more efficient. Addressing audience opinions in a lecture might also lead to very interesting effects. Because of the anonymity of the system, students can answer what they really think of have done, even the answer is not socially desirable. Finally, the audience can actively steer the direction of the lecture. Students choose between two options and the teacher will select the option that gets the majority of votes. A very special option is a lecture that describes a patient case. By voting one out of a list of possible clinical actions, the audience can simulate treating the virtual patient presented and will immediately be confronted with the implications of the chosen action.

CONCLUSIONS

Audience Response Systems can be used in many didactic ways to enhance the quality and efficiency of education.

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CATEGORY: Instructional Methods Abstract ID: 10-121

ACTIVE LEARNING HANDS-ON APPROACH IN TEACHING ECG BASIC CONCEPTS TO PRE-CLINICAL MEDICAL STUDENTS

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PURPOSE

A lack of proficiency in electrocardiogram (ECG) interpretation in medical trainees and practitioners has been lately noted. Meanwhile pre-clinical medical curricula are moving toward active learning and clinical integration. We have designed and implemented an active learning hands-on laboratory to teach the basic physiological principles of ECG.

METHODS

The laboratory has been in place for 4 years (2006-2009) and is conducted using IQ mark digital ECG machines. Each year, the class of 54-56 students was divided into six groups. Each group performed two recordings, one with and one without software interpretation.

RESULTS

During the 4 years this lab has been in place student performance on ECG questions on the physiology NBME exam significantly improved compared to the 6 previous years (2000-2005) without the lab. The difference in the mean % of correct ECG questions between our students and the national average improved from -9.5± 0.5 to +1± 0.4 ($p < 0.02$) before and after the ECG lab, respectively. Furthermore > 85% of the class performed well on the in-house follow-up lab exercise. The lab was well received by the students with consistent provided positive feedbacks. The majority of the students > 88% rated the lab as extremely or very useful in helping them understand ECG concepts as well as for their medical education.

CONCLUSIONS

Active learning hands-on approach appears to improve student understanding of the basic ECG concepts. Implementing this approach early-on in the medical curricula may improve the competency of ECG interpretation skills in the student's future practices.

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CATEGORY: Instructional Methods Abstract ID: 10-122

PRODUCING OBJECTIVE CENTERED PODCASTS FOR PREVIEW & REVIEW: A NOVEL FACULTY DEVELOPMENT TOOL FOR EFFECTIVE LECTURING

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PURPOSE

Lecturing is a complex communication dynamic that requires mastery of many skill sets. To improve the delivery of lectures we employed brief preview and review podcasts as a way to assist faculty in developing effective lectures focused on learning objectives.

METHODS

A series of preview and review podcasts, recorded with a USB microphone using Camtasia Relay software installed on a PC, were created to supplement lectures in cell biology and histology. Preview podcasts based on learning objectives were limited to 3 minutes and featured one objective at the top of the screen and an illustration below. Review podcasts were limited to 7 minutes and provided a framework for summarizing and studying the lecture. Preview podcasts were released at least one day prior to the lecture and review podcasts were released on the day of the lecture. An anonymous survey consisting of six questions was distributed via the course management system.

RESULTS

Sixty four responses (out of 170) were collected. Sixty percent viewed at least one preview podcast of which 20% found them somewhat helpful and 26% very helpful in focusing on what to learn. At least one review podcast was viewed by 56 % with 16% finding them somewhat helpful and 34% very helpful. One student comment suggested that "it would be good for other professors to do them because it would help them think about the big picture/point of their lecture and thus teach us more efficiently". Another responded, "I hope that all teachers will do them in the future."

CONCLUSIONS

The preview and review podcasts, although designed as an aid to learning, may actually serve to benefit the instructor. Podcasts do not fit the study style for many students; however, their utility for archiving lectures has been well established. The suggestion that more professors utilize preview and review podcasts has us currently exploring the applicability of this approach as a faculty development tool. The goal is to improve lecturing skills by focusing on learning objectives, clarity, brevity and the selection of excellent teaching visuals. These results represent a pilot study that we are in the process of expanding.

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CATEGORY: Instructional Methods Abstract ID: 10-123

A WAY TO LEARN CLINICAL REASONING IN THE PRECLINICAL YEARS

Nancy Fernández*, Diana Montemayor and Donato Saldívar. Universidad Autónoma de Nuevo León, Medical School, Monterrey, N.L. MEXICO

PURPOSE

Clinical Reasoning is the key competency of medical practice. Through this complex intellectual ability, patient's information is integrated with physician's knowledge and experience in order to get a diagnosis, treatment, rehabilitation, prognosis and prevention of patients. The question is: What is the better way to develop this competency in preclinical students?

METHODS

We looked out for an intellectual path that leads to Clinical Reasoning and found out that if clinical information is studied using the basic intellectual abilities: identification, description, comparison, definition and classification, and with the result of this starts a continues and repetitive intellectual play that goes from analysis to synthesis and evaluation we are learning Clinical Reasoning.

RESULTS

We designed an on-line course for first year students in which, by applying this intellectual path to solve clinical problems they start to learn Clinical Reasoning. At the end of the course they were able to solve clinical cases by applying the intellectual abilities they learned in the course.

CONCLUSIONS

The systematic use of this intellectual path allows students start learning Clinical Reasoning in the right way, avoiding learning the hard way what is expensive in time and effort. The learning of Clinical Reasoning must start in the first year and educators must provide the opportunity to learn it according to the course content.

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CATEGORY: Instructional Methods Abstract ID: 10-125

WHAT'S REALLY GOING ON? LEARNING RESOURCE UTILIZATION AND ACADEMIC PERFORMANCE

Edward P. Finnerty, Ph.D.*, Des Moines University, Des Moines, IA, 50312, U.S.A.

PURPOSE

While the traditional lecture format is still the primary instructional strategy, student learning styles suggest a more varied approach to be useful. The aim of this study was to examine the pattern of use of available learning resources and their influence on academic performance.

METHODS

A survey was offered to the students in Yr 1 Physiology and Yr 2 Cardiovascular System course to assess the student use of learning resources and academic performance. Participation was voluntary and anonymous.

RESULTS

Average class attendance was approximately 50%. MP3 audio recordings were used by 37% of the students for > 75% of the classes. Instructor handouts, PowerPoint slides and Notepool were the three key resources used by the students. There was a significant influence of MP3 audio file use on class attendance and performance: high lecture attendance with lower audio file use and stronger students using the audio files less. A significant influence of lecture attendance and academic performance was noted with students who attended class regularly performing better. Finally, those students who regularly attended class were strongest in opposition to self-study modules replacing selected live lectures. Overall, 50% of the students were NOT supportive of self-study modules with only 19% favoring this format.

CONCLUSIONS

Medical students do not regularly attend lectures, but they are strongly opposed to replacing them with self-study modules. Audio recording of lectures is a resource valued by students, but used routinely by only about 40% of the class. Those students who use the audio files extensively tend to have weaker academic performance. Lecture attendance does significantly influence academic performance with those regularly attending class performing better.

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CATEGORY: Instructional Methods eDemo Abstract ID: 10-126

VITAMIN JEOPARDY: AN INNOVATIVE ACTIVE LEARNING MODALITY FOR METABOLIC BIOCHEMISTRY

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PURPOSE

Active learning holds students responsible for their understanding, and shifts their emphasis from passive learner to active participant. In our Metabolic Biochemistry course, students are taught vitamins in a Jeopardy quiz team format (men vs. women) as an active learning modality. This format replaces two hours of traditional lectures.

METHODS

Students were provided pre-session learning resources (readings, recordings and study guides). Topics covered, both in previous lecture format, and in the present Vitamin Jeopardy session include: (A) water- and fat-soluble vitamins, (B) sources and recommended daily allowances, (C) metabolic functions, (D) vitamin deficiencies, and (E) vitamin toxicities. Using a hyperlinked Jeopardy board, a student chooses a multiple choice question from one of five different categories. Each student is given 15 seconds to answer the question using our audience response clicker system software. Results are tabulated, indicating the correct answer, and the % choices made by each team. The team with the highest correct response wins the points. The fastest responder of that team chooses the next question. This is repeated for 40 minutes. The best student from each team then competes in a "go for broke" final Jeopardy question.

RESULTS

The Vitamin Jeopardy session was recently completed. Metrics from the upcoming block exam will be discussed, compared to material previously taught by traditional lectures. Student evaluations were overwhelmingly enthusiastic and supportive, making lengthy dry material exciting, interesting, and memorable. Attendance dramatically increased.

CONCLUSIONS

This format has great potential for active learning, including class review sessions, quizzes, small group learning assignments, study guides and student assessment, as well as converting passive lectures into active sessions (as was the case for Vitamin Jeopardy, but also TBL or JiTT). As exam results are compared, the use of hyperlinked active learning resources, such as that created to teach vitamins, will undoubtedly increase in applications.

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CATEGORY: Instructional Methods eDemo Abstract ID: 10-128

THE EFFICACY OF 3D INTERACTIVE ANIMATIONS IN TEACHING EMBRYOLOGY

John R. Fredieu[1]*, Jackie Watson[2], Cory Hughart[2], Amanda Almon[2] and Tanya Nikiforova[1]. [1]Case Western Reserve University School of Medicine, Cleveland OH,44106 U.S.A., [2]Cleveland Institute of Art, Cleveland OH, 44106 U.S.A.

PURPOSE

Teaching embryology in a medical or dental school curriculum is difficult due to time constraints. However, embryology plays a large role clinical fields, including pediatrics, surgery, and primary care, due to the great impact of congenital malformations. The current lack of resources and learning time can be overcome by use of technologies that present the material in a clear, accurate, and interactive format. In this study, we investigated the impact of an interactive 3D animation module depicting facial development on medical student learning.

METHODS

The interactive animations were developed through a collaboration between medical school faculty, a medical student, and two biomedical artists. This production model is being examined as a basis for a collaborative curriculum between the CWRU School of Medicine and the Cleveland Institute of Art. For assessment of the impact of the animations on student learning, students were divided into two groups: those receiving the standard curriculum and those receiving the standard curriculum augmented with the interactive animations. Differences between the two groups were assessed using written pre- and post-tests, as well as focus group surveys and discussions.

RESULTS

Statistical analysis of the differences in test performance between the two groups showed that scores of the student group exposed to both the standard curriculum and the interactive animations tended to be increased over those exposed to the standard curriculum alone. Larger test group and focus group studies are currently underway.

CONCLUSIONS

Preliminary data suggests that interactive 3D animations may reduce the time required to deliver embryology content and may enhance the learning and retention of embryological concepts in medical and dental students.

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CATEGORY: Instructional Methods Abstract ID: 10-133

TEACHING BASIC SCIENCE WITH HUMAN PATIENT SIMULATORS INCREASES KNOWLEDGE RETENTION.

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PURPOSE

In addition to lecture, methods of teaching basic science during undergraduate medical training include evidence-based literature review (LIT), problem based learning (PBL), and human patient simulators (HPS). However, there is little evidence to demonstrate how the use of HPS compares to other forms of educational supplements in teaching medical students. This study was designed to compare HPS, PBL or LIT on learning and outcomes in the first year of medical education as compared to a control group (CON).

METHODS

Students were assessed over a 13 week period to monitor the understanding of 12 specific objectives in the areas of intestinal microbiology and physiology covered in the required didactic curriculum. Assessments occurred following normal curricular presentation of the objectives (pre-test), following participation in HPS, PBL, LIT or CON to assess immediate impact of the session on knowledge of the objectives (post-test), and 8 weeks following the post-test to assess long term retention of the covered objectives.

RESULTS

As anticipated, student performance declined over time for all groups. However, participating in the HPS experience significantly suppressed the observed decline in retention of the objectives by approximately 2 fold as compared to control.

CONCLUSIONS

Using human patient simulators provides an educational advantage for student retention of integrated basic science knowledge as compared to CON, PBL or LIT formats. The results of this study help define curricular mechanisms for improving student outcomes related to medical knowledge and provides a framework to assess the application and synthesis of medical knowledge.

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CATEGORY: Instructional Methods Abstract ID: 10-138

SIMULATION ACTIVITIES CAN STIMULATE LEARNING IN A GROSS ANATOMY COURSE

David P. Jerrett, D.M.D., Ph.D.*, Director of Anatomical Teaching Jennifer W. Gibson, Ph.D., Assessment/Evaluation Specialist N. Kevin Krane, M.D., Vice Dean for Academic Affairs

PURPOSE

Simulation Centers provide new opportunities for students to practice Clinical Skills and may offer unique ways for pre-clinical students to apply basic science knowledge through active learning solutions. We implemented simulation center (SimCenter) activities into the gross and developmental anatomy course and measured student and faculty perceptions regarding these activities.

METHODS

During each of the 3 blocks of gross anatomy, first-year medical students participated in simulation activities that correlated with dissections. These included: lumbar puncture and brachial plexus blocks during the musculoskeletal block, central lines/angiogram during the chest block, and airway intubation during the head/neck block. Clinical faculty supervised all activities. To evaluate this educational approach, students were asked to answer 6 questions reflecting on the value of their simulation experiences. Participating gross anatomy (GA) and clinical faculty (CF) were asked to complete a similar survey. Mean differences were analyzed using ANOVA.

RESULTS

Both GA (N=9) and CF (N=9) placed value on using simulation to enhance learning. While all faculty felt that dissection should be learned prior to simulation, basic scientists felt more strongly that learning through dissection should precede simulation (mean GA 5.00 vs. CF 3.67; $p<.05$). Overall, students (N=243) felt that simulation activities had the greatest impact on stimulating interest in learning gross anatomy (M=3.79/5.00) and helping them understand why learning the regional anatomy is important (M=3.98/5.00). Additionally, students felt that the airway intubation activity was more effective than the lumbar puncture and angiogram/central line activities in terms of understanding the gross anatomy, preparing them to perform the procedure, understanding informed consent, and enhancing performance on the block exam ($p<.05$).

CONCLUSIONS

Adding simulation activities to a gross anatomy course can enhance student interest in learning which may lead to better retention. Perceptions of basic and clinical science faculty may differ regarding how simulation activities can best be implemented.

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CATEGORY: Instructional Methods Abstract ID: 10-145

USE OF DEBATE FORMAT FOR TEACHING EVIDENCE-BASED MEDICINE

Richard E. Klabunde*, Ohio University College of Osteopathic Medicine, Athens, OH 45701, U.S.A.

PURPOSE

With increased emphasis on physicians practicing evidence-based medicine (EBM), it is important that we challenge students to incorporate principles of EBM into their learning. To this end, a debate format was utilized with students in our Problem-Based Learning curriculum to help them learn to critically evaluate and synthesize clinical research literature.

METHODS

A general debate topic was chosen and each of three groups of students (7-8 students/group) was assigned a specific proposition related to this topic. Each group was required to research their proposition and find 3 primary research papers (not review articles) to support their proposition, which were then distributed to the other two groups. On the day of the debate, each group was given 10 minutes to present the evidence supporting their proposition, with each presentation followed by the other two groups presenting evidence refuting the proposition. The 1 hour debate was followed by a 1 hour session during which consensus opinions were generated by the groups. Each group was then required to write a consensus report on their proposition outlining the evidence for and against, as well as presenting a best practice recommendation.

RESULTS

The debate required considerable preparation and group engagement. Most student comments indicated that they found the activity to challenge their thinking and understanding in ways that could not be achieved simply by reading about the topic in textbooks.

CONCLUSION

The debate format helps students to learn the value of searching for answers from clinical research literature and brings to light the complexities of determining best clinical practices that are based on sound clinical research.

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CATEGORY: Instructional Methods eDemo Abstract ID: 10-165
Award Nominee

MRISIM: TEACHING STUDENTS HOW MR IMAGES DEPEND ON TISSUE PROPERTIES AND DEVICE SETTINGS

Thom F. Oostendorp*, Radboud University Nijmegen Medical Centre, Donders Institute for Brain, Cognition and Behaviour, THE NETHERLANDS

In order to appreciate different medical imaging modalities students have to understand on which tissue properties each modality depends. In MR images the pixel values depend on 3 different properties, the weights of which are determined in a complicated way by the settings of the MRI device. We have developed the simulation program MRISIM to assist students in understanding how this works.

METHODS

We have recorded the same MRI slice repeatedly with different TE and TR settings, both in patients and in normal subjects. From these recordings we have estimated the underlying tissues properties for each voxel: T1, T2 and hydrogen density. The program MRISIM allows the user to choose the TE and TR settings, and then constructs MR images on the basis of these settings and the tissue properties described above.

RESULTS

In a lab class environment students use MRISIM to construct MR images for a range of TE and/or TR values. The students use the program to observe how the pixel values of certain voxels change with these settings. They note how the pixel value depends on the MRI settings, and how this dependence differs for different tissues (i.e: the tissue properties differ for these tissues). In this way they learn how optimal contrast can be obtained for certain tissues. We have used MRISIM for several years now, and we have found that it helps students in grasping the complicated relation between MR images and underlying tissue properties.

CONCLUSIONS

MRISIM is a useful tool in instructing students on MR imaging. We are now collecting data for a wider group of patients. Furthermore, we are currently working on including fMRI into MRISIM. When ready, MRISIM will be made available without charge via the World Wide Web.

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CATEGORY: Instructional Methods eDemo Abstract ID: 10-166

ECGSIM: HELPING STUDENTS TO UNDERSTAND THE RELATION BETWEEN THE ECG AND THE ELECTRIC ACTIVITY OF THE HEART

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PURPOSE

Learning to understand how the electric activity of the heart is expressed in the ECG waveform is not easy. The classic way to learn this is by studying text and figures in books, or listening to explanation by a teacher. The understanding of this relation is greatly improved if the student can use an interactive tool with which he can induce changes in the activity of the heart and observe their effect on the ECG.

METHODS

Our research has yielded a mathematical model that links the ECG at the body surface to the local transmembrane potential at the surface of the myocardium (both epicardial en endocardial). We have built the simulation package ECGSIM, in which this model is incorporated. It includes heart and torso geometries, reconstructed from MR images. The user may change the depolarization time, the repolarization time or the transmembrane potential amplitude in a region of the heart or globally, and observe immediately the result on the ECG.

RESULTS

By using ECGSIM it is easy to induce abnormalities such as bundle branch blocks and infarctions at various locations, and observe their effect on the ECG. We have observed that this helps students to understand what is going on, if they use ECGSIM in the context of a lab class with dedicated instructions. By now it has been used successfully in teaching by several groups all over the world. ECGSIM may be downloaded free of charge from http://www.ecgsim.org.

CONCLUSIONS

ECGSIM is an interactive tool that aids students to understand the ECG. It has already demonstrated its value in teaching. We are now engaged in a project to gather clinical cases and instructions to be distributed via the website.

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CATEGORY: Instructional Methods Abstract ID: 10-175

MAKING THE CONNECTION BETWEEN THE BASIC SCIENCES AND THE PRACTICE OF MEDICINE – TOOLS TO FACILITATE LEARNING

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PURPOSE

In their evaluations, students complained about the condensed way 45 hours of medical biochemistry were taught indicating that lecturing only was not conducive to deeply understanding and retaining the material. Moreover, students voiced their opinion regarding the lack of connection between the basic sciences in general and the clinical relevance of the material taught in the first year.

METHODS

To address the above issues, we implemented a curriculum change in the Medical Biochemistry course. This curriculum combines teaching methods that have proven to assist students in acquiring a better grasp of basic sciences. Two-thirds of the assigned course time was dedicated to interactive lectures using an Audience Response System. The remaining time was dedicated to six workshop sessions based on clinical cases. A difference between the usual TBL and this method is that the questions of the equivalent IRAT and GRAT covered the lecture material to be illustrated by the clinical case. Another difference is that an additional individual quiz focusing on the clinical case was administered at the end of the session. Additionally, using Inspiration 8.0 software, each group was required to construct a concept map to visualize the group's understanding and knowledge. A rubric was used to evaluate students' work.

RESULTS

A comparison of the results of formative and summative assessments taken by DO13 students and those taken by first year students of the last four years at Touro University Nevada showed a significant increase in the understanding of the material: the entire class passed, with more than 74% of students earning grades of "A" or "B". A clear correlation between the GPAs and students' performance on Medical Biochemistry exams was demonstrated.

CONCLUSION

This curriculum change demonstrated that when connections between basic sciences and clinical relevance are established early in medical education, learners are better able to retain information and to acquire solid clinical reasoning skills. Concept mapping was crucial in engaging students.

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CATEGORY: Instructional Methods Abstract ID: 10-178

BLENDED LEARNING IN MEDICAL EDUCATION: USE OF WEB-BASED LEARNING MODULES AND SMALL GROUP DISCUSSION FOR TEACHING HUMAN ANATOMY

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The teaching of human anatomy in the practical laboratory for 2nd year medical students was changed from didactic introduction to the subject to a blended learning model that included a brief students presentation followed by small group (7–8 students) discussions with rotating lab instructors. Students used a web-based structured learning modules (e-Learning) was introduced to facilitate existing face-to-face teaching to encourage more effective student preparation and then informed participation in an undergraduate anatomy laboratory-based course. Active learning was encouraged by group formation in the laboratory to examine the cadaver and solve some labeling exercise to test the group's e-Learning outcome. Tutor feedback was provided on student submissions of the exercise. Evaluation of the course was conducted via student questionnaires, individual student interviews, and analysis of student marks in examinations and of the e-Learning component.

Results were encouraging for the first implementation of such a curriculum modification. Results from further detailed surveys of student interactions and engagement and correlation analysis between student responses were also very supportive of the effectiveness of the course. There were a significant decrease in the number of failed students in the final examination in the new course with e-Learning and the previous year without e-Learning. various survey responses helped interpret results and strengthened arguments for e-Learning and suggested future improvements for student use of e-Learning. This mode of e-Learning used to support face-to-face learning activities in the laboratory can be adapted for other disciplines and may assist students in developing a greater appreciation and a deeper approach for learning from their practical class experiences.

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CATEGORY: Instructional Methods Abstract ID: 10-180

CONVERSION OF A CASE-BASED LECTURE TO A VIRTUAL MICROSCOPIC TUTORIAL; A PRACTICAL APPROACH

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PURPOSE

Virtual microscopy is becoming a more accepted method of teaching microscopic anatomy and pathology to medical students in the first two years of their undergraduate medical education. We demonstrate a practical approach to converting a case-based pathology lecture with still images to a virtual microscopic laboratory tutorial designed for a smaller group setting.

METHODS

The clinical history, physical exam findings and ancillary studies presented remained similar; however, a corresponding virtual slide needed to be selected to match each pre-existing case. The University of Iowa has a publically available website with various virtual images sorted by organ system at http://kickstart.health.usf.edu/Iowa/. After a short introduction to the particular case and a low-power still image "tease" of the virtual slide, the students, in groups of 2-4, previewed the slides on their computer and answered questions about the microscopic findings. Afterwards, the laboratory instructors went over the low and high power findings with the students from still images taken of the virtual slides. A pre- and post laboratory questionnaire to assess the students grasp of the microscopic pathology and comfort with the virtual slides was administered.

RESULTS

Approximately one hour per case was required to convert formats. Of the second year medical students queried (N=105), 98.1% had used a microscope at some point in their lifetime with the mean use falling closest to > 10 times. Ninety-three percent of the respondents that had used a microscope before (N=100) preferred using virtual slides. More detailed analysis of the questionnaire will be presented at the meeting.

CONCLUSIONS

Although significant work may be required, conversion of a case-based pathology lecture to a virtual microscopic laboratory tutorial can be less time consuming then creating one from scratch. It may also prove to be a cost-effective manner in which to reduce large group contact hours. A future direction may be to have the laboratory instructor manipulate the virtual slide for the class before independent learning.

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CATEGORY: Instructional Methods Abstract ID: 10-182

AN AUDIENCE RESPONSE SYSTEM ENHANCES LEARNING AND PROBLEM SOLVING SKILLS AT THE OMAN MEDICAL COLLEGE

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PURPOSE

Students enter the Oman Medical College after secondary education and take pharmacology in their 5th year. The curriculum, modeled after the western style instruction of US schools, is taught in English. Students are generally Arabic speaking with English as their second language. In order to promote classroom discussion with these students, who are generally reserved with respect to oral communication, a classroom response system (Turning Point - Turning Technologies, Inc.) was used which guarantees anonymity.

METHODS

The response system was generally used in sessions that occurred 1 to 2 days following the presentation of the material. MCQs constructed as clinical or experimental scenarios in the style of the USMLE were used.

RESULTS

Students evaluated the approach after two months. Fifty-four of 76 students completed a survey. Fifty-three agreed that Turning Point was helpful and encouraged its use. Students (75-87 %) indicated that the sessions helped them to recall drug names, to understand basic concepts, to prepare for problem solving questions on regular exams and to apply pharmacology in a clinical context. Eighty-five (85) % were more comfortable answering Turning Point questions (presumably due to the anonymity of the response) rather than responding orally to questions. Faculty reported that students who initially selected distractors applying rote memory began to use clearer reasoning skills. Also, the faculty felt that they had better insight into approaches for guiding students' learning.

CONCLUSIONS

Students and faculty became comfortable with this mode of instruction and recognized that the approach made communication more comfortable and promoted the integration of basic pharmacology into clinical problem solving.

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CATEGORY: Instructional Methods Abstract ID: 10-198

GERIATRIC EDUCATION OF PEDIATRIC TRAINEES IN THE HIGH-FIDELITY SIMULATED PATIENT SETTING

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PURPOSE

As the geriatric patient population continues to expand there are ramifications felt in all areas of medical practice. In particular, pediatricians are affected by geriatric caregivers but have little specialized training in dealing with complex geriatric issues. The 2000 census found that there were 2.4 million grandparent caregivers in the U.S. with the highest proportion in the South. This project sought to educate pediatric residents in some of the particular complexities of geriatric caregivers. This abstract describes the project and its outcomes.

METHODS

This program has been in effect for nine months. Pediatric and anesthesia residents in their first year of training are invited to the simulation center for a didactic session. Faculty from the simulation center, the general pediatric division and the geriatric division developed a medical case in which a child under the care of a geriatric caregiver ingests a medication and presents for care to an emergency department. In the simulated setting the learners interact with geriatric caregivers who have a hearing impairment and other complex medical conditions. A standardized debriefing is held in which principles of communication with hearing impaired adults are discussed. Videotaped review can also be used to demonstrate superior behavior or help make clear areas for improvement.

RESULTS

23 learners have participated in the program to date. 100% of the learners felt that the topic was valuable and applicable to their profession and that they would be able to apply what they learned in their future work. 97% reported that they would either come back or recommend the experience to others. Learners reported that highlights of the experience were having elderly caregivers present to give immediate feedback and having geriatric content experts teach practical tips for improving communication. All participants commented on the importance of lowering pitch and minimizing distractions.

CONCLUSION

A simulated patient/care-giver experience with a focused debriefing session is a novel curricular approach to teaching complicated geriatric strategies for pediatric trainees.

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CATEGORY: Instructional Methods Abstract ID: 10-204

LEARNING CURVES AND LONG TERM OUTCOME OF SIMULATION BASED THORACENTESIS TRAINING

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PURPOSE

Simulation based medical education has been widely used in medical skills training. However, the effectiveness and the long term outcome of simulation-based training in thoracentesis require further investigation. The study aims to access the learning curves of simulation-based thoracentesis training and to evaluate its long term outcome.

METHODS

Fifty-two medical students were enrolled in this study. All participants attended 30 minutes didactic training, as well as a step-by-step demonstration of a thoracentesis on the simulator. All participants must pass a multiple choice written examination before practice with the thoracentesis simulators. Each participant would perform five supervised but unmentored thoracentesis on the simulator. The measurements were taken and recorded by the supervisor. Participant's performance was assessed by performance errors (PE), procedure time (PT) and participant's confidence (PC). Learning curves for each variable were generated. Long term outcomes of the training were measured by the re-test and clinical performance evaluation one year later.

RESULTS

Fifty-two (24 females, 28 males) third year of medical school students were enrolled. All the students had no prior procedures performance. The participants' assessment scores were summerized across the PE, PT and PC. Significant improvements in PE, PT and PC were noted among the first 3 to 4 test trial ($p<0.05$). A plateau for PE, PT and PC in the learning curve occurred in Trial 4. Long term outcome of the training were measured by the re-test on fifty participants at six months after initial training. There was no significant difference between the Trial 5 and retest ($p>0.05$). One year later, forty two participants of this study and thirty two residents (Post graduate year 1) graduated from other medical school performed thoracentesis on patients under the supervision of a senior faculty. Participants received simulation-based thoracentesis training had better performance than the residents without such experience ($p<0.05$). There was no significant difference in demographic date and pre-test score between these two groups.

CONCLUSIONS

This study demonstrated simulation-based thoracentesis training can significantly improve the individual's performance. The full effect of learning from the modular can be achieved by four practices. Simulation based training is helpful for long term retention of skills and can be partially transferred to clinical practice.

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