JIAMSE

Journal of the International Association of Medical Science Educators

Volume 19 Number 3S 2009

Special Issue Poster Abstracts of the 13th IAMSE Annual Meeting

Leiden
The Netherlands
June 29-July 3, 2009

IAMSE on the Web
www.iamse.org

ISSN: 1550-8897

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Special Issue Poster Abstracts of the 13th IAMSE Annual Meeting Leiden, The Netherlands, June 29-July 3, 2009

Welcome to the research proceedings from the 2009 IAMSE Annual Meeting in Leiden, The Netherlands. IAMSE promotes the teaching and educational scholarship of the sciences basic to medicine, and its over 600 members work throughout the year to further this aim via webcast seminars, the association's online journal, colleague-to-colleague mentorship, and the annual meeting.

The Leiden meeting provided its almost 300 attendees from 30 countries an outstanding opportunity for faculty development and networking in an intimate and casual historic European setting. This meeting was the first in IAMSE history to be held outside North America. It proved to be a great opportunity to reach new participants in Europe and to make new alliances with local associations, such as the Netherlands Association for Medical Education (NVMO). The meeting featured plenary talks, technology demonstrations, poster sessions, and the well-loved IAMSE focus sessions, in which attendees gather in small groups to discuss and explore educational issues in depth. IAMSE is delighted to see that several contributions to the program were not only about student participation in medical education but were actually presented by students themselves. As medical education is all about training students, it is important that they are present at meetings like ours.

A key part of the annual meeting is the presentation of research posters from all areas of medical education, including technology, faculty development, assessment, innovative methods, and curriculum. This special issue of JIAMSE is devoted to the abstracts of these posters. We also offer the abstracts of the electronic demonstrations, an exciting format brought to the IAMSE meetings by the Slice of Life community. In an E-demo the presenter not only presents a paper poster, but also shows the audience a live demonstration of the computer application. In total 94 poster and E-demo abstracts were presented at the meeting. The Annual Meeting Review Committee reviewed all abstracts published in this issue prior to acceptance to the meeting program.

We hope that the following abstracts in this special issue will give you a taste of the enriching thought and diversity of our annual meeting, and we hope that you will join us at one of our future summer meetings soon.

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ASSESSMENT AND EVALUATION

MEDICAL SCHOOL LECTURE ATTENDANCE: WHO, WHY, AND WHAT IS THE EFFECT ON ACADEMIC PERFORMANCE?
Award Nominee

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PURPOSE
Medical student lecture attendance is consistently high for 3 semesters and declines in the 4th semester. In recent years, this decline has moved into the 3rd semester. This study asks: who chooses to skip lectures, what is the motivation and is there an effect on academic performance?

METHODS
This study used a web-based questionnaire plus three databases (admissions data; attendance data; course grades).

RESULTS
Top reasons cited for decreased lecture attendance in the 4th semester of the curriculum were: need to prepare for USMLE Step 1, pressure to study for cumulative exams and quality of lectures. Students cite USMLE Step 1 as the major stressor in Year 2. There was no correlation between level of attendance and course grades. There was no correlation between lecture attendance and ability of the student (based on admissions data) . Both undergraduate grade point average (uGPA) and combined MCAT scores were predictors of academic performance in the 1st and 2nd year courses with MCAT scores showing a stronger positive correlation than uGPA.

CONCLUSION
There is no correlation between the level of lecture attendance and the academic performance of medical students in the first two years of the curriculum. Using admissions metrics as reflective of ability, there was no preference for more or less able students choosing to skip lectures. The proximity of the USMLE Step 1 exam appeared to be a major factor in the decline in lecture attendance at the end of the 2nd year.

ASSESSMENT AND EVALUATION

USING FORMATIVE AND SUMMATIVE CBA TO STIMULATE STUDENTS' STUDY BEHAVIOR

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PURPOSE
In 2006 the Academic Medical Center – University of Amsterdam has started a new medical curriculum. One of the goals was to stimulate students to study regularly during the course and not only the last week before the final exam.

METHODS
During an eight week course there are two moments where students can earn extra credits by making a summative computer-based assessment. The test consists of 15 randomized MC questions and includes subjects discussed in the previous weeks. After question analysis students receive, besides their score, individual tailored feedback on their exam. The 5 most difficult questions are also discussed plenary by the teacher.

Before entering the laboratory or the dissection room students have to fill out an electronic formative test. At least an 80% score must be achieved before they can start their practical work. They can take the online test several times, 24/7, before reaching the 80% score.

RESULTS
30% of the participants pass the extra credit exam. An average of 73% of the students (n=31 2) expresses that the bonus assessments stimulate them to study regularly during a course. Averages of 4% of the students pass their final exam because of the bonus credit earned.

CONCLUSIONS
It seems that the use of midterm bonus assessments stimulates students to study regularly. However, it can also be a social desirable answer. After all, which student doesn't want to earn extra credits? Only a few students pass their final exam by using the bonus credits. A positive factor is that students can test their knowledge during a course. Individual feedback is thereby necessary to give students an insight in their knowledge gaps, on which a teacher can also anticipate.

The admission tests for practical education seem to be more successful. Teachers experience that students have more theoretical knowledge and are better prepared when they enter the laboratory or dissection room.

ASSESSMENT AND EVALUATION

ASSESSMENT OF LEARNING EFFICACY OF SMALL GROUP WORK USING A KEY WORD TEST

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PURPOSE
In modern (bio)medical curricula small group work is a central element. As deep learning and elaboration of learning are essential in small group work we hypothesized that key words representative for main concepts and principles could be used as a target for testing the efficacy of learning.

METHODS
We have designed a prototype of a key word test. The test was introduced to all 400 bachelor biomedical students of the RUMC during a course on Oncological Pathology, as an experimental instrument for monitoring learning efficacy. It consists of four questions on the nature and background of oncogenesis and two questions on the student's perception of their own efforts and degree of understanding. It was taken at the beginning (t=0), and at the end (t=1) of the small group session. The short test was well accepted by both students and teachers.

RESULTS
The score of t=1 exceeded that of t=0, especially regarding the two questions concerning key words highly representative for the particular small group learning goals($p<0.0001$). No influence on the score was found for biomedical or medical discipline, gender of the students, time table and tutor of the small group. There was an increase in the degree of confidence by the students on the understanding of the key words at t=1.

CONCLUSIONS/FUTURE DIRECTIONS
Our results suggest that it is feasible to monitor the learning efficacy of small group work using a key word test. The mechanisms of the learning efficacy deserve further investigation.

ASSESSMENT AND EVALUATION

USING MULTIPLE MCAT SCORES IN THE ASSESSMENT OF STUDENT PERFORMANCE
Award Nominee

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PURPOSE
The purpose of this study was to determine the use of multiple MCAT scores (or combinations thereof) in the assessment of students performance as measured by second year class rank. This study determined the use of multiple Medical College Admissions Test (MCAT) scores in the assessment of student performance as measured by second year class rank. The most recent research in this area used pre-1985 scores at a single institution.1

METHODS
770 students with multiple MCAT scores enrolled in one of three medical schools from 1991-2007 comprised the sample. Using the first MCAT attempt and the most MCAT attempt, the average score was computed. Also computed from the first and most recent MCAT was the highest score. A Pearson correlation analysis ($p < .05$) was performed between these four scores and class rank at the end of the second year.

RESULTS
For Verbal Reasoning there were no significant correlations. For Physical Science the highest correlation was the first MCAT attempt ($r = -.117$) and for Biological Science the highest correlation was the first MCAT attempt ($r = -.155$).

CONCLUSION /FUTURE DIRECTIONS
When reviewing MCAT scores for basic science performance schools should consider using the first attempt score on the Biological Science and Physical Science scores and realize the weak correlations.

1 Hojat M.,Veloski JJ., Zeleznik, C. Predictive validity of the MCAT for students with two sets of scores. Journal of Medical Education 1985;60:91 1-8.

ASSESSMENT AND EVALUATION

CORRELATIONS BETWEEN CRITICAL THINKING SKILLS AND MCAT PERFORMANCE REVISITED

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PURPOSE
In 1991, the MCAT underwent a dramatic change in content and score reporting. Two studies reported a positive correlation between the pre-1991 MCAT total and subtest performance and critical thinking (CT) skills using the Watson-Glaser Critical Thinking Assessment (WGCTA; Scott and Markert, 1994; Miller et al., 1993). However, the existing MCAT has not been evaluated for correlation to CT skills.

METHODS
This paper reports on the initial findings of a multi-year study of the CT skills of medical students at our institution and relationships between CT skills and MCAT performance in the combined 2007 and 2008 matriculating classes. The WGCTA was administered during orientation week to 291 volunteer participants (94% recruitment rate).

RESULTS
The total MCAT and WGCTA scores were 28.5 +/- 4.01 (mean +/- S.D.) (range 16-39) and 65.9 +/- 6.34 (range 46-77), respectively. There was a significant positive correlation between the total MCAT and WGCTA scores (0.45, $p<0.01$). MCAT verbal, physical science and biology subtests each exhibited positive correlations with total WGCTA scores (0.46, 0.31 and 0.29, respectively; $p<0.01$), but the writing subtest lacked such a relationship (0.06, $p>0.05$). The WGCTA inference, deduction and interpretation subtests exhibited positive correlations with total MCAT scores (0.35, 0.36 and 0.43, respectively; $p<0.01$). The recognition of assumptions and evaluation of arguments subtests exhibited lower, though still significant, positive correlations (0.17, $p<0.01$ and 0.12, $p<0.05$, respectively).

CONCLUSIONS
The study results indicate that CT skills of first-year medical students remain positively correlated to total and specific MCAT subtest performance. Comparisons with previously published studies will be discussed.

Supported by the Medical Education Foundation Fund of Arkansas.

ASSESSMENT AND EVALUATION

A FACULTY DEVELOPMENT WORKSHOP: GUIDING EDUCATIONAL RESEARCH TO CREATE SCHOLARLY PUBLICATIONS

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PURPOSE
Publishing scholarly work is important for medical scientists. Writing skills are attained in a faculty development workshop where hands-on and interactive applications are conducted in a supportive, peer environment. Our model has significant findings for participant knowledge, skills and satisfaction. Individual participants received consultation for their manuscripts at the IAMSE Annual Meeting (2008) workshop predicated on Glassick's (1997) scholarly criteria.

METHODS
What is the value of a conference workshop on writing for publication? A pre-post session questionnaire in the six-hour workshop targeted knowledge, intentions and self-efficacy measures and post-session reflection on learning satisfaction. Questionnaires included a Likert-type 5 point scale for session items (e.g., "To what extent are you able to use time effectively to write a manuscript?") and open-ended questions for other items (e.g., "What was most beneficial about today's session?").

RESULTS
Questionnaires were completed (n= 12) with data analyzed using Wilcoxson's signed rank test. Significance ($p<0.05$) was achieved on five of the eight items. The pre and post-session means were 3.09 (SD = 0.73) and 3.98 (SD= 0.60), respectively. Average item score gain = > 0.89. Item rankings included: Content relevance = 4.77; Interaction with peers = 4.69; Interaction with facilitators = 4.62; Activity relevance = 4.46; Effectiveness of presentation = 4.46 and Overall = 4.46. Added quantitative and qualitative data will be provided.

CONCLUSIONS
A workshop model meets needs of medical education scientists in writing for publication, especially for JIAMSE. We shall refine the model with similar target populations.

ASSESSMENT AND EVALUATION

DEVELOPMENT TOWARDS A NATIONAL EXAMINATION FOR RESIDENTS IN MEDICAL MICROBIOLOGY IN THE NETHERLANDS

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PURPOSE
In 2003 the idea matured in the Netherlands for a yearly national exam for residents in medical microbiology. The main reason was a demand for an instrument that could provide feedback to residents and the educational supervisors regarding the residents' growth of knowledge during the resident training.

METHODS
An exam was developed to assess knowledge and the appliance of knowledge on skills for different sub domains within the medical microbiology field. Test items were developed according to a blueprint based on the end level of the medical microbiology resident training. All test items were reviewed by a national review committee which analyzed content, format and relevance of the items.

RESULTS
Until now 5 national exams have been organized for residents in medical microbiology in the Netherlands. Participation was high (95%, an average of 60 residents per exam) and residents were divided into year classes (1-5). For each of the 4 national examinations residents who were further advanced in their training scored higher, on average, than their colleagues of lower year classes. For the first 3 year classes this increase was statistically significant.
Furthermore, investigation of the results of 20 residents who participated in all 4 national exams from 2005 to 2008 showed that their ranking score (within the total group of 60 residents attending an exam) significantly increased over the years.

FUTURE DIRECTIONS
These results indicate that a valid and useful feedback instrument has been developed to measure the growth of knowledge of residents in medical microbiology.

ASSESSMENT AND EVALUATION

PASSIVE/ACTIVE LEARNING PERCEPTION DISPARITY BETWEEN MEDICAL STUDENTS, NEW AND EXPERIENCED TEACHERS
Award Nominee

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PURPOSE
The advantages of an active rather than passive approach to learning, in preclinical years and future careers, of medical students, are well understood. Teachers may influence students' approach to learning through pedagogy. Changes were implemented in an anatomy unit taught in the medical course at our university to foster an active approach to learning. As part of these changes, this study compared students perceptions of their learning styles with the perceptions of their teachers.

METHODS
201 UK school leaving students enrolled in the first year of a five year course in medicine were asked to self assess their learning styles by completing a questionnaire designed to evaluate their passivity or activity in learning. Demonstrators (more senior students and newly qualified doctors) with limited teaching experience were also asked to assess the classes that they taught using a modified version of the student questionnaire. The same modified questionnaire was also completed by experienced (>10 years) lecturers familiar with active-passive approaches to learning.

RESULTS
The majority of students (86.7%) rated themselves as active learners. There was wide variation in demonstrator scoring, with the overall mean perceiving students as neutral, in between active and passive styles. In contrast, the lecturers universally scored the class as passive in learning style.

CONCLUSIONS/ FUTURE DIRECTIONS
This data questions whether first year medical students have insight into their own learning styles and demonstrates that they view their approach to learning in quite a different way to experienced lecturers. The data from the demonstrators implies that demonstrators with limited experience in teaching may not be able to accurately distinguish between active and passive approaches to learning, and may require additional training to foster an active approach in students that they teach.

ASSESSMENT AND EVALUATION

USE OF A CAPSTONE WRITING ASSIGNMENT AND SURVEYS TO EVALUATE THE IMPACT OF CURRICULAR CHANGE

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PURPOSE
At the Iowa State University College of Veterinary Medicine (ISUCVM), senior students spend 2 weeks in an afternoon Necropsy rotation. Recently, this clinical rotation was paired with a restructured, morning Clinical Pathology course, as both courses rely on pathology case data from the teaching hospital. We sought to validate this curricular change.

METHODS
We measured the impact of the change by comparing scores (before and after implementation) on a written assignment, the Case Correlation Assignment (CCA), and by surveying students and informally interviewing faculty after the change. The CCA is a written case report based on the medical record of animals treated and necropsied at the ISUCVM. We hypothesized that students taking the co-scheduled courses would demonstrate improved scores or subscores on the CCA relative to students from the previous two years. Ninety papers (30/year) were evaluated by two outside raters, using a 21-item, 5-level rubric.

RESULTS
An independent samples t-test was performed on scores from three rubric items. No significant difference was noted between the years from any rater, or when papers were compared by top, middle and bottom scores. However, the sample students taking the co-scheduled pathology courses performed somewhat better on one specific item within the rubric (Ante-mortem Data Interpretation). In response to surveys and interviews, students and faculty both endorsed the change.

CONCLUSIONS
Anecdotally, co-scheduling the pathology courses in the clinical year had a positive impact on instructors and students. Within the CCA, the Ante-mortem Data Interpretation item had the strongest trend toward improvement.

ASSESSMENT AND EVALUATION

A PROCESS FOR PEER EVALUATION OF TEACHING

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PURPOSE
Student evaluations of faculty teaching have limitations. We have developed a process of faculty peer review that is both formative and summative. We will provide details of a model of peer review that is designed to evaluate the quality of a faculty member's teaching and encourage improvement as well as reflection on teaching effectiveness in a supportive climate.

METHODS
The process includes: an interview with the faculty member to discuss teaching and assessment strategies; a review of the faculty member's teaching philosophy; one or more peer teaching observations; and a review of examination questions, handouts, slide sets, etc.
Department chairpersons initiate the review process by composing an evaluation team of two faculty members who have received training in preparation for peer evaluation. The evaluation instrument focuses broadly on the teaching domains of: clarity and organization, style, group interaction, content, professionalism, and assessment. The ensuing summary report is fashioned to allow the faculty member to reflect on: teaching-learning efficacy; communication skills; academic rigor; suitability and cohesiveness of course objectives and teaching content; student engagement in learning; quality of student understanding through performance; and scholarly teaching effort and ability.

RESULTS
Since its implementation, reviewed faculty members have found the process to be agreeably pertinent, influential in their teaching, and fair in its approach.

FUTURE DIRECTIONS
The sustained utility of this model will be reflected in future reevaluations of these same faculty members toward determining improved teaching efficacy and student learning.

ASSESSMENT AND EVALUATION

COMPETENCY-BASED ASSESSMENT OF COMMUNICATION SKILLS EARLY IN THE PRE-CLERKSHIP CURRICULUM

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INTRODUCTION
To prepare medical students for clinical immersion and ACGME competencies, we adapted the communications domain into a menu applicable to the pre-clerkship curriculum, and instituted competency-based assessments for first-year students.

OBJECTIVES
Our aim was to pilot and evaluate an oral presentation exercise to assess communication skills in the pre-clerkship curriculum.
Methods
The first pre-clerkship course assessed a 5-minute oral presentation during anatomy lab. Videos created by instructors served as examples for students. Instructors rated students "not yet at", "at", or "above" expected competency for 3 items from the menu and provided written and oral feedback. Faculty and students rated the usefulness of the activity.

RESULTS
Faculty noted that the presentations increased student confidence and stimulated anatomy learning. For the second year of the program, refinement of anchors and additional faculty development reduced faculty rater variability. Students and faculty rated usefulness of the assessment highly (students:4.17 sd=0.89, faculty:4.75 sd =0.45 5=maximum).

DISCUSSION
We successfully introduced formal assessment of communication skills through a presentation exercise. Key ingredients were faculty development and clear expectations for all stakeholders. Through videos depicting sample presentations, faculty observers developed a consistent understanding of the assessment rating scale, which a rating training session further refined. Students were apprised of expectations through online videos and the syllabus.

CONCLUSION
Formal assessment of communication skills early in the curriculum is an effective way of introducing students to competency-based measures. The next steps include assessing additional competency domains.

ASSESSMENT AND EVALUATION

LONGITUDINAL ASSESSMENT OF PHARMOCOLOGY AND PHARMACOTHERAPY IN MEDICAL SCHOOL

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PURPOSE
Concept maps have been identified as a useful tool for organizing existing knowledge or to create new knowledge. It has also been used to communicate complex ideas, and to assess understanding or diagnose misunderstanding. Concept maps mirror the processes of thinking and learning and provides a window into a students mind. Experiments show that subjects using concept maps outperform those who don't in long term retention tests. A concept map has three parts: concept, proposition and learning and several concepts arranged on a page linked by propositions constitute a concept map.

METHODS
In our medical school, concepts maps are used as an assessment tool in two modules of a first year medical course. Following an orientation to concept map creation, students were given a problem in cardiovascular physiology and in immunology in two separate modules. Students created concept maps individually or in self-selected groups and submitted the assignment online or as hard copies. Assignments were corrected using specific criteria. An online survey focusing on student's perceptions on the use of concept maps and its effect on their learning was administered at the end of the modules.

RESULTS
Most students used commercial software to create concept maps and worked in groups. Preliminary survey results indicate that students find these assignments engaging and help with their learning. In this presentation, the results of the survey will be discussed and examples of student concept maps will be shown. Conclusion/Future directions
Given the benefits of concept maps we hope to introduce more such experiences in this course and other courses in the medical curriculum.

ASSESSMENT AND EVALUATION

RETENTION OF BASIC SCIENCE INFORMATION BY SENIOR MEDICAL STUDENTS
Award Nominee

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PURPOSE
Over the past 30 years, NBME studies of the retention of basic science information have consistently shown performance declines as trainees progress through medical education. This research extends that work by analyzing patterns of performance of Step 2 and Step 3 examinees on Step 1 test items.

METHODS
244 content and statistically representative Step 1 items were rotated through unscored positions on 2008-09 Step 2 Clinical Knowledge (CK) and 2009-10 Step 3 test forms, and the performance of first-time examinees from US and Canadian schools was analyzed to identify item characteristics affecting examinee performance.

RESULTS
Across all 244 items, the mean item difficulty on Step 1 was 75.2%; on Step 2 CK, this value declined 4.4% to 70.8%; results for Step 3 were not available when this abstract was prepared, but will be available for presentation at IAMSE. Performance improvement (10%) on Step 2 CK was only observed for items written by the Behavioral Sciences Test Material Development Committee (TMDC). Performance for items written by the Pathology TMDC was similar on Step 1 and Step 2 CK, but performance was worse on Step 2 CK for all other Step 1 TMDCs, with the largest declines seen for Biochemistry (18%), Microbiology (10%), and Pharmacology (8%). Performance on items presented in the context of patient vignettes declined relatively little (3%), with larger declines observed for experimental vignettes (13%) and non-vignettes (14%). Step 2 CK performance on items concerning normal structure and function in the organ systems declined 7%, while Step 2 CK performance was better than Step 1 performance for items related to abnormal processes in the organ systems.

CONCLUSION
Shifts in examinee performance were similar to those observed in five previous NBME studies. These results were somewhat disappointing: one might anticipate that increased use of integrated basic science curricula would improve retention of basic science information. Additional research on teaching, learning and testing of trainees' understanding of basic science is desirable.

ASSESSMENT AND EVALUATION

USE OF A COMPETENCY TRACKING SYSTEM TO MONITOR STUDENT PERFORMANCE FROM DAY ONE: A PILOT STUDY
e-Demo

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PURPOSE
The assessment of students' competencies is a timely and important issue in medical education. To address this matter, we developed a competency-tracking system to evaluate performance deficiencies, information redundancy, and ineffective training methods for purposes of monitoring knowledge/skill performance and mastery. The purpose of this eDemo is to introduce and demonstrate the capabilities of our system.

METHODS
We developed a competency tracking system to align the American Osteopathic Association's core competencies to learning objectives, activities, and evaluations in all medical courses and required clerkships. A second year medical course piloted the use of the system in identifying students with problems early on. Key metrics (i.e. question/objective= define hypoxia, subtopic=hypoxia, topic=cell injury, competency=medical knowledge) were used to determine student deficiency in the medical knowledge competency.

RESULTS
Our competency tracking system has practical utility: (1) defining exactly what a student should look like and at what level through the curriculum, (2) internal review based on up-to-date, non-static information, (3) communication among faculty and clerkship directors who can now access the objectives, activities, and evaluation of competencies for all courses and clerkships (4) early student remediation and (5) instant reporting to administrators and accrediting bodies.

CONCLUSION
A competency tracking system can be a dynamic portal for all faculty, clerkship directors, and administrators to support consistency in the curriculum, evaluate student performance, and identify problem areas for students earlier. Our demonstration will alert other medical educators to options they may pursue with their institutions regarding the tracking of medical competencies.

ASSESSMENT AND EVALUATION

DEVELOPMENT OF A COURSE EVALUATION TOOL WITH HIGHER ACCURACY AND USEFULNESS IN MEDICAL EDUCATION

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PURPOSE
Student course evaluations are typically regarded as the most valid source of data in the assessment of teaching effectiveness (McKeachie, 1997). While it is estimated that almost 80% of North American medical schools utilize student course evaluation assessments, most research to date has focused on undergraduate populations as opposed to the medical school environment (Abrahams & Friedman, 1996). Medical schools have unique environments where students have little to no choice regarding the courses, the professors under whom they must study, and courses taught by multiple instructors which makes evaluation of courses different.

METHODS
A variety of research methods were used to develop a course evaluation instrument that addresses the two principal issues related to course evaluations seen in literature including the accuracy and usefulness of course evaluations (Tang, 1997). These methods included: a literature review, Q-Factor Analysis (both faculty and students), and focus groups (both faculty and students). New course questions were piloted in Fall 2008 and additional feedback was solicited from faculty and students.

RESULTS
Fourteen course questions were developed and piloted. Faculty rated each question with a high degree of clarity and accuracy. Both faculty and students indicated greater satisfaction with providing and receiving feedback for curricular improvements. Qualitative data was collected with overall positive comments.

CONCLUSIONS
Our research has resulted in a course evaluation instrument that yields better and more accurate feedback for faculty and a higher satisfaction with feedback given and received among both students and faculty.

ASSESSMENT AND EVALUATION

WHAT'S IN ONE MARK? TELESCOPING INTEGRATED AND ONGOING ASSESSMENTS

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PURPOSE
To determine the cumulative representative value of marks derived in an assessment of students at the end of the first three years (Stage 1) of medical school.

METHODS
A log of all of the component assessments, their value and content contribution over three years was mapped for the Stage 1 assessment in the medical school at the University of the West Indies, Jamaica. The retrospective cumulative value of a mark in the final result was determined by proportionately distributing the cumulative value of all examinations over the final 100 marks reported as the Stage 1 result. The distribution was stratified for written and practical examinations.

RESULTS
The student performance in a cumulative total of 2,252 items contributed to the final Stage 1 mark (22.5 item exposure per final mark earned). This included testing in 16 course examinations, 3 clinical clerkships, 4 OSPEs (the in-course assessments); and, two comprehensive examinations, a practical and data interpretation examination covering a wide breadth of content over 3 years (the final exam). The weightings of the in-course assessments were not equal. When the proportional representation of the assessment model was applied to the final result it was seen that one mark was represented by 9.1 items of equal value.

CONCLUSIONS
One mark in the final cumulated Stage 1 result carries substantial value in quota and breadth of knowledge. Final assessment scores in this integrated programme run over several years must consider the representational value of these scores in decision making.

ASSESSMENT AND EVALUATION

VARIATIONS IN PASS/FAIL CUT-POINTS IN MULTIDISCIPLINARY UNDERGRADUATE MEDICAL EXAMINATIONS

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PURPOSE
In 2006 the decision was taken to replace the fixed pass mark system which was in place in the Stage 1 (pre-clinical) part of the undergraduate medical programme at the University of the West Indies, Jamaica with formal standard setting. This paper describes the initial experience with introducing the modified Angoff method of standard setting to the programme.

METHODS
Course assessments are comprised of multiple-choice questions primarily from the basic sciences but include laboratory sciences and clinical disciplines. The maximum possible score for each examination is 100 percent. Under the modified Angoff method of standard setting, a panel of "expert" judges makes a determination of the performance of borderline students in each question. The average value for all questions is the pass mark. The difference between the cut point derived by standard setting and the former fixed pass mark was computed for each of the nine examinations reviewed. Feedback on the process was obtained from judges.

RESULTS
Judges' assessments generally produced lower pass/fail cut-points compared with the previous fixed score (mean difference of -3.2; range -9.2 to 2.4). Six of the nine examinations had standard set cut-points within 5 marks of the fixed pass mark.
Participating judges found the process was too time-consuming and were uneasy about making judgement on questions which were not in the discipline in which they teach.

CONCLUSION
Introduction of the modified Angoff standard setting process has produced slightly lower pass marks for the majority of examinations in this series. Faculty recruited as judges have reservations about the process.

ASSESSMENT AND EVALUATION

ASSESSING THE PERFORMANCE OF DISTRACTERS IN MCQ EXAMINATIONS USING A "THEORY OF EQUAL DISTRACTION"

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PURPOSE
To assess the performance of distracters in multiple choice questions (MCQs) in the Stage 1 Undergraduate Bachelor of Medicine, Bachelor of Surgery (MB BS) examinations at the University of the West Indies Mona.

METHODS
Students' performance data on 532 multiple choice questions from 8 examinations were obtained from computer grading. The observed frequency with which students chose the incorrect options for each question was determined after exclusion of very easy and very difficult questions judged by the calculated difficulty index. The probability of choosing a fully functioning distracter (expected frequency) was determined by equally distributing the number of students who got the question incorrect assuming an equal distraction model. The absolute differences between observed and expected frequencies were computed for the 1,175 distracters in the data set. The distribution, mean and median of the differences were determined. Differences approaching zero between observed and expected frequencies are deemed to be indicative of higher performing MCQs.

RESULTS
The distributions of differences between observed and expected frequencies for all examinations were positively skewed. The median difference ranged between 8.7 and 12.7 percent. Two examinations had modal differences close to zero (<2).

CONCLUSIONS
On the basis of distracter analysis, the eight examinations assessed in this study appear to have similar performance of distracters. There is room for improvement in item writing to enhance distracter functioning. The median absolute difference of the observed and expected frequencies of students' choice of distracters is proposed as an indicator for monitoring the quality of MCQs.

ASSESSMENT AND EVALUATION

DEMONSTRATING Q METHODOLOGY FOR MEDICAL EDUCATION
e-Demo

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PURPOSE
Medical education research is often concerned with assessing the attitudes or perceptions of individuals on various issues. For example, researchers might be interested in examining physicians' perceptions regarding evidence-based medicine or in understanding faculty attitudes of course evaluations. In such cases, subjective data are collected through a variety of means, and the researcher must determine the interpretation of the results. This presentation will introduce and demonstrate a method to evaluate such data. Q methodology is grounded in the study of human subjectivity and is designed to examine these types of attitudes and perceptions. Participants are asked to sort a series of statements that are structured to represent a broad range of ideas related to the topic. Statements are then subjected to factor analysis procedures to derive clusters of individuals with shared viewpoints. In this presentation, we present a step-by-step approach of applying the method and analyzing data.

METHODS
FlashQ is an online tool capable of collecting participant data. This free program enables researchers to collect Q-sort data online in an interactive fashion similar to in-person sorting. FlashQ will be demonstrated.

RESULTS
Results can easily be tabulated using a freeware package called PQMethod 2.11. We will demonstrate the integration of FlashQ with PQMethod and show participants the data analysis process.

CONCLUSIONS
Q Methodology is a useful approach in the assessment of attitudes or opinions. It can also be used for program evaluation purposes, and thus can address a wide array of questions.

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ASSESSMENT AND EVALUATION

CURRICULUM, INSTRUCTIONAL METHODS, AND EVALUATION IN MEDICAL EDUCATION: A TEN YEAR REVIEW

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PURPOSE
The purpose of this study is to describe trends related to curriculum, instructional methods, and evaluation over a 10 year period across 5 prominent medical journals.

METHODS
All published articles from five prominent medical education journals over a ten year period were retrieved for analysis. These medical journals include: Academic Medicine, Journal of the International Association of Medical Science Educators, Medical Education, Medical Teacher, and Teaching and Learning in Medicine. A coding key was constructed based on specific elements related to medical curriculum, instructional methods, and evaluation. Coding is currently in progress, with each principal investigator (2 raters) independently coding one-half of all articles comprising the total sample. Prior to coding, 20 articles were randomly selected and coded by both investigators. Cohen's kappa suggested high inter-rater agreement.

RESULTS
As our ten year review and content analysis is currently underway, finalized results cannot yet be reported. Upon completion, however, our results will describe trends in medical education over the previous 10 years related to the advancement and organization of curriculum practices, instructional approaches regarding the delivery of information, and the evaluation methods being utilized, both in and out of the classroom, for assessing mastery and fluency of such information. Attention will also be given to the incorporation and assessment of core competencies delineated by ACGME and AACOM.

CONCLUSIONS/ FUTURE DIRECTIONS
Results from this study will not only provide information regarding evolving trends in medical education but will also provide avenues for additional research and future advancements concerning these issues.

CURRICULUM AND INTEGRATION

USE OF A DIFFERENTIAL DIAGNOSIS TEMPLATE TO PROMOTE CLINICAL DECISION-MAKING SKILLS IN BASIC SCIENCE

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PURPOSE
Although many organ-based curricula promote integration of basic and clinical sciences, students frequently have difficulty in developing a differential diagnosis for patients with multisystem diseases. We have developed a series of autopsy cases as a platform to illustrate basic science principles and to develop clinical reasoning skills in a general pathology course.

METHODS
Groups of 4 first-year students are assigned a case consisting of gross and light microscopic images obtained from autopsy cases that highlight basic science principles. The students are provided with a standard differential diagnosis template (vascular, inflammatory, traumatic, autoimmune, metabolic, idiopathic, neoplastic, congenital, degenerative, environmental) and a brief (1-2 sentence) clinical history and are required to complete the differential diagnosis template online for comments by the course instructor. One day later, the group of 4 students presents the case to the class, emphasizing basic science aspects of the case and clinical manifestations of disease processes. Student presentations are peer-evaluated using an electronic assessment tool.

RESULTS
In previous years, case presentations were regarded as a valuable part of the basic pathology course. However, evaluations indicated that students who did not prepare the cases often did not actively participate. Having the students prepare a differential diagnosis prior to the case presentation has increased participation in the discussion, both live and online.

CONCLUSIONS
We propose that having students work through a differential diagnosis template in a basic pathology course will foster integration of basic and clinical sciences and promote the development of clinical reasoning.

CURRICULUM AND INTEGRATION

EDUCATOR'S PREDICTIONS FOR THE FUTURE OF MEDICAL EDUCATION

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PURPOSE
Strategic planning requires thoughtful considerations of what the future may bring. The goal of this study was to gain a global perspective on potential future developments. We elicited predictions of the speed and the direction of changes from experienced medical educators who had a variety of academic backgrounds and came from around the world.

METHODS
This investigation used brainstorming and silent voting exercises from four conference sessions to predict the state of medical education in 20 to 25 years. The programs were: 1) a workshop at the 2002 AMEE conference (Europe), 2) a symposium at the 2005 AMEE conference (Europe), 3) an interactive poster at the 2008 Ozzawa conference (Australia), and 4) a workshop at the 2009 Generalists in Medical Education conference (USA). All sessions included an international audience with a wide range of administrative and academic backgrounds and responsibilities.

RESULTS
For each of 12 topic areas (e.g., Basic Science, Clinical Science, Doctors, Patients) we could ascertain the Top 5 predictions medical educators could envision. For example, it was predicted that "Assessment in 2025" is more likely to use utilize open computer exams, is likely to become more diverse (i.e., multiple forms of assessment), more focused on growth (i.e., formative), more continuous (e.g., use of portfolios), and more aligned with the curriculum. Predictions about the general speed of change varied significantly.

CONCLUSION
In order to make effective decisions for the present we need to keep the future in mind. Of course there are "Wild Cards" (e.g., disasters) or "Disruptive Innovations" (e.g., new technologies) that can change the field radically. However, the potential trends identified through this investigation are worth considering when engaging in educational and resource planning.

CURRICULUM AND INTEGRATION

CREATING A LEARNING ENVIRONMENT THAT FOSTERS INTEGRATION OF HISTOLOGY, PHYSIOLOGY, AND BIOCHEMISTRY

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PURPOSE
New medical students struggle to assemble content from various basic science courses into a coherent conceptual framework. As basic science faculty we felt it unfair to expect students to grasp the connections between basic science disciplines unless we led by example.

METHODS
To promote such integration, we created a 7-credit, 24-week course blending content traditionally found in separate histology, physiology and biochemistry courses. Three departments collaborate in our course, which integrates structure and function "from molecules to man". A faculty leader from each department monitors course content and directs participating faculty. These 13 faculty also teach in other courses, which fosters cross-course integration. Our hybrid course includes 89 lectures, 18 faculty-proctored histology labs, abundant self-study material (print and online), graded formative assessments (online), and 10 major examinations. Course features fostering integration include: (1) Lectures blend histology/physiology/biochemistry; (2) Histology labs coordinate with lectures; (3) All lecturers participate in histology lab; (4) All lab faculty lecture; (5) Faculty integrate lecture and lab material in self-study exercises, practice exams, online assessments, and exams.

RESULTS
Over nine years, this course has garnered increasingly enthusiastic reactions from students, faculty, and administrators. Students provide formal evaluations, and face-to-face feedback during histology labs and focus groups. Key to our success is the culture of cross-departmental collegiality and the faculty's passion for teaching.

CONCLUSION/ FUTURE DIRECTIONS
We must accommodate our medical colleges' expansions from one to four campuses while continuing to foster a learning environment where students grasp the links between structure and function, from molecules to man.

CURRICULUM AND INTEGRATION

ARTICULATION FROM SCIENCE TO MEDICINE TO SPECIALIST TRAINING AT THE UNIVERSITY OF NEW SOUTH WALES

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PURPOSE
The six-year undergraduate Medicine program at UNSW offers considerable flexibility in terms of sequencing and availability of electives. Taking advantage of this, we have developed a graduate entry stream from our Bachelor of Medical Science program, as well as an advanced standing pathway for specialist training based on electives that articulate with educational activities after graduation.

METHODS
For the graduate entry stream, high-performing students in the BMedSc program are provisionally selected into Medicine after completing core courses in year 2. They subsequently complete year 3 and a research Honours year, then enter the Medicine program after a bridging course, at the equivalent of year 4. The advanced standing pathway for specialist training has initially been implemented in Pathology. Students complete a research project in a relevant area, then undertake an elective focusing on the use of investigations in clinical diagnosis. Together with face-to-face and on-line educational activities during internship, plus an introductory Pathology term in the following year, this will allow graduates to gain one year of advanced standing in the Pathology specialist training program.

RESULTS
Introduction of the graduate entry stream has increased enrolment demand for the BMedSc, with a progressive rise in entry cutoff scores. Increasing numbers of students have registered interest in the advanced standing pathway in Pathology. Further evaluation is ongoing, as these initiatives are still at a pilot stage.

CONCLUSIONS
Opportunities for articulation will help to recruit research-oriented science students, and to promote specialisation in areas with strong foundations in the medical sciences.

CURRICULUM AND INTEGRATION

CLINICAL PRACTICE GUIDELINES AS AN INTEGRAL PART OF MEDICAL EDUCATION

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PURPOSE
The Centre for Clinical Practice Guidelines of Palacky University Faculty of Medicine and Dentistry (CCPG), one of the working groups at the Department of Social Medicine and Health Policy, was established in 2007 to be concerned with development, implementation and evaluation of clinical practice guidelines (CPGs). Members of the CCPG are medical doctors of various specialties, nurses, medical educators as well as sociologists, a psychologist, a librarian, a lawyer and others. Our broad aim is to develop, teach and disseminate methods for development, adaptation, implementation and evaluation of CPGs and to provide support and resources to anyone who wants to make use of clinical practice guidelines.

METHODS
Development of new undergraduate and postgraduate medical educational programmes focused on CPGs. Implementation of the educational programmes into the Palacky University curricula and the Ostrava University curricula. Dissemination of educational programmes in co-operation with other universities, teaching and district hospitals.

RESULTS
We offer 6 workshops and 1 seminar. The first one has been developed for undergraduate medical students with no or low experience with CPGs use in clinical practice; the others are for experienced medical or nursing students, health care professionals and CPGs developers:
Introduction to CPGs development, adaptation, implementation and evaluation;
Introduction to methodology of CPGs development and adaptation;
Guidelines for guidelines;
CPGs adaptation;
Implementation of CPGs;
Critical appraisal of CPGs;
Legal aspects of CPGs.

CONCLUSION
CCPG innovates undergraduate and postgraduate medical education and disseminates the CPGs methodology knowledge as well as the principles of evidence-based health care.

CURRICULUM AND INTEGRATION

VISUALIZATIONS OF SHARED KNOWLEDGE OF SPECIALISTS

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PURPOSE
Schemes like concept maps are valuable for making knowledge structures explicit. This study investigates what are the common characteristics of schemes that are made by multi disciplinary teams about clinical problems, and whether these schemes are useful for medical education.

METHODS
Seven groups of three specialists from different disciplinary backgrounds created a scheme about a clinical problem. In a second session, the schemes were revised in order to let participants experience the dynamic nature of knowledge. Schemes were analyzed using descriptive statistics. By means of a questionnaire (statements on a 5 point Likert scale), the usefulness of the schemes in medical education was surveyed.

RESULTS
Although the instruction was, to make as much knowledge explicit as possible, the specialists limit themselves, in particular in adding basic science concepts. In the second session, most adaptations affected the relations between concepts and the hierarchical ordering. Concepts were often categorized along the lines of the phases of the clinical reasoning process. Within these categories, disciplinary clusters of concepts were distinguished. Although the schemes showed a high complexity, they were assumed to be useful in both preclinical (3.9) and clinical education (4.1). This difference is not significant. In preclinical years, there is a slight preference to use the schemes as a help for the teacher to explain clinical problems (4.1) but usage by the students is considered as possible (3.8).

CONCLUSION
Schemes cannot explicate all the knowledge related to a clinical problem. Encapsulated basis science concepts are often left out. A second session motivates participants to restructure and reconnect concepts. Further research will focus on the use of the schemes in medical curricula.

CURRICULUM AND INTEGRATION

ADAPTATIONS IN ANATOMY TOWARDS A SYSTEMS-BASED INTEGRATED CURRICULUM
Award Nominee

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PURPOSE
Universities should provide opportunities to learn new facts and skills in an efficient way to meet set outcomes. The new integrated medical curriculum reform programme was initiated at the Stellenbosch Faculty of Health Sciences in 1999, changing from the traditional discipline-based curriculum to a student-centred, integrated, systems-based curriculum. The aims were to promote active student involvement and developing continual clinical skills.

METHODS
A new modular curriculum replaced the old discipline-based curriculum and consisted of a 19-week linear lecture-based curriculum, with reduction of lectures and practical sessions, exposing students to anatomical structures and dissections. Recent changes included a shift from the duplex parallel study programme to a simplex model, where the basic sciences were integrated into the clinical system-based curriculum. The modules where Anatomy was involved, consisted of 107 days in the duplex model (135 days for the clinical theory), whereas the new simplex model consists of 248 days of fully integrated system-based modules.

RESULTS
These adaptations resulted in full integration of the anatomy of the old curriculum with the clinical relevance in the system-based modules. The new programme changed the learning process from a lecture-based, knowledge transfer programme to student group activities, constructed around study guidelines and applied clinical cases for achieving the set outcomes.

CONCLUSION
The active and eager participation of the students in the practical group activities, with the improved ability to integrate and apply their anatomical knowledge, indicates that the new approach is justified. Continual renewal of innovative adaptations will ensure a viable new curriculum.

CURRICULUM AND INTEGRATION

A METHOD FOR INTEGRATING GROSS ANATOMY WITH PATHOLOGY IN THE BASIC SCIENCE CURRICULUM

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PURPOSE
This pilot study tests the use of histologic sections prepared from student-dissected cadavers as a platform for integrating anatomy with pathology.

METHODS
Gross anatomy is taught as a team-based experience, with groups of 4 students responsible for completing a cadaver dissection. The final week of the course, a pathologist came to the anatomy lab, assisted students with identifying abnormal tissues in each of their cadavers, and obtained tissue specimens which were then histologically prepared and digitally photographed. The images were made available to students during their general pathology course two months later. Students were expected to analyze the histologic sections and correlate their microscopic findings with their previously-completed summary of gross findings. Groups with specimens demonstrating interesting educational pathology were asked to present their findings to the class.

Analysis: Qualitative interviews were conducted addressing students' perceptions of the educational benefit of the exercise as it pertains to integration of anatomy with pathology. After the course, students will complete a feedback form that addresses these same issues from a quantitative standpoint. Responses will be compared against feedback from students who took the course prior to this integrated component.

RESULTS
Students reported that the opportunity to analyze specimens obtained from "their" cadavers helped them to better understand the pathology underlying their gross anatomical findings. They also felt it established continuity of learning between the two courses.

CONCLUSIONS
We propose that analysis of histologic sections obtained during dissection in gross anatomy facilitates the integration of gross anatomy with microscopic anatomy and pathology.

CURRICULUM AND INTEGRATION

WHAT DO STUDENTS EXPECT FROM PRE-CLINICAL PATIENT CONTACTS AND HOW EFFECTIVE ARE THEY?

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PURPOSE
Early contacts with patients help medical students to learn and to develop appropriate attitudes towards their studies and future practice. In the third year Leiden undergraduate medical curriculum, patients with rheumatoid arthritis and with low back pain of diverse origin participate in small group sessions implemented as a part of the block Musculoskeletal Problems. The purpose of these sessions is to give students an opportunity to train history taking and physical examination with 'real' patients. This study investigates the expectations students have of these sessions and the effectiveness of this intervention.

METHODS
To evaluate the students' opinions on the sessions, participating students were invited to take part in a focus group. Ten students agreed. The focus group discussed the students' expectations (focus group 1) and their satisfaction with the sessions afterwards (focus group 2) extensively. The data thus collected, were converted into survey and emailed (before and after the sessions) to all students who participated in the sessions. Educational effectiveness was measured by comparing the participants' results on the end-of-block test with the non-participants.

RESULTS
Survey 1 was completed by 80 out of 179 participants (80/179; 44.7%). The most frequently mentioned expectations, selected from a list of statements, were: 'stimulation of memory processes' (71.3%), 'improvement of physical examination skills' (67.5%) and 'contextualization of theory' (68.8%). Survey 2 was completed by 72 participants (72/179; 40.2%). The most important benefits experienced by the participants were: 'contextualization of theory' (93.1%), 'stimulation of memory processes' (91.7%) and 'understanding of the impact of illness' (91.7%). Most students (81%) were (very) satisfied with the sessions and would sign up again (1 00%).Participants scored significantly higher at the end-of-block test than non-participants, even after correction for confounders (p=0,019).

CONCLUSIONS
The pre-clinical patient contacts have positive effects on students' learning and should be implemented throughout the preclinical curriculum.

CURRICULUM AND INTEGRATION

IMPLEMENTATION OF PRE-CLINICAL CONTACTS IN LEIDEN UNDERGRADUATE CURRICULUM

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PURPOSE:
Early small scale contacts with patients have positive effect on students' learning and are a permanent part of the 3rd year block Musculoskeletal Problems of the Leiden undergraduate medical curriculum. Historically, the block uses trained patients with rheumatoid arthritis to lecture students in small groups how to approach patients with joint diseases and to demonstrate their joint pathology. No structured feedback on student's professional attitude was provided. No additional information, either lab or X-rays, is available and no time for self-reflection is reserved. The purpose of this study was to implement students' opinions on experienced benefits of the sessions to improve its design.

METHODS:
In 2008, a survey was sent to all students participating in the sessions to evaluate the benefits. The least positively answered statements were: participation in the sessions improves skills in history taking and in examination of the joints, teaches how to use translate theoretical knowledge into practice, has positive effect on student's professional attitude, and facilitates self-reflection on student's role as a doctor.

RESULTS:
To facilitate a broader and deeper experience the sessions have been re-designed. Forty untrained patients with arthritis of diverse origin were recruited from the outpatient clinic of the rheumatology department to participate. Before the sessions, students were obliged to see an Internet-based video on history taking and joint examination of patients with arthritis. The sessions were supervised by a rheumatologist and structured to train students in history taking, joint examination, problem-solving and presentation skills. Patients' lab results and X-rays were directly available on line. Patients were instructed to give a structured feedback to the students about their professional attitude and time was reserved for self-reflection.

CONCLUSIONS:
Students' opinions on the experienced benefits of an educational module were taken into account when improving a design of a module. A protocol describing how to set up sessions will be made available on line to coordinators of all pre-clinical blocks to assist them in organizing pre-clinical contacts.

CURRICULUM AND INTEGRATION

INTRODUCTION OF AN ELECTRONIC CURRICULUM: IMPLEMENTATION AND EVALUATION AFTER THREE YEARS
Award Nominee
e-Demo

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PURPOSE
Technology allows enhancements in medical education including self-directed learning, student collaboration, and improved access to materials. When the University of Kansas, School of Medicine (KUSOM) introduced a new basic science curriculum in 2006, we used technology in multiple ways.

METHODS
The technology components included a required tablet PC for students, lecture podcasts, web-based access to curriculum materials, virtual microscopy, electronic faculty and course evaluation, and electronic examination. The tablet PC is the centerpiece of the curriculum and is used to integrate technology components and provide 24/7 access to all curricular material, including lecture podcasts. We reduced lectures by 40% and replaced material with small group sessions and web-based learning.

RESULTS
The implementation curriculum was successful. We encountered few technical problems, and student and faculty satisfaction has been high. Podcasting was extensively used both instead of and in addition to attending lectures. Virtual microscopy has been a welcome change from microscopes, though creating an active learning laboratory environment has been a challenge. E-textbooks were not used effectively by students or faculty. We found that a technology-intensive curriculum requires extensive time and resources. Some NBME Subject Exam scores have improved while others have declined. Initial results on Step I of the USMLE are no different than the previous year.

CONCLUSION/ FUTURE DIRECTION
Ultimately, we hope to improve students' knowledge, problem solving abilities, clinical skills, and USMLE Step One scores. Our electronic curriculum was implemented successfully. Refinements of the curriculum continue as it evolves to include fewer lectures and more interactive learning experiences.

CURRICULUM AND INTEGRATION

A TRAINING AND EDUCATION CONTINUUM FOR DENTISTRY AND MEDICINE – A BOLOGNA ORIENTED CONCEPT

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PURPOSE
1999 the EU member states decided in their Bologna Declaration to overcome permanent problems with recognition, crediting, quality, mobility and internationalization until 2010. One of the recommendations was to introduce a life-long training concept based on three cycles: bachelor, master and doctorate.

METHODS
Though a lot of countries already implemented a variety of curricula in medicine reserve is observed. If implemented, faculties reshaped their curricula simply by announcing the preclinical phase bachelor phase and the clinical one master phase. As traditional basic medical training and education is per definitionem at the undergraduate level these curricula not only violate the recommendations but are explicitly contra-productive to the goals of the Bologna initiative. Beyond this the question arises whether a (basic) doctor and dentist must be a master. RWTH University Aachen Medical Faculty developed a concept (i) to simply reorganize the actual 12 semester structured medical curriculum (2 x 14 weeks) in trimester (3 x 14 weeks); as for the 10 semester structured dental curriculum without any loss of quality, and (ii) to allow restricted licensure according to the Medical resp. Dental Treatment Act for an additional two-year national interim cycle towards full licensure to fulfill the EU-regulation of at least 6 resp. 5 year training and education.

RESULTS
The intended reorganisation (i) meets the bachelor standard by delivery of an employable doctor and dentist, (ii) allows students to start specialization two years earlier as before, (iii) assures that the shorter length of study is related to the half-life of actual medical knowledge.

CONCLUSIONS
The concept meets the respective Bologna Recommendation exemplary. It is therefore expected that the concept will be Gold Standard for the MedEd-Project about accreditation and certification of the German Society of Medical Education.

CURRICULUM AND INTEGRATION

THE LIFE STAGES COURSE AS A MULTIFACETED COMPONENT OF A NEW CURRICULUM

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PURPOSE
The Life Stages course is incorporated into the integrated curriculum of a new medical school. It extends through the last five and a half weeks at the end of the second year of study.

METHODS
The Life Stages course was designed with a three-fold purpose in mind: 1) to integrate morphological, functional and psychological changes that occur between the intrauterine and late stages of life; 2) to review previously encountered aspects of various basic sciences in the context of the development and aging processes; and 3) to provide exposure to common topics and ambulatory experiences in pediatrics and geriatrics.

RESULTS
Basic science information related to the life cycle is presented together with clinical, psychological, sociocultural, and ethical aspects specific to various age groups and reinforced by several half-day meaningful clinical experiences in pediatrics and geriatrics. These clinical experiences also strengthen the interprofessional interactions with other healthcare providers. The course content is viewed as part of the curricular continuum. It is linked to material presented in previous and concurrent courses and the clerkships to follow. A diverse array of instructional modalities is matched to individual sessions to facilitate the development of clinical reasoning abilities and the acquisition of appropriate knowledge, skills and attitudes.

CONCLUSIONS
The curricular placement and content of the Life Stages course makes it a multifaceted component of the curriculum that wraps-up, reviews and expands on knowledge, skills and attitudes introduced in the first two years and links them with the educational needs of the clinical clerkships.

CURRICULUM AND INTEGRATION

INTEGRATING NEUROSCIENCE AND PSYCHIATRY/BEHAVIORAL SCIENCES AMONG COURSES IN A NEW MEDICAL SCHOOL

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PURPOSE
A new medical school curriculum offers multiple possibilities and challenges for reshaping and enhancing traditional ways in which the material is structured, presented, and tested.

METHODS
In designing the new program across the first two years of the curriculum, three areas received special simultaneous attention: a) coverage and proper sequence of topics; b) balance between content and pedagogical modality for each session; and c) appropriate placement in individual courses to interconnect with other disciplines, threads and topics.

RESULTS
The design process blending Neuroscience, Psychiatry/Behavioral topics within and across individual courses required constant shifting between placing content pieces; applying conceptual aggregates derived from various disciplines; and connecting institutional, course, and session goals and objectives. In the new program, an overview of basic Neuroscience concepts is presented in the first semester of study. Specific concepts are enhanced and expanded in system-based courses. Morphological and molecular concepts are from day one linked to their functional/clinical relevance. In the eight-week Neuro-Psychiatry I course, at the beginning of the second year curriculum, the clinical Neuroscience is expanded and seamlessly linked with Neurology, Ophthalmology, and Psychiatry/Behavioral Sciences, with focus on patient centered medicine. Thematic program topics specific to the pediatrics and geriatrics are scheduled in the Life Stages course, at the end of the second year curriculum.

CONCLUSIONS
The merging of Neuroscience with Neurology, Behavioral Sciences, and Psychiatry as a unified longitudinal program offers unique opportunities for integration and reinforcement of knowledge, elimination of redundancy, and continuity with other disciplines across the curriculum.

e-LEARNING

CHILD PROTECTION - RAPID MULTIDISCIPLINARY E-LEARNING DEVELOPMENT

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PURPOSE
The need for a learning package in Wales for Child Protection at Level 2 was reported to Wales Deanery's E-learning Unit. After verifying this we created a team with the purpose of developing a package to be used as part of a blended programme of education across Wales

METHOD
The design process has been guided by ELU Instructional designers and a multi-disciplinary steering group representing Child protection trainers. The project is case based and presents different perspectives on each case for each group of learners (i.e. Community Worker, Allied Professions, Hospital worker, Dentist).
The media used in constructing the resource (Adobe Captivate, Flash, HTML) combined with the platform for hosting it (Moodle 1.9) presented unique possibilities. This combination allowed us to produce a high quality multimedia resource rich in learner centred activities with integrated assessment. It also allows evidence of course completion to be delivered for each learner group based on successful completion of various course components.

RESULTS
This approach resulted in the rapid production of a high quality course that kept to a single set of objectives for all learner groups. It also provides the flexibility needed to contextualise the learning experience making it relevant to adult learners.

CONCLUSION
This approach met the challenge of creating a single course that caters for very diverse learner groups. The future holds the production of more scenarios and evaluation of whether the model can be used for other subjects with equally diverse learner groups.

e-LEARNING

ACUTE PAIN MANAGEMENT
e-Demo

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PURPOSE
The need for a learning package in Wales for Acute Pain Management was reported to Wales Deanery's E-learning Unit. After verifying this we created a team with the purpose of developing a package to be used as part of a blended programme of education across Wales

METHOD
The design process was guided by medical experts and instructional designers. It combines behaviourist, cognitivist, and some constructivist theory with the trial-and-error type principles found in PBL and game based learning.

RESULTS
The resulting resource is a self contained, case based scenario set on a hospital ward. The learner is introduced to a ward simulation built in Adobe Flash that includes all the items they would usually find on a ward for gathering information about the case and for managing their patient's condition.
The learner is then guided through the case from taking a pain history through to managing their patient's pain. An integrated assessment engine evaluates each decision the learner makes and provides them with detailed feedback that incorporates any necessary learning materials.

CONCLUSION
Developing Learning objects with little or no compromise produces great results although time from start to completion is extended. The first case was developed with the idea of using it as a template. This is now complete and further scenarios are under development.

e-LEARNING

E-LEARNING SUPPORTED PBL IN MEDICAL EDUCATION: INTERACTION OF LEARNING STYLES AND LEARNING OUTCOMES

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PURPOSE
The aim of this study was to investigate the interaction of students' learning styles and e- learning application usage, satisfaction with e-learning, and exam scores in problem based learning (PBL) exam.

METHODS
The e- learning application was developed to support student self-learning activities during PBL sessions in 2007-2008 academic year. Kolb's Learning Style Inventory and a questionnaire were administered at the end of the PBL module in order to determine the students' learning styles and their perceptions of the e-learning application. Additionally, computer log files and PBL exam scores were also compared to investigate the effect of e-learning on their academic achievements. All data comparison was based on learning styles. All statistical analyses were done using SPSS for PC (version 13.0). Chi-square and Kruskal-Wallis tests were used in statistical comparisons.

RESULTS
It was determined that the majority of students were assimilator (52.2%) and converger (25.8%). Data results of the present study revealed that 89.4% of the students used the e-learning application, and 72.7% of students were satisfied with e-learning application. There was no statistically significant difference between the four learning styles in terms of the rate of e- learning use and satisfaction with e- learning, and PBL exam scores (?2:6.73, p=0.08, ?2:3.90, p=0.27, ?2k-w=1 .98, p=0. 12, respectively).

CONCLUSIONS/ FUTURE DIRECTIONS
In the present study our hypothesis was three dependent variables (satisfaction, usage, success from the e-learning application) will vary among the students with four learning styles. However, no statistical difference was found between learning styles and three dependent variables (satisfaction, usage, success). We think suggest that e-learning application was greatly accepted by medical students belonging to each of learning styles, and therefore should be used by medical teachers in PBL and traditional courses.

e-LEARNING

DEVELOPING HIGH QUALITY E-LEARNING BY USING THE E-LEARNING LIFE CYCLE

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PURPOSE
In 2006 the Academic Medical Center – University of Amsterdam has started a new medical curriculum. One of the goals was to increase the use of high quality e-learning modules in education.

METHODS
We introduced an E-learning Life Cycle of development, evaluation and renewal to implement high quality e-learning modules in medical education:
First, the teacher and the e-learning consultant make a plan about the integration of e-learning within the course. After making a choice on different subjects, the e-learning consultant makes a scan if the preferred subject is not already an existing e-learning module. If not, the module will be developed by the teacher and an e-learning consultant. A checklist is used to consider the different quality aspects of e-learning.

After finishing the module, students have to fill out a survey, reviewing the quality and points of improvement. The questions used within the e-learning module are also analyzed statistically. Based on both results the modules and its content are yearly revised by the e-learning consultant and the teacher.

RESULTS
Students are highly satisfied with the e-learning modules used in medical education, but had comments on the quantity of text used. The most important aspect of a successful e-learning module lies within the quality of the feedback provided.
Question analysis within the e-learning module showed where students experienced difficulties on certain medical subjects, on which the teacher anticipated during lectures.

CONCLUSIONS
Using the E-learning Life Cycle, teachers will be actively stimulated to use e-learning in their education. Existing e-learning modules are reused and the quality is structurally reviewed on which the modules are adjusted. The medical content is up to date.
Structural evaluation of questions used within the module gives the teacher also a good insight in difficulties which students experience.

On our poster evaluation data will be presented as well as the different quality aspects of e-learning.

e-LEARNING

THE GRASSROOTS INITIATIVE: DOES IT WORK? AN OVERVIEW OF GRASSROOTS PROJECTS

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PURPOSE

The University of Amsterdam sponsors the Grassroots project that has been held yearly since the introduction of the new curriculum. Grassroots are designed to stimulate the use of IT in education for teachers without any previous computer experience. Ten projects get a funding of 1.000 euro for the duration for one academic year to complete their Grassroot. After completion the results are published in a brochure for promotional activities and to engage teachers to use these Grassroots in their own education. An overview of the 3 most successful Grassroots over the last few years:

1 .Pharmagame - A serious game was developed for pharmacology based on Jeopardy! A student gets MC questions on different pharmacological subjects and can earn a high score if they perform well.
Grassroot: the database was designed so that other department could easily design their own Jeopardy! In the future every trade association should have their own Jeopardy! Also research was conducted to compare the exam results of Jeopardy! users compared to non users. Costs: approx. 700 euro for development. Time: 3 months
2.Video diary of a chronic illness - In the undergraduate education more time could be spend on patient centered education. To present students with a realistic view of daily effects of a choric illness, patients who visited the hospital were asked to make a video journal to show these consequences and the effect is has on everyday living. Grassroot: the video materials were used during education but also for e-learning modules. Other courses intend to use this method too. Costs: 1400 for 4 cameras. Time: 6 months
3.Video database Medical Psychology -The faculty of Medical Psychology often encountered interesting fragments on television which could be used for education. A database was developed wherein teachers can enter the data about the show they have seen based on the online streaming from the internet.
Grassroot: the fragments will be used for education and e-learning materials, but also other faculties have interest in a video database. Costs: free software. Time: 5 months

CONCLUSION

With Grassroots is it possible not only to involve those who lack experience using IT in their education, but it also opts for the use of education in a new way that has not been done before. With little means and little funds great results can be accomplished with a Grassroots initiative. Some Grassroots were initiated by one person, but are now implemented throughout the faculty.

e-LEARNING

MUSCULOSKELETAL MEDICINE INTERACTIVE LABORATORY EXERCISE FOR FIRST YEAR MEDICAL STUDENTS
e-Demo

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METHOD
A video of each patient was obtained during a scheduled outpatient General Rehabilitation clinic visit. A written consent form was obtained from the patient for the video session. There were a total of ten patients filmed representing the following conditions: lumbar radiculopathy, frozen shoulder, sacroiliac ligament strain, plantar fasciitis, knee ligament tear, knee osteoarthritis, carpal tunnel syndrome, lateral epicondylitis, trochanteric bursitis, septic knee, and gout. Each video was incorporated into digital module that was programmed to allow the students to answer questions related to diagnosis and treatment. The module included images and relevant clinical data obtained from the patient records.

RESULTS
Ten completed digital laboratory modules have been incorporated into the Musculoskeletal Medicine course.

CONCLUSIONS
Student evaluations, anecdotal feedback, and examination results have concluded that the digital laboratory modules have been very successful. They have been taught for two years and students have indicated that the basic content and digital format have made them useful resources during their clinical years.

e-LEARNING

INNOVATIVE APPROACH TO INTRODUCE CLINICAL TREATMENT IN THE ANATOMY LAB MODULE

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PURPOSE
The purpose is to introduce first year medical students to clinical treatment approaches by developing joint and spine injection stations within the anatomy lab module. Each station is staffed by a physician specialist, utilizing unembalmed cadavers to teach joint and spine injections.

METHOD
First year medical students were introduced to various types of musculoskeletal conditions and anatomy through flash-based file modules, lectures, dissection, and pro-section. Anatomy demonstrations included the computer-based flash modules with the associated unembalmed cadaver at each station. Five stations in the anatomy lab were developed, including spine, elbow, hip, shoulder and knee. Students were taught appropriate joint and spine injection techniques based on anatomical landmarks at each station by a physician instructor.

RESULTS
The students demonstrated better understanding of key concepts and structures compared to previous classes, as demonstrated by higher test scores on anatomy practicals and multiple choice written exams.

CONCLUSIONS
Student evaluations, anecdotal feedback, and examination results demonstrate that basic anatomy modules using injections on unembalmed cadavers have been successful. This technique has been taught for three years and students have expressed its usefulness in the understanding and application of basic anatomy.

e-LEARNING

ESTABLISHING, INTEGRATING AND EXPANDING A MEDIA RICH ONLINE COURSE FOR CRANIO-MAXILLOFACIAL SURGERY
e-Demo

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PURPOSE
The field of cranio-maxillofacial surgery has teaching relevant specifics and calls for interdisciplinary perspective. Small and narrow anatomical structures limit practical capabilities for demonstration and training. To overcome these limitations and improve the quality of teaching images, 3D models and video are used. Aim is to increase the applicability of specific knowledge and allow better preparation for patient procedures.

METHODS
Over the course of two years an online course was developed consisting of virtual lectures, PBL with patient cases, a virtual internship in the OR and additional material like a 3D head model. Limiting the load of the workflow creating material was essential to guarantee operating while continuing expansion of the course. Measures for high data availability had to be taken to provide continuous availability of the course. PresSTORE was chosen for its high grade of automation, ease of use and remote administration.

RESULTS
Since its start in 2007 550 students and postgraduates have participated in CRANIONLINE. Evaluation showed that the course was well accepted. Continuous access to structured OR media proved to be a motivational factor for students and resulted in better understanding of complex procedures. Lecturers reported higher levels of competency of some procedures with the students.

CONCLUSIONS/ FURTHER DIRECTIONS
Benefit for students and lecturers alike encourages further expansion of CRANIONLINE – cmf surgery. Capabilities for capturing video in the OR are available and material is regularly collected. It is planned to cover the topics of craniofacial surgery and dental implantology in the near future.

e-LEARNING

THE 'WIKIVET' PROJECT: SUPPORTING INNOVATION IN LEARNING AND TEACHING IN VETERINARY EDUCATION
e-Demo

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PURPOSE
A collaboration between the UK veterinary schools has been established in a project called 'WikiVet' facilitated by a Higher Education Academy funded community of practice (CoP) and supported by JISC.

METHODS
The CoP was established in April 2007 supported by funding from the Higher Education Academy. A decision was taken early on to involve undergraduate students for uploading content in to the wiki and a launch workshop was held in July 2007 to begin this process. The platform chosen for the wiki development was 'mediawiki' hosted on a central server.

RESULTS
The initial focus of the project has been on pathology and the wiki can be viewed at http://www.wikivet.net/. There has been significant interest across the veterinary community and the speed of its development has surpassed the expectations of those involved.

CONCLUSION/ FUTURE DIRECTIONS
Fundamental to the success of the project is the ongoing involvement of veterinary students in creating the content of the wiki with the support of subject specialists. It has been empowering to create their own dynamic learning environment using new technologies to support their learning and to make a difference to the learning activities of veterinary students everywhere.

e-LEARNING

IMPLEMENTATION OF A PATIENT SIMULATION FOR TEACHING LABORATORY MEDICINE IN A PRE-CLINICAL COURSE
Award Nominee
E-Demo

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PURPOSE
Teaching laboratory medicine is frequently not formalized, resulting in variable coverage. Therefore we have developed and implemented a web-based computer-assisted patient simulation (LabCAPS) that is specifically designed to facilitate teaching and testing of laboratory medicine concepts.

METHODS
LabCAPS is created in a Perl-scripted MySQL database structure. Upon engaging the simulation and reading a clinical scenario, the student sequentially prioritizes diagnostic hypotheses, orders tests and procedures, makes a diagnosis, and selects management. To develop a scoring key, up to 5 experts engage the simulation. To automatically score student performance, points for ordering a test are awarded proportional to the % of experts who also ordered the test. To prevent "gaming" the simulation scoring system, a penalty is imposed for ordering tests that no expert would order. After completion, students can view their results compared with the experts. Subsequent to this, an electronic evidence-based interpretation is provided. In the pathology course, 156 pre-clinical students were provided practice cases, and assigned one case to prepare outside of class. They then presented their assigned case and rational for their workup in a small group setting of 8 students. In a followup evaluation for reliability we enlisted 13 paid volunteer second year medical students from a separate institution to engage 8 cases each.

RESULTS
Student satisfaction ratings in the pathology course were excellent (4.2/5.0). Reliability for measuring test ordering skill showed very encouraging results (alpha = .67) in spite of the low stakes evaluation.

CONCLUSION/ FUTURE DIRECTION
We believe that the LabCAPS format can be effectively implemented in a variety of small group settings in the pre-clinical (or clinical curriculum), or for self-paced or independent learning.

e-LEARNING

ONLINE EDITING OF A NEUROLOGICAL ATLAS
Award Nominee
e-Demo

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PURPOSE
Among the plethora of online neuroanatomical atlases it is hard to find one which can be easily be adapted to specific educational needs. A paper based neurological atlas, consisting of gray scale drawings of sections in three directions, has been converted to an online atlas in which neuroanatomical structures are defined as sets of polygons that exist separately from the images. Sets of structures and different naming schemes and presentation modes can easily be defined by the teacher.

METHODS
In the paper version of the anatomical atlas, anatomical structures were indicated by numbers, but no region boundaries were indicated. However, electronic versions of the unnumbered drawings were available. For the online version, all structures had to be evaluated on their educational purpose and drawn as a polygon, the coordinates of which were stored in a database. Two student-assistants performed this task online using a web-based image annotation tool developed at the Leiden University Medical Center. The coordinates allow for different representations of the structures, e.g. shaded or highlighted area's, boundaries or labels with restricted center-of-mass arrows. The terminology of the atlas was extended, based on teacher and student input and on the online source anatomicalterms.info.

RESULTS
The paper atlas was successfully converted to an online version. Minor omissions or inconsistencies in the atlas were detected and corrected and the terminology was extended. The online atlas has been used in a basic neuroanatomical course and a psychiatry course, which required different representations of structures.

FUTURE DIRECTIONS
For common students, the atlas is currently static: they can only select and view structures defined by the teacher. In the future, the online drawing tool can also be used by students to add annotations in online discussions, as an answering mode for test questions or in a student-teacher cooperation for constructing annotated graphical assets.

e-LEARNING

PLATO, A SINGLE E.PLATFORM FOR DOCTORS TRAINING IN WALES
e-Demo

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PURPOSE
Considering the wide array of electronic resources available to medical trainees and their Educational Supervisors the Postgraduate (PG) Deanery for Wales took the decision to set up a single e.platform for delivery and signposting of high quality resources. The learner groups include 2600 trainee doctors/dentists and their Educational Supervisors (approx 1400) working in a range of NHS Trusts in Wales who require flexible education and training programmes delivered at a pace, place and time of their choosing, informed by the requirements of specialty curricula and the Postgraduate Medical Education and Training Board (PMETB) that oversees the quality of training provision in the UK.

METHOD
The PG Deanery is using MOODLE in collaboration with Learning@NHS Wales. We have adopted a bottom-up and top-down approach to course content and user engagement. There are no fixed templates as trainees and Educational Supervisors are encouraged to design resources to meet local and/or national learning needs. Significant developments to MOODLE have allowed trainees and Consultants to be able to design and develop their own modules with minimal training. If the users require support this is provided by the Deanery E.Learning Unit staff.

RESULTS
There are currently 30 live modules that fall into 3 broad categories (1) clinical training mapped to specialty curricula –learner group doctors in training (2) clinical training for all health care staff and (3) training for those Consultants in Hospital Practice who act as supervisors. There is a variety of media used from a simple repository function (searchable trainee induction handbook) to interactive multimedia packages. Some specialties, eg ENT surgery are using a blended approach with summative assessments. Other e.modules, eg Cervical Screening Wales target General Practitioners and nurses in primary care as a part of an accredited Cert/Dip required for clinical practice.

CONCLUSIONS/ FUTURE DIRECTIONS
Users rate this ‘one stop shop’ approach and the signposting to other quality assured resources is highly valued. Future plans include expansion of the number and range of modules to meet local and national needs across all specialties in Wales plus a range of evaluations to ascertain if doctors’ practice has changed.

e-LEARNING

IMPROVING ACCESS TO CERVICAL SCREENING TRAINING VIA A BLENDED APPROACH e-Demo

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PURPOSE
Medical Education and training in the U.K. has undergone significant changes recently, with the implementation of Modernising Medical Careers and the European working Time Directive. In order to meet new training needs, in an evolving working environment with new time constraints, and increased patient throughput, technology assisted learning approaches have been used to enhance and improve access to Cervical Screening training opportunities for the 2000 General Practitioners (G.P.) and G.P. Practice Nurses throughout Wales

METHODS
The Wales Deanery E-Learning Unit has developed and piloted a multimedia interactive e-learning course for Cervical Screening training. The course is hosted in the Wales Postgraduate Virtual Learning Environment – PLATO (Postgraduate Learning and Teaching Online). PLATO is used to deliver the content, provide a range of assessment types, track and monitor learner activity in a grade book, provide discussion forums and produce personalised completion certificates. The e-course is integrated with face to face teaching programmes in a blended approach.

RESULTS
This electronic demonstration will focus on principles and techniques of course construction, engagement strategy, and tangible benefits to the learner group. It will demonstrate a successful case study in the field of Cervical screening training and provide a replicatable template for a successful e-course integrated with a virtual learning environment.

CONCLUSION/ FUTURE DIRECTION
The outlined approach has provided effective solutions to the problems of delivering training to a geographically dispersed group, where busy working environments provide constraints to attending face to face sessions. The model is scalable and replicatable in other medical specialties.

INSTRUCTIONAL METHODS

DEVELOPMENT OF A CASE-BASED CURRICULUM EXERCISE FOR A DIVERSE LEARNING COMMUNITY

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PURPOSE
As the teaching arm of the Boston City Hospital and Boston Medical Center, Boston University School of Medicine (BUSM) has a strong historical commitment to diverse patient populations. The faculty and student bodies are similarly diverse in ethnic, social, economic, academic, and other variables. Institutionally, our commitment to teach and support our diverse community is an integral facet of our educational philosophy. We believe that a commitment to diversity enables us to make important contributions to the health care professions, including teaching cultural competency and transforming the health care workforce to mirror the patients they serve.

As course manager for the first year Medical Genetics course at BUSM, implementation of these principles, particularly in the context of our small group sessions, is a priority. These sessions are highly collaborative in nature and therefore are an ideal place to tap into the wide range of experience of our students.

METHODS
A new case study, based on the experiences of an African American medical student, has been developed for use in the Medical Genetics course. The case also includes elements designed to resonate with individuals of European descent, and it covers universal genetic principles important to medical professionals in a variety of specialties. Further, the small groups themselves were created upon the foundation of existing advising groups to maximize student diversity in terms of pathway of admission and Myers-Briggs type indicator.

RESULTS
Pairing case-based discussion and diverse student groups creates an engaging curricular exercise designed to explore clinical issues related to diversity. Students reported an especially strong motivation to work with the case to understand issues of clinical importance. Feedback from students also provided insight into elements influencing group dynamics, elucidating the complex interplay between student advising and student learning environments. Because most other courses in our medical school utilize some form of small group teaching, variations of these strategies could be expanded to globally strengthen our commitment to our diverse student body.

INSTRUCTIONAL METHODS

THE EFFECT OF SMALL GROUP DISCUSSION VERSUS LECTURE ON LEARNING OF ECG INTERPRETATION SKILL

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PURPOSE:
This study carried out to compare lecture versus small group discussion on ECG interpretation skill of medical students at Mashhad University of Medical Sciences, Iran.

METHODS:
A sample of 44 medical students matched based on gender and their marks in national entry exam and then allocated to lecture (22 students) or discussion group (22 students) randomly. After a pre-test and filling of the Kolb learning style inventory, one group was taught by lecture and another group by small group discussion. The lecture was a 2 hour session that presented important topics and some examples using power point. In discussion group some real ECG cases were delivered to discuss by students in small groups coordinated by a tutor. Both groups participated in post tests one week later while questions were selected from approved questions bank and different for each group. Also, questions were different in pre-test and post-tests but with the same weight. Data were analyzed by SPSS software version 11.5.

RESULTS:
Findings indicated a significant difference on pre-test and post-test marks in lecture group but there was no significant difference in small group discussion (P=0.396). Also, the dominant learning styles were assimilating and converging in all students.

CONCLUSIONS:
Students in lecture group had better marks than discussion group on post-test. It may be due to several factors. For example, traditional system of high school education in Iran does not prepare students for team working. The other factor related to learning styles of students. Because, assimilating style is not the best one for discussion and team working. Teachers have to select the best teaching method based on several factors such as content, learning style, educational theories and cultural background.

INSTRUCTIONAL METHODS

LEARNING STYLES AND EDUCATIONAL ACHIEVEMENT OF NURSING STUDENTS

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PURPOSE
Teachers should consider the personal differences of students and determine factors in which may put effect on students' educational achievement. A descriptive study carried out to determine the learning style of undergraduate nursing students and their marks in an Iranian university.

METHODS
Students learning styles were assessed using Kolb learning style inventory. Its validity and reliability was determined before implementation. Data of students' marks were extracted from their educational records. 195 nursing students participated in this study. Data were analyzed by descriptive and analytical methods, using SPSS 11.5.

RESULTS
Findings indicated that most of students were female (83%) with mean age 22 year. The dominant learning style of students was assimilating (53.8%) and the rest of them had converging (28.9%), diverging (11.2%), and accommodating (6.1%) styles. Although the students with assimilating and converging styles had better marks, but there was not significant relation between learning styles and students' marks.

CONCLUSIONS
Learning style is an important factor for determining students' differences and their learning interests. But, it seems, this issue has no unique role in predicting students' achievement. Because, educational achievement is a complex issue and may not be predicted only by learning style. It is needed to carry out more research on Kolb learning style in relation to other variables such as personal professional interests, attitudes and motivations.

INSTRUCTIONAL METHODS

EFFECTIVE TOOLS FOR SMALL GROUP FACILITATOR DEVELOPMENT

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BACKGROUND
Given the importance of small group learning in medical education, resources for faculty development are vital. After failing to find existing resources that fit our needs, we collected best practices from expert educators and distilled them into concrete faculty development tools. These tools include video clips and a workshop facilitator guide.

PURPOSE
We report on the efficacy of these faculty development tools.

METHODS
A team of educators, professional media experts, and students used storyboarding to create scripted videos demonstrating different facilitation styles. We developed a facilitator guide to provide 1) background on characters and scenarios in the videos, and 2) a framework for leading a faculty development workshop. We ran several workshops using these materials: three short workshops for small group facilitators in the preclerkship curriculum, and one longer workshop in an ongoing faculty development series.

RESULTS
Participants in the short workshops (n=37) rated the usefulness of videos as a springboard for discussion 4.67 (sd=0.59); the overall quality of videos 4.57 (sd=0.73), and the overall quality of the training sessions 4.57 (sd=0.61) (5 = highest). Course directors report the videos make small group facilitator training more consistent and realistic. The overall quality of the longer workshop was rated 4.56 out of 5 (n=1 6). Participants reported the use of videos and brainstorming about specific challenges in small group to be valuable.

CONCLUSIONS
Our tools are useful for consistent and effective faculty development.

FUTURE DIRECTIONS
Create a stand-alone web-based version of videos to increase accessibility of these tools.

INSTRUCTIONAL METHODS

A RANDOMIZED STUDY IN 2 GERMAN MEDICAL UNIVERSITIES USING A MODIFIED FLANDERS INTERACTION ANALYSIS
Award Nominee

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PURPOSE
Study focused on improvement of lecturing. Past research has shown that "empathic" teachers who are Indirect (accept, encourage, praise, ask questions) and stimulate "student talk" are more effective than those who are more Direct (lecturing, giving directions, criticizing). The Flanders Interaction Analysis (FIA) has been shown to be reliable for diagnosing teaching.

METHODS
Teaching improvement defined as changes in 7 teaching behaviors: increases in faculty question asking; increases in student talk; decreases in faculty talk; increases in the Indirect to Direct teaching ratio; use of case-based teaching; increases in teacher empathy; increases in organization of teaching. These criteria were based upon large studies (classroom analyses in 42 US states and 7 countries) using FIA. We modified the FIA by adding measures of empathy and organization of teaching. We stratified (by teaching experience) and randomized 22 volunteers into 2 matched groups. One had an intervention of the modified FIA plus an expert feedback session in both semesters. The controls had the FIA but no feedback intervention. We measured expert and student evaluations of both groups following each lecture. Our hypotheses: 1) faculty in experimental group receiving the intervention would improve teaching more than controls without intervention; 2) faculty receiving intervention would improve teaching in summer after receiving winter intervention as rated by experts and by student evaluations.

RESULTS
Results (using a paired t-test) showed faculty in the experimental group improved significantly on all 7 measures, whereas faculty in the control group did not change significantly on 5 of 7 measures.

CONCLUSIONS
As a result of the study, faculty have become motivated to become better teachers and are being trained.

INSTRUCTIONAL METHODS

REVERSING THE SEQUENCE OF HISTOLOGY LECTURE AND LABORATORY DISCUSSION

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PURPOSE
To improve the educational quality of limited teaching contact time by replacing traditional study-hall-like laboratories with small interactive discussion sessions that precede lecture, and by shifting material students can reliably prepare on their own to self-study.

METHODS
Nearly a decade ago BUSM reversed the traditional sequence of lecture before lab and scheduled all of our light microscope laboratory sessions to precede their companion lectures. Two years ago, we replaced traditional glass slide and microscope laboratories with virtual microscopy, which allowed us to replace the supervised laboratory sessions with the combination of self-study laboratory exercises and faculty-facilitated interactive small-group discussions.

RESULTS
Lecture time becomes more efficient by eliminating the need to explain classic descriptive histology in lectures. Furthermore, students come to lecture already familiar with the relevant vocabulary and morphological relationships that are key to the lecture topic. As a result, lecturers can spend limited lecture time on important concepts, interdisciplinary links, and clinical relevance.

Adopting Virtual Microscopy (VM) enabled further pedagogical improvement. Because all students examine the same virtual slides, the laboratory guide was written to promote self-study. By shifting the laboratory exercise to self-study, the scheduled laboratory contact time was replaced by interactive sessions that allow faculty facilitators to model proper reading and cognitive processing of histology material, to demonstrate its relevance to pathophysiology, and to improve students' test-taking skills.

FUTURE DIRECTIONS
Student focus groups provide feedback for continued improvement. We will continue communication with colleagues to design further horizontal and vertical integration between histology and other disciplines.

INSTRUCTIONAL METHODS

VIDEO-ASSISTED REAL-TIME SIMULATION (VARS) IN PAEDIATRICS

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PURPOSE
Critical care situations in children have large impact on involved medical health professionals. These situations occur infrequent which implicates that each individual professional has few opportunities to gain experience. These skills involved include technical aspects (e.g. airway management) as well as non-technical skills (e.g. communication between team members). Learning on the job which has been the education model for many years has become obsolete in respect to patient as well as team safety.

Our team incorporated video-assisted real-time simulation training (VARS) to obtain and maintain the skills necessary for critical care.This training allows the learner to make mistakes, and learn from them without harming a patient. Immediate post event debriefing facilitates the development of new strategies, and increases self-efficay in the technical as well as non-technical domains.

METHODS
We developed VARS training for use in paediatric medicine using a staged model. Medical students focus on theoretical aspects as well as physical parameters of a critically ill child. Paediatricians in training focus on technical skills, while more experienced medical professionals also train non-technical skills. We both use low- and high-fidelity manikins, and developed a special training manikin for the use of extracorporal membrane oxygenation.

RESULTS
We will present our preliminary results with simulation training for technical as well as non-technical skills necessary for critical care medicine in children. We will illustrate this by showing characteristic interactions and behaviours such as team working, decision making and elements of communication.

CONCLUSION
Video-assisted real-time simulation seems a very promising educational method for training technical as well as non-technical skills in acute paediatric critical care medicine.

INSTRUCTIONAL METHODS

CAN THE SELF-EFFICACY OF STUDENTS BE INCREASED BY AN INTERACTIVE TRAINING PROGRAM?

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PURPOSE
Life-support training can lead to an increase in knowledge, skills and change of attitudes. One factor influencing attitude is self-efficacy.

A previous study suggested that life support training during medical education in the Netherlands has no demonstrable effect on the student's self-efficacy. Students appeared to have less self-efficacy for the recognition of vital signs and for cardiopulmonary resuscitation (CPR) in children than in adults.
We developed a structured, interactive central clinical training program (CCTP) including paediatric life support training before the paediatric clerkship. This study evaluates the change in self-efficacy generated by this program.

METHODS
Three student clerkship groups (n=82) were asked to rate their self-efficacy regarding recognition of vital signs and CPR in children and adults using a visual analogue scale before and at the end of the CCTP and at the end of the clerkship.

RESULTS
65 (79%) of 82 students completed the study. Self-efficacy for the recognition of vital signs and for CPR in children ($p<0.001$) and adults ($p<0.01$ tot $p<0.001$) increased strongly. This occurred during the CCTP without a further increase during clerkship.

The self-efficacy for these skills in children at the end of the clerkship was comparable to the self-efficacy for these skills in adults at the start of the CCTP.

CONCLUSION
A structured, interactive program including paediatric life support training significantly improves the self-efficacy of students. Moreover, the self-efficacy for adult and paediatric life support skills increases. The absence of a further increase during clerkship was disappointing.

INSTRUCTIONAL METHODS

FOLLOW THE YELLOW BRICK ROAD TO GET TO CLINICAL DIAGNOSIS

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PURPOSE
To get a precise clinical diagnosis, it is necessary to go through sequential previous diagnoses. For the expert, this is a simple process that he/she executes in an automatic way; nevertheless, for the novice this represents an unknown process. For this reason it is important to analyze the different diagnostic levels that build this intellectual route as well as the sequence it happens.

METHOD
We analyzed the intellectual route the expert goes through in order to get to a clinical diagnosis as precise as possible. This process implies in first place the identification of the affected structure, followed by the affected function, signs and symptoms and etiology. The integration of these leads to the final clinical diagnosis.

RESULTS
As a consequence of this analysis we identified the following sequence of diagnostic levels: morphologic, functional, semiologic and etiologic. These are the main diagnoses that are made before we get the final clinical diagnosis that directs the patient management.

CONCLUSION
The knowledge of the way that leads to the final clinical diagnosis allows medical teachers to design methodological strategies to make the student aware of the process, and through its systematic practice become an expert using it in an automatic way.

INSTRUCTIONAL METHODS

ROLE OF BODY TRACKER IN THE PROMOTION OF HEALTHY HABITS IN BEGINNER AND ADVANCED MEDICAL STUDENTS

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PURPOSE
Promotion of healthy personal habits during early medical education may encourage students to adopt those personal habits later in their career. To determine whether medical students make healthy choices when it comes to diet and exercise we provided 1st year medical students studying in the Caribbean a questionnaire designed to investigate their eating strategy. We also followed their participation in Body Tracker sessions designed to provide them with accurate determination of their weight, BMI, and percent body fat.

METHODS
We collected information through an eating survey provided by the American Heart Association (n = 70). We also recorded attendance of students (n = 354) participating in Body Tracker Sessions throughout the first year.

RESULTS
A large proportion of 1st semester medical students are aware of the number of calories they consume (77%), and avoid eating fast-food (57%). Beginner medical students are less likely to participate in the Body Tracker program, but participation was greater consistently as students progressed with the medical education.

CONCLUSION
Medical students are very conscious and aware of the choices they make for healthy eating. Early sessions designed to target beginner medical students after the first week of class were fruitful and led to higher attendance and participation consistently throughout the first 12 weeks. Their participation was less compared to their fellow peers who were into the more advanced level in their medical education. Body Tracker served as a tool to promote healthy habits and continued to attract the beginning medical students as they progressed into advanced medical status.

INSTRUCTIONAL METHODS

INCORPORATION OF RADIATION ONCOLOGY INTO THE MEDICAL SCHOOL CURRICULUM: A TWO-YEAR ANALYSIS OF THE ONCOLOGY EDUCATION INITIATIVE

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INTRODUCTION
As part of the Oncology Education Initiative, we incorporated structured didactics by a Radiation Oncology attending physician into the curriculum of the required Radiology clerkship. We report on students' overall attitudes toward this Initiative.

METHODS
After exposure to the didactic session, we administered a cross-sectional survey of fourth-year medical students rotating through a required radiology clerkship in the classes of 2007 and 2008.

RESULTS
Of the 301 students, 258 (86%) participated in both the didactic session and questionnaire. All 258 (100%) students felt that oncology was an important component of undergraduate medical education; while 241/258 (93%) felt radiation oncology was also important. 174/258 (67%) reported limited knowledge about radiation oncology prior to the Initiative. An alarming 158/258 (61%) and 171/258 (66%) did not feel there was adequate exposure to cancer care in the pre-clinical and clinical years, respectively. Subsequent to the didactics, 243/258 (94%) were motivated to learn more about radiation oncology and 240/258 (93%) reported a better understanding of the multidisciplinary nature of cancer care. 250/258 (97%) felt that the radiology clerkship was an opportune time to receive radiation oncology teaching.

DISCUSSION
Graduating medical students do not feel adequately prepared to manage patients with cancer, particularly those undergoing radiation therapy. To the best of our knowledge, our medical school is the first to create a formal didactic program of radiation oncology taught alongside radiographic interpretation and immediately reinforced in a clinical setting.

FUTURE DIRECTIONS
Even a concise introduction to radiation oncology provides exposure to the field and shift attitudes about the need for further study.

INSTRUCTIONAL METHODS

VIRTUAL ELECTRON MICROSCOPY IN CELL BIOLOGY
e-Demo

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PURPOSE
Virtual microscopy of histological glass slides can emulate conventional light microscopy. Up till now, such a digital simulation does not exist for ultrathin electron microscopic slides. Due to the relative inaccessibility of electron microscopy, evaluation of subcellular structures by (bio)medical students is performed with the aid of photographic prints. In this study, the generation and evaluation of virtual electron microscopic slides is discussed.

METHODS
A T-lymphoblastic cell was used as an example. Electron microscopic pictures were taken at 2 magnifications (25000 and 50000), processed in an analogue or digital way and stitched to reconstruct the image of the total cell. This image is viewed with the free on- line available virtual microscopy viewer OlyVIA?. Since the discernibility of 3 separate layers of a membrane approaches the resolving power of a TEM (1-2 nm using conditions for biological specimens), the possibility of distinguishing the trilaminar structure of cellular membranes on the virtual pictures was the requisite.

RESULTS
Virtual images obtained at an original magnification of 25000, scanned at a resolution of 800 dpi could compete in quality with pictures developed directly from negatives obtained by electron microscopy. It is possible to navigate and zoom into details in a way emulating electron microscopy.

CONCLUSION
Virtual electron microscopy is innovative and offers new perspectives to interpret cytological pictures and to teach cell biology in an interactive and unique way.

PROFESSIONAL DEVELOPMENT

AN INTERPROFESSIONAL STUDENT HEALTH CARE TEAM

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PURPOSE
The purpose of this project was to form interprofessional student health care teams to educate students on the role of various health care professionals in patient care and management.

METHODS
Interprofessional student heath care teams consisting of a MS1 medical student, a third year undergraduate nursing students, and a graduate social work student were formed within the College of Health and Human Services of Indiana University Northwest. Each team was assigned a patient at a nursing home/assisted living facility. The student health care team followed this patient for a period of two years, making periodic individual visits to see the patient, and meeting as a team either in person or online in a chat room to discuss the progress of the patient, the plan for patient care and to educate each other on their role as a team member. The medical student team member made two presentations on their patient to their peers and faculty. The first presentation was in the second semester of the MSI year and was a complete medical history on the patient. The second presentation was in the fall of the MSII year and consisted of a report on the physical exam of their patient. In the second semester of the second year, the team made a team presentation of their patient and discussed what they had learned from each other.

RESULTS
Students reported that this was a valuable educational experience and would help them to be better health care professionals and understand their and other health care professionals' roles in the care and management of patients.

CONCLUSIONS/FUTURE DIRECTIONS
We plan to continue and expand this program with the inclusion of other health care students within the College of Health and Human Services.

PROFESSIONAL DEVELOPMENT

THOUGHTS, FEELINGS AND DRAWINGS OF FIRST YEAR MEDICAL STUDENTS BEFORE THEY MEET THEIR FIRST PATIENT - THE CADAVRE
e-Demo

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PURPOSE
For most of the first year medical students, anatomy lessons mean starting to learn “human body”, memorizing new “Latin words”, wearing “whites”, going through some “rituals” with specific smell of the labs, working with “bones and the cadavre”. Although real cadavre is no longer used in some medical schools, at a place where classical mysterious and fascinating atmosphere of anatomy labs are still valid, there is an orientation program for the students. The aim of this presentation is to share experiences and get views from the participants about this program.

METHODS
Students are asked to write their thoughts and feelings about working with bones and body of a dead person and to draw what they imagine to see at the lab where they are going to meet the cadavre for the first time.
Together with faculty from Anatomy Department, the teacher of behavioral sciences, runs discussions with the students on topics like “respect for the cadavre and for the patients”, “importance of human dignity” and “awareness about thoughts and feelings of oneself”.

RESULTS
A qualitative analysis of the results of this orientation program for the last three years, with impressive examples of thoughts, feelings and drawings of the students are going to be presented during the session.

CONCLUSION
It has been observed that the program helps the students handle their anxiety before meeting the cadavre, helps them to be aware of their own thoughts and feelings and express themselves through a discussion as well as by their drawings.

PROFESSIONAL DEVELOPMENT

RESIDENT BARRIERS TOWARDS PRACTICING EBM, A SYSTEMATIC REVIEW

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PURPOSE
Physicians are expected to work according to the principles of evidence based medicine (EBM). Insufficient time and lack of skills are known barriers to this practice. Residents could have additional barriers, since their practice is strongly influenced by the educational system and clinical supervisors. Objective of this study was to systematically appraise and summarize the literature on the barriers of residents in the application of EBM in daily practice.

METHODS
MEDLINE, EMBASE, the Cochrane Library, CINAHL and ERIC were searched. Additionally, the abstracts of relevant conferences were screened manually and experts in the field were contacted. Original studies on the barriers of residents in applying EBM in daily practice were included. Two reviewers independently applied the inclusion and exclusion criteria to select the relevant studies from the titles, abstracts or full test of the references retrieved by the literature search. Methodological quality was assessed and results were extracted by two reviewers using prespecified data-extraction forms.

RESULTS
The search resulted in 511 titles, 84 abstracts, and 3 studies suggested by experts of which 9 were included in this review. These studies were quantitative surveys (n = 4), quantitative interviews (n = 1) and a RCT (n = 1), and 3 were qualitative studies. The quality of the included studies was high. The most frequently mentioned barriers for residents were limited available time (28 – 85% of residents), attitude (moderate (positive) in 53%-70% of residents), and knowledge and skills. In four studies, specific barriers related to the position of residents, like influences from staff members, lack of experience in EBM and low possibilities to change conditions are described.

CONCLUSIONS
Residents experience specific barriers to practice EBM. These barriers should recognized and integrated in the EBM training program of residents.

PROFESSIONAL DEVELOPMENT

CHALLENGES AND INNOVATIONS OF PERSONAL AND PROFESSIONAL DEVELOPMENT INTO MEDICAL EDUCATION
Scholarship Winner

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PURPOSE
To describe the implementation of a Personal and Professional Development (PPD) theme in the five year undergraduate medical training programme at the University of the West Indies, Jamaica.

METHODS
Two years ago a structured orientation program for medical students was introduced along with a concerted effort to ensure that the PPD themes are infused throughout each year of training. The aim of PPD is that all students from orientation to separation become critical thinkers with superior problem solving skills, effective and efficient as individuals and in teams, articulate, culturally sensitive, and committed to ethical behaviour. Workshops, role plays, skills laboratory, videos and didactic seminars are held for 2 hours per week in different semesters across the curriculum. Themes include communication and motivation theories, team building, and ethics. Students demonstrate learning through role play, group presentations and examinations.

RESULTS
350 students have participated in the new orientation program. Improvement in group work and better understanding of the role of other professionals in the inter-professional team approach to patient care has occurred. Students have also become more culturally aware and sensitive in their communication skills. New strategies for measuring and rewarding not just learning but development need to be developed. Appreciation of the program increases with clinical and community exposures and students are motivated by their own innovations.

CONCLUSION
Diverse teaching and learning strategies encourages team building and facilitates excellence in communications as one of the paramount approach to patient care.

PROFESSIONAL DEVELOPMENT

THE DESIGN AND IMPLEMENTATION OF AN EARLY CAREER FACULTY DEVELOPMENT PROGRAM IN MEDICAL EDUCATION
Scholarship Winner

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PURPOSE
The study identifies the needs of early career medical school faculty in order to implement faculty development programs in medical education.

METHODS
The first phase of the research used an anonymous, online IRB-approved survey to ask early career faculty about their: (1) demographics, (2) teaching categories, (3) educational goals and obstacles, (4) selection of faculty development training topics and time, and (5) self-identification as Early Career Faculty.

As indicated by the survey results, the second phase of the study developed and implemented faculty development training. Data collected included the number of participants, their departments, and program evaluations.

RESULTS
Survey Responders (N=80) represent 86% of the medical school departments and teach 49% at the undergraduate level and 70% at the graduate level. Half of the survey population participates in clinical patient care and 21% in clinical research. The top topics for faculty development training were: mentoring, facilitating small groups, effective lecture strategies, evidence based medicine, presentation skills, and bedside teaching. Major barriers preventing faculty from achieving their educational goals are clinical responsibilities, lack of specific guidelines for academic advancement, and lack of formal training in education and educating adult learners.

CONCLUSIONS
The results indicate that while early career faculty express an interest in teaching, there is a sense of lack of time and incentive to pursue faculty development in medical education.

FUTURE DIRECTIONS
The third phase will investigate different ways that early career faculty can be awarded time and promotional points for attending faculty development programs in medical education.

PROFESSIONAL DEVELOPMENT

TEACHING STYLE IN CLINICAL NURSING EDUCATION: IRANIAN NURSING TEACHERS' EXPERIENCES
Award Nominee

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PURPOSE
There are many studies about nursing clinical settings and their problems, but the teaching style as a whole has not been widely studied. Therefore, this study aimed to explore nursing teachers' perceptions about teaching style in the clinical settings in Iran.

METHOD
A grounded theory approach was used to conduct this study. Fifteen nursing teachers were interviewed individually, 2006-2007. The interviews were tape-recorded and later transcribed verbatim. The transcriptions were analyzed using Strauss and Corbin's method.

RESULTS
Three main and twelve sub themes emerged from data and these could explain the nature of the teaching style in clinical education of the Mashhad Faculty of Nursing and probably others in Iran. The main themes included: multiplicity in teaching style, nature of clinical teaching, and control and adaptation in education atmosphere. Multiplicity in teaching style was the dominant concept in this study. Each teacher had a personal and individualized style which was flexible according to the situation, type of the skill (course content), education environment and facilities, and level of the learner.

CONCLUSIONS
This study can guide nurse teachers to know more about teaching styles and use them appropriately in the clinical settings. The findings have developed knowledge in the field of teaching in clinical settings and revealed the nature of nursing clinical teaching style. Teachers, students, educational planners and stakeholders can use these findings to promote the quality of teaching and learning in clinical settings, nursing education and health care.

This study illustrates that clinical education is a personal and interpersonal experience with its rules and principles, and requires the active participation of both teachers and students. The teaching styles discovered in this study can be used in any kind of clinical education.

PROFESSIONAL DEVELOPMENT

UNCOVERING THE POSITIVE INFLUENCES OF THE HIDDEN CURRICULUM

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PURPOSE
Much of medical student learning occurs through observation of both positive and negative clinical role models, i.e. the hidden curriculum. Instead of focusing on the negatives, we sought to identify positive experiences during clinical clerkships. By defining contributing themes of positive encounters and positive personal characteristics we hope to increase their frequency and build upon the current success of the informal curriculum.

METHODS
Twenty third-year medical students at were interviewed Appreciative Inquiry. AI uses interviews to gather information about positive experiences. Students were asked to describe an experience where they witnessed or participated in excellent patient care and to identify the personal characteristics that of those involved. Transcripts of interviews were analyzed for thematic categories by two reviewers in an iterative process and coded for the presence or absence of the themes. Discrepancies were resolved via consensus.

RESULTS
Thirty seven percent of accounts described empathy, 32% concentrated on completeness of patient care, and 26% cited commitment of spending time with patients. Contributing personal attributes were dominated by compassion (53%) and humanistic attitude (37%).

CONCLUSIONS/ FUTURE DIRECTIONS
The majority of medical students in this study experienced excellent patient care as part of their hidden curriculum. These encounters revealed compassion, empathy, and humanism along with an unhurried, all-inclusive nature of care. Efforts should be made to identify, acknowledge, and reward persons exhibiting such traits as role models. Such a system would support continuation of such encounters and foster these attributes to become standard of care and medical education.

STUDENT SUPPORT

STUDENT CONCERNS ABOUT LEARNING THE SCIENCES BASIC TO MEDICINE

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PURPOSE
Medical schools ponder the impact their programs have on student learning. This is especially the case during times when the curriculum is undergoing major reforms. Over the last five years The Sophie Davis School of Biomedical Education (a 7 year BS/MD degree program in New York City) underwent some major changes in their pre-clerkship training program. This abstract reports on an evaluation project that captured the students' experiences and concerns related to their goals for studying.

METHODS
The entire cohort of students who completed the pre-clerkship years in 2008 (N=56) was invited to participate in focus groups to discuss their training experience. 21 students (37.5%) attended 3 focus groups which were run by an external evaluator at off-site locations. All groups were diverse in terms of gender (12 females, 9 males), ethnic background and academic standing (GPAs ranged from 2.90 to 3.49). The 90 minute long sessions were audio-taped and underwent a thematic analysis. The focus group question guide included inquiries about study habits and goals. A series of concerns related to learning basic sciences could be identified.

RESULTS
This qualitative study revealed that student learning is driven and directed by three diverse goals: a) studying for course tests, b) studying for board exams, and c) studying for clerkships and the future practice of medicine. These goals take on different priorities based on the proximity of exams, the perceived relevance of the course material to medical practice, the "importance" of the course within the academic setting, and the level or training or closeness to the clinical years. Students seem deeply concerned about "high yield" studying, and the lack of curricular alignment is viewed as major frustration within the overall training experience.

CONCLUSION
As a BS/MD program the school may have some unique characteristics, but the concerns students identified are likely to be experienced in other institutions as well. Academic programs should find ways to bring into line their learners goals for studying in order to reduce student stress and maximize the programs educational impact on future performance.
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STUDENT SUPPORT

FACULTY PERSPECTIVES REGARDING NONTECHNICAL COMPETENCIES IN VETERINARY MEDICAL EDUCATION
Award Nominee

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PURPOSE
The purpose of this study was to explore perceptions of veterinary educators regarding the importance of nontechnical competencies for veterinary graduates and their placement in veterinary medical education.

METHODS
A survey was administered to veterinary faculty members at five institutions. Participant information included age, gender, terminal degree, rank, discipline, and years teaching experience. Respondents rated the overall importance of 14 competencies on a 1-7 scale. Faculty then indicated where each competency should be taught or cultivated (preveterinary, preclinical, clinical, and/or postgraduate training).

RESULTS
Faculty respondents generally agreed that nontechnical competencies are important for veterinary graduates and should be cultivated across the spectrum of veterinary education. The support was greatest for ethical development, critical thinking, interpersonal and intrapersonal competencies and was less for management and business competencies. Basic science, non-veterinarian and junior faculty tended to more strongly appreciate the importance of nontechnical skills. Large animal faculty and midcareer faculty exhibited a more reserved level of support. Although not statistically significant, women faculty tended to rate the importance of nontechnical competencies higher than male faculty ($p = 0.06$). Women also were more likely to support the development of nontechnical competencies across the continuum of education. Junior faculty were less likely than others to view clinical education as a primary time for their development.

CONCLUSIONS
Faculty characteristics affect perceptions of the importance and place of nontechnical competencies in veterinary education, especially gender, discipline and career stage. Faculty development and curricular discussions should be prepared with these differences in mind.

STUDENT SUPPORT

AT-RISK STUDENTS' PERCEPTIONS OF USING DEEP BREATHING MEDITATION TO REDUCE ACADEMIC STRESS
Award Nominee

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PURPOSE:
At-risk students may exhibit symptoms associated with test anxiety that can interfere with academic achievement. Providing them with techniques to alleviate those symptoms may be helpful; yet, few schools provide students regular opportunities to practice stress reduction techniques. This study measures the changes in at-risk students' perceived test anxiety symptoms, beliefs and Deep Breathing Meditation (DBM) use after participating in six weeks of regular DBM sessions.

METHODS:
Five different groups of at-risk students (N=1 62) participated in this study during the summers of 2004 through 2008. All students were considered educationally disadvantaged. Each year's group completed a DBM Pretest prior to their first class and a Posttest six weeks later at the conclusion of the semester. The DBM test instruments used a 10-point Likert-type scale to track changes in students' perceived feelings, beliefs, and DBM use. The incoming groups began two classes with five minutes of DBM for a total of 30 sessions each summer.

RESULTS:
Analyses revealed all areas changed significantly during the study period. Students reported perceptions of significantly less test anxiety ($p \leq 0.000$), nervousness ($p \leq 0.000$), and self-doubt ($p \leq 0.000$), and increased concentration ($p \leq 0.000$), use of DBM during exams ($p \leq 0.000$), and belief that DBM helped them academically ($p \leq 0.000$).

CONCLUSIONS:
Our findings suggest that significant behavioral changes occurred when at-risk students practiced regular, five-minute DBM over a six-week period. Allowing students to practice a strategy to counteract symptoms associated with test anxiety may assist them in abandoning ineffective behaviors and replacing them with an empowering coping technique.

STUDENT SUPPORT

TEACHING BEYOND THE CORE – HOW LONG CAN IT CONTINUE?

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PURPOSE
In 2001 a revised undergraduate medical curriculum was introduced at the University of the West Indies, Mona (Jamaica) campus. This curriculum includes a Special Study Module (SSM) programme for students in the first three years (Stage 1). In SSMs students pursue small course of limited content which delivers material that is in addition to or outside of the core of knowledge required by all students. This paper evaluates the first seven years of the SSM programme and the challenges of maintaining it.

METHODS
A total of 49 SSMs were reviewed and categorised according to the area of concentration. A focus group involving staff and students was conducted at which participants carried out a SWOT (Strengths-Weaknesses- Opportunities- Threats) analysis of the programme followed by discussion to identify the options for its future.

RESULTS
One-third of the SSMs covered clinical areas while 11.2% addressed the basic sciences. The SWOT analysis revealed a wide range of benefits to participating students and opportunities for curriculum diversification through collaboration with external stakeholders. The main weaknesses that were identified resulted from a lack of resource support and the threat of an expanding core curriculum eroding time for non-core activities.

CONCLUSION
Special study subjects in the early years of medical training are largely covering non-core topics. Given the student interest and perceived benefits, the maintenance of this programme requires greater buy-in from staff and will depend largely on both increased resource support and allocation of time.

STUDENT SUPPORT

BIOMEDICAL MASTER PROGRAMMES OVERVIEW

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PURPOSE
The national biomedical student committee (BMSO) is the consultation body of all biomedical students in the Netherlands. Once a month the students' participation, curricula and other developments are discussed. All Dutch universities, which provide biomedical programmes, are represented. One of the goals of the BMSO is to provide structured information to (prospective) students of all (bio)medical Bachelor and Master programmes. One of the latest activities of the BMSO is the Biomedical Masters 'menu card', a structured overview of all information about the master programs that are in some way linked to the Biomedical Bachelor programs.

METHODS
The overview of master programmes are grouped per university, but also per scientific field of interest, creating two straightforward. Not only research Masters, but also differentiations to communication, education and management are included. These overviews are made accessible on the Internet, www.bmso.nl.

RESULTS
All universities offer broad programmes, which are presented in different ways and names. There are a lot of similarities but universities also offer special niche programmes. Moreover near all universities offer programmes preparing students for a career outside research. In this overview 32 programmes are included of which it six times concerns the general Biomedical Master. Within these general Masters, there are 46 'directions'. All this possibilities are classified in 19 fields of interest.
It also becomes clear that the borders of 'Biomedical Masters' are someways hard to define.

CONCLUSION
With this overview the first step has been made to create a full inventory of the current Biomedical Masters programmes. This overview currently provides one of the best possible overviews for Bachelor students who are interested in biomedical Masters. The BMSO hopes that this overview will help them in this important career decision.

STUDENT SUPPORT

SOURCES OF STUDY ADVICE AND RATINGS OF HELPFULNESS IN FIRST YEAR MEDICAL SCHOOL COURSES

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PURPOSE:
The purpose of this study was to identify sources of study advice for first year medical school courses, and to determine how helpful students perceive this advice to be.

METHODS:
First year students completed an online survey. They responded to whether study advice was provided to them by course instructors, first year or second year students, or faculty providing academic support (Cognitive Skills Program). Students rated the helpfulness of advice received for specific courses (Anatomy, Biochemistry, and Cellular/Genetic Mechanisms) on a 5-point scale (1 = always helpful…5 = never helpful.) Students were also asked to rate their learning experience in each course and comments were solicited.

RESULTS:
The amount of advice students reported receiving from the different sources varied by course. The highest percent of advice received overall for both Biochemistry and Anatomy was from second year students. Mean ratings of helpfulness ranged from a high of 2.03 (advice from faculty for anatomy) to a low of 2.64 (advice from first year classmates for anatomy.) Students also evaluated their learning experience in Anatomy most positively. Comments concerning most helpful advice were categorized in themes of time/effort management, general and specific study strategies, and how to use course resources.

CONCLUSIONS:
Study advice is provided from many different sources during the first year of medical school. Anatomy lab may be most conducive for faculty to provide study advice. This advice is positively related with student evaluation of their learning experience. Student comments indicated the usefulness of advice about both how to study and what to study.

STUDENT SUPPORT

THE IMPACT OF COUNSELING SYSTEM ON THE ACADEMIC PERFORMANCE AND THE EMOTIONAL WELL-BEING OF FIRST YEAR MEDICAL STUDENTS

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PURPOSE:
University education requires an adaptation period for new students. Family & peer relationships problems, accommodation & financial issues, emotional & physical problems, adjustment to a new environment account for some of the elements of this period. We implemented a Counseling System (CS) to address these issues to help students to succeed academically and lead a satisfying social life. This study is conducted to investigate the impact of CS on the academic performance & emotional well-being of the 1st year medical students.

MATERIALS & METHODS:
Upon admission, 120 students sought an academic counselor. The Counselor Committee (n=40) of voluntary faculty members was founded upon the request of Ege Univ. Med. Sch. Association of Social Support. The Committee established the guidelines for counseling and defined the common roles of the counselors. Counselors were further prepared for social and personal counseling by the guidance of a Clinical Psychologist. It was made clear that they are not expected to solve the problems but provide independent & objective guidance and assistance to students for proper solutions. Data on counselor-student contact frequency and content was obtained from a questionnaire applied to counselors. Social adaptation of students were evaluated according to data from "Personal Acceptance Form" (PAF) in which students self-rated how good they were in social life and well-being. Databases of participants (admission scores data; 3 in-term quiz grades; end-block final exam grades; PAF scores) were used to evaluate the impact of the new system.

RESULTS:
Students who received counseling had statistically insignificant but higher in-term quiz (74,7±12,6 vs 72,5±13,3, 57,1±12,8 vs. 56,2±13,4, 61,4±14,8 vs. 59,8±13,3) and end block final exam grades (53,9±12,7 vs 52,9±11,9) compared to students without counselors. This difference was best observed in the 1st quiz applied in the 4th week of the semester. PAF scores are currently being analyzed in detail and will be presented at the meeting.

CONCLUSIONS:
Although a statistically significant relationship between academic performance and counseling was not found, first year medical students benefitted from counseling in their overall social adaptation.

TBL/PBL

Flashcards and Clickers in TBL – Is The Nature of the Feedback Tool Related to Student Satisfaction?

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PURPOSE
In Team Based Learning (TBL), learning groups simultaneously respond to identical questions. In early TBL classrooms, groups indicated answer choices by raising large color-coded flash cards. More recently, electronic response systems (clickers) were introduced. This study asks: are students' attitudes towards team-based learning associated with response medium type (i.e. flashcard or clicker)?

METHODS
From 2004 - 2008, TBL was used in a core Veterinary Clinical Pathology course. Flash cards were used in 2004, infrared clickers in 2005 and 2006, and radio frequency clickers in 2007 and 2008. Following each course, students completed a questionnaire (five point satisfaction scale) regarding (a) the effectiveness of flashcard OR clicker use (depending on which was used), and (b) the effectiveness of TBL activities.

RESULTS
Overall, 522 students (approximately 100 per year) responded. Differences in satisfaction across years were analyzed using an ANOVA. There was no statistically significant difference across years in students' satisfaction with TBL activities. Satisfaction with flashcard/clicker use differed across years, with students being significantly more satisfied in 2006, 2007, and 2008 than 2004; 2005 satisfaction did not differ significantly from other years.

CONCLUSION
Because satisfaction with TBL activities was stable across years, this study provides no evidence that simultaneous report mechanism is related to overall satisfaction with TBL. The finding that significant differences in satisfaction with flashcard/clicker use did not coincide with changes in the medium suggests that the instructor's growing facility in managing TBL affected the change in attitude more than did the difference in response medium.

TBL/PBL

PBL FROM THE LEARNER'S PERSPECTIVE

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Canada

PURPOSE
Much has been written about the theory behind, and the methodology associated with, PBL in which it has been described as a 'learner centered' educational method. This begs the question as to how the learner perceives this educational approach. This study was designed to probe the learner's perspective on PBL

METHOD
A 31 item survey probing their beliefs about PBL was delivered to an incoming medical class: (i) before any orientation to PBL; (ii) after an orientation session on PBL; (iii) after their first 5 week PBL block; (iv) after 3 PBL blocks; and, (v) at the end of their first year of (7) PBL blocks. The survey probed their beliefs about: a) the tutorial process, including the role of the tutor; b) teamwork; c) group dynamics; and d) the advantages of PBL.

RESULTS
The students were in agreement with many of the 31 statements made about PBL however, they disagreed amongst themselves about: the role of the tutor in the group process, including whether the tutor should hold back on their professional knowledge; whether students should speak for an equal amount of time; whether group dynamic problems should be solved by the whole group or, separately, by the individuals involved; and, whether PBL was an advantageous learning methodology for the acquisition and organisation of knowledge.

CONCLUSIONS/ FUTURE DIRECTIONS
The students have identified a number of issues associated with the PBL methodology with which they struggle. Focus groups designed to probe these issues is the next step.

TBL/PBL

CLINICIANS VS. BASIC SCIENTISTS: TEACHING PERSPECTIVES OF PROBLEM-BASED LEARNING TUTORS
Award Nominee

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PURPOSE
Problem-Based Learning (PBL) tutors facilitate student learning by encouraging development of higher order thinking skills and monitoring group dynamics, but without directly transferring knowledge. However, the beliefs and intentions that influence and justify tutors' behaviours are poorly understood. This study contrasts expert tutor clinicians against those with basic science backgrounds to investigate their own "teaching perspectives" and views about the most effective approaches to PBL tutoring in the first two years of the medical curriculum.

METHODS
Participants were sixteen clinicians and nineteen basic scientists; all experienced and identified as superior facilitators. Each (a) ranked summary descriptions of the five teaching perspectives in order of decreasing effectiveness as PBL tutoring strategies, then (b) completed their own on-line Teaching Perspectives Inventory (TPI) surveys.

RESULTS
Tutors consistently ranked the Developmental perspective description as the most congruent with the PBL approach, followed by Nurturing, Apprenticeship, Transmission and Social Reform. Clinicians ranked Nurturing and Apprenticeship higher than basic scientists (Mann-Whitney U, 0.047 and 0.028, respectively). Their TPI profiles confirmed the Developmental perspective as most dominant among most participants. Clinicians, however, were significantly higher in Apprenticeship ($t=2.90$, $p<0.008$).

CONCLUSION
Our results confirm the Developmental perspective – firmly rooted in the constructivist philosophy – as overwhelmingly dominant among experienced and highly regarded PBL tutors, whether clinicians or basic scientists. A comprehensive outline of the results, their potential contributions to the ongoing debate regarding the impact of professional background on tutor expertise and their implications for tutor training constitute the take-away sheets for this poster session.

VALUE OF TEAMS FOR FIRST TIME TBL STUDENTS IN JAPAN

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PURPOSE
In 2008, a class of 115 medical and biomedical science majors in their second year of study began taking scientific English classes at Kyushu University. The program posed problems for language learning because of the high teacher/student ratio. In foreign language classes 20 students or less is recommended for optimal learning (Johnson, 2001). Team Based Learning (TBL) was implemented to provide a better language learning environment. The course was taught following Michaelsen's (2002) principles of TBL with students divided into 19 teams. This study investigated whether Japanese students who have primarily been taught using didactic methods find working in teams valuable enough to warrant continued use of TBL.

METHODS
A "value of teams" questionnaire, as shown on the poster, was used to survey 105 second year students upon completion of the course. Responses were made on a scale of 1-5 from strongly disagree to strongly agree. Four of the 13 items measured student perceived value of working with peers (WP), and 5 items measured perceived value of group work (VGW). An additional 4 items were distractors.

RESULTS
Students valued working with peers very highly with an average 72 students (N = 105) responding to the WP items positively. An average 25 students responded "neither agree nor disagree" and an average 7 students responded negatively on WP items. Group work was valued less with an average 60 students responding positively to VGW items. An average 35 students responded "neither agree nor disagree" and an average 8 students responded negatively to the VGW items. Learning outcomes and student course evaluation results will be discussed in the presentation.

CONCLUSIONS
Although students highly valued working with their peers, there was less value placed on group work. The results support the further use of TBL as a teaching strategy with over half of the students showing that they value both WP and VGW. Improvement of group assignments and instruction on the value of groups will be undertaken to increase the effectiveness of TBL. Extrapolating TBL to other physical skills will be encouraged for faculty and curriculum development.

TBL/PBL

PLEASING SOME OF THE PEOPLE, ALL OF THE TIME... EXPERIENCES WITH TBL

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PURPOSE
With class sizes of > 400 students, the Medical Microbiology "small group" sessions were no longer meeting our educational goals and had become highly time and faculty intensive. The partial integration of Team Based Learning was therefore explored and subsequently initiated. The goal of this poster is to present our main observations from the first year of implementation and to discuss the challenges encountered, therefore providing useful information for faculty considering implementing TBL.

METHODS
A series of pre-reading assignments were assigned via a Course Management system. These were followed by individual (Scantron based) and team readiness assessment tests (IF-AT forms) at the start of each two week module. The remainder of the first and remainder of the second week consisted of team-based activities. With some modifications, this basic structure was followed for both the Spring (400 students) and Fall terms of 2008 (480 students).

RESULTS
The full format of the sessions, samples of the tests and assignments, etc., will be provided. This will be accompanied by a discussion of the specific challenges encountered, such as faculty preparation time, and the associated student impressions: enthusiasm and "buy-in" to the TBL format, perception of pre-reading assignments and exercises as valuable, etc.

CONCLUSIONS/ FUTURE DIRECTIONS
The initiation of a new teaching methodology, especially when it is unfamiliar, brings various challenges and problems. One of the biggest problems we encountered was the overall student attitudes with regard to aspects of the TBL set-up. Details are provided as to either how these attitudes were resolved or how they could have been prevented from occurring.

TBL/PBL

USE OF LEARNING ISSUES AS STUDY RESOURCES AND EFFECT ON STUDENT PERFORMANCES: IN TBL ANATOMY COURSE

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PURPOSE
In medical education, in addition to changing pedagogy, a variety of teaching strategies now serve to promote active learning. In teaching anatomy to first year medical students, we have implemented a modified Team-Based learning (TBL) strategy, that included replacement of lectures with learning issues and quizzes as self guided study resources. TBL allowed us to maintain an enriched course content that promoted active learning.

METHODS
A total of 170-195 students were divided into teams of 5 to 8. For weekly discussion, students received a series of learning issues derived from textbooks of basic anatomy, embryology and clinical correlations. In order to assure that each student completed the assigned out of class preparation, weekly sessions started with an ungraded quiz, which also served to monitor individual student progress.

RESULTS
We measured student scores in the departmental tests and a final NBME subject examination. As seen, students in the TBL curriculum performed better than students in the traditional curriculum. These changes are statistically significant ($p<0.01$).

CONCLUSIONS/ FUTURE DIRECTIONS
The several positive attributes of TBL aided successful management of the anatomy curriculum and improved students' performances. TBL is being introduced in other courses, and this will allow us to assess the long-term influence of team learning in future professional behavior of our graduates.

TECHNOLOGY AND EDUCATION

USE OF TECHNOLOGY TO ENHANCE SMALL GROUP LEARNING
Award Nominee

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PURPOSE
Many medical schools use facilitator-led small group analysis of clinical cases in the first two years of their curriculum. The major disadvantages are the large number of faculty required and the disparity of experiences between groups. To address these disadvantages, we are using technology to run 16 groups simultaneously with a small number of facilitators.

METHODS
Two-way audio and video communication is established between the facilitators and the small group rooms. Facilitators include a process expert and one or more content experts. Additional facilitators can include a "patient" and on-call specialists such as a clinical pharmacist. Each group takes a turn asking a question of the patient to elicit a history. TurningPoint and discussions between the groups are used to identify needed tests. If students lack a skill (e.g. reading a chest X-ray), either a content expert can address that point, or a recorded segment of a previous lecture can be played for the groups. MCQ's and between-group discussions are used to arrive at a diagnosis and decide on treatment options.

RESULTS
The use of technology has allowed us to run many more case studies than would be possible if a faculty facilitator was required for each small group. Students and faculty like that this process encourages discussion between groups and that the experience is uniform between groups.

CONCLUSIONS
The benefits of this technology are (1) more efficient use of faculty time and expertise, (2) the ability to simulate doctor-patient interactions in history-taking and (3) the ability to stimulate discussions both within and between groups.

TECHNOLOGY AND EDUCATION

USE AND BENEFITS OF LECTURE RECORDINGS IN MEDICAL EDUCATION

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PURPOSE
Medical schools provide many educational resources in their basic science curriculum, including slide-based lecture, handouts, study guides/questions, reviews, textbooks, primary literature, and web-based links. We recently instituted a web-based lecture recording system, which synchronizes lecture audio with visual components, as opposed to previous audio-only recordings. This study sought to determine how this recording system was being used by students, whether its availability impacted class attendance, and whether this resource had a positive effect on student performance.

METHODS
First and second-year medical students were surveyed regarding class attendance and use of lecture recordings. In addition, students indicated their impression of how lecture recordings influenced exam performance. Student perception was compared with actual exam results.

RESULTS
Of the 227 students who completed the survey, 75% (N = 169) utilized the lecture recording system. Of the 169 students using the resource, 13% (N = 22) mentioned a decline in lecture attendance, indicating a large majority used recordings to reinforce lecture presented material. Despite how it was used, 91% (N= 153) felt this resource improved exam performance. Actual performance from six basic science courses is discussed in detail with respect to utilization of lecture and/or recording resources.

CONCLUSION/ FUTURE DIRECTIONS
First- and second-year medical students overwhelming responded in favor of audiovisual-synchronized recordings. While the empirical benefit varied from course to course, the overall use of synchronized recording clearly benefits competency learning in medical education across a broad range of basic science topics.

TECHNOLOGY AND EDUCATION

INTERACTIVE EXERCISES AND REVIEW QUESTIONS AS PART OF A NEUROSCIENCE WEBSITE FOR MEDICAL STUDENTS

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PURPOSE
A website containing neuroanatomy review and neuropathology content was created for Year 2 medical students taking a neuroscience system course. The purpose of the current innovation was to develop a variety of interactive practice exercises related to this content for students to practice recall and application of concepts.

METHODS
A website template was developed that could be used online or downloaded. Navigation was designed to be flexible with maximal user control. Content from a previous CD-ROM version was updated and additional images were provided. New interactive practice opportunities were created. These included multiple choice questions with explanations, open-ended clinical-pathological correlation questions with explanations, and case studies to help students practice localization of lesions. In fall 2008, the website was recommended in the Year 2 neuroscience system course. Feedback comments from students were requested through the anonymous online course evaluation system and a focus group was held.

RESULTS
Written comments by students indicated that the website was an excellent, easy to use resource to assist in learning the material in a PBL curriculum. Specific features that were mentioned as beneficial included case studies, practice questions, and "games" for review purposes. Suggestions for further development included more images, diagrams, and interactive practice options.

CONCLUSION/FUTURE DIRECTIONS
Student feedback has indicated that the website with practice exercises is an extremely useful educational resource. Further studies will be designed to investigate student preferences for types of interactive exercises and the effectiveness of specific features.

TECHNOLOGY AND EDUCATION

USE OF PATIENT INTERVIEWS ON VIDEO IN PRECLINICAL LECTURES
e-Demo

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PURPOSE
One of the courses in the third year of the preclinical medical curriculum in Leiden is a 3 weeks' block titled "Common complaints". It deals with complaints that are frequently seen in the practice of the Family Practitioner such as headache, diarrhea and acute cough. Until 2008 these complaints were presented to the students by written case histories.

METHODS
Last year we introduced video interviews taped in general practices. In class, the students had to judge the communication between patient and doctor as well as the process of medical problem solving during the patient contact. Students could access the tapes afterwards as they were made available in digital format through the Blackboard learning environment. We measured how many students of the group used the tapes afterwards and how often the several consults were used. At the end of the course a questionnaire about appreciation of this educational tool was presented to the students.

RESULTS
About 250 students followed the course. Between 60 and 70% of these students used Blackboard to access the interviews. Most of the video interviews were seen between 1000 and 2000 times each. Most students were satisfied about the use of the video tapes and considered this way of education to be a useful tool.

CONCLUSION
Using video consults seems to be a useful tool in the preclinical curriculum to demonstrate communication and problem solving issues.

TECHNOLOGY AND EDUCATION

INFUSION PUMP SYSTEM: LICENSE TO CARE

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PURPOSE
The purpose of this e-learning is to train healthcare professionals, so they can act according to safety regulations while using this specific infusion pump system. The operation of the infusion pump system in the e-learning is an exact copy of the real pump. The construction (explanation, practice and assessment) and interaction-possibilities of the e-learning provides learning in a realistic and safe way.

METHODS
This training consists of 2 parts, a basic and an expert module. Both modules are completed with an assessment. The basic module contains clear instructions for preparation and basic use of the infusion pump system. The expert module is based on common practical situations and specific situations where the safety of the patient is at risk. The modules include instruction, practice and feedback. All functions of the infusion pump are programmed for interactive purpose. When the healthcare professional has passed the assessments he/she receives an official certificate. Only then they are licensed to care.

RESULTS
This e-learning module has just been finished. All healthcare professionals of the hospital can be participate in this e-learning. It will be available in the summer of 2009. We will evaluate the training by analyzing the results of the assessments and interview a selection of the participants. The evaluation results will be used to improve the e-learning module.

CONCLUSION/ FUTURE DIRECTIONS
The development of this e-learning module has been commissioned by the section Medical Technology & Clinical Physics. This section has the responsibility for all medical equipment in the hospital. Their ambition is to train and assess all users of medical equipment as part of patient safe care. This training and assessment of the infusion pump system is the first e-learning module commissioned by this section. In the future more e-learning modules will be developed for the safe use of medical equipment. The evaluation results of the infusion pump system will be used to improve the educational quality of the e-learning in the future.

TECHNOLOGY AND EDUCATION

ENHANCING ETHNOGERIATRIC TRAINING IN MEDICAL EDUCATION USING THE AUDIENCE RESPONSE SYSTEM

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PURPOSE
Assess ethnogeriatrics changes in knowledge and attitude using the Audience Response System (ARS).

METHODS
A one group, pre-post design was used: 176 UAB first year medical students were given ARS questions before and after their lecture on "Dementia" and "Cultural Competent Health Care" to assess their knowledge regarding cultural diversity within the U.S. population and cultural differences in attitudes at the end-of-life.

RESULTS
Participants were mostly Caucasian males. At baseline, in the class of 2012, 89.8% of the students knew that ethnic minority patients are expected to comprise 50% of the U.S. population by the year 2050 compare to 96.6% of the students after the intervention. At baseline, 72.1% of these students felt you should always inform the patient of his/her terminal illness, while 97.1% of the students after the intervention, recognized that some cultures protect patients by avoiding discussions related to death. At baseline, in the class of 2011, 80.1% of the students thought that African-Americans (AA) and White Americans have the same beliefs in end-of-life care, while 98.3% of the students after the intervention, recognized more aggressive treatment preferences of most AA. Overall, the students felt that the ARS was easy to use and improved their attention and understanding of lectures.

CONCLUSIONS
This study demonstrates that the immediate feedback obtained from technology-based ethnogeriatrics training enhances students' attention and allows the lecturer to monitor students' understanding of how health beliefs may affect patient care now and in the future and reinforce key concepts that may not be clear.

TECHNOLOGY AND EDUCATION

CORRELATION OF THE SUMMARY METHOD WITH THE LEARNING STYLES: A SURVEY FOR ANATOMY TEACHING

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PURPOSE
Summary is the last part but one of the important parts of the lesson. We aimed to study the relationship between preference of the summary method (video demonstration, question-answer, brief review of slides) and learning styles.

METHODS
A total number of 131 students were included to the present study. Kolb's learning style inventory was used to understand the students' learning style and a questionnaire for summary method selection. The questionnaire and inventory were collected and analyzed. Students' scores and numbers were noted according to their learning style. The given scores (1 /2/3 as low and 4/5 as high) were arranged according to students learning styles. Therefore, students with the same learning style were also categorized according to their low and high scores. Every summary method was analyzed according to each learning style.

RESULTS
Comparison of the data revealed that summary method with video demonstration received the highest score among the other methods Additionally, statistical analysis of the numbers of the students (in each learning style) who scored the video demonstration as high score revealed that students in each learning style were significantly scored the video demonstration with the high score comparing with the low score. Therefore, summarization of the lesson by video demonstration was found to be the most accepted or preferred summary method in the anatomy lessons.

CONCLUSIONS
We suggest that such summary method should be incorporated into anatomy lessons. Since anatomy has a large number of visual materials, we think that it is the right lesson to use this summary method.

TECHNOLOGY AND EDUCATION

HEART: FORM AND FUNCTION - ANIMATION IN 3D
Award Nominee
e-Demo

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PURPOSE
This presentation will consist of a series of animations of a heart model created in 3D to show structures such as myocardial fiber arrangements, valvular apparatus, in motion. This demonstration will allow attendees to view and interact with the animation that was developed to teach heart structure and function.

METHODS
The initial model was created using Autodesk's Maya Modeling tool. Once the model was created, different motion of the heart, valves, and conduction system was constructed and the animation created. The animation was then rendered out as a video file. For the animation with audio, voice talent was recorded and the audio was combined with the video. Adobe Flash was used to create the interface and the videos inserted.

RESULTS
The animation was used during web-based instruction and also in classroom settings during lecture.

CONCLUSIONS/ FUTURE DIRECTIONS
The animations showed in this DEMO will be part of a CD ROM or DVD and will be available to healthcare professional educators

TECHNOLOGY AND EDUCATION

A WOMAN'S WORLD: DISCOVERING THE DYNAMIC MENSTRUAL CYCLE
e-Demo

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PURPOSE
Previously, the primary means of teaching the concept of menstrual cycle has been printed word or static visual aid. With the advent of web-based teaching, the task of the teacher is to present the same material in a more dynamic format that will appeal to all types of learners. This demonstration will allow attendees to view and interact with a learning module developed to teach students and patients about the menstrual cycle.

METHODS
The menstrual cycle learning module was developed using Adobe Flash® technology, including animations, text and narration of the text by a professional voice-over artist. . Students and patients were divided in three distinct groups and exposed to the animation module, Powerpoint, and to text only respectively. Students and patients were provided with a pre-test and post test survey prior and after the use of the module respectively.

RESULTS
The use of this computer-based learning module for students and patient education has proven effective in a variety of educational settings such as classroom and web-based instruction. The comparison of the three modalities studied (Module, PowerPoint and Text) show no statistical difference among the groups. A post-module survey provided to students and patients described the use of the module as a good learning experience in particular the review of the dynamic process by the use of the animations.

CONCLUSIONS/ FUTURE DIRECTIONS
We intend to expand the use of the module to a wide range of patient care areas and also to a diverse population of students.

TECHNOLOGY AND EDUCATION

VIRTUAL MICROSCOPY WITH BLACKBOARD AN APPROACH TO UNDERGRADUATE HISTOLOGY INSTRUCTION
Award Nominee

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PURPOSE
Teaching histology using conventional microscopes in formal labs is becoming more difficult as instructional hours are becoming scarce and today's students are more comfortable with a laptop than a microscope. In this context, virtual microscopy (VM) provides some possible solutions. We are introducing VM exercises into the histology component of a basic science first year course where we have 114 medical and dental students with 26 hours of instructor contact time.

METHOD
This electronic demo will show how we have integrated Aperio's CS scanned slides into the histology component of a Blackboard first year medical/dental basic science course.

RESULTS
VM allows computer-savvy, microscope-phobic students to interact with histological material. This material can be presented as instructions, activities, games or self tests. Student responses to this approach in the form of survey results and written comments will be presented.

CONCLUSIONS/FUTURE DIRECTIONS
Virtual microscopy facilitates student interaction with histological material using computers. We will be presenting examples of our approach.

TECHNOLOGY AND EDUCATION

IF WE PRESENT IT, WILL THEY COME? AN INNOVATIVE APPROACH TO SELF-DIRECTED HISTOLOGY INSTRUCTION
Award Nominee

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PURPOSE
We have recently integrated histology into a first year medical/dental basic science course. Knowing that our students have little time and moderate microscopy skills, we replaced conventional labs with a study room designed to facilitate active learning in an atmosphere that encourages students to move from dependant to self-directed learning. Because we are in the process of adding a virtual microscopy (VM) component to our course, we wanted to evaluate student use of this room.

METHODS
A variety of resources are provided: microscopes with glass slides and accompanying labeled images, histology workbooks with pictures and descriptions of the glass slides, supplementary illustrations, models, textbooks, research papers on related topics, and self tests. During the first 2 weeks of the course instructors are freely available. After this introductory phase, instructors are present rarely; students are expected to work independently or with other students. Students were surveyed both informally and formally.

RESULTS
Informal and formal surveys have been positive. Students used the room for most or all the modules and used most of the types of resources. The room became a pleasant room to interact with classmates. Self-directed and collaborative learning was observed.

CONCLUSION/ FUTURE DIRECTIONS
The study room provided a surprisingly positive active learning environment. Results from formal surveys will be presented and used to refine the design and use of this study room as we incorporate VM.

TECHNOLOGY AND EDUCATION

YOODA – A FREE LICENSED DATABASE PROGRAM FOR SEARCHING ALL HISTOLOGICAL AND ANATOMICAL NO.

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PURPOSE
The recent revisions of histological and anatomical nomenclatures, approved by International Federation of Associations of Anatomists (IFAA), were published by the Federative International Committee on Anatomical Terminology (FICAT) in 2007 as Terminologia Histologica (TH) and by the Federative Committee on Anatomical Terminology (FCAT) in 1998 as Terminologia Anatomica (TA), respectively. But any program or other electronic tool, comparing older versions and these latest revisions of the histological and anatomical nomenclatures, is overall missing.

METHODS:
We have created a free-licensed program YOODA for this purpose, working with various databases. Histological and anatomical terms of older versions of both nomenclatures, ranging from BNA (Basiliensia Nomina Anatomica), issued in 1895 to the last edition (6th Ed. of Nomina Anatomica and Nomina Histologica in 1989) and listed according to TA and TH, were entered in the database.

RESULTS
The database includes the unique identification number, the official Latin term, most frequent English synonyms and terms of the older nomenclatures. Moreover, as produced in the Czech Republic, it is completed with Czech terms as well. Totally, it includes 10 versions of the nomenclatures in three languages, extended with the most common eponyms, which have not been incorporated in the official versions of the nomenclatures. The program possesses a searching tool, too. It is accessible and can be freely downloaded from the website: http://www.anatomickenazvoslovi.cz/

CONCLUSION/ FUTURE DIRECTION
YOODA has been intended for purposes of teachers, students, scientists, reviewers and translators. Next step of our project is to enter synonyms in other languages of the EU nations, following their national official nomenclatures, if exist.

TECHNOLOGY AND EDUCATION

THE USE OF EBOOK READERS IN UNDERGRADUATE MEDICAL EDUCATION
Award Nominee
e-Demo

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PURPOSE
Reading text from a computer screen for a longer period of time is not very pleasant. The technology behind a CRT tube or a TFT screen generates a flickering image and emits light, which causes effects like exhausted eyes and headache. To solve these problems E-book readers have been developed using an innovative screen technology called E-ink. With this technique the displayed text does not flicker and looks very much like real paper. E-book readers recently became available in the consumer electronics segment. In a pilot study we investigated the usefulness of this new technique for medical education, as a replacement of books and syllabi.

METHODS
From October until December 2008 we provided 15 students with an E-book reader. For this study we delivered all necessary text files on the reader, ranging from syllabi to chapters from commercial books used in our curriculum. For obtaining the latter documents we cooperated with several publishing companies. Students were invited to use the device in all their educational activities. At the end of the study, students were asked by questionnaire to report back their experiences. We did include technical performance but also usefulness of the device in the educational process.

RESULTS
Students encountered several small technical issues, but in general they managed quite well to work with the device. They were very positive on the device when using it for reading in situations where books are not available, like in public transportation or in between lectures at the coffee bar. However, they were not enthusiastic on using it at home while studying for exams. It turns out that for studying students like to use multiple sources at the same moment, which can more easily be facilitated by paper books.

CONCLUSION
The E-book reader used still has some technical issues to be resolved, but in general the device performed quite well. Students liked working with digital documents and E-book readers for short reference and in places without books. In preparing exams however, they still preferred paper books.

TECHNOLOGY AND EDUCATION

PHARMWEB: CATCHING STUDENT INTEREST AND INCREASING KNOWLEDGE WITH INTERACTIVE ONLINE MODULES
Scholarship Winner

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PURPOSE
Problem Based Learning curricula pose unique challenges for pharmacology education. Students encounter pharmacology interspersed throughout the curriculum, causing students to overlook and deemphasize pharmacology learning opportunities.

METHODS
An online, supplemental pharmacology curriculum ("PharmWeb") was developed for first-year medical students to increase student knowledge and engagement. Eight online, self-paced modules were written collaboratively by faculty and students, and included a topic introduction, brief reading assignment, and self-assessment quiz.
Pre- and post-tests were used to assess pharmacology knowledge acquisition. Engagement was assessed via survey questions, number of module viewings, and quiz completions. Retrospective survey data was also collected from the preceding class as a comparison group.

RESULTS
Students showed statistically significant learning gains ($t[32]=6.12$, $p<.0001$) from pre- (mean: 4.0, SD=.77) to post-test (mean: 5.8, SD=1 .3). In addition to the 8 questions repeated from the pre-test, the post-test contained 5 new items to measure learning transfer; students did very well on these transfer items, with a mean of 4.0 (SD=.77) (80% correct).
Student engagement was also high: 84% visited the site at least once. Twenty percent (33 students) used the system regularly, completed the pre- and post-tests, completed at least 6/7 weekly quizzes, and visited the modules an average of 29.2 times.
Fifty-three students completed the survey, and the comparison group includes 83 retrospective survey responses. Feedback suggests students were satisfied with the modules.

CONCLUSIONS/FUTURE DIRECTIONS
The inclusion of brief, supplementary, introductory, online modules in pharmacology can lead to improved learning and student engagement. Results will also be compared to retrospective data from the previous year's class, who did not have access to PharmWeb.

TECHNOLOGY AND EDUCATION

CLINICAL SIMULATIONS AS PART OF FIRST YEAR MEDICAL PHYSIOLOGY EDUCATION

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PURPOSE
While human patient simulators (HPS) are increasingly used to teach clinical skills in a risk-free environment, they are infrequently incorporated into the teaching of the basic sciences in medical school. Here, we present two HPS experiences that integrate the teaching of physiology with the teaching of clinical, problem solving, and communication skills.

METHODS
For the last 4 years, the physiology course at IUSM-TH has included 5 sessions using a HPS (Medical Technologies Inc.), and 2 of these are presented. The first session simulates juvenile diabetes, and combines the practice of history and physical taking skills with the physiology of hyperglycemia and ketoacidosis. It is followed by a scenario that exposes students to an elderly person with hypoglycemic symptoms. The second session starts with a trauma patient in an ambulance and focuses on the acquisition of ER skills. It is followed by a hospital scenario and concentrates on understanding the physiological changes related to blood loss. Furthermore, students role-play a follow-up visit of the patient with his primary care physician, with the objective to discuss long-term care and to practice communication skills. All simulation activities are debriefed by basic scientists and medical specialists.

RESULTS
Thorough preparation of the handout material, the in-class activities, and the wrap-up sessions are time consuming, but key for achieving the objective of teaching physiology in combination with clinical skills. Student evaluations are overwhelmingly positive, and student exam grades have improved.

CONCLUSION
Students showed a better understanding of physiological principles and also gained limited, but valuable experience in practicing clinical skills. Student satisfaction improved because of the enhanced learning. Increased effort is required on the part of the basic science and clinical faculty to create realistic clinical scenarios.