2nd International Conference
“Research in Medical Education”

25 – 27 May 2011
University of Tübingen · Faculty of Medicine

A Conference in Celebration of the Ten-Year Anniversary of the Competence Centre for University Teaching in Medicine Baden-Württemberg

SHAPING DIAMONDS
FROM BENCH TO BEDSIDE

ABSTRACTS
Teaching with virtual patients

Moderated Workshop „Train The Trainer”
14:00-15:30, Room 104, LLG1, May 26th

Free trial-access at PC terminals all day
8:30-17:00, Room 104, LLG1, May 26th

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Editor: Dr. med. Maria Lammerding-Köppel, MME
Competence Centre for University Teaching in Medicine Baden-Württemberg

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**Australia:**  
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**Austria:**  
Lischka, Martin, Medical University of Vienna  

**Germany:**  
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Dieter, Peter, University of Dresden  
Fischer, Martin, Witten/Herdecke University  
Schäfer, Thorsten, University of Bochum  
Weyrich, Peter, University of Tuebingen  

**Switzerland:**  
Bonvin, Raphaël, University of Lausanne  
Stadelmann, Barbara, University of Bern  
Woermann, Ulrich, University of Bern  

**USA:**  
Taylor, Julie, Brown University, Providence  
Tekian, Ara, University of Illinois, Chicago
Welcome from the Faculty of Medicine

Dear Colleagues,

Research in medical education has made decisive advances over the past decade. As a result, forms of teaching have been adapted in response to research findings about how we learn, exams have been adjusted to the needs of physicians, and curricula are continually being reformed and rethought in the context of rapid advances in medical knowledge. Studies evaluating educational interventions have played a central role in this process. Long-term outcomes of medical education, however, have not been studied extensively. How is theoretical knowledge put into practice, and how can the transfer be fostered in the educational process? These questions apply to all levels of medical education and everyday clinical work. The 2nd International Conference on Research in Medical Education focuses on this transfer from lecture halls, labs, and books into clinical practice at all levels of medical expertise.

At the same time, the conference also marks the 10th anniversary of the foundation of the Competence Centre for University Teaching in Medicine Baden-Württemberg. In its first decade, the Competence Centre has paved the way for the integration of teaching qualifications in the academic career. It has designed and provided a curriculum for the systematic training of academic teachers, later widening its scope to include conference skills and career development for young researchers and students nationally and internationally. Initiating and conducting research in medical education has been another integral part of our efforts. We invite you to celebrate with us at this conference on advances in research in medical education.

It is with great pleasure that we welcome you to Tuebingen.

Prof. Dr. I. Autenrieth
Dean
Faculty of Medicine
University of Tuebingen

Prof. Dr. S. Zipfel
Dean of Medical Education
Faculty of Medicine
University of Tuebingen

Dr. M. Lammerding-Köppel, MME
Director
Competence Centre for University Teaching in Medicine BW
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1. Teaching and Assessment (1)

I-1.1 Improving Communication Skills for Medical Students – Peer and Video-Reviewed “Patient” Interviews for Gynaecologic and Obstetrical Patients

Becker, Sven; Kagan, Oliver; Abele, Harald (University of Tübingen Medical School, Obstetrics and Gynecology, Tübingen)

Objective: Weekly structured seminars are a key element of German Medical Education (Wochenpraktikum). Because of large student groups and increasing patient sensitivity, providing meaningful “practical” experience has become difficult. Our goal was to explore, how a new concept of Tutor guided mock-patient interviews on specific, prepared subjects with medical students assuming the parts of “doctor” and “patient” could be implemented. Key element was immediate evaluation by peer-discussion and video review of the interviews. Goal of the new approach was to incorporate “fact-learning” with training of communication skills in a practical setting.

Methods: 10-12 medical students participating in the OB/GYN-Weekly seminar were divided into groups of two (dyad). Each dyad was given a typical subject pertaining to doctor-patient communication (e.g. “Giving diagnosis of miscarriage”, “Discussing diagnosis of chlamydial infection”). Four days were given to acquire competence in the subject matter. On the final day of the seminar, the dyads were given 5-10 minutes to improvise a “typical” doctor patient interaction. The interview was watched by the other members of the group and video recorded.

Results: During the course of the regular semester, more than 150 medical students participate in the weekly OB/GYN seminar (10-12/week). Theoretical concepts of improved teaching often fail when tested in a routine environment and confronted with large numbers of participants. A total of 24 students participated in this feasibility project. Student acceptance of the new approach was high. Interviews lasted 5-8 minutes, giving enough time for video review (10 minutes) and discussion (5-10 minutes). Post-seminar questionnaires indicated high satisfaction and self-perceived learning experiences both in the “doctor” and in the “patient” group. High points were also given for the fact-learning and practical aspect of this approach. Logistic requirements are acceptable (1 room, 1 tutor, 1 camera and display system) as is the overall time requirement (3-4 hours).

Pre- and post-interventional questionnaires revealed that students had experienced on average no more than 2-3 similar structured interviews. In almost 100% of cases, the offered experience was felt to fit in well into the week-long seminar. Both the patient- and physician roles were felt to benefit from the session. Opinion was divided as to whether video-recordings increased the learning-effect.

Discussion: Important physician skills can be taught in a practical setting using recorded and reviewed mock-interviews. Large groups of students can be offered this highly active and interactive learning approach at reasonable cost of personal and logistic equipment. Role-playing is a highly efficient learning tool that needs to be used more often in medical education, particularly when communication skills are concerned. Particularly in sensitive areas, where direct patient-student interaction can be problematic, realistic clinical situations requiring both knowledge and “soft” interactive skills can be simulated. Incorporation of modern audiovideo-recordings allows for a high quality assessment and the unique possibility of self- and peer-review.

I-1.2 Phantom-Based Training of Ultrasound-Guided Intercostal Nerve Block and Stellate Ganglion Block

Blunk J, Bauer K, Benrath J (Universitätsmedizin Mannheim, Klinik für Anästhesiologie, Mannheim)

Objectives: Ultrasound-guided nerve blocks have become popular due to accuracy and especially due to patient safety [1]. However, acquiring proficiency in these techniques is not always easy. After observing ones peer, one is often thrown into the task with little or no assistance. Considering the skills that are necessary [2], improvement in training the procedure is of major interest to guarantee patient safety and high levels of success. Since there are only few teaching models [3], conceptually, these do not conform to the requirements of interventional pain therapy; we contrived two training phantoms that simulates bone contact with the needle, allowing a realistic training setting. These phantoms were integrated into a 1.5 hour curriculum to realistically train the student or physicians without “touching” the patient.

Methods: These phantoms were used in a teaching curriculum for medical students and physicians, based on an introduction via standardized power-point presentation. This was followed by a demonstration of the
anatomical structures, in vivo. A gel cushion was used to learn needle and ultrasound probe coordination, and simultaneously looking at the monitor (hand-hand-eye coordination). After a 5 minute training session with the gel cushion, the subjects performed 5 rounds of blocks within each phantom. The time needed to perform the nerve blocks was recorded. The first round was assisted by the trainer. Three groups of participants took part in the study according to their experience in using ultrasound techniques (group A: beginners, group B: diagnostic ultrasound, group D: "experts"). At the end of the training session the participants were asked to fill out an evaluation sheet. Statistics were done using one-way analysis of variance (ANOVA).

**Results:** The learning curves from the intercostal model over the 5 blocking sessions showed a significant difference for the first 3 sessions between group A, resp. B, and group D (beginners vs. experts). Group A and B differed only marginally. The training session using the stellate model showed significant differences between group A and D, at this point only during the first 2 sessions.

In comparison, due to “bone” contact as the end point for success, the stellate model was more straightforward. In this case the learning curves for group B and D were approximately equal. Again, by the end of the 5th session the beginners drew level with the “experts”.

**Conclusions:** The time achieved during the last 2 sessions was only slightly slower in the non-proficient group, indicating rapid learning, and a distinct increase of proficiency for all three groups. Even the physicians with the highest proficiency with interventional techniques needed adjustment time to learn the technique. Besides being faster in achieving the end point during the first round, in all, non-proficient students as well as experts reached similar end points after the 5th round. This indicates the great importance of a sophisticated teaching curriculum before the actual interventional technique is carried out in the patient.

This phantom based training is well accepted by both students and the more proficient physicians, and will be integrated in the modular based pain curriculum for students of the medical school of Mannheim, as well as in skill labs for physicians. In the future, new phantoms for other interventional therapies will be developed and evaluated accordingly.


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**I-1.3 Dr. House Revisited – Clinical Cases in Basic Science**

Boeckers A, Fassnacht UK, Boeckers TM (Medical Faculty, Institute of Anatomy and Cell Biology, Ulm)

Since summer term 2007 the Institute of Anatomy and Cell Biology offers the optional interactive lecture “Dr. House revisited” to medical students in their 2nd year of premedical education.

We focus on three main learning objectives: First, we want to motivate our students to transfer their acquired knowledge into the presented clinical context, while pursuing critically the diagnostic and decision-making process shown in the presented Dr. House episode. Secondly, we want our students to rehearse their basic knowledge in anatomy in preparation of their oncoming M1 examination. Finally, we want to encourage our students to take over a professional role as a doctor. Therefore, we formulate hypotheses about a doctor’s professional behaviour – as it is mentioned in the hippocratic oath – and relate these to Dr. House’s behaviour.

In 10 weekly sessions we present 10 different Dr. House episodes. Each splitted into small sections which are interrupted by short input lectures. Students transfer their knowledge into clinical settings like the performance of a physical exam, identification of anatomical structures in X-rays or the interpretation of clinical symptoms.

We administer an interactive teaching concept which includes role plays and MC-questions, which have to be answered by the faculty’s tele-dialogue device (TED) as a formative assessment method to reflect the students’ individual proficiency level. A third (n=80) of the semester cohort attended „Dr House revisited” regularly and evaluated it as excellent.

In cooperation with our colleagues from the biochemistry and physiology department we are able to present “Dr House” in an interdisciplinary manner since last year.
I-1.4 Communication Skills Training Enhances Patient-Centeredness in Postgraduate Physicians: Results of a Randomized Control Trial

Juengler J1*, Buermann B1, Ringel N1, Riemann U1, Schultz JH1, Langewitz W1, Spang J1 (University Hospital of Heidelberg, General Internal Medicine and Psychosomatics, Heidelberg)

Satisfying medical communication improves the therapeutic relationship and enhances patient involvement, collaboration and satisfaction (e.g. Schmid Mast et al., 2007; Mallinger et al., 2005). Patient-centered behaviour has shown to be significantly and positively related to patient satisfaction (Venetis, et al., 2009; Zandbelt et al., 2007). Therefore improving patient-centered communication has become a main target of communication trainings in the medical setting. Patient-centeredness is operationalized by attentiveness towards patients’ psychosocial and physical needs, enabling the patients to utter concerns, creating a sense of partnership, and capacitate the patient to be involved in decision making (see Bensing, 2000; Mead, Bower & Hann, 2002). In this study we investigated the effectiveness of a time-limited communication skills training for practicing physicians with a focus on patient-centered communication.

40 physicians (20 f, 20 m; age M=33.6, SD=6.74) were randomized in an intervention and a waiting control group using professional and demographic characteristics as stratification variables. The intervention group participated in a 3-day communication skills training, featuring a ward round with simulated patients and nurses and individual coaching sessions. Consultations were videotaped at baseline and after the intervention to analyze communication skills using the Roter Interaction Analysis System (RIAS). Additionally self reports of perceived subjective competence were assessed.

RIAS analysis showed a significant improvement in the training group concerning patient-centered communication (M=65.81, SD=47.75 to M=71.33*, SD=29.19, p <.05). No significant effects were found regarding the amount of orienting utterances or psychosocial information. Self-competence was already very high at baseline in both groups (M= 7,8 SD= 0,99, 10 point likert scale, 1=do not agree at all, 10= do fully agree), which might explain why it did not increase further after the intervention.

A 3-day intervention for postgraduate physicians can significantly improve patient-centered communication. The study is registered in ISRCTN60811508.


I-1.5 Student Tutors Can Effectively Teach Basic Echocardiography – A Randomized Controlled Trial


Objective: Heart disease remains the leading cause of morbidity and mortality in the Western world and the population at risk is very large. A traditional physical exam has been shown to have low sensitivity in revealing relevant cardiac pathologies. Therefore, a different screening method is required in order to decide which patients should be referred to an expert echocardiographer.

Basic echocardiography performed by non-cardiologists with relatively little training increases sensitivity of the screening and is therefore a suitable supplemental test to history taking and physical examination. Ideally, this skill should be taught to all medical students. However, the training requires supervised hands-on experience and instruction in small groups, which presents a challenge since the number of expert echocardiographers and their time is limited. A feasible instruction model would be to teach the students basic echocardiographic skills using a practical approach with a subsequent echocardiography observership with an expert.

We thus investigated whether student tutors can teach these basic echocardiography skills effectively.
Methods: Student tutors received a fulltime three-week echocardiographical training and attended a twelve-hour didactic course. A total of 30 volunteer 4th and 5th year students without prior echocardiographical training were randomly assigned into two equally large groups. They participated in a ten-hour basic echocardiography course taught either by an expert cardiographer (EC) or by a student tutor (ST). Using a pre-post-design, the students were evaluated in an OSCE. The students had five minutes to take two photographs, in which they had to correctly mark twelve anatomical structures and to assess the function of the mitral valve. Two blinded expert cardiographers rated the students’ performance using a standardized checklist. Students could achieve a maximum of 25 points.

Results: Both groups showed significant improvement after the training (p < .0001). In the group taught by EC the average increased from 2.3 ± 3.4 to 17.1 ± 3.0 points, and in the group taught by ST from 2.7 ± 3.0 to 13.9 ± 2.7 points. However, the difference in improvement between the groups was also significant (p = .03).

Conclusions: Although the knowledge gain during a short introductory echocardiography course was greater when taught by expert cardiographers rather than student tutors, student tutors can also teach basic echocardiography skills effectively.

I-1.6 Can the Perception of a Lecture Be Improved by an Accompanying Seminar?

Dr. Ebinger, Martin; Dr. Busch, Andreas (University Children's Hospital, Department I, Tübingen)

Objective: In many university hospitals, teaching is based mainly on lectures held by senior staff members. By systematic evaluation (see methods section) all the different teaching courses of the University Children’s Hospital Tübingen were rated into the top quantile, only the mail lecture received average ratings by the students. While it is difficult to change this traditional structure or to improve the teaching style of single lecturers, we tried to enhance the perception of the main lecture by adding an accompanying seminar.

Methods: This seminar was planned to take up the content of the main lecture: The knowledge is repeated in a patient-oriented learning (POL) manner. The sandwich-like structure starts with the presentation of a case, the students work out cardinal symptoms and corresponding differential diagnoses, they propose a diagnostic work-up and a final diagnosis. The lecturer acts just as moderator without the intention of providing new knowledge.

The measurement of students’ perception is done by a systematic online evaluation (http://www.tuevalon.de/) generating a response rate of 50 to 80 % of the participants. The quality of a course is rated according to German school marks: 1 (very good) down to 6 (unsatisfying).

Results: The seminar started with the spring term 2007. While the rating of the seminary itself was excellent (marks from 1.4 to 1.7), the perception of the main lecture dropped at first from 1.9 (2007) to 2.5 (2008), then raising continuously to 1.6 (spring 2010).

Discussion and Conclusion: The different rating of main lecture and accompanying seminar shows that the students are capable to perceive both courses separately. So the improved grading of the mail lecture is not just a spill-over of the well accepted seminary. The initial drop in the rating of the mail lecture points in the same direction. Since there was no major change in the main lecture (same lecturers, same content) we assume that the effect of the improved grading is related a) to the perception of the students due to a better structure and clinical connection of the content, and b) to the lecturers, who are taking part in the seminary and therefore start to restructure their lecture in regard to patient-oriented learning and clinical relevance. We conclude that an accompanying seminar is helpful to improve the perception – and possibly the content – of a lecture in the setting of a university hospital.

I-1.7 Effect Quantification of Skills Training

Fichtner, Haupt, Karwath, Jatzwauk (University Hospital Halle, Department of Anesthesiology, Halle/Saale)

Background: Practical training of basic interdisciplinary skills has been proven to be of high value for medical students and Skills Labs are widely established in international Medical Faculties. However, it is not common practice to quantify the effect of a single teaching intervention in order to assess quality and the relations to the resources spent. We developed a new method to quantify the quality of surgical hand disinfection and used it to assess the effect of our 45-minute standardized training of operating room behavior and surgical scrubbing of our 3rd year medical students.
Method: The quality of scrubbing was assessed using an uv-light reflecting dye in the disinfection solution and a standardized graphic procession pathway to measure the insufficiently covered area of the four sides of both hands. The dye was not visible without uv-light and the students had not been informed on how the measurement was conducted. 161 medical students were randomly selected and evaluated either before or after a single training of a standardized surgical scrubbing method. Their experience of clinical scrubbing was also noted.

Results: The students before training showed an average insufficiently covered hand area of 7.33% and after the training 4.99%, p<0.001. Most benefit of the training showed students with average scrubbing experience of greater 10 but less than 50 times (delta 4.2%). Students with less experience (<10) did obviously improve less from the single training (delta 3.1%) and students with experience of more than 50 surgical scrubbings did not draw significant benefit from the training (delta 0.02%).

Conclusion: Our method is able to differentiate performance levels that are relatively small due to the simplicity of the clinical skill. Surgical hand scrubbing using a standardized method instead of individual care of full disinfection coverage is able to lower the skin area that is insufficiently covered. Our training is best for students with low to medium experience, but can be improved for the training of students with no experience.

I-1.8 Audience Response System: A Tool for Evaluation of Prior Knowledge with Immediate Adaptation of a Course?

Hennig, Harald; Steinmann, Daniel (University Medical Center Freiburg, Department of Anesthesia and Critical Care Medicine, Freiburg)

Background: Audience response systems (ARSs) are valuable tools for improvement of learning in didactic lectures, seminars and courses [1]. ARSs can help students to gauge their level of mastery and student presenters to better gauge their audience [2]. Furthermore, ARSs is useful to assess prior knowledge and demonstrate when learning occurred during a course [3]. We hypothesized that ARSs are suitable for evaluation of prior knowledge which could be used for immediate adaptation of a course.

Methods: 40 medical students who had attended the course cardiology within the course internal medicine prior to the study participated in a seminar about acute coronary syndrome within the course preclinical emergency medicine. Participants were randomly assigned into two groups. For evaluation of the prior knowledge four questions were developed:

(i) I’m able to describe the typical symptoms of an ACS;
(ii) I know the basis monitoring and feel save in interpreting a 12-channel ECG of an ACS;
(iii) I know the basis treatment of an ACS; and
(iv) I’m able to describe the necessary drugs and their dosage for an ACS.

Medical students in group A (control group) were asked the four questions prior to the seminar about possible gaps in their knowledge by the lecturer and the seminar was adapted according to the feedback. Medical students in group B (audience response group) were asked to use an audience response system (TurningPoint, Turning Technologies, Ohio, USA) to answer the four questions (5-point Likert scale: 1, strongly agree; 2, agree; 3, undecided; 4, disagree; and 5, strongly disagree). The results were immediately provided on the seminar screen. If less than 75% of the students answered a question with strongly agree or agree the seminar was adapted. Furthermore, a move in competency, the current motivation for the seminar and the overall quality of the seminar was evaluated.

Results: The motivation for the seminar was equal in both groups. In group A, only two students remarked the need for further information according to question (iv). In group B, ARS revealed the need for further information according to question (ii) and (iv). Furthermore, anonymous ARS analysis in group A showed similar results than in group B. Move in competency occurred regarding questions (iv) in group A and all four questions in group B. Group B evaluated the quality of the overall seminar better than group A.

Conclusions: Our preliminary study showed that ARS allows true detection of the level of prior knowledge. The ARS results are valuable for immediate adaptation of a course. Furthermore, using the ARS leads to a better move in competency in both self-assessment and post-course evaluation.

I-1.9  Acquisition of Factual Knowledge by Electronic Flashcards and Its Implications for Clinical Reasoning

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**Background:** Acquisition of factual knowledge is an essential part of medical education, but correct application of this knowledge to clinical cases makes the physician.

**Aim:** To investigate whether learning factual knowledge with flashcards directly promotes reasoning abilities and which other factors are associated with good performance in clinical reasoning tasks.

**Methods:** In a controlled laboratory setting 80 medical students were exposed to electronic flashcards containing specific factual knowledge (here: nephrology). Afterwards the retention of factual knowledge (factual knowledge test) and the performance in clinical reasoning tasks (key feature problems and problem solving tasks) were evaluated. Additionally a panel of factors which might influence clinical reasoning was inquired via questionnaire.

**Results:** Students performed well in the factual knowledge test but worse in the reasoning tasks. No correlation between factual knowledge and reasoning ability was observed whereas performance in key feature cases was significantly correlated with performance in problem solving tasks. Results in clinical reasoning were positively influenced by cognitive capacity, motivation, clinical experience and the intended career as clinician.

**Conclusions:** Learning with flashcards is a suitable way to acquire factual knowledge, but does not promote reasoning abilities. In contrast factors like motivation or clinical experience support clinical reasoning.


I-1.10  Suture Workshop in Porcine Skin: Teaching Students the Basics of Dermatologic Surgery

Jahn J, Mahler V, Bauerschmitz J (Hautklinik Erlangen, Operative Abteilung, Erlangen)

**Objectives:** Objective of our newly arranged suture workshop is to acquaint our students with basic surgery techniques. In doing so, our focus lies on teaching the most useful types of sutures [1, 2]. After participating in our propaedeutic suture class students should feel confident regarding small excisions with wound closure on patients in a physician monitored setting [3].

**Methods:** First, suture types are theoretically introduced in a short power point presentation. Then, we provide a hands-on setting for performing excisions and applying the sutures with flaps of porcine abdominal skin. The proceeding of the individual suture is elucidated step-by-step. Subsequently, the students have ample time to practice the sutures with support of an experienced dermatologic surgeon and student tutor.

**Results:** During the training, one can observe a profound increase of confidence among the students regarding the suturation. The suture class found great enthusiasm among the students regarding its practical approach and relevance for their future occupation. The feedback from our students was exclusively favourable. As the new teaching model has only been introduced term the results of the respective students’ online evaluation is still pending.

**Discussion/Conclusion:** Due to demographic aging in coincidence with lifestyle changes the number of UV-induced skin tumors is increasing [4, 5]. Therefore, it is fundamental to teach the next generation of medical students the basic techniques of dermatologic surgery. Early access to the field and practical exercises will help to tap the full potential of our students regarding surgical procedures.
I-1.11 Medical Students on the Cusp of Professional Life: Perception of Current Deficits in Pharmacology and Retrospective Suggestions for Improving Pharmacology Teaching

Johannsen, Wencke; Matthes, Jan; Koerfer, Armin; Herzig, Stefan (University Hospital of Cologne, Department of Pharmacology, Köln)

Background and objectives: A British study [1] shows that 30% of the foundation year 1 doctors rate their knowledge of clinical pharmacology as poor or worse and that many of the reported adverse drug reactions and drug interactions could have been avoidable with more extensive undergraduate training. Therefore the pharmacology subproject in the Cologne PJ-STArT-Block (preparatory week for the final year in semester 10, www.pjstartblock.uni-koeln.de) mainly intends to raise the students’ awareness of drug interactions, adverse drug reactions, drug dosing errors and drug therapy according to the guidelines. Aim of our study is to reveal the fields in which medical students feel to have or lack pharmacological knowledge and skills. Furthermore we aim to collect students’ suggestions for improvement of pharmacology teaching.

Methods: During the first two terms of the Cologne PJ-STArT-Block 35 semi-structured interviews were conducted dealing with the issues pharmacology teaching, suggestions for improvement, and students’ deficits. Frequently mentioned knowledge gaps and recommendations for improvement were operationalized and incorporated in a questionnaire to substantiate the qualitative results quantitatively. During the third term of the Cologne PJ-STArT-Block the questionnaire was answered by 113 fifth-year medical students.

Results: 54% of the interviewees stated to lack pharmacological knowledge “in a wide range”. Being asked to be more specific, 46% of the medical students named “drug interactions”, 26% “antibiotics”, 23% “trade names and/or names of active substances” and “drug dosing”, 17% “adverse drug reactions” and 11% “indications for drugs”.

40% of the students requested pharmacological considerations to be emphasized in other clinical disciplines. 26% claimed too rare occasions for recapitulating previously gathered knowledge. 23% recommended more case examples during pharmacology lectures to develop a praxis-oriented focus.

Questionnaire results showed a consent to the given fields of deficits (5-item Likert-scale from 1 = “fully agree” to 5 = “do not agree at all”), e.g. (mean±SD) 1.71±0.88 on “my deficits are located in the field of drug interactions”, and 1.46±0.83 on “my deficits are located in the field of drug dosing”, but 3.19±0.97 on “my deficits are located in the field of indications for drugs”.

Interviewees’ suggestions for improvement could also be confirmed by the questionnaire. Ratings on the items “other clinical disciplines do not sufficiently address pharmacotherapy”, “I’d like to have broader offer for recapitulating my pharmacological knowledge” and “I’d like to discuss more cases during pharmacology lectures” were 2.24±1.18, 2.06±1.20 and 2.29±1.11, respectively.

Summary and conclusion: Student perception of deficits in pharmacological knowledge is quite differentiated with nearly the half stating “drug interactions” but only about one tenth stating “indications for drugs”. Students’ suggestions for improving pharmacology teaching mainly aim at multidisciplinarity and the application of knowledge. This should be thoroughly considered to develop a teaching plan for sustainable learning in pharmacology, enabling medical students to enter professional life with confidence.

I-1.12  TüInfoRM - The Tübingen Interactive Teaching Course on Information Retrieval and Evaluation in Medicine

Lang J, Naumann A, Blumenstock G, Eichner M, Walter T, Dammeier J, Walter C, Schiefer U (University Hospital, Ophthalmology, Tübingen)

Objectives: To assess the effect of the TüInfoRM teaching course on the students' performance of literature search and analysis of retrieved abstracts.

Methods: TüInfoRM is designed as a two day interactive training course on literature retrieval with "PubMed" and analysis of the retrieved abstracts considering the CONSORT criteria (Hopewell 2008). The search results of an experienced librarian, supplemented by the proposals of three neuro-ophthalmological experts, were considered as gold standard ("experts' abstracts"). The following search task was chosen: "Therapeutic procedure in optic neuritis in young adults"). The information recall (IR) was defined as the percentage of the experts' abstracts which was retrieved by a student; a "fuzziness index" (FI) quantified the percentage of irrelevant abstracts found by a student; a "discordance score" (DS) was based on the experts' ratings of each abstract on a scale from 0 to 10: for each abstract which was found and rated by a student, the distance of the student's rating from the experts' rating interval was calculated (abstracts not considered by the experts were neglected); DS was then calculated as the sum of these differences. 95% confidence intervals (CI) were calculated for the mean difference of the participants' pre- and post-teaching results, using a normal distribution approximation. The course was evaluated by a questionnaire.

Eighteen students (3 male, 15 female) participated in the pilot course.

Results: IR improved from 8.7 % to 16.8 % (mean individual improvement 8.2 [CI -0.8 to 17.1]), FI improved from 83.7 % to 71.0 % (mean individual improvement 12.7 [CI -3.6 to 29.0]) and DS improved from 69.1 to 66.1 points (mean individual improvement 3.0 [CI -0.04 to 6.0]). The median overall course ranking of the participants was 2 (median 1.67) on a scale with 1 = very good to 6 = insufficient. Furthermore the participants marked our concept with 2 (median 1.67) whereas the use of such a training course was rated 1 (median 1.17). 16 out of 18 participants would take part in a follow-up course and 17 out of 18 would recommend the training course to a friend.

Conclusion: The TüInfoRM pilot course is a promising tool for improving students' literature search and analysis results. It should be considered as an enhancing element in medical education, due to the importance of a qualified retrieval of information as a key qualification in both, medical studies and clinical practice and research.


I-1.13  Module 23 – An Integrative Approach to Interdisciplinary Teaching and Assessment

Lottspeich, Christian; Niedermaier, Sophie; Keil, Stephanie; Schmidmaier, Ralf; Siebeck, Matthias; Reincke, Martin (Ludwig-Maximilians-University (LMU) Munich, Deanship for Medicine, Medical Curriculum Munich (MeCuM), München)

Background: With the rapidly growing knowledge in medicine there has been a tendency to create an increasing amount of subspecialties. Previously, medical schools in Germany tried to keep up with this development by increasing the amount of obligatory courses in traditionally structured curricula. This bears the risk of mediating overly specialized knowledge while neglecting clinical basics.

Nowadays patient care is approached in a multidisciplinary and integrated way with an emphasis on the role of the general practitioner cooperating with subspecialists. This concept is reproduced in our interdisciplinary clinical year Module 23.

Didactical concept: We built eight organ-oriented, four-week blocks: AINS (Anesthesia, ICM, pain medicine), blood and immunology, cardiovascular system, endocrine system, gastrointestinal system, NUGS (nephro urogenital system), musculoskeletal system, respiratory system. The teachers of each block defined the learning objectives in an outcome-based, operationalized manner. A databank was established that displays for all students and teachers the learning objectives of each course or training. The students will be divided into eight groups of 60 students and rotate through these blocks. They will acquire their theoretical knowledge basis in different forms of lectures, seminars and exercises. This knowledge will be applied in a secure learning environment during PBL-courses and simulation training. Finally it can be transferred into clinical practice during bedside teaching and ward rotations. The course structure will be supplemented by e-learning, an interdisciplinary lecture series and elective courses giving the students the opportunity to
pursue special interests. By reducing the number of compulsory courses we provide more time for self-study and preparation for assessments.

At the end of each block a summative assessment takes place consisting of a written assessment as well as an assessment of practical skills. Every block decides on the assessment method in order to adjust the assessment to the individual learning objectives and teaching formats.

Conclusion: Due to the high frequency of assessments we ensure an integrative and continuous approach to learning. It also allows the implementation and validation of new assessment methods which can be compared with each other in randomized and controlled studies.

I-1.14 From Simulation to Bed-Side: Effectivity of Undergraduate Skills Lab Training Compared to Classic Bed-Side-Teaching

Lund F, Weyrich P, Werner A, Jünger J, Nikendei C (University Hospital Heidelberg, Department of Psychosomatic and General Internal Medicine, Heidelberg)

Introduction: The effectiveness of medical skills laboratory training is widely recognized throughout medical education (1). Yet, the transferability of procedural skills acquired in skills laboratories to actual clinical practice on undergraduate medical educational level has rarely been investigated. We therefore conducted a prospective randomised trial to answer the question, if students having received training of intravenous (IV) cannulation in a skills laboratory setting are perceived and rated as more professional regarding technical and communication skills compared to students that underwent traditional bed-side-teaching when assessed 1) subjectively by patients and 2) objectively by independent video-assessors.

Methods: The power analysis revealed that n = 42 students were required for each study group in order to detect the expected effect size (α = 0.05; power 0.8). 84 volunteer first year medical students were randomly assigned to one of two groups. The intervention group (IG; n = 42) trained intravenous cannulation in a skills laboratory receiving instruction according to Peyton’s Four Step Approach. The control group (CG; n = 42) took part in standard bedside teaching on intravenous cannulation. Students with previous training in cannulation and previous experience in performing assessed procedures were excluded from the study. Following the intervention, performance of IV cannulation in clinical setting with volunteer patients was video-recorded for both groups. Patients assessed students’ performance using the Communication Assement Tool (CAT) (2) and the rating form of the Integrated Procedural Protocol Instrument (IPPI) (3). Two independent video assessors scored performance of the students using a binary checklist and IPPI ratings. Student’s T-Test and Mann-Whitney U-Test were used for statistical analysis.

Results: 42 students of the interventions group (19.86±1.80 years, 16m/26f) and 42 students of the control group (20.38±2.53 years, 16m/26f) agreed to participate in the trial. Sociodemographic variables did not significantly differ between the two study groups. Students’ procedural performance and patient-physician communication did not significantly differ between groups (p = 0.544 for CAT; p = 0.683 for IPPI ratings) when rated by patients. However, assessment of video taped sessions showed that practising IV cannulation in a skills laboratory setting resulted in a significantly shorter time (IG: 595.4s ±188.1s; CG: 692.7s ±247.8s; p=0.049) needed for the performance on patients. Interestingly, students of the IG were not only faster, but also completed significantly more single-steps of the procedure correctly (IG: 0.64±0.14 percent of binary checklist; CG: 0.53±0.18, p = 0.004). In addition the intervention group scored significantly higher on IPPI ratings than the control group (IG: 3.09±0.65; CG: 3.44±0.92; p = 0.015). Interrater reliability was 0.910 (p = 0.0001) for binary checklists and 0.734 (p = 0.0001) for IPPI ratings.

Discussion and conclusion: Training of IV cannulation in a skills laboratory is successfully transferable to the clinical setting. It enables students to perform IV cannulation faster, more correctly and more professionally on patients in terms of technique and communication than compared to traditional bed-side-teaching.

I-1.15 Microsurgical Skills Trainings in Students’ and Residents’ Education – Learning Curve and Its Motivational Impact

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**Objectives:** Training techniques to acquire motor skills are important tools in students’ and residents’ education for developing expertise. In surgical education practical experience accounts for one of the most important factors to arouse young students’ interest in the surgical field and to motivate residents to get involved with their work (1). By contrast, specialty related motor skills are taught either very little during medical school or late in residency. This study was performed to evaluate a microsurgical skills training on a tympanoplasty model with regard to the learning curve and the participants’ motivation for a surgical specialty.

**Methods:** Twenty-seven randomly chosen 5th year medical students were divided into two groups. Group 1 (n=13) had to perform an ossicular and tympanic membrane reconstruction on a tympanoplasty model on days 1 and 21, whereas group 2 (n=14) had to perform the same procedures on days 1, 7, 14 and 21. Group 1 was observing a specialist on days 7 and 14. Attempts and time of prosthesis placement and time for tympanic membrane reconstruction with cartilage slices were recorded. Tremor frequency and amplitude were obtained at the same time points. For all parameters, 6 otosurgeons served as gold standard for the reconstruction results. An adjusted study interest questionnaire (SIQ) was used to assess students’ motivation (2) and an additional 5 items were referring to the self-evaluation and the benefit of the tympanoplasty training regarding decision-making for a (micro-)surgical specialty.

**Results:** Students in group 2 showed a significant improvement in attempts and time until prosthesis placement, tympanic membrane reconstruction time and its integrity over the study period compared to both, baseline measurement on 1st day and group 1. A beneficial learning effect for the prosthesis placement was already seen between the first and second training, with a time interval of 7 days. This improvement could not be detected in group 1, with a time interval of 21 days. However, the obtained learning curve did not reach the experts’ level. Gender, tremor indices and students’ motivation (SIQ) showed no correlation with the reconstruction parameters; whereas the training itself had a positive impact on students’ interest (additional items) in the surgical specialty.

**Discussion:** Training with the tympanoplasty model is suitable to acquire first microsurgical motor skills and to arouse students’ interest in the surgical field. Although, some SIQ items had shown a prediction for high scores in a clinical practical examination in otolaryngology (3), this effect was not seen in our study. Noticeable success on the reconstruction results can be achieved with a single training unit once a week. By contrast, observing the specialist on performing the reconstruction had no impact neither on the individuals’ skills success, nor on the motivation for a surgical specialty. Therefore, surgical skills training should be implemented into students’ and residents’ education. Interest in the surgical field seems of paramount importance under the light of a declining number of trainees in surgical specialties (4). In addition, the gratifying acquisition and mastery of skills during residents’ education are responsible for the improving work related satisfaction over the years of training (5). However, further studies have to clarify the long term effect and transferability of the acquired microsurgical motor skills.

“Train the Trainer” (TTT): A Primary Care-Based Mixed Medical Education Intervention in Heart Failure. Effectiveness and Predictors of Evidence-Based Prescribing Behaviour

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Objectives: Evidence-based (Eb) clinical practice guidelines reflect essential knowledge and care recommendations, are increasingly common worldwide and need to be translated into patient care [1]. Chronic (systolic) Heart Failure (CHF) is a common, disabling, deadly and costly disease. More than 90 percent of patients are treated in primary care. However, little is known generally about tailored dissemination and implementation strategies [2]. Nevertheless, the combination of different intervention elements seems most promising for improved care and health outcomes [3-5]. The TTT project developed and evaluated a tailored multidisciplinary educational intervention for CHF (ISRCTN08601529). Analyses of baseline prescribing behaviour showed overall good guideline adherence [6], and the intervention improved physicians’ prescribing behaviour, e.g. regarding treatment to target doses of ACE inhibitors [7]. It also found poor health-related quality of life, caused mainly by co-morbid depression [8]. The presented study evaluated further physician-related outcomes and verified the role of physician and patient variables as determinants of Eb pharmacotherapy.

Methods: Cluster-randomised clinical trial design with a baseline and follow-up assessment after seven months. The TTT-intervention consisted of four interactive educational meetings, the control group received a state-of-the-art lecture (Standard). Physician outcome(s) (measures) were self-perceived competencies (self-developed instrument) andcardiological and psychosomatic factual knowledge (blueprint based multiple choice test one month before follow-up). Patient variables as suggested by the literature (age, gender, NYHA functional status, blood pressure, potassium level, renal function [9]) and the target variable of dosing at follow-up (ACE inhibitor/ARB dose ≥50% of dose) were derived from the trial documentation. Statistical models included generalised linear mixed effect models, analysis of covariance (effect evaluation) and two-level logistic regression models accounting of clustering of the data.

Results: Thirty-seven participating GPs were randomised (18 vs. 19) and 168 patients were included. 146 and 153 patients could be analysed for the evaluations of effectiveness and verification of determinants. At follow-up, there were significant between group differences in favour of TTT in terms of the mean percentage of target doses (known outcome, p=.03), global confidence in CHF therapy (p<.01), and in knowledge in the psychosomatic (not cardiological) domain (p=.046). 90 (59%) patients had ≥50% of target dose. The only significant determinants of improved prescribing of ACEi/ARB remained patient age (OR 0.95, CI 0.92-0.99, p=0.01) and global self-confidence (at follow-up) (OR 1.09, CI 1.02-1.05, p=0.01), while NYHA (I/II vs. III/IV) functional class showed a trend (OR 0.63, CI 0.38-1.05, p=0.08).

Conclusion/Discussion: The tailored intervention showed improvements over standard medical education regarding self-perceived competencies, care-specific knowledge and Eb prescribing. Less complex and intensive interventions have not shown to be effective on performance [10] suggesting a trade-off between cost and benefit of CME. While higher patient age and worse disease stage are known barriers to treatment, the role of self-assessed confidence as predictor could reflect an intervention effect that might improve physicians’ accuracy in self-assessment [11].

I-1.17 “F” is for Film – Teaching Psychiatry Through Movies

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A majority of Oscar-nominated movies feature mental illness. Many of these demonstrate rather naturalistic impressions of psychiatric patients. Using movies to offer an attractive teaching approach for medical students to gain knowledge of psychiatric diagnoses seems to suggest itself.

We developed an elective seminar for graduate medical students using abstracts from films like “Trainspotting” or “Iris” to illustrate each of the ten F-chapters of ICD-10 psychiatric diagnoses. According to regulations, 25 students were admitted to the course in the summer term 2010 and winter term 2010/11 each. Of these 85% and 67% respectively had already passed the compulsory lecture in psychiatry. Of the total of 50 students (72.5% female, 24.7 years), 35 volunteered to take part in a pre-post knowledge test concerning criteria for ICD-10 psychiatric diagnoses. The test comprised 7 open and 3 single choice questions. Additionally, attitudes towards psychiatry, psychiatrists, mental illness and therapy of mental diseases were assessed pre-post using the “Attitudes Towards Psychiatry” questionnaire (ATP-35; 1, 2).

Quality of the teaching and acceptance of the method was assessed after each term using ratings and open questions.

At the beginning of the course, participants scored an average of 14.03 of a maximum of 25 in the test on ICD-10 criteria. After the course at the end of the term, participants were assessed with the same questions, resulting in highly significant (p<0.0001) increase to a mean of 21.9 points. The pre-post design of the test was not made explicit to the students and none of the test questions was formally mentioned or answered throughout the course. Evaluation of the course revealed overall positive results and high acceptance of the methods.

Our results indicate that using movies is an effective and attractive tool to teach psychiatry.


I-1.18 Training of Clinical Skills in Surgery – A Training Concept for Medical Students

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Objectives: During undergraduate medical education the trainee should not only gain theoretical knowledge but clinical skills must be to the fore of medical training, especially in surgery, where the mastery of basic skills is of great importance for the young learner. The acquisition of basic clinical skills during surgery clerkships has been shown to be inadequate. Several studies demonstrated that practical training can be improved. However, only training concepts for solitary skills have been developed and evaluated. This work presents a training program to teach students the basic clinical skills in surgery.

Methods: The program consists of one-week training in basic clinical skills in surgery and a three-week clerkship on surgical ward. In their skills training, a maximum of 6 students per group rotate through 12 modules with various teaching methods as skills lab training, simulation and role play in order to enlarge their clinical competence in basic and specific surgical skills as well as improve their competencies regarding behaviour and attitudes. On the ward, students learn to integrate the acquired skills in practice under supervision.

The teachers participated in an one-day training to prepare for the skills training.
Results: Evaluations of the training program from both learners and teachers were excellent. They rated the training concept as significant improvement in surgical training. The total training program was rated 1.35 (Likert Scale: 1 = very good to 6 = poor), the skill training was rated 1.3, the clerkship 2.25, respectively.

After skill training, students felt more comfortable and secure when actually performing skills on the ward. The teach-the-teachers course was rated very positive (1.5).

Conclusion: The standardized training program helps students acquire basic clinical skills in surgery.

Effects of a Standardized Patient Based Training on the Performance of 4th Year Students During a Preoperative Clinical Evaluation: A Rater Blinded RCT

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Introduction: In most medical schools there is only very limited time for clerkships in anaesthesiology. It is therefore of up most importance to have effective and efficient teaching methods to train the students in the basic understandings of the preoperative clinical evaluation. Because of limited time resources of clinicians we were interested in teaching effects with non physicians.

Research question: Does one 30 minutes teaching sequence given by standardized patient improve the performance of 4th year medical students in a preoperative clinical evaluation with real patients?

Methods: All 4th year medical students of the University of Berne received a lecture on the pre-anaesthesia visit in the beginning of their one week anaesthesiology clerkship. With written informed consent 144 students were afterward randomized either to the control (n = 71) or the intervention group (n = 73). In the intervention group, each student was individually trained by a standardized patient (SP) for 30 Minutes. Experienced anaesthesiologists (blinded to the randomized group of the student) assessed the preoperative clinical evaluation performance of the student on a real patient with help of an adapted mini-cex1,2. The following aspects were assessed: History taking, physical examination (airway assessment) communication of perioperative management, assessment and classification (American Society of Anesthesiologists Physical Status Classification Scale3), organisation and efficiency, professional behaviour, overall impression. Mean test scores of the control- and the intervention group were compared using t-tests and the effect size (Cohen's d) was computed.

Results: From the 144 students a mini-cex could be performed with 136 (drop out rate= 5.6%). Students in the intervention group (n=70) scored significantly higher compared with the students in the control group (n=66) regarding their overall impression scores (8.8 ± 0.8 SD vs. 8.3 ± 0.9 SD, p=0.002; effect size: 0.56). They gained also higher scores than the control group with respect to the following aspects: history taking (8.6 ± 1.0 SD vs. 8.2 ± 1.0 SD, p=0.020), physical examination (8.8 ± 1.1 SD vs. 8.4 ± 1.3 SD, p=0.113), communication of perioperative management (8.1 ± 1.4 SD vs. 7.8 ± 1.5 SD, p=0.418), assessment and classification (8.8 ± 1.1 SD vs. 8.3 ± 1.3 SD, p=0.050), organisation and efficiency (8.5 ± 1.3 SD vs. 7.9 ± 1.2 SD, p=0.019) and professional behaviour (9.2 ± 0.9 SD vs. 8.8 ± 1.1 SD, p=0.022).

Discussion: A single encounter with trained SP significantly improves the performance of 4th year medical students in preoperative clinical evaluation. Remarkably one 30 minute teaching sequence of a non physician revealed a medium effect size on the overall impression. That opens a wide field of further adaptation to other clinical settings were students have to assess patients. The reason why no significant differences in physical examination (airway assessment) and the ASA physical status classification was found might be that the lecture already covered the necessary content of these scoring system which could not be improved by the SP encounter. A limitation is that long term effects of the intervention could not be analysed within the framework of this study.

I-1.20  StuBS – Studierende Begleiten Schwerstkranke Menschen (Medical Students Accompany Incurable Patients)

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**Background:** Palliative care still is a globally neglected area of medical education [1]. Even though the current state in Germany is no exception to this, one can see ongoing structural changes: in 2009 the subject of palliative medicine was tied into the Medical Licensure Act as a cross-disciplinary subject and hence all medical faculties must start to implement palliative medicine as a compulsory subject for teaching and examination [2]. The emerging of palliative medicine as a discipline and its compulsory implementation lead to the question how to design adequate education in palliative care.

**Design:** Therefore, in 2009 the Department of Palliative Care at the University Medical Center Freiburg initiated a pilot programme for second- and third-term medical students called StuBS. This elective course aims at sensitising students for the perspective of incurable patients by offering them the opportunity to visit volunteer patients regularly (5-6 times over 3 months) in their everyday lives. The students are supported by workshops, counselling supervision and intervision as crucial elements of the programme, which is evaluated by formative and summative assessment methods.

**Objectives:** StuBS as a programme is designed
(1) to sensitise students for the perspective of incurable patients and
(2) to determine a possible change of knowledge, skills and attitudes towards the care of incurable patients.

The evaluation’s main objective is an in-depth analysis of the student's learning outcome regarding (1) and (2).

**Methods:** Qualitative data were collected before and after the student-patient-contact by using semistructured, audiotaped interviews. In total the data corpus consists of 18 student interviews and 9 student portfolios. Data analysis was conducted according to the principles of qualitative content analysis, a systematic, theory-guided method by using a category system [3]. MAXQDA, a software text analysis tool, supported the analysis.

**Results:** Five domains of self-perceived learning outcome were identified by analysing the student’s interviews and portfolios:
(1) Psychosocial insights 
  a. into the patient’s personality and coping strategies 
  b. concerning the patient care 
(2) Improvement of communication skills 
(3) Gain of competencies in self-reflection particularly with regard to the future role as physician 
(4) Reflection of ethical and spiritual attitudes towards death and dying 
(5) Importance of team-support 

**Discussion/Conclusion:** The five identified domains indicate that StuBS especially emphasises perspective taking, communication skills and attitudinal change, but not the enhancement of theoretical knowledge. The results – summarised as a change in attitude towards the care of incurable patients – coincide with the EAPC (European Association for Palliative Care) recommendations for undergraduate medical education [4]. Furthermore they match with other study results showing an increased student’s comfort level in connection with end-of-life care experiences [5]. Accordingly, StuBS can be considered as an innovative and important educational intervention that is related to practice and should be implemented permanently. As these qualitative results are not statistically representative, further investigation should include quantitative analysis. The obtained data of StuBS as empirically based reconstructions of the student’s self-perceived learning outcome should provide a heuristic basis for the construction of quantitative research instruments.

I-1.21 Effects of Restructuring the Practical Neurological Training for Medical Students

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Introduction: Neurology is one of the most important disciplines in medicine and gains further impact because of the increasing incidence of neurological symptoms and diseases. In consequence, medical education should improve the neurological knowledge and hopefully attract students to become neurologists. Therefore, we aimed to improve the practical part of our medical students' curriculum in neurology and assessed the results of these interventions.

Methods: In the past course unit 2005, medical students were assigned to specific neurological wards for one working week and being taught by the resident and attending on ward as they accompanied them in the daily duties. For the first intervention, we added a course in neuroanatomy to refresh knowledge before entering the clinical part. The second intervention included clinical work framed by interactive sessions to discuss cases and diseases. In the final intervention three, two tutors (one attending, one resident) were assigned to the students only and were relieved from clinical duties. The neurological courses were evaluated by the students in regard to form and content and by the residents in regard to their own motivation and their own learning profit before (2005) and after intervention (2009). This was done by an automatic online-evaluation tool (EVALuna) and questionnaire.

Results: The named interventions improved the rating by students: Organisation was rated to be improved by 0.1 (not significant) Content was improved by by 0.7 (p<0.05, table 1). Each single item showed improvement except for “size of groups” (table 2). In addition, the perception of the tutors has changed, since they gained motivation and improved their neurological knowledge from teaching (table 3). These interventions lead to improved in-hospital ratings from place 13 to the second one at the end of intervention.

Conclusion: The three interventions improved the clinical course based on the evaluation from students and teachers. Moreover, acceptance and motivation of teachers was highly improved.
2. Self-Directed Learning and Assessment with E-Media/
E-Teaching Formats (1)

II-2.1 Study Design for a Cluster Randomized, Controlled Interventional Study on the Benefits of an Additional E-learning Unit in Epidemiology for Medical Students

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Objectives: The role of Epidemiology in the study curriculum of human medicine has been expanded in Germany since 2002. According to our experience in the new curriculum Epidemiology however is not one of the favourite subjects of medical students. Therefore learning methods providing both motivation and success should be encouraged. Little is known on the additional benefits of alternative forms of studying Epidemiology for medical students. Therefore our goal is to investigate value and acceptance of an additional e-learning unit in Epidemiology for students of human medicine at the University of Ulm. Here we present the study design of this planned investigation.

Methods: A controlled interventional study will be performed over one semester. All 4th year medical students will get informed about the planned study. Participation is on a voluntary basis. Approximately 180 students in 9 seminar groups will be cluster randomized to one of the two interventional groups or to the control group. In the two interventional groups students have access to a personal account on our internet based learning platform. The interventional groups get exercises (questions on a scientific paper, multiple choice questions) related to the contents of the Epidemiological lectures and seminars but at different points of time: Some will receive these exercises early, the others later in the lecture period. Control subjects have no access to the e-learning unit.

Students in the interventional groups will get access to their results only if they fill in a short evaluation sheet with questions on acceptance of the learning unit and their own motivation to participate (secondary end points). Primary end point is the mean difference in the point scores of the final examination between interventional groups and control group. Statistical methods comprise student’s t-test and multiple regression analysis. We have a positive votum of the local ethics committee for this project.

Results: Based on the results of a first pilot study on 20 students of medical statistics early in 2010 we expect a participation rate of approximately 80%. In this pretest students with an additional e-learning unit reached better results (higher average point score, n.s.). The acceptance of e-learning was generally high (good evaluation results by 12 of 14 responses) and also the acceptance for our e-learning module was high in the students participating (positive evaluation by 11 of 14 responses).

Discussion/Conclusion: In our pilot study we found an improvement of results and a high acceptance of the additional e-learning unit. Selection bias can not be excluded because of voluntary participation. Another question is how representative can the results of students of medical biometrics with a high affinity to mathematical topics be for medical students for whom we would expect a lower affinity? On the other hand the positive results of the e-learning unit in our first pilot study can give some information on the beneficial effects to our students regarding examination results and learning motivation. Especially in a less beloved subject like Epidemiology such an additional e-learning unit might be worthwhile.

II-2.2 Introduction of an Online ECG Basic Course at the Medical Faculty of Ulm University

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Introduction: At the medical faculty of Ulm University an optional course “ECG Basic Course” is offered during the clinical part of the study. This is an interactive lecture with practical exercises in the form of the analysis of approx. 70 ECG curves. In the ECG basic course as a presence event, the students are taught to interpret ECG’s partly by solving practical exercises, partly by classical lectures. Since, because of infrastructural reasons, this can be offered only to a limited number of participants, an additional online ECG course will be available from the summer semester 2011 to give all students the opportunity to participate in the ECG Basic Course.
Methods: All twelve lectures have been recorded in the winter semester 2010/2011 with the software Camtasia. Because of the many commentaries of the teacher concerning each film, a Tablet-PC has been used for recording. On the learning platform MOODLE of the medical faculty a protected area has been established to limit the access strictly to the participating students. The access to each virtual lesson is password protected. In the virtual course hours each lecture recording, the transcript, as well as the to-do exercises and exercise ECGs are set.

Course: By registering for the online ECG basic course, students are unlocked on the learning platform for online ECG. It is important to check if the online course students deal with the course record and with the related exercises. So the first lesson is automatically accessible to all course participants, whereas the following eleven lessons are protected by separate passwords. To get these passwords students have to deal with the exercises and send them to the course teacher by email. The exercises are corrected by the lecturer. If the student has worked on all twelve virtual lessons, he is admitted to the exam in the presence course. For content questions, students can send an email which is answered by the lecturer every week on a certain day. In addition, a chat is set up in which the lecturer is available online 1.5 hrs per week.

Conclusion: With this additional offer it is possible for all students to take part in an ECG Basic Course during the clinical part of the study – whether as a presence event or online.

II-2.3 A Questionnaire to Evaluate Computer-Assisted Learning Programs

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Objectives: Computer-assisted learning (CAL) programs are becoming more widely used in medical and dental education. Evaluation and refinement are essential components of the development process. In the literature, several evaluation instruments have been described. They are always study-specific. No universal instrument exists to compare the different available programs. Furthermore in most cases these instruments are not validated. Schulz et al (1999) elaborated quality criteria for publications in medicine [1]. Based upon this catalogue a questionnaire for medical CAL programs was defined [2]. The purpose of this study was to demonstrate the validity and reliability of a modified questionnaire.

Methods: The study was conducted in the Operative Department of the Dental School at the University of Frankfurt am Main, in the academic years 2008-2009. Data were collected from 102 dental students, which participated at the first, second and fourth clinical semester and from 14 dental teachers of the above mentioned department. They all used the interdisciplinary „Toothache Walk-in Clinic” CAL program, which can be downloaded under:

http://elearning.med.uni-frankfurt.de/basic/

The instrument used consisted of 43 statements. Possible responses ranged from 0 to 3 (0 = strongly disagree, 3 = strongly agree). Explorative factor analysis was carried out to assess the validity and the suitability of the supposed four factors (A1-A14: handling and technical aspects, B1-B6: functional range, C1-C6: content; D1-D17: didactics and applicability for education).

Results: A total of 90 questionnaires were received (response rate 88%). The explorative factor model consisted of 43 items. It considered in contrary to the expected four-factor model (A-D) three factors. The varimax-rotation method affected variables B2, B3, B6, C1, D1-D17 by the first factor (didactics and suitability for education), observed variables A1-A14 by the second factor (handling and technical aspects) and B1, B4, B5, C2-C6 by the third factor (content and functional range). The mean score for the 43 items varies between 2.32 (SD = 0.47, scale 0-3) and 2.47 (SD = 0.36, scale 0-3). The lowest scoring item deals with the third factor „content and functional range“. The highest scoring item deals with the second factor „handling and technical aspects“. Cronbach’s alpha reliability coefficients for the three factors demonstrated high levels (0.83-0.89).

Conclusions: The results indicated that a three-factor model comprising 43 items fit the data well and that the statistical conditions were satisfied. The questionnaire can be recommended for the universal evaluation of CAL programs.
II-2.4 Gaining Expertise While Running One’s Own Dental Practice? The Web-Supported Postgraduate Study Program “MasterOnline Periodontology” Makes It Possible

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Introduction: Periodontology becomes more and more important in research oriented and in practical dentistry due to demographic change and the successful developments in the field of tooth conservation up to an old age. Contradictory to these facts is the small proportion of periodontology in basic dentist training. This leads to a high demand of further education in the field of periodontology in dentists’ offices. The University of Freiburg’s MasterOnline in Periodontology program aims at teaching practicing dentists scientific expertise and practical competences in the fields of periodontal diagnosis and therapy on a M.Sc degree level and a flexible part-time basis.

Study Program Design: The program is accomplished in a transfer oriented teaching design. It combines online and attendance segment (blended-learning concept). Renowned experts of the field and an independent advisory board ensure the scientific quality and actuality of the curriculum. Each module follows the didactic concept of “problem based learning” (POL): interactive case reports introduce into the subject and lead to the systematic acquisition of the comprehensive background knowledge. Flexible learning is allowed through online delivery of scripts, OP-Videos, and animated lectures. The practical competences building upon theory are applied and trained in the subsequent attendance segments.

Motivation and Personal Support: Online tests, and group- or single exercise ensure students’ involvement and motivation. Intensive personal support is provided by certified “tele-tutors” who are recognized experts in periodontology. Core of the program are the weekly online meetings promoting a lively exchange of ideas within the groups. This so called “virtual classroom” (VC) offers the students a platform to present own patient cases, and to discuss the results of exercises among each other as well as with the course teachers. Within this “Community of Practice” the wealth of experience of each participant is put to use for everyone.

Evaluation results: The first Master program in periodontology accredited in Germany was inaugurated in October 2007. Three classes of dentist in private practices are currently enrolled. Evaluation results have shown a high level of acceptance for the teaching mode. Following Kirkpatrick’s training evaluation model [1] quality assurance activities do not only focus on participants’ acceptance but also include measures to verify the program’s impact on practical implementation. Thus, graduates were asked about the transferability of the content of teaching in their clinical practice. They reported an increase in periodontal treatments and a high success rate in their dental practices since the beginning of the study program.

In summary the University of Freiburg has established an innovative flexible part-time continuing-education program without excessive practice downtime. It provides enhanced medical care in the field of periodontology and allows successful graduates – the first cohort has graduated in September 2010 - to improve their competitive position.

1 Kirkpatrick, DL. Evaluating Training Programs: The four levels. San Francisco: Berret-Koehler, 1994

II-2.5 Implementation of Virtual Patients in the Curriculum of Surgical Education in the University of Heidelberg

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Objectives: Virtual patients are more and more common in medical education (www.virtualpatients.eu). They allow students by means of a multimedia-based clinical case to engross their knowledge, make clinical decisions and get specific feedback. We implemented and evaluated virtual patients in our general surgery module to find out, if this is an adequate method - or at least generates an additional benefit - to teach surgically relevant topics. In particular, we focused on the prevention of common pitfalls, because we assume that virtual patients are suitable to raise awareness at this early stage of education.
Methods: We generated virtual patients (VP)-cases according to important didactic principals[1] on the basis of frequent clinical situations. Every case was constructed with a relevant, mostly diagnostic and/or therapeutic pitfall around the thyroid gland, hernias, ileus and bite-injuries. The students work on the cases online on their own or in a tutorial during their general surgery module. The evaluation was done by employing a questionnaire, mainly based on standardized questionnaires on design and curricular integration of virtual patients [2].

Results: During the summer term 2010 a total of 246 evaluation sheets on virtual patient cases were completed. 36.2% of the students stated that they experienced work on the VP-cases like they were taking realistic medical decisions (rating 4 and 5 on a 5-pointe Likert-scale). 22,8% even felt like the doctor responsible. The essential conclusion of students on beneficial effects of VP-cases was: 1) that one has to reassess one’s differential diagnoses with any new arising information (37.4%) and 2) that one has to search for results to challenge or support them (42,3%). In general, about one third of the students (35%) felt more safe to deal with patients with such medical problems after finishing a VP-case. Half of the students (53,7%) felt more comfortable with developing differential diagnoses due to the individual feedback given during the VP-case.

Results of winter term 2010/2011 are owing.

Conclusion: Interactive cases may be a valid tool for knowledge transfer. Students consider the implementation of virtual patients as helpful and supporting for the clinical application of knowledge, especially in the acquirement of typical algorithms and common pitfalls. VP seem a realistic instrument to prepare students for work on real patients, but, can of course not replace the real patient experience. It should be pointed out, though, that it can´t replace real bedside teaching, even if it can serve as a valuable additional tool.


II-2.6 MyMiCROscope – Virtual Microscopy in Blended Learning at Ulm University

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Objectives: The growing diversity among the students and the rapid increase of new technologies entering the system of higher education, demand to reconsider traditional learning methods. In order to facilitate learning experiences and self-directed learning for medical students, a blended learning model instead of an exclusive instructor-led approach to teach microscopic anatomy was introduced. This methodical change was performed in two steps: First development of a novel virtual microscope, MyMiCROscope, and second reorganization of the traditional course of microscopic anatomy to implement the new e-learning tool.

Methods: We planned and performed the development and integration of a novel virtual microscope, MyMiCROscope, into a face-to-face approach to teach microscopic anatomy. MyMiCROscope includes all histological course slides as virtual slides in a chronologic order analogue to the course curriculum. The virtual slides are continuously zoomable, high quality pictures implementing important information given through systematic annotations. To integrate MyMiCROscope into the program of the course of microscopic anatomy a revision of the course script and reconceptualization of the course was accomplished.

Results: The virtual microscope, MyMiCROscope, offers new possibilities to interact with the user. With the establishment of a dynamic annotation system, which allows, for the first time, systematic but easy access to information from different operation levels, the user is allowed to interact with MyMiCROscope in a way that respects individual needs as well as individual levels of knowledge. The change of a sole instructor-led course into a blended learning approach through the implementation of MyMiCROscope combined with the reorganization of the course resulted in a change of the learning behaviour of the students: group work and social interactions were supported.

The evaluation of MyMiCROscope showed a high acceptance of the blended learning model. 97% of the volunteering students approved that they would recommend MyMiCROscope and 94% would like to use it as self-directed e-learning tool for preparation of the first oral exam. They esteemed MyMiCROscope as a useful, new e-learning tool supporting their own learning outcome in microscopic anatomy by offering them control over content, learning sequence, pace of learning, and the free choice of time and place. Comments of the students endorse that they do not want MyMiCROscope to replace the traditional instructor-led course where they use the light microscopes to examine the histological slides but they want it as an effective, motivating complement to the course, forming part of a blended-learning concept.

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Conclusions: This study shows (1) the advantages MyMiCROscope incorporates for self-directed learning and (2) that blended learning in undergraduate medical education is able to fulfill the individual needs of the students and support social interactions without discarding practical skills.

**II-2.7 MasterOnline Physico-Technical Medicine – First Experiences With a New Concept for Occupation-Accompanying Medical Education**

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Objectives: In order to cope with the constantly growing requirements in handling medical technology, it is necessary that physicians acquire new competences particularly within the fields of medical technology and medicine physics. In the new accredited MasterOnline degree program “MasterOnline Physico-Technical Medicine (PTM)” such technical authority is conveyed. Since for a meaningful interpretation of learning contents a certain practical experience in the medical field is necessary, the study course PTM addresses specifically medical professionals with a professional experience of at least one year. Including a scientific thesis (Master Thesis) the entire study program covers 90 Credit Points (according to ECTS) and leads to the degree „Master of Science“. Targeting 12 to 15 credit points per semester, the work load for a typical student is maximally 10 hours per week. The course was developed by the medical faculty of the Albert Ludwig University of Freiburg in cooperation with the faculty for mechanical engineering and process engineering of the Furtwangen University (HFU). The study course PTM supports continuing medical education. CME-points are provided by the Landesärztekammer Baden-Württemberg.

Methods: The study course first covers physical and technical basics with phases of practical training. Building on that, two of various advanced courses in different fields of medical technology (technology in intensive care medicine, technology in surgery, technical cardiology, radiology, and other) can be selected. The conveyed technical and physical competences enable the physician to understand technical and physical interrelationships about recording of a biological signal up to its technical data processing. The acquired research and development competences permit the graduate of PTM to solve tasks in clinical and industrial research.

In order to cope with the intensive vocational situation of the physician this study course follows the “Blended-Learning”-principle, thus it is conceived as an on-line study course with a small proportion of intermittent presence phases. PTM is realized within CampusOnline, which is the central online-learning platform of the University of Freiburg. Modern forms of e-learning apply to the study-course PTM including e-lectures, online lectures in „virtual presence“ and self-assessments. Regular on-line seminars, in which current questions are discussed, complete the concept.

Results: First experiences prove that the students participate actively in this study course with highest motivation and large commitment. A first evaluation-survey yielded that the students‘ work-load is in the targeted range of less than 10h/week. The students’ satisfaction with work-load, structure and contents of the modules is high. Synchronous meetings in the virtual classroom were pointed out to be helpful and were requested to proceed more frequently. In total, the study course was rated very positively.

Conclusions: The Blended-Learning concept turns out to fulfill the requirements for occupation-accompanying continued medical education, since it offers the possibility on the one hand to study self-employed accessing text documents, lecture recordings and electronics lectures and on the other hand to convert in concentrated presence phases this knowledge into practical exercises. For the support of asynchronous self-learning modules, synchronous seminars are demanded by the students.

**II-2.8 The Physical Examination of Children – A Video-Based Training Project for Students and Physicians**


Objectives: The physical examination of children differs from that of adults in many ways. The 4 week pediatric Block of the Heidelberg Curriculum Medicinale (HeiCuMed) is often our students first and only contact with pediatric patients throughout their medical training. The physical examination of children is taught and practiced in small groups (3 sessions of 90 minutes per week).

In order to use this limited time more effectively we developed a video-based training project to better prepare the students for practical instruction. The objective of this study was to evaluate whether the videos
were well accepted, helpful as preparation for examining a real child and how they were used by the students from the students perspective.

**Materials and Methods:** 20 training videos, which demonstrate the correct method for physical examination of children as well as clinical procedures, such as Lumbar puncture and resuscitation of the newborn, were created under the supervision of attending senior physicians. All videos and corresponding checklists were available online through the Heidelberg eLearning Platform. These were presented to the students at the beginning of the course and they were encouraged to use them as a means of preparation for bedside teaching. Student opinion were sought through a paper-handout based survey, consisting of 7 closed and 3 open ended questions.

**Results:** 175 students participated in the survey. 89.8% of students thought the training videos were helpful in preparation for performing the physical examination of children, and 68.5% felt they made them more comfortable in performing an examination (percent given is the sum of those agreeing by indicating Likert Scale 4 or 5). 91% thought the training videos portrayed relevant examples of the correct manner in which to perform a physical examination. 85.7% used them in preparation for the practical examination, and 91.5% believed the videos were a worthwhile learning experience. The average grade (Scale: 1 = Very Good to 6 = Insufficient) given was 1.7 (in 93.3% Grade 1 or 2). Free answer comments indicated that the training videos were accepted as a very positive, voluntary educational resource.

**Discussion and Conclusion:** The training videos were accepted by the students as a generally positive and helpful means of preparation for performing physical examinations of children. The vast majority felt it was a rewarding learning experience and used the videos to prepare for the OSCE. Another positive aspect of the videos is the possible use as an instrument for standardizing the training for physical examinations in children and for standardizing the assessment of these practical skills. To this end, training seminars for teachers and examiners will take place before each semester. Further studies are needed to evaluate the effectiveness of the videos in a randomized controlled experiment. Currently the described videos are integrated in virtual patients, to be used as preparation for bedside teaching. This will allow for integration of interactivity and feedback and putting the videos into a clinical context. First results using focus group analysis are expected at the time of the congress.

**II-2.9 Key Feature-Assessment of Communication Skills: Development, Implementation and First Results**


**Introduction:** “ProfKom” is a governmental promoted multi-centered project for the development of e-learning modules for both training and assessment of communication skills. For the first time, a modified key feature approach with the web-based learning environment “CASUS” was used for assessing cognitive elements of those skills. This approach focuses on identifying errors and best practice in specific conversational situations.

**Question:** To examine the ability of the CASUS key feature cases (KFC) to assess communication skills after completing a computer-based communication training.

**Methods:** 18 medical students (fm: n=9, m: n=9) participated in a computer-based ProfKom-communication training (learning environment "Nickels") and completed two education modules: 1. “communication expertise” (time-on-task: 31, +/- 7 minutes) and 2. „shared decision-making” (time-on-task: 105; +/- 21 minutes). For computer-based assessment (CASUS) 15 KFC were used with five textual, auditory and cinematic examples each, respectively. Response formats were multiple choice (five) and free text answers (ten).

**Results:** Internal consistency of all KFCs was satisfying (Cronbach’s Alpha = 0.68). Achievement of students was best with cinematic KFCs (.53, +/- 11), followed by textual (.42 +/- .20) and auditory KFCs (.28, +/- .13). Significant positive correlations were seen between outcome of assessment and study level (r = .619, p = .008), self-assessed previous knowledge about communication (r = .519, p = .027) and computer experience (r = .692, p = .001), respectively. Students with a higher level of study performed better in assessment (z = -.216, p = .031), as well as students with more frequent computer use (z = -.267, p = .008).

**Conclusions:** This first results on reliability and validity of key feature assessment of cognitive elements of communication skills can be used for further development of KFC focusing on more complex situations in patient-physician communication.
Integration of the Basics of Dental Implantology Into Preclinical Dental Education Using Online-Based Lectures

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Objectives: The objective was to develop an online-based lecture to teach basics in dental implantology without using additional human resources. The online lecture should be the exclusive source giving the theoretical background for a practical course.

Materials and Methods: The investigation was realized with two consecutive terms including a total of 110 students. Internet access established prior to the start of the project. After definition of the teaching targets, the structure of this e-lecture was embedded into an already existing workflow for the treatment of a dummy patient with a complete denture. The e-lecture should give the basics of dental implantology and specific knowledge how to improve the stability of a complete lower denture using two implants placed in the canine region. The e-lecture included film sequences of clinical treatment steps and laboratory procedures, power point presentation with sound and explanation by text components. The e-lecture was evaluated by the students. Knowledge of dental implantology, essential for the practical work (modification of a lower complete denture), was verified by a written assessment.

Results: All students worked on the lecture at home. The evaluation was performed by 77.4% of the students. The mean time required was 5.5 hours (SD 2.7h) ranging from 2 to 15 hours. More than 53% of them watched parts of the lecture more frequently than once. Using a grading system from 1 (very good) to 6 (bad) the mean overall rating of the e-lecture was 2.6 (max: 1, min.: 5). The majority considered the educational objectives as accurately defined and well represented. The media application was rated as adequate. The quotation of studies was evaluated with a high variability. The students estimated the considerable increase of knowledge and felt well prepared for their practical work at the dummy as well as explaining the sequence of operation to somebody else. However, the amount of topics was evaluated as too extensive.

The assessment score of the part „dental implantology“, within the written assessment was almost normally distributed around grade 3 indicating a high quality. The inner consistency was less satisfactory (Cronbach’s alpha: 0.428, Guttmann’s λ: 0.483), but better compared to other topics within the written assessment. The difficulty P of single queries ranged from 0.346 to 0.890 and the adjusted discriminatory power r’ ranged from 0.088 to 0.386.

Conclusion: The e-lecture on the topic dental implantology demonstrated the capacity to replace a classical lecture. Besides a high number of campaigners a proportion of detractors of this specific teaching method have to be considered.
3. Beginners and Students in Difficult Situations

III-3.1 Introduction of an Online Consultation System for Students in the Dean’s Office of the Medical Faculty of Ulm University

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Introduction: More and more students need study counseling. However, it is often a long way to go on the campus (or here in Ulm from one location to another), so the time between events is hardly sufficient for a meaningful consultation. Moreover, the trend is more and more to do things online by using new media (Smartphone, notebook ...) for time reasons. The Faculty of Medicine of Ulm University would like to take this trend to break new ground. As the first medical faculty in Germany, it plans to offer students an online consultancy. During three months it should be tested whether and how useful online consultation for the students in their daily student life is.

Methods: For the testing of an online counseling for students a free Live-Support-Tool has been made available so that the test run takes place without additional financial burden. The tool runs on an Apache Server and requires PHP, at least in version 4.1.0 and a MySQL database. This guidance tool is a Live-Support-Software that allows students to get in touch with the consultants by 1:1 Chat (in text version). Each call can be printed by the student after the consultation; the consultant will automatically receive the counseling by e-mail for archiving.

For the test run a test period of three months was set. The consultant is available on two days a week - once in the morning, once in the afternoon. To prevent abuse of the system, the access to online consultation is only possible via the learning platform MOODLE of the Medical Faculty of Ulm. After registering on this learning platform, the medical students of Ulm access to online consultation and can ask questions to the consultant in real time.

Conclusion: The three-month test run is set to find out if and how students accept the offer of online counseling. In addition, it should be found out whether the online consultation requires additional counseling hours and consultants or whether it could be integrated into the existing counseling hours and consultants.

In all test counseling sessions the time of request, the duration of the conversation, the type of request as well as the result are stored and analyzed statistically.

If the test run shows that the online counseling has no benefit in the everyday life of the students or that they are dealing with requests that require no professional consultation at all the system will not be introduced.

Should the system be introduced, a useful instrument for quality assurance in consultation could be originated by the storage of consultation data such as time, duration, results, consultants, etc.

III-3.2 Survey on the Degree of Satisfaction with the Complaint- and Idea Management-System of the Medical Faculty of Ulm University

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Problems: 1. In what way are students satisfied with the complaint- and idea management-system?
2. How do students perceive the handling of their submitted contributions?

Background: In workday life the chance to express problems, suggestions or commendations directly and promptly towards persons or positions in charge lacks. Feedback, which is important for smoothly flowing lecture, gets lost or remains unsaid. Due to the electronic complaint- and idea management system the Medical Faculty of Ulm University was able to create this possibility for students. Problems, suggestions and commendations are led anonymized or not-anonymized to the corresponding complaint- and idea manager of the particular department, as well as to the deanery of medical education.

Methods: After an introduction period of three terms, an online-survey on satisfaction with the complaint- and idea management-system was conducted in fall 2010, using the online-survey tool “Limesurvey”. For four weeks, students were enabled to fill in a form, consisting of 15 questions, which can be classified in three categories: utilization, satisfaction and usability. All items were analyzed descriptively and in addition, certain items were correlated (Spearman’s Rho).
Results: From 159 participants who filled out the questionnaire completely, indicated 90 students to be unaware of the complaint- and idea management system. It was noticeable that these were mostly students in the first semesters. Of the 69 participants who knew the system, more than half say they have used the system once or more. The average of the questions “Were your contributions taken seriously?” “Has your request been handled satisfactorily?” and “Has anything changed appropriately for your contribution or request/complaint?” was 4.0 = strongly agree, to 5 = not true at all, consistently below the mean value 3. These issues were therefore evaluated tend unfavorable. The question of the satisfaction on the same range has an average of 2.7. A high and both sides-significant correlation is between the items: “Your contributions have been taken seriously?” and “your request has been handled satisfactorily”. A mean relation exists between the items: “Your contributions have been taken seriously?” and “Are you satisfied with the system?”

Conclusion: In summary it can be said that the complaint- and idea management system of the Medical Faculty, should be made known particularly among students in the first semesters. Here it would be advisable to inform the students throughout the semester introductory courses of using the system and for establishing, the integration of a more visible link on the learning platform. Moreover, it was determined that the satisfaction of those who used the system, depends on how to deal with the incoming contributions from the Board Managers in the departments. The acceptance could be enhanced by students to be better informed about responses which were received on contributions (e.g. changes to take cognizance of their contributions, discussions between the parties, etc.). It is assumed that by consistent feedback the feeling of “to be taken seriously” can be increased among students, thus increasing satisfaction with the system.

To optimize the acceptance for the system and its benefits, students should therefore be better informed about what happens to their contributions, complaints or suggestions.


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Objectives: One challenge students meet on their way from bench to bedside is communication with patients. The Project ProfKom aims at the development and evaluation of an instructional design that guides students from the theory of leading a targeted, client centered conversation to its practical application (BMF joint project “ProfKom - Professionalizing tomorrow’s doctors’ and teachers’ communication skills”, www.profkom-projekt.de, FKZ 01 PH 08015). The effectiveness and learning success of three instructional elements are compared to each other and a control condition: E-learning, role play and a combination of both (blended learning). Target groups are students of medicine and the teacher profession, who will communicate with patients or parents (Gartmeier et al., in press). Incorporating these two professions into the study facilitates the comparison of both with regard to the transferability of instruction design principles between these professions.

In this study, a first version of the blended learning instructional design - adapted to both professions - was developed and tested. Objectives were to explore how students evaluate their learning success and to gather feedback on the content and design of the e-learning modules and their combination with role plays. The obtained data are used for a refinement of the design and the following studies.

Methods: 42 medical and 35 teaching students worked on the three e-learning modules general communication skills (GCS), shared decision making (SDM) and analysis of communication situations presented in videos, followed by role plays. Learning success was measured by key feature assessment for communication skills and by a measure of communication related self-efficacy. After working on each of the e-learning modules, the participants filled out questionnaires which allowed free comments and contained items about content and learning steps. After the role play they evaluated its combination with the modules. Before and after the instruction phase the students completed a questionnaire with items regarding their self-efficacy with respect to conduct an SDM-conversation.

Results: First results are based on the free comments in the questionnaires. The participants gave positive statements about the combination of e-learning and role play. In the e-learning modules they liked the “clear structure”, “exercises”, “interactivity” and especially the films which illustrated good and bad
communication examples. While they suggested to improve the GCS-module by going more into detail, they rated the SDM-module as too extensive. Concerning the improvement of communication related self-efficacy, a repeated Measures ANOVA revealed a significant improvement in self-efficacy over time in both groups with a large effect size ($F(1, 70) = 18.02; p < .005$).

Further analyses of the questionnaire and test items were not completed by the time of writing this abstract, but the results will be presented at the conference.

**Discussion and perspectives:** The first results indicate that students welcome the combination of e-learning and role play. In the e-learning modules we could implement unique potentials of this method (e.g. films, interactive elements) which were positively evaluated. Concrete hints of the participants will help to improve the modules for the following studies. Moreover, the results on the improvement of communication related self-efficacy provide a first hint that the training generates a subjective learning effect. In our following studies, learning success will not only be measured by key feature assessment but also by rating communication with standardized communication partners.


**III-3.4 SiLVi (Simulierte Lehrvisite) – Early Training of Team Communication During Ward Rounds**

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**Background:** The acquisition of key competencies such as professionalism and communication skills gains an increasing impact on undergraduate medical education. Although communication in an interprofessional team plays an important role in the clinical setting, it is often not adequately represented in medical curricula. Ward rounds in particular pose several challenges for inexperienced residents who just started their clinical formation in regard of interprofessional as well as doctor-patient-communication. From an ethical point of view these competencies should be trained and assessed in a protected learning environment and must not be achieved by trial and error with real patients.

**Didactical concept:** The simulation of a ward round (SiLVi – simulierte Lehrvisite) is integrated into the obligatory ward week in Internal Medicine during the 2nd clinical year at the medical school of LMU Munich. During the ward week students are encouraged to observe the ward rounds with a standardized observation sheet in order to learn from model situations. To prepare for the following simulation the students get additional assignments and have to elaborate on different features of a ward round such as duration, directions of verbal communication and information flow.

The week is completed by a ward round simulation at the simulation centre in a simulated patient room which can be observed through a semireflecting mirror and is also videotaped for further analysis. The students take over the roles of the rounding team: attending, resident, nurse, patient and medical student. Every role has a detailed script of a specific situation that leads to a conflict as a result of miscommunication. The students re-enact a typical scene from an interprofessional ward round such as an absent flow of information. They thus experience typical but challenging critical situations in a safe learning environment and can learn from mistakes made during the simulation.

By experiencing the conflict from various points of view the participants can thus reflect on their behaviour during the simulation as well as on typical challenges in team communication. When playing the unfamiliar role of the patient the students can develop a deeper understanding of needs and fears of their patients. After the simulation the participants analyze the occurred conflicts and compile optimization strategies using video feedback and tools for interaction analysis.

**Conclusion:** SiLVi is an innovative way of teaching team communication skills and professionalism, preparing medical students for their future work as doctors in a ward team. Its novelty is based on the use of new didactical instruments and focus on communication skills instead of factual medical knowledge. The standardized setting allows scientific monitoring and evaluation for example of the use of standardized patients and mechanisms of acquiring communication competencies.
**III-3.5 Digital Rectal Examination: Combination of Part-Task Trainer and Standardized Patient Compared to Standardized Patient Alone – Effects on Student Acceptance and Perceived Realism of Training Situation**


**Objectives:** Digital rectal examination (DRE) is an important part of a comprehensive physical examination. In spite of the fact that it is has been shown to be effective in screening for abnormalities of the anus and colon as well as the prostate gland, it is widely underperformed, because often patients and doctors feel embarrassed while performing the examination. Methods of teaching DRE include part-task-trainers and standardized patients (SP). Although teaching via SPs seems to be favourable, the physical and psychological strain for SPs is considerably high. We designed a controlled trial to investigate different approaches of teaching DRE, namely a combination of part-task-trainers and SP compared to SPs alone.

**Methods:** We randomly assigned 24 voluntary students in their 5th or 6th year to two different groups. Both groups received a lecture on DRE prior to the intervention. Thereafter, the part-task trainer group (PTG, n=12, 6 male, 6 female, age 25.8) performed a DRE on a part-task trainer, the other group (SP-G n=12, 5 male, 7 female, age 25.0) performed a DRE on a SP. Regarding the PTG the part-task trainer was placed behind a SP who could provide direct feedback by seeing a video transmission of the examination on a monitor in front of him. Both groups received a structured feedback by the SP after the examination. To assess pre / post self-efficacy-ratings related to DRE sessions and acceptance, participants completed a questionnaire prior and after the training using a six-point Likert scale (1 = fully agree; 6 = completely disagree).

**Results:** Both groups showed significant improvement in self-efficacy ratings concerning the ability to perform an independent DRE on a real patient (PTG (mean, SD): pre 3.58±1.5, post 2.08±0.8, SPG pre 3.75±1.3, post 1.67±0.7). The improvement did not differ significantly between both groups (p=0.25). After the training all participants felt able to perform a DRE on a real patient without feeling embarrassed (PTG1.92±0.8, SPG 2.0±1.0; p=0.98). In terms of realism, there was no significant difference concerning accompanying communication or information of the patient, only the examination itself was rated more realistic by the SPG (PTG3.51±1.9, SPG 1.13±0.9, p=0.03).

**Discussion/conclusions:** Performing a DRE on a part-task trainer with a SP, who can give direct feedback as an “add-on”, compared to DRE with SPs who are willing to be examined by students has comparable effects on acceptance and self-efficacy ratings, even though the examination of SPs is rated more realistic. The effects on objective performance need to be further examined.

**III-3.6 Services for Pregnant Medical Students in Preclinical Courses and Clinical Rotations**

**Liebhard H, Niehues J, Hummler H, Reister F, Britsch P, Weber J, Ziegenhain U, Fegert JM (Ulm University Hospital, Department of Child and Adolescent Psychiatry, Ulm)**

**Objectives:** After having identified a gap of advisory and counselling services for pregnant medical students at all medical faculties in Baden-Württemberg regarding the law of maternity leave in preclinical courses and clinical rotations, appropriate management and guidance for pregnant medical students is being presented.

**Methods:** The findings and recommendations are based on a pilot study at Ulm University assessing a family-friendly medical curriculum in 2008/2009 [1,2,3,4], a study on the career-family-balance of the medical education conducted in 2009/2010 in cooperation with the medical faculties of the universities of Freiburg, Heidelberg, Mannheim, Tübingen, Ulm [5,6] and a published expert’s report on the medical basis regarding the duration of maternity leaves in 2010 [7].

**Results:** (1) Legal guidelines for maternity protection: In Germany the legal guidelines for maternity protection (including students) are determined by the law on maternity leave (Mutterschutzgesetz – MuSchG § 3 Abs. 1, § 6 Abs. 1). The mandatory duration in Germany consists of fourteen weeks, six before birth and eight after birth. Employers are legally obligated to monitor the compliance with this time frame. In addition, the state laws on education (Landeshochschulgesetz §36; §61; Hochschulrahmengesetz §4, §16, §34) intend to protect students’ pregnancies, birth and family foundation with the same regulations as the national law on maternity leave.

(2) Recommendations for counselling medical students: Our studies show that no medical faculties, neither the dean’s office nor departments, offer sufficient services or reliable information on pregnancy safety in medical students. We would therefore recommend following measures:
New Interuniversitary Bachelor of Medical Technology: A Dual Challenge for Students

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Objectives: The interuniversitary bachelor of Medical Technology was developed by the Eberhard-Karls University Tübingen and the University of Stuttgart. It is characterised by being research oriented, showing flexible study design and diversified basic study period. It uses the specific expertise of two universities: technical science and engineering at the University of Stuttgart and natural and medical sciences at the University of Tübingen.

Outstanding within this bachelor program is the interprofessional and interuniversitary concept. Students need to be organized very well to study two very different disciplines and to manage the change of location. One central keyword within this interuniversitary study program is integration: integration in two universities, integration in two academic disciplines, and integration even in existing study courses. To ensure the students' identification with both universities from the very beginning and to satisfy wide interests, study courses at both universities were fixed in the curriculum at the very beginning being aware of the additional expenditure of time for the students. Existing study courses were set in the curriculum to facilitate the contact to students from other disciplines and of course for financial reasons.

This dual challenge having an interuniversitary and interprofessional study program was reflected in matters of student learning, integration in existing study courses, identification with two universities, as well as changing location.

- Online-informations for all medical students in the beginning of studies about maternity leave
- Briefing interested students who are planning pregnancy
- Instruction of teaching staff about maternity protection of students
- Clarifying the workflow and tasks with the university’s department of occupational health and safety
- Training of the dean’s offce’s and student secretaries’ counselling staff
- Definition of individual risks and endangerments for pregnant students in preclinical courses and clinical rotations


Furthermore the expertise focuses on the health of pregnant women and young mothers, the paediatric issues of the child and the relationship between parent and child, attachment and child development.

Our next current expertise is focusing on the identification of specific obstacles for healthcare professionals such as physicians or nurses. Studies show that female gynaecologists who still work shortly before due date are facing higher risk pregnancies [11].

Methods: The reflection of those challenges was carried out by personal discussions and established questionnaires (reaching 80% of the students), as well as in feedback discussions (50% students) and mentoring groups (20% of students in three groups making 60% of the students). Using those different evaluation tools, various aspects can be highlighted and anonymous as well as personal feedback can be included in the reflection.

Results: The audience are first-year students having a strongly pronounced addiction to natural science and engineering with a deep interest in biomedical questions. The students appreciate to benefit from the interuniversitary surroundings at two renowned universities with different competences and to achieve a joint degree of both universities.

Two thirds of the students change location by train and use this time for preparation and rehearsal. Nevertheless, it was noted that enough time for traveling has to be scheduled and that the willingness to change location is reduced to two days a week and once a day.

The students appreciate specific study courses for themselves and criticise huge audience and unspecific courses as they cannot identify the benefit for Medical Technology.

For a successful integration in two academic disciplines it is important to have a fifty-fifty distribution of both technical science and engineering as well as natural and medical sciences. Otherwise, students showing a stronger addiction to one of the disciplines miss out. The academic content in the professional studies (third year) may hopefully be initiative as the courses are planned in a Y-Model to facilitate flexible study design.

Perspective and Discussion: For further studies, the evaluation and quality management will be strengthened. Firstly, to make the evaluation concrete and measurable, standardized questionnaires will be used and secondly, to use the potential of the students’ idea focus group discussions to specific aspects will be established.

III-3.8 Raising a Family While Earning a Medical Degree? A Study on Supporting Factors to the Career-Family Balance of Medical Education in Germany

Niehues J, Prospero K, Liebhardt H, Fegert JM (Ulm University Hospital, Clinic for Child and Adolescent Psychiatry, Ulm)

Objectives: Considering the difficulty of combining a career in the medical profession with starting a family and the increasing rate of involuntary childlessness of academic women a new approach to career-family balance including the stage of medical education is needed.

In 2009/2010 the family research team of the Clinic for child and adolescent psychiatry of the Ulm University Hospital in cooperation with the Medical Faculty of Ulm University therefore conducted a study on the career-family-balance of the Medical Education. The purpose of the study was to examine which existing and necessary factors enable a successful medical education for students deciding to raise a family. On this basis practical recommendations on how to address the increasing importance of career-family balance are shared with the Medical Faculties of Baden-Württemberg.

Methods: Qualitative and quantitative data of studying parents at all five Medical Schools in Germany (Freiburg, Heidelberg, Mannheim, Tübingen and Ulm) were collected in 2009/2010 to examine the living and study experience of students with children and to contrast supporting and hindering factors for studying parents at individual as well as university level. 60 problem-oriented guided interviews with studying parents were conducted in 2009/2010. The transcripts were analysed using qualitative content analysis. A quantitative online survey was sent out to all studying parents in Baden-Württemberg in summer 2010.

Results: Of all 10,742 students in medical education in Baden-Württemberg in summer 2010, 4.2% were raising children. 52% of these students took part in the online survey.

The data shows that having children during medical education has been a conscious decision for most parents (63%). However, they often face problems with coordinating their studies with their family. The main problems are generated through the nature of the medical degree with many compulsory classes, courses in the afternoon and many exams in short time periods. At the same time many of the parents had problems finding necessary information on studying with children (46%). Only a quarter had received academic advice on how to successfully coordinate studying with children. Studying parents, for the most part, have no knowledge of existing offers of academic counselling by the Medical Faculties.

As a result the interviews as well as the online survey show that the possibility of an individually edited flexible study organization that can accommodate for special circumstances like sick children, is a crucial prerequisite for a successful study experience.

Discussion/conclusions: Increased career-family balance for studying parents can enhance the students’ satisfaction and provide universities with a valuable competitive edge. Facing the increasing importance of career-family balance in the medical professions, universities need to raise awareness of the possibility of
combining a family with earning a medical degree as well as of existing support structures. It is important that the Medical Faculties provide a framework that enables the compatibility of academic requirements with family demands. Individual and flexible planning of the semester to ensure a successful study-family balance has to be made possible with the help of an academic advisor. The Medical Faculties therefore need to appear more approachable to studying parents preferably before students face difficulties with their study organization.


### III-3.9 How Content Are Medical Students with Their Work-Life-Balance?

**A Cross-Over Study to Evaluate “Life Satisfaction” of Medical Students**

Rau T, Geiler S, Allroggen M, Plener PL, Weninger L, Böckers TM, Ludolph AG (University Hospital Ulm, Department for Child and Adolescent Psychiatry and Psychotherapy, Ulm)

**Objectives:** In students’ opinion the life satisfaction of medical students is especially low because of the work load at medical school [1,2]. The „questionnaire for life satisfaction“ by Henrich & Herschbach (2000) evaluates the contentment in eight different areas of life (friends, leisure time, health, financial situation, work/study, housing conditions, family life, partner relationships/sexuality) [3]. Aim of the study was the evaluation of the „life satisfaction“ of medical students in all semesters until internship in these eight areas of life.

**Methods:** Starting in winter term 2010/11 we asked all medical students at the University of Ulm to participate in an online-survey using the e-learning platform MOODLE. The 5-point-scaled „questionnaire for life satisfaction“ was slightly modified (1-5). For the assessment of the general life satisfaction the figures of all eight areas were summed up and the mean was calculated. With a t-test for independent samples we looked for differences between first year, second year-students up to internship and also for differences between males and females.

We also compared the means of the single items with study year and gender by t-test. The correlation between the different areas of life was assessed by Pearson’s correlation coefficient.

**Results:** Out of 2277 medical students in Ulm, 714 (67% females, 33% males) filled out the questionnaire (response rate 31%). The mean for general „life satisfaction“ of all students was 3.83 (SD 0.56). No significant difference could be detected in relation to the different years of medical school or gender. In the areas “income” and “work” male students were significantly more content than females. We found a negative relation between duration of study and contentment with work/study and a positive relation between study time and partnership and housing. Social situation and all other areas of life correlate significantly for all medical students. The relation between study/work and leisure activities was also strongly positive.

**Discussion/conclusions:** Ulm medical students seem to be content with their general life situation. The relation between work/study and free time hints to a well-adjusted work-life-balance.

Our results are not in line with other studies investigating stress and life satisfaction [1,2,4,5,6,7]. We will conduct a follow-up study in Ulm to verify these pilot data.

4. **Student Selection and Outcome Evaluation**

**IV-4.1 Which Work Aspects Are Relevant for Residents? Results from a Graduate Survey**

Biller S, Giesler M (Universitätsklinik Freiburg, Studiendekanat, Freiburg)

**Background:** The shortage of doctors is widely discussed in Germany. One reason for the shortage may lie in the difficulty to combine a career with personal commitments, responsibilities and desires (e.g. parenting, recreational activities).

**Objectives:** The aim of this study was to find out whether there is an imbalance between work aspects and commitments, responsibilities and desires of young residents.

**Methods:** All young doctors who graduated from Baden-Württemberg (BW) medical faculties in autumn 2007 or spring 2008 were requested to participate in a graduate survey which was conducted in autumn 2009 in cooperation with the International Center for Higher Education Research (INCHER – Kassel) and the “Kompetenzenetz Lehre BW”. 514 residents responded (response rate = 42%). 61% of the sample were female. The extensive questionnaire contained 19 Items addressing work aspects. Participants were first asked to rate the importance of various aspects of their work on a five-point Likert scale (1 = “very important”, 5 = “of no importance”). Subsequently they were asked to judge the degree to which these work aspects were realized in their current working situation (1 = “to a great extent”, 5 = “not at all”). In order to test for significant differences between importance and situation ratings as well as between the sexes t-tests were used.

**Results:** Work aspects with highest individual importance for residents are “work climate” (M = 1.20), “possibility to qualify” (M = 1.34) and “interesting work content” (M = 1.46). The “possibility to do research” is rated least important (M = 3.41). The largest significant gender differences in importance-ratings are found for “high salary” (Mmale = 2.08 vs. Mfemale = 2.42), “good career opportunities” (Mmale = 1.98 vs. Mfemale = 2.37), “having executive functions” (Mmale = 2.23 vs. Mfemale = 2.63). Work aspects evaluated as being given in the current working situation to a large degree are “possibility to help others”, “challenging work”, “security of employment”, “interesting work content”, “work climate”, and “possibility to apply acquired competencies” (all M < 2.0). Work aspects rated as given to a moderate or even lesser degree are “possibility of social influence” (M = 3.50), “possibility to do research” (M = 3.48), “adequate leisure time” (M = 3.25), “compatibility of family and work” (M = 3.19), and “having executive functions” (M = 3.14). The largest significant gender difference was found in the “possibility to do research” (Mmale = 2.33 vs. Mfemale = 3.64).

Nine work aspects show differences larger than Mdiff = -0.6 between individual importance and current-state. The largest differences are found for the work aspects “adequate leisure time” (Mdiff = -1.35) and “compatibility of family and work” (Mdiff = -1.21). The largest significant gender difference was found for “compatibility of family and work” Mdiff-male = -0.95 vs. Mdiff-female = -1.37).

**Discussion and Conclusion:** Work climate and the possibility to qualify seem to be the most important work aspects of residents at the beginning of their career. But there is an imbalance between the importance of and the opportunity for adequate leisure time and the compatibility of family and work. The latter discrepancy is most prominent for female residents. This imbalance may indeed lead to dissatisfaction with work conditions and in the long run to shortage of doctors.

**IV-4.2 Final Year Medical Students Under Close Supervision in the Emergency Department: A Reliable Model in Regard to Diagnostic Accuracy**

Celebi N, Herter D, Fenik L, Steinecke V, Riessen R, Weyrich P (Medical Clinic, Endocrinology, Tübingen)

**Objectives:** Novices are more prone to commit diagnostic errors, yet every physician has to go through a novice period in order to become an expert. Therefore, we prospectively investigated whether a teaching model that includes an experienced specialist serving as a student’s personal coach and supervisor can reduce diagnostic errors in this critical period of physician’s training.

**Methods:** From November 2010 to February 2011, 188 patients in the emergency department (ED) were quasi-randomly assigned to the care of a specialist registrar (SR) (n = 89) or a medical student (MS) supervised by a specialist registrar (n = 99). 22 medical students and 8 specialist registrars (supervisor or specialist registrar) worked at the emergency department during that time. The supervising physician
oversaw two to four medical students, but did not care for the patients directly. The supervisor performed the initial assessment of every patient cared for by MS. Medical students participated in this teaching model during their first two weeks in the ED. We subsequently compared the working hypothesis/diagnosis recorded upon admission in the ED with the discharge diagnosis, thus evaluating the accuracy of diagnoses made by SR versus MS. We also recorded the number of diagnostic procedures ordered and the PCCL-Level (Patient Co-Morbidity Complexity Level, a National Diagnosis Related Groups-System index, which modifies the reimbursement according to the severity of the patients’ co-morbidities).

**Results:** The working hypothesis/diagnosis changed in 23% of the patients cared for by SR and in 11% of the patients cared for by MS (p = .03). The PCCL-levels of the patients in the SR versus MS-group were comparable: PCCL 0 46% vs. 39%, PCCL 1 0% vs. 0%, PCCL 2 19% vs. 18%, PCCL 3 19% vs. 20% and PCCL 4 16% vs. 22% (p = .66). SR ordered an average of .74 ± .84 diagnostic procedures apart from laboratory investigations and ECGs, while MS ordered 1.05 ± 1.1 (p = .07) procedures.

**Discussion:** The diagnostic accuracy of closely supervised medical students caring for ED patients was significantly better than that of the specialist registrars in comparable (in regard to severity of preexisting co-morbidities) patient groups. This finding may be explained by the fact that the student group ordered – although not significantly - more diagnostic procedures, and that the individual student focused on a significantly lower number of patients (an average of two patients per day) compared to the SR (an average of six patients per day). In addition, the diagnostic process in the MS group was a result of teamwork, while the SR worked alone. However, this prospective study provides evidence that novices can match the specialists in the diagnostic ED process, if close supervision is provided.

**IV-4.3 The MD Degree in Germany: Decoration or Dedication?**

**Hints from a Graduate Survey**

Fabry, Gotz; Giesler, Marianne; Biller, Silke; Streitlein-Böhme, Irmgard (Medical School, Department of Medical Psychology & Sociology, Freiburg)

Many physicians (about 60%) in Germany hold an MD degree (“Dr. med.”). Thus, medicine is the academic discipline with the highest rate of doctoral theses overall. However, the quality of the MD theses has consistently been called into question and is assumed to be very heterogeneous. In contrast to most of the PhD theses many of their medical counterparts are prepared and completed during the course of medical education instead of afterwards.

Against this background we surveyed medical graduates to find out whether they had started or even completed a doctoral thesis and if so, what type of studies they (had) conducted. We also looked for differences between theses characteristics and individual differences such as academic achievement.

**Methods:** 514 graduates from five medical schools in the federal state of Baden-Württemberg (BW) were surveyed 1 – 1.5 years after graduation (Project in cooperation with INCHER-Kassel and “Kompetenznetz Lehre in der Medizin BW”). Aside from questions directed at the medical thesis (e.g. methodology used, type of study, mentoring, grade achieved) the survey contained measures of academic achievement (final school grade, 2 national exams) and satisfaction with the learning environment.

**Results:** 55.4% of the participants had finished their thesis, 38.9% were still working on it and 5.3% had not started a thesis yet. Based on the types of projects – experimental (1), clinical with (2) or without (3) direct involvement of patients and non-clinical/non-experimental (4) – we compared four groups. In group 1 68% (n = 228) of the participants had finished their theses compared to 53% in group 2 (n = 131), 44% in group 3 (n = 73) and 51% in group 4 (n = 39). Differences existed regarding the quality of the theses: In group 1 most of the theses received an excellent grade: “summa cum laude” (11%) or “magna cum laude” (76%). While 3.1% of all theses in group 2 received “summa cum laude”, the majority received “magna cum laude” (43%) or “cum laude” (43%), 11% received “rite” (the lowest grade possible). None of the theses in group 3 and 4 received “summa cum laude”, about one third received “magna cum laude” (28% and 30% resp.), half of them (59% and 50% resp.) received “cum laude” and the rest received “rite” (14% and 20% resp.).

Overall, 88% of all “summa cum laude” theses used an experimental design. These differences are also reflected in the rate of publications, which is highest in group 1 (48.7%) compared to 32.6% in group 2, 20.5% in group 3 and 23.7% in group 4. We found further differences with regard to academic achievement: Individuals in group 1 had better final school grades compared to group 4 and achieved better results in the first national exam compared to groups 2 and 4.
Discussion and Conclusion: Our results suggest differences in the quality of MD theses that coincide with the different types of projects. Compared to the other groups, individuals preparing an experimental study complete their theses earlier, achieve better grades and publish their results more often. As it is usually more demanding to conduct an experimental study, this type of project might be more attractive to individuals with a deeper interest in research. Further studies are necessary to deepen our understanding of the motives fueling doctoral theses in medicine.

IV-4.4 Who Strives for a Doctoral Degree in Medicine? Findings from a Graduate Survey

Giesler M, Biller S, Fabry G, Streitlein-Böhme I (Faculty of Medicine, Medical Psychology & Deanery of Student Affairs, Freiburg)

Objectives: In Germany, medicine is the academic discipline with the highest rate of doctoral theses overall and about 60% of physicians hold a doctoral degree ("Dr. med."). This is probably due to the fact that MD theses can be prepared and completed during university studies whereas in other disciplines doctoral theses are possible only after final exams. Against this background we wanted to find out more about person characteristics of residents who already had completed their thesis, those that were still working on it and those who never had started a thesis in the first place.

Methods: In autumn 2009 we surveyed all residents who had graduated from the five medical schools in Baden-Württemberg (BW) up to one and a half years earlier. This survey was conducted in cooperation with the International Center for Higher Education Research (INCHER – Kassel) and the "Kompetenznetz Lehre BW". 514 residents (61% female) responded (response rate = 42%). The extensive questionnaire contained items addressing study conditions, course of study, doctoral thesis, work aspects etc.

Results: Up to one and a half years after graduation 55.4% of the residents had completed their doctoral thesis, 38.9% were still working on it and 5.3% had never attempted to earn a MD degree. Compared to their colleagues the latter had the best final school grades. They also had significantly more children and a higher proportion of them reported that their current occupation allowed them to reconcile their work and family life. Those residents who had already completed their thesis had achieved better results in their final medical exam. Compared to their fellows these residents also were more self-assertive and more confident with regard to their ability to apply scientific methods. In addition, they had completed clinical rotations in foreign countries more often. Finally, residents who were still working on their thesis had significantly more professional experience prior to their medical education. No significant differences between these three groups were found for sex or age.

Discussion and Conclusion: Results show significant differences between residents with a doctoral degree, residents still writing their thesis and residents who never started one. The majority of the participants had already finished their doctoral thesis. As these residents also had the best final grades, went abroad more often during their studies and seem to be more self-assertive, they might be more goal-oriented compared to their colleagues. The small group of residents who never started a thesis have more children and therefore seem to be more engaged in family life. Little can be said about residents having not yet completed their MD thesis. Future panel studies should focus on this group and look for means to support them to accomplish their academic goals.

IV-4.5 Qualitative Content Analysis of Written Submissions (CV’s) in the Student Selection Process – Finding Categories and Giving Weights

Hofmann M, Zupanic M, Nitsche J, Fischer M (Faculty of Health, Medicine, Witten)

Background: For more than 20 years the University of Witten/Herdecke has adhered to its own student admission procedure. Since 2005 this application procedure consists of a written and an oral application phase (assessment centre). Several research projects with different approaches will be presented here.

1) In 2007 a retrospective classification of all applicants of the year 2005 was conducted, with the objective of finding academic and non-academic predictors for acceptance at Witten/Herdecke. The QUEST model was used to classify the items in sequence of declining power and in coherence to the targeted variable (acceptance). In this study the high school graduation mark showed to be of high significance for the admission process at the University of Witten/Herdecke. The high negative predictive value pointed out that the QUEST analysis is not suitable for replacing the existing admission process, but might be used for pre-selecting candidates.
2) In 2010 another study using matched-pairs-design was conducted focusing on the question of what distinguished successful applicants from those who had been refused after the written application phase. Matching was successfully performed on the basis of socio-demographic parameters such as age, gender and high school graduation marks. The only significant result could be shown for the trait 'stay abroad'. Characteristics such as school performance and professional achievements obviously do not meet the profile of requirements for medical applicants and omit personality traits completely.

Summary of work: 3) In recent research we therefore focus on a qualitative analysis of the curriculum vitae with the aim of building categories in order to develop checklist supporting the decision-making process for faculty members. We conducted a between-group comparison up to saturation of the identified categories which was reached at about ten CV’s of applicants which had been refused after the written application process and ten CV’s of applicants which had been accepted after assessment centre.

Summary of results: A qualitative analysis of content according to Philipp Mayring including paraphrasing of content specific text passages and category-building revealed in a first attempt twelve meta-categories concerning:

- academic performance, biographic data and school career,
- motivational factors such as reasons for career choice as medical doctor, objectives and role models,
- socio-psychological aspects such as social involvement, personal qualities and skills.

Conclusion/future prospect: Qualitative categories determined in recent research will have to be analysed against the quantitative aspect of frequency. Further research is needed on assigning meaningful weights to these categories in order to form a basis for designing a standardised Multiple-Mini-Interview (MMI) admission course.


IV-4.6 Winds of Change: Component and Selection Profile of the German Aptitude Test for Medical Studies (TMS)

Kadmon, Guni; Kadmon, Martina (Medical Faculty, HeiCuMed, Heidelberg)

Introduction: Since its re-introduction in 2007, the aptitude test for medical studies (TMS) has continuously gained importance for the selection of medical students to the faculties of Baden-Wuerttemberg, Luebeck, Bochum, Leipzig, Mainz, and Erlangen.

Aim: To examine the effect of the TMS on the profile of the student cohorts admitted to our faculty as well as its reliability and component profile.

Methods: For student selection of our faculty ranks the applicants according to the baccalaureate grade point average (bGPA), weighted with 60% up to 2006 and 51% thereafter, the TMS, weighted with 39%, and an additional bonus for previous achievements of maximal 40% up to 2006, 10% thereafter. The 200 best ranking candidates are admitted. As of 2007 the number of valid applications has been restricted by additional admission criteria. The selection data from 2006 (n = 3855), 2007 (n = 1001), 2009 (n = 1318), and 2010 (n = 1348) were anonymised and examined statistically (SPSS® 16).

Results: In 2006, the average bGPA of the 200 highest-ranking applicants was 777 points (grade 1.0 on a scale of 1.0 (best) to 5.0 (fail)). Following the introduction of the TMS the average bGPA of the top 200 applicants has decreased to 762 (1.1) in 2007, 713 (1.4) and 701 (1.4) in 2009 and 2010, respectively. This was due to an increase of the number of applicants with lower bGPAs among the 200 applicants with the best TMS scores: from 0 in 2007 to 116 in 2009 and 137 in 2010. As a result, the number of applicants with baccalaureate grade 1.0 that were “edged out” of the top 200 rank list by applicants with worse bGPAs rose from 0 in 2006 and 2007 to 121 and 122 in 2009 and 2010, respectively.

The proportion of male applicants remained almost constant from 2006 (39.4%) through 2010 (36.5%). However the male proportion among the 200 best-ranking applicants increased from 40.5% in 2006 to 53.5% in 2010.

The TMS includes nine items (subtests). Reliability was examined by the data of the applicants of 2009 (626 TMS participants) and 2010 (580). Cronbach’s α for standardised items was 0.751 in 2009 and 0.774 in 2010. Interitem correlation ranged from 0.111 to 0.605 (mean 0.251), suggesting dimensional differences between items. By factor analysis, overall as well as for the participants with sub-average test
scores two components could be discerned: one component including the verbal and mathematical sub-tests, and one including the subtests relating to visual-figurative-spatial cognition. In contrast, the test results of the best-scoring TMS participants (1.5xSD above average or better) could be allocated to as many as four components with mean interitem correlation within components of 0.526.

These included
(1) comprehension of general and scientific/medical texts,
(2) mathematical exercises,
(3) concentration and memory exercises, and
(4) visual-figurative-spatial cognition tasks.

This suggests that the dimensional differences detected among the best-scoring TMS participants are more differentiated than among the less successful participants.

Discussion: The TMS enables a wider range of applicants than previously to successfully compete for admission to our faculty and has resulted in establishing an equal proportion of male and female students. It has a well-defined component structure with high item reliability. Reliable validation of its predictive value can be estimated, however, only when enough cohorts will have advanced into the clinical part of the studies.

IV-4.7 Organisation of and Resonance to the German Aptitude Test for Medical Studies (TMS)

Kirchner, Anna; Kadmon, Guni; Kadmon, Martina (Medical Faculty, HeiCuMed, Heidelberg)

Introduction: The reform of the German Higher Education Law (HRG) from 2004 delegated to the universities the task of selecting 60% of their students by their own criteria. Following an impulse from the Medical Faculty of Heidelberg University, the aptitude test for medical education (TMS) was re-introduced as a student selection tool by the five medical faculties of Baden-Wuerttemberg in 2007, supported by the Ministry for Cultural Affairs, Youth, and Sport Baden-Württemberg. Participation in the TMS is optional. A slightly modified form of the test is used in Switzerland and Austria. The Medical Faculty at Heidelberg University took upon itself the organisation of the TMS on behalf of all participating faculties.

Aim: To examine the organisational development of the TMS, the progress of participation in the test and demographic aspects of the participants.

Organisational structure and tasks: ITB Consulting GmbH (ITB) prepares the test questionnaires, marks the tests and informs the participants of their results. The TMS Co-ordination Office at Heidelberg University is responsible for all other organisational aspects. This includes allocating, securing, and furnishing test locations nationwide, providing information on-line (www.tms-info.org) and by a regular telephone consulting service, participant registration, recruiting and training examiners in collaboration with ITB, secure preparation and distribution of the necessary test material, running the test.

Participation statistics: (1) Faculties: The participating faculties were initially restricted to the five medical faculties of Baden-Wuerttemberg. By 2011 they were further joined by Luebeck, Bochum, Leipzig, Mainz, and Erlangen. The remaining Bavarian Faculties consider joining in 2012.
(2) Applicant participation: The number of initial registrations rose from 6400 in 2008 and 2009 to 8650 in 2010 and 12194 in 2011. For 2012 at least 15000 registrations are expected. 89% (2008) to 93% (2011) of those registered also paid the fees, but only 4453 persons (78% of those entitled to participate) actually took the test in 2008, 4570 (79%) in 2009, and 6159 (77%) in 2010. The overall proportion of females (63-65%) to males (35-37%) remained stable throughout this period, but varied between 75%-25% and 58%-42% among the different German federal states. The proportional distribution of the registered participants from the different federal states generally was similar to the relative distribution of the population among them. However, Baden-Wuerttemberg (13% of the German population) has continuously been over-represented, although this has been diminished from 33% of the registrations in 2008 to 25% of in 2011. Registration of non-resident foreigners has increased from 74 in 2008 to 220 in 2011.

Discussion: The increasing number of medical faculties recognising the TMS reflects their confidence in its relevance for student selection. The increasing resonance to the TMS among applicants to medical and dentistry studies probably is both due to the popularity of these faculties and to the fact that the TMS enables a wider range of applicants to compete for admission to these faculties. Interestingly, the increase in applicant participation in the TMS is proportionally similar in all federal states, regardless of the geographical distribution of the participating faculties. This calls for an enormous organisational effort by the TMS Co-ordination office of Heidelberg University.
**IV-4.8 Learning Outcome and Student Satisfaction During Final Clerkship Year at the Medical Faculty Mannheim – Mentoring Is the Key to Success**

Narciß, Elisabeth¹; Obertacke, Udo²; Fritz, Harald²; Glahn, Esther Maria¹; Kriz, David²

¹ Medical Faculty Mannheim, Heidelberg University, ² Otto-Selz-Institute for Applied Psychology; University of Mannheim; ³Medizinische Fakultät Mannheim der Universität Heidelberg, Referentin Kompetenzzentrum Praktisches Jahr, Mannheim

**Background:** Increasingly, medical students in their final clinical clerkship year (PJ) demand remuneration or are already being paid. At our faculty, there is a consensus that quality of training should have priority over payment. Therefore, we wanted to determine how satisfied students are with various parts of their clerkship and how they -subjectively- assess their learning outcome. A working model was developed by OSI (Otto-Selz-Institute for Applied Psychology; University of Mannheim) based on the ‘multidimensional conditional model for learning outcomes by Rindermann’ and an appropriate questionnaire was designed in cooperation with a working group of the Medical Study Dean’s office.

**Methods:** A cross-sectional survey was carried out in mid-2010 by means of an anonymous online-questionnaire containing 85 questions. Two cohorts of students were enrolled, one being at the end of the third part (117 students), the other at the start of their second part (23 students) of their clinical clerkship year (the clerkship divided into three parts called ‘tertials’. A total of 118 of the 140 students (84,3%) answered the questionnaire. This translates into a total of 317 assessed tertials, which were fairly equally divided between the three subjects (104 surgery/ 109 internal medicine/ 104 an elective specialty). Analysis of the questionnaires was done by OSI.

**Results:** Overall, students are reasonably satisfied with their clerkship year (mean = 3,54 of a Likert scale ranging from 1 = completely unsatisfied to 5 = completely satisfied). As may be expected, the ‘satisfaction level’ is highest when they had choose their specialty (elective part: mean 4,46 based on 104 answers; tertials done abroad: mean 4,54 based on 49 answers). The difference is significant between electives and compulsory subjects, while tertials done abroad are not assessed as ‘better’ compared to the most positively rated teaching hospital in Germany. There is a strong positive correlation between ‘satisfaction’ of students and the perceived level of support on the ward. The ratio ‘patients per doctor’ and the ‘perceived work load’ correlate negatively with the satisfaction level. Interestingly, the remuneration level during clerkship does not play an important role in students satisfaction; students are in general not content with their remuneration (mean 2,3 out of 5), but are not more content when comparatively better paid.

The perceived learning success was rated using an outcome scale of 26 items. Again, the elective scores clearly better than the compulsory tertials: mean = 4,11 compared to 3,52 (internal medicine) and 3,42 (surgery). The teaching hospital, in which students felt most ‘satisfied’ also rated best in terms of learning outcome (mean = 3,95). When analysing the factors predicting a good learning outcome, the ‘support level at the ward’ together with a combination of prior knowledge, interest, motivation and skill levels is essential. The perceived work load, however, has no significant influence.

**Conclusion:** To increase student satisfaction and learning outcome in the final clerkship year, more resources should be invested in a mentoring programme. Also, students benefit the more from their final year when they have a high clinical knowledge level at the start of their clerkship. Remuneration of the students does not significantly influence satisfaction levels nor learning outcomes.

**IV-4.9 Future Competency Profiles in Human Medicine Demanded by the Labour Market**

Menzi, Brigitte; Heyse, Volker; Schircks, Arnulf; Pfister, Christoph A. (Health Policy Directorate, Section Continuing Education, Bern)

**Objectives:** Based on the discussions on demographic change, the Swiss Federal Office of Public Health (FOPH) has identified a gap in knowledge concerning the competency requirements for various occupational fields in human medicine. Therefore, the aim of the project was (1) to identify the specific generic skills required by certain labour markets for physicians today and in the future and (2) to examine the extent to which existing medical training in Switzerland does or does not respond to these needs.

**Methods:** By choosing a hybrid methodological approach – combining literary analysis [1], multi-disciplinary expert interviews based on KODE®X, workshops and competency diagnostics instruments – the future situation was described as accurately as possible. Six exemplary occupational fields included general practice medicine, hospital medicine, management, medical research, administration and insurance, and telemedicine. Experts defined the most important generic competencies for these occupational fields.
The results were then compared and adjusted to the current conditions, which were measured by applying the KODE® [2] competence diagnostic tool – containing standardised questionnaires – to students and residents.

**Results:** Nine major developments will most likely influence the needs of the future labour market: demographic change, commoditisation of the health market, extension of the occupational profile “physician”, increase in outpatient care, consistent implementation of quality management, internationalisation of healthcare services, new models for the division of labour, professionalisation of human resource management and a change in the understanding of health and disease in society. Seventeen different competencies were identified per occupational field out of 64 competencies defined in the competency-atlas of CeKom® containing personal, activity and action ability-related, functional-methodological and social-communicative competencies. One third of the competencies was different between the fields and could define a competency profile for the health professionals working in this field. A review of the actual implementation revealed that competencies in the minor fields of study are taking on increased significance in international educational objectives as well [3], with one focus being on the social and communicative competencies. Competencies which are reflected in longer-term actions, on the other hand, are to date not considered systematically enough. A non-representative competency assessment with medical students at two Swiss universities, which compared actual and required competencies, arrived at a similar conclusion [4]. The assessment showed that 71 percent of students are sufficiently qualified for at least one professional occupational field, while 28 percent of students do not (yet) fulfil the requirements. But further studies would be necessary before these results could be generalised.

**Conclusion:** In order to ensure that all prospective physicians dispose of the generic competencies necessary for the exercise of their profession in a specific context in future, those competencies must be weighted more heavily and embedded systematically in medical training.

5. Teaching and Assessment (2)

I-5.1 “This was both catastrophic and brilliant” – Tutors’ Feedback in Practical Training in Emergency Medicine

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Feedback is a crucial element in clinical teaching that enables and advances students’ learning as well as their professional development. Students are supported in identifying their learning needs and in coping with challenges [1, 2]. Throughout the study, we focused on immediate, referring to feedback given during the students’ performance, and formal feedback corresponding with feedback that occurred after the students’ performance.

In spite of these benefits, prior research indicates a lack in tutors’ feedback skills, especially in terms of dealing with students’ mistakes. Nor could be found any research on feedback in emergency medicine education. Thus, this study aimed to examine medical tutors’ feedback techniques. Also, it was aimed to explore if they are consistent with results of prior research in other fields of medicine that identified aspects relating to structure, content and the way of giving feedback as effective [3].

We focussed communication processes between tutors and students that were related to students’ acting in the practical training in emergency medicine. We expected both a deviation between literature-based recommendations for effective feedback and actually shown feedback skills and that tutors would provide rather immediate than formal feedback. The given feedback itself was assumed to be mainly positive and to be neglecting students’ mistakes.

In order to explore tutor’s feedback techniques, 21 videos showing scenario teaching situations comprising of simulated patients in emergency medicine were reviewed considering structure, content and the way of providing feedback as levels of analysis.

Qualitative data analysis showed that all tutors provided feedback at some point but that the extent, content and the ways of giving feedback varied, confirming our expected discrepancy between suggested and actually provided feedback.

While immediate feedback was mainly provided to take correction when students got stuck in their performance, reinforcing feedback was given by only some tutors. Most tutors offered formal feedback whereas reinforcing feedback was giving more frequently than corrective feedback. It was striking that students’ mistakes were neglected by some tutors and that one tutor did not provide feedback at all.

Data showed that most tutors are familiar with at least some feedback techniques and used them in order to support their students. Some tutors, however, were lacking feedback techniques. We thus suggest further training in giving effective feedback especially in terms of giving corrective formal feedback so that students may be supported in learning and the development of their professional skills.


I-5.2 Preparation with Peer-Assisted-Learning Improves the Results of an Objective Structured Clinical Examination in Interdisciplinary Pain Therapy

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Background: Peer-assisted Learning (PAL) is an effective method to train clinical and communicative skills. The skills lab of Charité-Universitätsmedizin Berlin (TÄF) has a long tradition of PAL tutorials, which are autonomously organized and performed by specially trained students of the traditional and the reformed curriculum. Aim of these tutorials is both preparation for internships and preparation for tests and exams, participation is optional and free of charge. One out of 42 different tutorials is offered for preparation of the Objective Structured Clinical Examination (OSCE) in interdisciplinary pain therapy at the end of the 4th academic year of the regular curriculum. Aim of this retrospective analysis was to evaluate the effect of PAL on the results of the above mentioned OSCE.
Methods: Thirty-two tutorials “interdisciplinary pain therapy” (10 potential attendants in each tutorial, duration: 2 hours) were offered for a total of 640 students from October 2009 until July 2010. Therefore, 50% of the students had the possibility to participate, available places were assigned in the order of application.

All tutorials and the OSCE were evaluated by an optional questionnaire and OSCE-results were compared between students with (“PAL-students”) or without preparation by PAL (“Non-PAL-students”). Differences between the groups were analysed by Fisher’s exact test for nominal scaled data and by Mann-Whitney test for ordinal scaled data.

Results: 311 out of 521 OSCE-examinees participated in PAL-tutorials, 360 (69%) complete questionnaires could be analysed. Therefore, 225 PAL-students and 116 Non-PAL-students were included in the analyses. PAL-students reached significantly higher numbers of points in OSCE compared to Non-PAL-students (p=0.022). No significant difference could be found concerning passing or failing the OSCE.

No differences between PAL- and Non-PAL-students could be found concerning duration of self-studies and mental over- or underload during OSCE. 87.3% of all OSCE-examinees rated PAL as a useful method for OSCE preparation. No significant difference between PAL-and Non-PAL-students could be found concerning this item.

Discussion: PAL is a useful method for preparation and improves the results of the evaluated OSCE. One limitation of this retrospective analysis is the optional participation at PAL without randomisation. This may indicate, that more dedicated or more motivated students participated in PAL and that these students had consequently better results in OSCE. However, duration of self-studies for preparation of the OSCE as another indicator for student’s motivation or dedication showed no differences between both groups.

Further, prospective, randomised investigations are necessary to confirm the above mentioned results.


I-5.3 Video-Assisted Feedback as an Innovative Approach to Implement Guidelines in General Practice Internship

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Introduction: In Germany medical students have to pass an internship at the end of their academic studies. It is divided in three parts, each with four month of duration. Beside internal medicine and surgery a third part is an elective and can be passed in general practice. Our innovative approach aims to implement guidelines into real life situations of an internship in general practice via formative feedback in the one-to-one teaching condition.

Educational Concept: Firstly the physician and the internship student choose and review one out of 14 guidelines in general practice. Secondly, a subsequent patient – student – consultation is recorded on video. Afterwards, a video-assisted formative feedback is given by the physician. A checklist with main learning targets (communication, medical examination, a structured case report according to the guideline) supports the feedback in content.

Conclusion/Outlook: We will present the results of our pilot which tests the feasibility of our approach. The pilot will be accompanied by a qualitative evaluation (semi structured interview) to gain insight into barriers and challenges for the future implementation process. We will discuss our results in the light of workplace-based assessment and the concept of teaching students professionalism in real-life situations.
I-5.4 An Integrating System for Assessing Students’ Progress in the Anatomical Dissection Lab

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Learning anatomy in anatomical dissection lab can be seen as a multiple step task based curriculum.

1. Students have to prepare for their personal task by for instance repeating the systematic anatomy of those structures to be dissected in their region assigned to them.
   a. Read (aloud) the instructions for the tasks (joint, muscles, regions, etc.) in question
   b. Analyze the tasks: anatomical entities mentioned; borders, contents of regions, etc.
   c. Define learning goals from the fields of at least:
      i. Systematic anatomy
      ii. Topographical anatomy
      iii. Corresponding disciplines
      iv. Technical procedures
   d. Individual study: repeat and/or elaborate the defined items
2. They must present these preparations to their companions, who have another task, i.e. another region.
3. They have to perform the dissection and to find out whether and how their own specimens differs from the basically taught anatomy, especially they should pay attention to individual peculiarities and differences.
4. They have to
   a. document their progress and findings in a proper form and
   b. present their results to their companions.

Doing so, they gain practical knowhow, manual skills, as well as factual and procedural knowledge. Furthermore, they are trained to teamwork. Assessing these learning objectives must comprise of as many of these goals as possible.

We designed a multimodal assessment system comprising four different aspects:

1. Oral contributions of factual and procedural knowledge are assessed by five independent short structured oral exams (sSOEs). These oral assessments are dedicated to different topics in accordance with the progress of the course and comprise three questions each. Each question is judged with up to three scores; thus a student can acquire 45 scores in total by these sSOEs.
2. Their interaction with other students is assessed by structured observation. Good interaction with and proper contributions to their group are awarded with one score per fortnight; this results in up to five scores per course.
3. Also the main product of their work, the specimen, is assessed on a two-weeks basis. Students are awarded up to three scores for a perfect dissection. Perfect means that all anatomical structures are dissected properly, and the dissection doesn’t exclude the borders or limits of the region dissected. Two scores are awarded when the specimens shows minor destruction such as removal or cutting apart of minor structures or when the borders or limit of the region dissected are spared. One score is awarded when there are major destructions such as cutting apart a major nerve or vessel. Completely inadequate dissection doesn’t get any score. By this, students can acquire up to 15 scores.
4. Finally, the students’ documentation of their work including their findings in their specimen is assessed by their course-portfolio. This portfolio should contain proper documentation of the work’s progress (who did when what), their actual findings in their specimens (i.e. anatomical variants and variations), their reflection on their work and their contribution to ethical issues. The portfolio is a team product and is assessed as a whole, so each student is awarded the same amount of up to six scores.
I-5.5 Physical Examination: Deficits and Training Needs of Final Year Students

Buss B, Diefenbacher K, Krautter M, Koehl-Hackert N, Nagelmann L, Lauber H, Huwendiek S, Jünger J, Nikendei C (Medical Faculty, Psychosomatic and General Internal Medicine, Heidelberg)

Introduction: Physical examination is one of the most important doctors’ technical skills, notwithstanding the increasing mechanization of medicine [1]. Physical examination skills are mainly trained during medical studies in skills labs among one another and on wards at bedside [2]. At the University Hospital of Heidelberg, physical examination skills are taught in different courses during a longitudinal skills curriculum [3]. In order to assess final year student physical examination skills to estimate training deficits and to enable further curriculum planning, a prospective descriptive study was conducted in winter term 2009/10.

Method: 40 final year students of the University Hospital of Heidelberg participated in this study (n= 40; gender: 25 female, 15 male; age: M=24.9; SD=1.14; semester: M=11.02; SD=0.85). Physical examinations were performed on standardized patients in a skills lab setting. All examinations were filmed and digitized. In order to assess examination performance, a standard of physical examination was beforehand developed by an interdisciplinary expert team of the University Hospital of Heidelberg. Referring to this standard, five checklists with binary items (1: aspect of procedure was conducted completely correct / 0: aspect of procedure was conducted only partly, containing errors or was missing) were designed to detect student’s deviations from the clinical standard: (1) supply of standard-examination setting - 10 items; (2) examination of thyroid gland - 26 items; (3) examination of the heart - 28 items; (4) examination of lungs - 21 items; (5) examination of the abdomen - 48 items. Correctness and completeness of students’ physical examinations were assessed by two clinical experts, doctors of internal medicine, by viewing the video sequences. At first, videos were analyzed autonomously. The final voting was discussed together. Gender differences in mean failure rates were analyzed by using Student’s t-test (SPSS, Version 17.0 SPSS Inc., Chicago, IL, USA).

Results: In general, final year students have shown a relatively high failure rate. From 133 single aspects of procedures (binary checklist items), 81.9 (SD=11.3) were accomplished faulty or incomplete on average. This corresponds to a mean percentage failure rate of M=61.6% (SD=8.6). The mean percentage failure rate in checklist 1 (supply of setting) was very high (M=73%; SD=13.8). Little attention has been paid to doctor-patient interaction. Often clear instructions to patients were lacking. The average failure rates for the examinations of the four selected organ systems showed slightly different results. The examination of the heart and the abdomen was carried out better in average (M=58.21%, SD=11.95 and M=56.46%, SD=11.10). Major problems appeared in examination of thyroid gland and lungs (M=62.79%, SD=15.44 and M=71.19%, SD=13.16). For all checklists no differences in gender specific results were found (t-test; p>0.05).

Discussion: The results of the study show the specific needs for skills training in physical examination beyond the first years of undergraduate medical studies. The professional skill of physical examination is very complex and needs continuous repetition and a longitudinal skills training curriculum. Especially the supply of standard-examination setting and the increase in sophistication of single examination procedures should be focused in further curriculum development. The use of standardized patients in addition to trainings on ward could proof a lasting training effect [4].


I-5.6 Student Evaluation of Clinical Teachers in Relation to Teaching Experience in Years

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Background: Studies on development of expertise show that experience is needed for expertise but does not automatically lead to becoming an expert. Different possible ways of development are described, some leading to expertise by extensive deliberate practice and reflexion, others staying on the achieved level after an initial learning phase, or even regress (‘arrested development’). In this study we wanted to investigate whether these findings could be applied to clinical teaching.
**Methods:** We investigated 3 groups of clinical teachers in emergency medicine with different levels of teaching experience: group 1 ‘novice’0-1 year, group 2 ‘intermediate’ 2-7 years, group 3 ‘experienced’ more than 8 years. Each teacher taught a session of 50 min to 5-6 students. At the end of the session teachers were evaluated by means of a teaching quality questionnaire by their students. The questionnaire was based on an empirically based checklist for teaching quality (8 categories).

**Results:** 43 clinical teachers were evaluated. Students rated the novice and intermediate teachers distinctly better than the experienced teachers in all 8 categories and in the overall rating.

**Discussion:** Clinical teachers with longer teaching experience are not necessarily evaluated better than those with less experience. Findings suggest that the analyzed clinical teachers did not reach expert status. Reasons need to be explored in further studies.


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**I-5.7 Standardized Patients’ Perspective and Their Motivation for Taking Part in the Training of Digital Rectal Examination**

Diefenbacher K, Krautter M, Kohl-Hackert N, Buss B, Nagelmann L, Lauber H, Jünger J, Nikendie C (University Hospital Heidelberg, Department of General Internal and Psychosomatic Medicine, Heidelberg)

**Background:** The use of standardized patients (SPs) in undergraduate medical education is well-established. They are used for the training of communication skills but also for teaching how to conduct a physical examination (1), (2). Digital rectal examination (DRE) is an important part of a comprehensive physical examination and it has been proved effective in screening for abnormalities of the anus, the rectum or the prostate gland (3), (4), (5). In spite of this, it appears that occasions to practise DRE in undergraduate medical education rarely exist (6), (7). Therefore it is invaluable to use SPs to teach DRE as well. The aspect of why SPs take part in such training units has hardly been a subject of research so far. We have designed a study to find out about the SPs’ motivation, their feelings and expectations.

**Methods:** Medical and psychological professionals used theoretical and practical methods to teach the SPs (n=4) about the DRE and prepared them for participating in the education of medical students. Afterwards the SPs received a semi-structured interview about the training and their future use by the students. The interview took 12 minutes on average and dealt with five topics with one to four questions on each topic. The five topics were the SP’s motivation for participating, including the reaction of their social environment, their feelings and expectations before the training and of their future use in students’ classes, their experience of the training and their ideas for improvement. The qualitative content analysis was done by Mayring’s method of structuring (8) and supported by the software MAXQDA 10.

**Results:** A personal increase of knowledge, being helpful to medicine and the feeling of doing something meaningful were the main reasons given by the SPs for participating. It was important for the SPs to know that they would not be physically harmed and that they could cancel the project. The SPs described themselves as having little fear of contact. Most of the SPs said that they did not talk about their participation because they were afraid of being misunderstood. One SP confirmed that his social environment had reacted bemused. The training was a positive experience for the SPs and they hardly sensed shame because of the professionalism and the comfortable atmosphere. The SPs agreed with the concept of the training. For future reference they wished to have more repetition and a definite course of action should conflicts with students arise. They also mentioned that further suggestions for improvement may occur to them after their assignment. As long as the SPs felt well prepared they did not have any concern about being used in the students’ classes. However, they were afraid that some students might not respect their privacy or that the setting might not be realistic.

**Conclusions:** The results of the actual study offer new and interesting insights into the SPs’ thoughts and emotional state. For the SPs it is important to know that they will not be harmed, that their privacy will be respected and that they have the possibility of ending their participation. Mentioning the personal benefits such as the increase of knowledge or being helpful to medicine, the main reasons mentioned by the SPs during their interviews, could help to gain new SPs. To avoid a sense of shame, professionalism and a comfortable atmosphere seem to be very important. It remains open as to how it can be achieved that the social environment sees the use of SPs for the DRE as normal and a matter of course.


I-5.8 Analysis of Quality and Feasibility of an Objective Structured Clinical Examination (OSCE) in Preclinical Dental Education

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Introduction: For the first time, an objective structured clinical examination (OSCE) has been used in preclinical dentistry. It was taken at an early stage (propaedeutics course). Our objective was to evaluate the reliability, validity, and feasibility of the examination and the effect of circuit number on OSCE score.

Materials and methods: The OSCE was designed by an expert committee on the basis of pre-reviewed blueprints and checklists. Eleven stations formed an interdisciplinary circuit. Six groups of students (n=62) passed sequentially round the same circuit. Statistical analysis was performed by use of SPSS. Reliability was determined by measurement of internal consistency (Cronbach's α, Guttman's λ2), Standard Error of Measurement (SEM; comprising generalisability index α, dependability index Φf and pass-fail reliability pc), consistency coefficient κk, item-scale correlation (Pearson correlation), and, because the unidimensionality of the stations could not be assumed, factor analysis including varimax rotation. Convergent validity (Pearson correlation, T-Test), and predictive validity for future preclinical courses and the final preclinical examination were assessed by analysis of variance (ANOVA). The effect of the circuit number on score improvement was calculated, including a correction for the general competence of the students (ANOVA). Cost was calculated on the basis of the time invested.

Results: Fifty-three out of sixty-two students passed the OSCE (mean score: 67%; SD 7.7; range: 47-81). Scores for each station correlated significantly with total scores (r=0.35 to 0.54; P < 0.01). For internal consistency, α = 0.75 (relative SEM 3.8) and λ = 0.766. The dependability index was Φ = 0.694 (absolute SEM 4.4), pc = 0.89 and κ = 0.61. Factor analysis yielded two components: dental-materials-oriented stations and all other stations (explained variance 43%). Scores correlated significantly with success in passing practical tests (i.e. performing dental procedures under examination conditions) (known group validity, P < 0.01) and with scores for subsequent courses and the final preclinical examination (Physikum) (predictive validity, P < 0.001). Later groups performed 4% better on average (CI 95%: 1.2 to 6.8 %; P < 0.01). The cost was 181 Euro per student.

Conclusion: The OSCE is reliable and valid in the context of preclinical dentistry. The cost is substantial. The problem of improvement of students' results with ascending circuit number has to be addressed.

I-5.9 Standardised Students: A New Instrument for Quality Assurance of an OSCE

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Introduction: Objective structured clinical examinations (OSCE) are one of the standard examination formats for assessing psychomotor and communication skills. At Heidelberg Medical School we have implemented a 13 station OSCE at the end of the surgical clerkship. We could show that the OSCE reaches high reliability as measured by (0,86): Standardised rater instructions support an adequate Cronbachs' inter-rater reliability. Nevertheless systematic errors and individual rater preferences cannot be ruled out completely. Therefore, we plan to establish a new instrument for quality assurance in our OSCE. The present abstract describes the pilot phase of the project with the aim to analyse the feasibility of the standardised student concept.
Methods: Students who have already completed the surgical clerkship and passed the OSCE are trained to perform for a certain OSCE station at a defined level. For the student training, the checklist of the specific OSCE station is modified, so that for each item strengths and weaknesses defined for the level to be trained are clearly described. Four students are trained on each checklist, 2 at a borderline level and two at an excellent performance level, one male and female for each level. In order to guarantee standardised student performance, in a first step each student is assessed by the experienced OSCE rater who has been involved in the definition of the performance level under OSCE conditions. Thus, inadequate performance may be corrected.

Results: After training, a real-time OSCE is performed. Each trained student shows the defined performance in three subsequent OSCE settings within one day with a different rater each time. The repeated performance is video-taped and rated by additional three raters. First data on the project will be available by April 2011, which we would like to present during the RIME-Meeting.

Discussion: We believe that “Standardised Students” will add to quality assurance of an OSCE and may also be used in the training of future OSCE raters.

I-5.10 Development, Implementation and Execution of an Innovative Teaching and Examination Format in the Cross-Sectional Course “Clinical Environmental Medicine” for Students of Medicine

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In human medical studies in Tübingen the cross-sectional course „Clinical Environmental Medicine“ was performed as five 1.5-hour lectures followed by a multiple-choice examination. In the winter term 2008/2009, to improve teaching, educational objectives, instructional methods, and the examination modus were changed.

The new educational objectives were “To identify and evaluate environmental medical risks, and to communicate these risks.” Students should obtain the key skills, necessary to deal with questions from their future patients concerning environmental health. This includes acquiring information, critical evaluation of sources, risk assessment and risk communication.

In the new format 160 students, the cohort group of a term, were divided into small groups of 6-7 students. During the introductory plenum lecture the 24 groups were assigned their topics. The topics were, for example: “Do I have to remove my intact amalgam fillings?” or “PCB (polychlorinated diphenyls) in a kindergarten – ventilate strongly or renovate the building?” The teachers listed several good internet sites for each subject for the students. The students organized themselves for lecture preparation, researched their topics and could add further references.

About four to six weeks later they held their presentations, each planned to last 10-12 minutes during the week-long course. In the presentation the students must comment on the main question of their topic which was usually found in the title. A discussion, which should last 5-8 minutes, followed. It was important that in the presentation and/or in the discussion all group members were involved.

In the 1.5-hour seminars five 18-minute PowerPoint presentations (including discussion) from the students were given. In each seminar there were about 80 students and at least three teachers listening. In addition to the students’ presentations, short lectures from the teachers and an excursion were offered. As excursions the students could participate in a guided tour through Stuttgart concentrating on the climate problems of a big city, or could visit a municipal sewage plant. To get the graded course credit the students had to attend a total of four modules, which could be chosen from nine modules. Several students attended more than four modules.

For quality control a group of at least three teachers graded the presentations and discussions, following an assessment plan known to the students. The same grade was given for each member of the same group. This was quite a novelty for the faculty of medicine of the Universität Tübingen. The grading sheets were documented and stored. Only one student in a term wanted to discuss his grade because he considered it not good enough.

In discussions between students and teachers during the course and in the student online evaluation (Tuvalon) students expressed their favourable response and generally positive reaction to the new format. A minority of the students would like to keep the standard lecture system. Two original comments from
students: “... It is rather inappropriate that the students have to teach themselves ...”, “I am convinced that I have learned so much more in environmental health, than I would have from a multiple-choice examination.”

We intend to continue in the new format, but are aware that further improvements of the educational format must always be considered. For example we try to involve the students more in rating their presentations themselves.

I-5.11  Development of a Review Form for OSCE Stations: Validity, Relevance, Plausibility and Realizability Have to be Checked Before Using the Station

Kujumdshiev S, Conrad Ch, Wagner TOF (Department of Internal Medicine, Pneumology, Frankfurt/Main)

Objectives: An OSCE [1] consists of different stations, each of which has to be valid and plausible. To meet the requirements an efficient and comprehensive evaluation process is needed. This study aims at developing a standardized review form for the reliable evaluation of OSCE stations.

Methods: The first version of the review form was developed by means of a multi-level Delphi procedure. As pretest 30 experienced OSCE observers reviewed blindly stations rated before as ideal and usable or non-useable. Position effects were controlled by changing sequence randomly and were analyzed using the Mann-Whitney-U test. Scores and score limits were analyzed. Observers were additionally asked qualitative questions about the form. 44 observers filled in the second version form for their OSCE station before and after examining. All stations had been reviewed before by an expert. Again, scores were calculated. Differences between scores before and after station observation were analyzed using the Wilcoxon-signed-rank test.

Results: The Delphi-procedure provided four criteria for an OSCE station of decreasing importance: validity, relevance, plausibility and realizability. It was decided that during the review process, each criterion has to be rated as existent or not and scored from 1 to 10 points. Scores are multiplied with importance and added to general score with a maximum of 100 points. Score limits were set to determine whether a station is ideal and usable, has to be improved or is not usable. Furthermore the observers specified the difficulty of the stations.

After evaluating all results the experts determined stations with difficulties between 0-1 and 9-10 cannot be used at all, difficulties from 2-5 can be used for lower grades and 6-8 for higher grades. Qualitative analysis of the first version showed that comprehensibility of the form had to be slightly improved and space for comments should be added. Significant position effects could only be found for the feasibility of one station (p<0.03). Analysis of score limits showed the following results: The usable station was rated as such by 87% of the observers, the remaining 13% rated it as has to be improved (minimum 60, maximum 100 points). 75% of those who rated the station as ideal and usable gave a score of at least 75 points. The non-useable station was rated as such by 67% of the observers, 17% found it as has to be improved, and 17% as ideal and usable (minimum 0, maximum 86 points). Those observers who rated the station as non-useable gave a score of less than 75 points, and 85% of them gave less than 58 points. Accordingly the score limits are: 0-60 = non-useable, 61-75 = has to be improved, >75 = ideal and usable.

The second test supported the score limits. 93% of the observers gave scores higher than 60. Significant differences in scores before and after observation could not be found. Difficulty was rated significantly higher after evaluating the OSCE (T= 44, p=0.012).

Discussion/Conclusion: The developed review form is a comprehensive and valid instrument for reviewing OSCE stations. Whether a station has been actually observed or not does not have a significant effect on scores. Therefore the review form is ideal and usable for the evaluation of existing as well as new OSCE stations.

Patient Presentation in Course and OSCE: A Pilot Study

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Objectives: Oral patient presentation is a crucial skill medical students have to learn. That is why a new course module for patient presentation was introduced in the third year's history taking and physical examination course. An OSCE station was constructed and implemented (1). This study evaluates module and station.

Methods: During the course students were taught to present patients according to our scheme. Afterwards the students were given the chance to practise with different real patients receiving structured feedback by their tutors. A new station for patient presentation was introduced in the final OSCE. It consisted of a preparation part with health records and the oral presentation, 5 minutes each.

270 students participated in the OSCE. It consisted of seven stations (history taking, physical examination and patient presentation). Stations varied each time, but the patient presentation station remained the same. There were five runs in total. Assessment of the students' performance in patient presentation focussed on (a) content (max. 19 points, 70% of station), (b) completeness and accuracy of statements (max. 4, 15%) and (c) bedside manner and dealing with the patient (max. 8, 15%).

The OSCE station was analysed in terms of difficulty, discriminatory power (Pearson correlation) and its influence on the reliability of the whole exam (Cronbach's alpha).

Course module and station were evaluated. Furthermore the number of completed patient presentations in the course per student was collected to analyse the influence of practice on the performance in the OSCE. The Mann-Whitney-U-test was used.

78% of all students reported that they completed more than one real patient presentation during the pilot course. The mean score for those students was 15.5 points (part a), 3.3 (part b) and 6.3 (part c). The mean score for students who completed only the introductory module for patient presentation was 15.0 (a), 3.0 (b) and 5.9 (c). The Mann-Whitney-U-Test implied only a tendency to show a difference between groups.

OSCE results of the five runs were averaged. The mean difficulty was 0.8 and the mean discriminatory power was 0.394. Reliability of OSCE lay between 0.447 and 0.684 for the different runs. The mean corrected item-scale-correlation for the patient presentation was 0.134.

Questionnaire analysis showed that students liked the practical orientation and the possibility to practise a patient presentation under the guidance of a tutor. Students mentioned the positive examination ambience and that the station was easy.

Discussion and conclusion: The patient presentation is a practice-oriented and reasonable enhancement of the course and the OSCE. The implementation of both was successful. All students who practised patient presentations in the course module several times had an improved performance in the OSCE.

The OSCE showed an acceptable reliability probably caused by seven stations only. Discriminatory power of the patient presentation was good. The low item-scale-correlation can be explained by the variety of the OSCE stations. We intended and succeeded in designing a station with a low difficulty as it was new to the students and students are only in their 3rd year. The module for patient presentation and the OSCE station therefore are highly regarded by students and teachers. As a consequence of the pilot study we have implemented the course module and the OSCE station type.


The Challenge to Implement a Feedback Culture to Improve Medical Education

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Objectives: In the context of the practical year (PJ) we see that students lack in clinical expertise. Deliberate practice is essential for the development of clinical competence [1]. Therefore, in May 2009, a structured formative feedback was implemented for medical students during their PJ. By giving the students continuously structured feedback they should be better prepared for career entry as a medical doctor. The follow up of the student performance helps to identify student needs and to offer individual support. We hope that the project supports the implementation of a feedback culture, which improves medical education, interprofessional teamwork and doctor-patient-relationship at the university hospital.
Methods: We have developed a formative assessment concept according to Mini Clinical Evaluation Exercise (Mini-CEX) [2] and Longitudinal Evaluation of Performance (LEP) [3]. After the observation in clinical context the students receive feedback following 8 criteria which were rated on a checklist. The final-year students themselves make appointments for feedback for every two weeks. We performed guided interviews of students and teachers to investigate spontaneous perceptions and hidden conflicts of the project.

Results: Until now 785 feedback encounters have taken place. The students performed less feedback as expected (2928). The number decreases in the course of the PJ. The teachers predominantly select practical skills and judge the students mostly as excellent independent from their study level. Situations with focus on communication-skill are rarely chosen. Students and teachers perceive the project and its objectives mainly in a positive way. The students avoid heads, seniors and consultants for feedback due to a more hierarchical system. Because of their mainly summative test experiences in the curriculum so far they show fear of examination. The students have problems with the required self-responsibility in making appointments because in the curriculum it is less demanded so far. The limited interest of the teachers in performing feedback is due to lack of time and limited prestige of teaching in the faculty. Students and teachers are uncertain about requirements owing to a lack of common values and defined out-comes for clinical competences. A feedback culture is not yet established.

Conclusions: The return rates show that the project is not fully accepted by students and teachers and the motivation of the students to perform feedback drops in the course of the PJ. Therefore we have implemented collegiate tutors and intensified the public relations. The teachers have difficulties to express criticism constructively thus their attendance at the offered feedback trainings should be improved. Free text fields on the checklist should help to make the feedback more constructive. The definition of study objectives for the PJ is in progress. The discovery of hidden conflicts has initiated a process of self-reflection on clinical competences and learning climate. It has shown areas for faculty development. The implementation of feedback culture must start far earlier in the curriculum.


I-5.14 (How) Does OSCE Work in Undergraduate Education?

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Introduction: Traditionally undergraduate dental education is taught with the main emphasis on laboratory education. Student assessment within these kinds of courses mostly consists of the students’ laboratory work in addition to a multiple choice examination (MCQ). The teaching method in its origin leads to a lack of understanding of clinical procedures of prosthetic fabrication, especially in complex subjects like teaching complete denture.1 Therefore the undergraduate course of teaching complete denture in Aachen was reformulated in 2010. A detailed educational objective checklist defined the learning targets in general and in detail. The new course puts its main emphasis on the understanding of clinical procedures by using innovative educational methods like blended learning, simulation patients and clinical / laboratory seminars. The amount of laboratory work had been reduced to minimum. Therefore a useful assessment tool in addition to the MCQ had to be found to reflect the learning outcomes of the instruction2.

Objective: To develop and implement the objective structured practical and clinical examination (OSPE/OSCE) as a summative assessment tool in the reformed undergraduate course of teaching complete denture. Methods: A total of 10 5-min. stations were created. All stations were based on the educational objective checklist. The modified Angoff method was used to define the standard setting. The stations were scored based on a checklist from 0 to 25. Within the stations the students had to explain context as well as evaluate and perform different treatment techniques. Standardized patients had also been part of some stations. According to the number of students (n=49 second year students) the examination was planned as a double filled flow path with a total of 10 examination stations and 3 break stations. So it was possible to examine all students in two sequences (24 / 25 students). Before the examination was carried out there was an informative meeting for the students to make them familiar with the organisation and flow of the OSCE. Also the examiners were instructed.
Results: A total number of 49 students passed through the OSCE. There was a failure rate of 12.2% (MCQ=0%). The mean score reached was 205.5 (82.2%). There was a significant (p=0.01) and high correlation (0.796, Pearson) between the examination results of the OSCE and the MCQ. The reliability of the OSCE was at least 0.869 (Guttmann’s λ, MCQ=0.761). There was no station with a low corrected item discrimination (r’= min 0.324; max 0.680) although the stations’ difficulty was found to be on average middle to easy (P= mean 0.822). In comparison the questions of the MCQ were of worse item discrimination (57% of all questions were r’<0.20) with mostly the same difficulty like OSCE (P= mean 0.831). Respectively the majority of the students considered the OSCE method fair (79.5%). About 93.6% stated that the requirements had referred to the educational objective checklist and had been expressed clearly (87%).

Discussion/Conclusion: The results of the OSCE demonstrate that it can also be a valid and reliable method for undergraduate assessment. The achieved level of quality is mainly based on the development process by considering important factors (e.g. educational objective checklist, standard setting method, instructions). Giving direct feedback during the OSCE would be a further improvement within the existing concept to enhance students’ life long learning.

1 Obrez, A; Lee, DJ; Organ-Boshes, A; Yuan, JC-C; Knight. A clinically oriented complete denture program for second-year dental students. J Dent Educ 2009; 10 (73):1194-1201

2 Mattheos, N; Ucer, C; van de Velde, T; Nattestad, A. Assessment of knowledge and competencies to implant dentistry in undergraduate and postgraduate university education. Eur J Dent Educ 2009; 13 (1):56-65
6. Self-Directed Learning and Assessment with E-Media/ E-Teaching Formats (2)

II-6.1 Improvement of the Cost-Benefit Ratio of an Interactive Voting System

Brachmann S, Eichner B, Geiler S, Grab C, Ochsner W (Kompetenzzentrum E-Learning in der Medizin, Medizinische Fakultät der Universität Ulm, Ulm)

**Background:** Since the winter term 2009/2010 a TED-System for the interactive support of lectures is provided at the medical faculty. The TED-transmitters are distributed to all students in the study course of medicine, molecular medicine and dentistry in the preclinical term. There are currently about 2200 TED-transmitters in circulation. Because of the annual distribution to the students, who keep their transmitter the whole studies, there will be estimated 17 000€ costs annual until March, 31st 2013 (about 400 transmitters plus support). The financing occurs by tuition fee.

**Objectives:** Are our expectations towards the interactive voting system fulfilled as far as the expenditures are profitable?

**Our expectations toward the TED-system:** We expected, that because of the constant presence of the TED-transmitters the system could be implemented comprehensive, to discuss decision-questions fast and uncomplicated also with large groups and for evaluating the conclusions; furthermore the examination of pre-knowledge should be taking place constantly, equally the investigation of the state of knowledge and the gab of knowledge with direct feedback to the students.

**Our concrete experiences with the TED-system:** The concrete use of the system is heterogeneous, and the utilisation is rather low. The reasons are lacking knowledge of the software, time loss because of the log-in and partly big technical difficulties (e.g. PC is slowing down, Power Point presentation is crashing). Besides the students often don't have their transmitters with them or the transmitters are not ready for use because of empty batteries. So the result is a minimal participation (often only 20% of the students) at the voting in lectures even the professors are willing to use the system.

**Result and Improvement:** Our Expectations towards the TED-system weren't fulfilled. The costs are not in an acceptably relation towards the usability of the system. One solution approach would be not to give the transmitters directly to the students but to install the TED-transmitters in the big lecture halls (costs about 20 000€). Because of that there are some advantages, beside the low costs. The TED transmitters and the whole system could be maintained regularly, thereby the technical breakdowns will be minimised. The lecture hall caretakers could support the professors easier and all the present students have the possibility to participate at the voting. Because of that a higher attendance will be reached and the professor's acceptance increases. A further aim is the joint use and the potential cost sharing with the other faculties of the university.

II-6.2 The Heidelberg Longitudinal Interdisciplinary Virtual Patients Project to Foster Clinical Reasoning: Results So Far


**Objectives:** Clinical reasoning is a cornerstone of medical education, which appears to be insufficiently taught during medical studies (Norman & Eva 2010). The use of Virtual patients (VPs), which are interactive computer cases, where the users act as healthcare professionals, are especially suited to fostering clinical reasoning (Cook et al. 2010). So far there are no reports that VPs were designed according to established principles, integrated into the curriculum in a blended learning fashion and used throughout the medical studies in a longitudinal interdisciplinary project. The goal of this project is to investigate whether clinical reasoning in medical students can be fostered through (i) longitudinal repeated work up of VPs and (ii) through explicitly blending the work up of VPs with face to face sessions.

**Methods:** The overall project was developed according to Kern et al. 1998.

(i) The needs assessment of the target learners was done via a focus group study among medical students (Huwendiek et al. 2009a) and the project plan accordingly refined.

(ii) The VPs were developed interdisciplinary according to established design principles to foster clinical reasoning (Huwendiek et al. 2009b).
We wanted to subject to chance because there may be no suitable patients on the ward at a particular time.

It is an essential part of medical training from the very first. Nevertheless, bedside teaching is a worthwhile learning experience (M: 4.06, SD: 0.03). This indicates that the VPs and their integration scenarios were well received and prepare students well for clinical reasoning in real patients (M: 3.82, SD: 0.04) and was a rewarding and worthwhile learning experience (M: 3.82, SD: 0.04).

**Discussion and Conclusion:** As the project is still young and no students have gone through the entire project we summarized the evaluation findings of all medical specialties where virtual patients were used. These indicate that the VPs and their integration scenarios are well received and prepare students well for clinical reasoning in real patients. However, to evaluate the impact of the overall project on the clinical reasoning skills in medical students further studies are in preparation which will be done as soon as students have gone through the entire project.

**Acknowledgement:** We thank the committee of study fees and the dean’s office for their generous support.


**II-6.3 The Next Generation Netter of Neurology**

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**Objectives:** “What you have seen is what you remember.” In his famous atlas Frank Netter visualized the anatomy and clinical symptoms of numerous diseases. But especially in neurology many symptoms only become truly accessible to the student by capturing motion and speech. Therefore, bedside teaching is an essential part of medical training from the very first. Nevertheless, it is a sorry fact that bedside teaching is subject to chance because there may be no suitable patients on the ward at a particular time.

We wanted to:
- make learning less subject to chance
- enrich and vary each student’s experiences
- enable easy and repeated access to different aspects of a certain disease
And, since we already had in mind to build a computer-based training (CBT) based on video recordings of real patients, we also wanted to
   - make the best use of CBT

Methods: Starting in 2007 with “The neurological examination” we filmed experienced neurologists performing a neurological examination of healthy students. After having met the very strict regulations of German data protection and patients’ rights, we filmed about 100 patients with neurological disorders in reference to the students’ medical curriculum: “The neurological diseases”. All video-recordings were clipped, carefully edited and embedded in a CBT and enriched with additional media, “The emedia skills lab Neurology/Neurosurgery”.

The graphical user interface was especially designed to suit didactic needs, such as:
   - Conveying the logical structure of the neurological examination by structuring the program accordingly
   - Getting a more thorough understanding via contrast-enhancement by matching normal conditions with pathological conditions and vice-versa, by having the differential diagnosis conditions ready at hand for direct comparison
   - Enabling role model learning by offering both a narrated and an un-narrated version of the video-clips, which enables students to focus on the doctor-patient-interaction
   - Promoting correct association-making when learning about a disease by arranging all subitems of a disease “at a glance”:
     - short summary
     - key questions to ask
     - medical history
     - pathological findings
     - differential diagnosis conditions
     - imaging studies
     - laboratory tests
     - anatomic aspects in interactive illustrations and animations
     - therapeutic aspects incl. neurosurgical procedures
     - normal findings

The whole project has been carried out by a team of physicians supported by media professionals of our Audiovisual-Media-Centre and funded by the newly established “student fees fund” of RWTH Aachen University.

Results: We developed a comprehensive CBT with an “at a glance” setting of neurological diseases, inspired by the famous Netter atlas but going beyond it in employing modern technologies so that neurology can be experienced in motion and speech: “The Next Generation Netter”.

Since 2008 several surveys among students were conducted, showing that the CBT is highly accepted. Both modules were blended into the medical curriculum of neurology at the Medical School of RWTH Aachen University via a semantic web.

Perspectives: As it costs not only money but also considerable time and effort to realize such a comprehensive production, we would like to share our experiences and to inaugurate a national or even international collaboration in the field of electronic media for medical faculties as a shared-knowledge platform with special emphasis on the protection of patients’ rights.

II-6.4 Using Virtual Patients and Skills Laboratory Training in a Blended Learning Scenario

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Objectives: Practical skills lab training is increasingly popular in medical education. Preparation for the skills training is generally through paper handouts or instructor introduction and demonstration. So far there is little data on the impact of different modalities of cognitive preparation for such training. Furthermore, skills lab training requires teaching in small groups with a high demand on tutors for facilitation and supervision. The objective of this study was to evaluate whether Virtual patients (VPs) are a feasible and effective tool for skills lab preparation from the students and teacher perspective.

Methods: Pediatric skills lab training was introduced in 2009 to our faculty in a blended learning scenario with VPs. The training covers relevant pediatric procedural skills (lumbar and bladder puncture, pediatric basic life support). VP scenarios present typical clinical cases pertinent to each procedure enhanced through multimedia. It is mandatory that students complete the VP cases by the day before the skills training. Students’ opinions were surveyed using instruments developed within the electronic Virtual Patients Project
(eViP) in the fields of VP design and curricular integration with the skills training. Answers were given on a 5-point Likert Scale from 1 (strongly disagree) to 5 (strongly agree). Results are shown as mean and standard deviation. We additionally asked our tutors about their perception of the attending students and their level of preparation.

**Results:** The results in the subcategories of the VP design are authenticity 3.5±0.7, professional approach 3.5±0.9, coaching 4.0±0.7, learning effect 3.8±0.7 and overall judgement 4.0±0.7. The curricular integration was perceived in the subcategories as follows: teaching presence 4.0±0.9, cognitive preparation 4.3±0.7, social presence 4.2±0.8, learning effect 4.0±0.7 and overall judgement 4.3±0.8.

In their comments students specifically valued the multimedia-based clarification of procedures. Tutors indicated that the VP cases prepared students well for the skills lab training, allowing an efficient use of time in the training.

**Discussion and Conclusion:** Our results indicate that virtual patients offer an enjoyable and effective tool to prepare students for skills training. By being cognitively prepared, time can be used more efficiently in the skills lab. Compared to standard preparation (text books, handouts etc.) virtual patients offer customization of provided information and enhance it with interactivity and multimedia support.

### II-6.5 Interprofessional Blended Learning with Virtual Patients and Practical Training to Improve Pediatric Emergency Care


**Background:** Pediatric emergency care presents a unique challenge. There are indications that can arise significant deficiencies and uncertainties even during emergency care provided by health care professionals. The Heidelberg Center for Child and Adolescent Medicine is developing an interprofessional blended learning concept, consisting of virtual patients, online discussions, and practical training for physicians and nursing staff. In contrast to student training there is little data concerning the use of blended learning in continuing medical education, particularly inter-professional training (Hunt et al. 2008 et 2009).

**Objectives:** What are the needs for continuing medical education for physicians and nursing staff and how can an appropriate teaching program be established?

**Materials and Methods**

The development of the project is based on the 6-Step Approach by Kern (Kern et al. 1998) for developing medical curricula. With this poster we will present the results of the needs assessment, the specific needs of the target groups, and, as a result of this, the development of the first virtual patient case and hospital-specific treatment guidelines.

**Results:** The results of the needs assessment show a high need for standardized training of emergency procedures and algorithms, as well as an eagerness among physicians and nursing staff to participate in emergency training. The general concept of the training as well as the experiences reported during execution of the pilot program will be presented.

**Discussion:** While physicians reported a greater need for increased training concerning procedures and algorithms than did the nursing staff, the latter placed greater value on improving team communication. The causes for this and the integration of these aspects will be discussed.

**Conclusion:** There is a high need among physicians and nursing staff for interdisciplinary continuing medical education in pediatric emergency care. Blended learning as an integrated teaching concept combining e-Learning and practical training seems a worthwhile concept, which allows for optimal individual preparation and practical training in teams.

This project is supported by the Klaus Tschira Foundation Gmbh.

II-6.6 PC-Based Microsimulation Improves Practical Performance in an OSCE

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Objectives: When 5th year medical students are trained in emergency medical care, it can often be observed that they are not able to transfer their theoretical knowledge to a case scenario with a simulator. One reason might be that learning theory is insufficient for building a mental model. To solve that problem we introduced a serious game (MicroSim® from laerdal, Norway) which simulates an ED in a virtual reality, where the students have to treat medical emergencies. We observed that his method improved the practical performance in everyday training.

This leads to the following research question:

Does MicroSim® improve the practical performance of fifth year medical students in an Objective Structured Clinical Examination (OSCE) though being a theoretical medium? Does MicroSim® also influence other types of knowledge?

Methods: To answer this question we randomized the participants (fifth year medical students at Martin-Luther-University Halle-Wittenberg, n = 205) after ethical approval of the IRB into three groups (each n ≥ 65). The participants of this prospective, randomized, controlled, observer-blinded study were given literature on resuscitation, chest pain and dyspnea. After an initial OSCE (pretest) focusing on a standardized approach, the groups either had access to MicroSim® (solving such cases), or had to write a reflective article about standardized approach concerning these topics. The third group simply read the literature without further intervention. In a second OSCE (posttest) we evaluated the structured approach again. In addition we asked to fill in different standardized questionnaires before and after the intervention (e.g. learning preferences, avoidance, time spent on computers, etc.)

Results: We were able to show a significant improvement in the OSCE-scores in the MicroSim group, compared to the other group (12,0% vs. 8,4%, p < 0,008, f = 0,22). It seems this result can be ascribed to the sub-items concerning a structured approach. No differences in the quality of performance were found. An explorative data analysis also found interesting results. Depending on group assignment the learning strategies and self-efficacy influenced the performance.

Discussion: To our knowledge this study is the first to show the effect of using an e-learning program to improve practical performance. Though it is assumed, that simulation changes behaviour, so far there was no proof that even theoretical Micro simulation changes performance more than standard current theory learning (reading literature), or even the active dealing with the content when creating a summarization of findings.

When repetation is a favoured learning stile this method suits perfectly to prepare for an OSCE. In education it is well known that a high self-efficiency reduces performance. MicroSim® seems to prevent this effect following the mastery learning concept.

Conclusion: The authors conclude that interactive e-learning tools are valuable for improving practical performance in a blended-learning setting. Knowing that there is not the one perfect method for all learners, this study also shows for what kind of learner this method tends to improve performance.

However, further research on this topic needs to be conducted.

II-6.7 eLearning in Undergraduate Education – The Successful Story of a Clinically Oriented Blended Learning Course for Teaching Complete Denture


Introduction: A large project at Aachen Medical Faculty is to develop a web-based teaching and learning application for dental education which is comprehensive in fields and times of study. The main goal of the project is to improve students’ knowledge of (complex) treatment context as well as making them familiar with treatment / laboratory procedures. With regard to content, typical procedures of diagnosis and treatments are visualised by recording patients.

These films are supplemented with relevant dental laboratory techniques as well as theoretical knowledge. For this express purpose software was developed. Afterwards some modules have been developed (e.g. palpation of chewing muscles) but past experience has shown that the best developed elearning tool seems not to work in education if it is not appropriately curricular-integrated.

Objectives: 1) To develop within the teaching project a module for teaching and learning complete denture. 2) To change the curriculum of the undergraduate course for teaching this topic into a blended learning format so that the module was a central part of the course and used by teachers and students.
Methods: 1) The new module presents the chronological workflow of the construction of a complete denture. 27 films have been recorded. Content was established with regard to a new educational objective checklist for teaching complete denture.

2) Traditionally undergraduate dental education is taught with the main emphasis on laboratory education. This leads to a lack of understanding of clinical procedures, especially in complex subjects like teaching complete denture.

Also the new concept of the dental licensure act implies more clinical teaching in undergraduate education. So the new curriculum focused on clinical procedures by using mostly small group teaching (e.g. seminars, mutual exercise courses). Lectures as well as laboratory work had been reduced to minimum. Private study time was a fixed part of the curriculum. All activities were supposed to be combined with the module. The educational objective checklist was created to give transparency to teachers and students as well as to show the connection between teaching content and where it could be found in the module.

Results: 49 second year students attended the four-week long course. Within this period between 100 and 7000 daily views of the program by students alone were registered. The majority of the students stated that the intensive connection of physically attended lessons and the module was absolutely helpful (93,5%). The teaching content was considerably better expressed by the module than by lecture only (93,4%). Private study was easy with the module (90%), it was a successful didactical design (91,2%) so they were able to get a good understanding of complex procedures and contents (80%). The students prepared themselves for the teaching lessons (77,3%) as well as for the final examination (93,2%) by using the module. The assessment of the course (OSCE, MCQ) approved the fact that the students had been able to reach the teaching objectives.

Discussion/Conclusion: The curricular connection of different teaching methods with elearning, as described above, both based on a detailed educational objective checklist, has proved to be a successful concept for a blended learning course – especially to teach clinical subjects in undergraduate education. Additionally the students wish for a quiz as a sensible amendment of the module (71,4%).


2 Obrez, Ales; Lee, Damian J.; Organ-Boshes, Anna; Yuan, Judy Chia-Chun; Knight. A clinically oriented complete denture program for second-year dental students. J Dent Educ 2009; 10 (73):1194-1201

II-6.8 Evaluation of Two Computer-Based Learning Environments on Dentistry

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Aims: The aim of our study was to evaluate the efficiency of two different and current computer programs that differ in the grade of interactivity and the use of audio content.

Materials: 85 dental students (14 in their first clinical term, 26 in their second and 45 in their fourth) were randomly assigned to one of two experimental groups. One group studied within a high-interactive visual-only computer-based learning environment (Webkit, University of Freiburg, Germany). The second group studied within a low-interactive learning environment with audio content (Adobe Presenter). Both programs referred identically to a case report on localized aggressive periodontitis.

Methods: The students’ gain of knowledge was tested by a pre- and post-test. The post-test for the transfer of knowledge contained questions about a different case report and was designed to measure the students’ understanding and their ability applying their knowledge. Furthermore, questionnaires on workload (modified NASA-TLX), motivation, and program acceptance were used.

Results: An ANCOVA with the experimental groups as a dependent variable and prior knowledge (pretest result) as covariate showed better learning results for the low-interactive program (mean = 22.59; SD = 4.53) compared to the high-interactive program (mean = 21.13; SD = 3.93; F(1,82) = 4.93, p = 0.029). A significant aptitude–treatment interaction (ATI) for the workload experienced during the learning process indicated that students with little prior knowledge put more effort into learning with the low-interactive program, while students with a lot of prior knowledge put more effort into learning with the high-interactive program (F(1,74) = 7.92, p=0.006).

Conclusions: Although the low-interactive learning program had an advantage, both programs showed themselves to be potentially useful in the training of dentistry skills. However it seems that beginners should preferably be confronted with a low-interactive program, whereas more advanced learners can be effectively activated by learning within a high-interactive computer-based learning environment.
7. **Mentoring/Tutoring/Coaching**

III-7.1 **Efficacy of a Tutorial for First Year Students by More Experienced Students (NePAL) – A Cluster-Randomised Controlled Study**

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**Introduction:** The first semester is a special challenge in medical school. Next to the unfamiliar atmosphere, the new surrounding as well as many additional tasks an enormous increase of study burden is added. In this situation some reports suggested that more experienced students appear especially qualified to impart necessary organizational knowledge with regards to content and behaviour, so called “near peer-assisted learning.”

At the medical faculty of the Goethe University in Frankfurt am Main more experienced students tutor the more junior students of the 1st preclinical semester in the “near-peer-assisted learning” Programme (NePAL) on a honorary basis since 2006. This prospective controlled study should clarify whether more first semester students pass the final exams in anatomy, chemistry and physics through the participation in the programme.

**Methods:** This cluster-randomised study was started in the winter term 2009/2011. All students who commenced the studies in Medicine or dentistry at the Frankfurt faculty obtained the possibility to be randomized to the program (individually or in small groups with a maximum of 6 students) or to a control group.

The students of the intervention groups received weekly honorary tutorials (2 – 3 hours/week) in addition to the regular curricular program. Tutors were successful medical students in higher semesters that were trained to deliver a given content. The crucial points of these tutorials were solving the study and comprehension problems, assistance in the student’s daily routine, studying content of the current subject as well as exam preparation. The control group followed the regular study programme without tutorials.

The primary endpoint was the passing of the exams in anatomy, chemistry and physics. The results between the groups were compared with the Fisher-Exact-Test.

**Results:** In total 383 of 504 first semester students participated voluntarily (71.9%). These were assigned to the intervention group (33 groups, n = 198) or to the control group (31 groups, n = 185). In an intention-to-treat analysis the participants in the intervention passed all three exams more frequently (p ≤ 0.000001) compared to the control group. In the intervention group 75.8% passed all three exams compared to only 16.8% in the control group.

The anatomy exam was passed by 81.8% of the intervention group, whereas only 23.8% of the control group passed, the chemistry exam was passed by 87.49% or 23.2% respectively and the physics exam 78.8% opposite to 37.8%.

**Conclusion:** The implementation of an additional near-peer assisted learning programme for students in the first semester showed to be highly effective and was well accepted. These encouraging results underscore the need for further investigations concerning the assignability in medical schools and the long term effects on student’s results.

III-7.2 **Tutor am Physiologischen Institut der Universität Tübingen**

Dr. Dreischer, Peter; Prof. Dr. Garaschuk, Olga (Physiological Institute, I, II, Tübingen)

Der Einsatz von Tutoren hat sich schon seit geraumer Zeit bewährt und ist dadurch zum integralen Bestandteil der medizinischen Ausbildung geworden. Die Hauptaufgabe der Tutoren besteht hierbei in der Betreuung der praktischen, parallel ablaufenden Teilversuche.

Unser Ansatz am Physiologischen Institut der Universität Tübingen ist es, durch intensive Betreuung der Tutoren, ihnen das nötige Rüstzeug zur Erfüllung ihrer anspruchsvollen Aufgabe mitzugeben. Wichtige Komponenten sind dabei:

- Erarbeitung der Lehr- bzw. Lerninhalte mit erfahrenen Dozenten
- Gemeinsamer Aufbau der entsprechenden Versuchsanordnungen
- Einarbeitung in den praktischen Versuchsaufbau etc.

Die jeweiligen Dozenten, die die Seminare zu den einzelnen Versuchsteilen abhalten, sowie die für das Praktikum Verantwortlichen stehen hierbei jederzeit als Ansprechpartner zur Verfügung.
III-7.3 Influence of the Facilitative and Non-Facilitative Tutors’ Behavior in Problem-Based Learning: A Mixed Methods Exploration

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Objectives: In problem-based learning (PBL) tutorials, tutors play an important role in facilitating students’ learning. Few studies have investigated this key role in both a quantitative and qualitative sense. This study explored the influence of facilitative and non-facilitative tutor behavior from both the students’ and tutors’ perspectives.

Methods: This study employed a prospective, experimental, single-blind, randomized, and controlled design. It consisted of two groups and involved interventional as well as pretest-posttest assessments. A total of 101 dental students in their first clinical year and 4 tutors participated in this study in over 2 years within a hybrid curriculum. The students were PBL-novices, while the tutors were content-experts. The subjects were randomly assigned to one of the two intervention groups. All tutors were educated in special courses to their specific tutorial behavior. In separate sessions each tutor acted in either a facilitative or a non-facilitative way, based on studies of Tuckman and Walsh [3], [4].

The groups were evaluated by external observers who registered the facilitation technique. Data were obtained quantitatively from written responses to (1) a questionnaire asking students about the effectiveness of their PBL tutor(s) [1] and to learning-oriented group interactions [2], as well from a (2) multiple-choice questionnaire (MCQ). Qualitative data originated from (3) semi-structured interviews with the tutors and from (4) focus group interviews with the students. Quantitative data were analysed with the software SAS 9.1. Qualitative data were analysed by qualitative content analysis.

Results: There were no differences between the groups with respect to age, gender, and primary knowledge. Overall, 192 questionnaires were returned (response rate 95%). Explorative-factor analysis demonstrated acceptable alpha coefficients (0.53 – 0.87) for the validity and adequacy of the 8 factors analysed, i.e., support, tutor effectiveness, acceptability, motivation, moderation, conflict potential, overall performance of the tutor, and group interactions. The external observers documented statistically significantly higher group activity when the tutors applied a facilitative approach. Furthermore, the facilitative technique was significantly superior to the non-facilitative technique with respect to learning motivation and tutor effectiveness. In the MCQ assessment, a marginally significantly better (p = 0.06) result was obtained for the facilitative approach. The interviews with the tutors revealed differences in group dynamics and assessment of the tutor role. Tutors preferred the facilitating approach at the beginning of PBL. However, they found that the non-facilitating approach was more effective during the process of PBL. The focus-group discussion emphasised the impact of the tutor role on the student and assessment of the two tutor roles by PBL students. Overall, the students preferred the facilitative behavior employed by the tutors.

Conclusions: PBL beginners in a hybrid curriculum preferred the facilitative tutor approach, especially with respect to learning motivation and tutors’ effectiveness. Our data showed a slight benefit of the non-facilitative approach with respect to knowledge accumulation. The qualitative data supported the quantitative results. Additionally, tutors reported improved awareness of their role and impact on the learning ability of their students. This training may be a useful addition to faculty-development strategies.


### III-7.4 On-Ward PAL Programme: Effects on the Quality of Medical Students’ Clinical Placement – A Qualitative Analysis

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**Objectives:** Peer-assisted learning (PAL) as an established teaching method offers a variety of advantages for both students (1) and peer tutors (2; 3). While peer tutoring methods are widely used in skills lab training settings (4; 5), reports on on-ward PAL programmes are rare (6). At the University of Heidelberg, a PAL programme with clearly defined teaching contents was introduced on internal medicine wards (7; 8; 9) to facilitate the transfer of skills lab training to the bedside. Quantitative research results based on questionnaire evaluation revealed significant advantages for the intervention group receiving tutorials (IG) compared to the control group (CG): The IG accounted a higher subjective learning effect, feeling more integrated on ward and less anxiety concerning on-ward work. However, qualitative research aspects were lacking so far. Therefore, focus group interviews were used to explore in depth how students perceived PAL programme in comparison with those who hadn’t any structured on-ward programme.

**Methods:** 168 medical students in their third year of training were randomly assigned to one of seven intervention wards or one of seven control wards. During their five-week clinical placement on ward, the IG (n = 88; M=23.6 years) received 10 accompanying patient-centred tutorials lead by 14 final-year student tutors (8 female, 6 male; M=26.2 years) who had a special training programme before. The CG (n = 80; M=23.3 years) did not take part in the PAL programme. After the placement, 28 students of the IG (13 male, 15 female; M=23.33 years) participated in 4 focus groups interviews, 15 students of the CG (6 male, 9 female; M=23.2 years) in 3 interviews. Qualitative data obtained by focus group interviews were transcribed and analysed according to grounded theory approach (10).

**Results:** 499 individual statements on relevant topics were identified from the transcriptions. The peer tutors seemed to decisively influence the perceived quality of the clinical placement of the IG: The tutor appeared to represent an important contact person to the ward team and an important motivator for the work on ward. Concerning the teaching contents, the tutor was reported to easily adapt to the students’ level of knowledge. Students stated that it was easy to overcome inhibitions to ask questions because the tutor was in the same age. Furthermore students perceived the supervision while performing clinical procedures as extremely helpful. Students of the CG felt that the quality of the clinical placement mainly depended on their own engagement and that only in some cases the ward physicians’ commitment also contributed to the learning success. Furthermore the CG wished to be more integrated on ward and supervised by medical staff. Interestingly, both groups equally reported about a satisfying learning effect concerning clinical skills.

**Conclusion:** The student tutor seems to play a central role for the IG-students during their time on ward whereas within the CG-students mainly individual factors influence the quality of their placement. Although satisfying subjective learning effects concerning clinical skills were reported by both groups, teaching contents of the clinical placement of the CG are insecure. The on-ward PAL programme with its clearly defined teaching contents facilitates a standardisation of the clinical placement on ward. Further studies are required to investigate the objective learning effect and sustainability of the programme.

III-7.5 Medical Students’ Learning Style: Toward Effective Learning

Nurhadi, Asty Amalia (Medical Faculty, Medical Education, Makassar)

**Purpose:** Students have different levels of motivation, different attitudes about teaching and learning, and different responses to specific classroom environments and instructional practices. Studies show that matching teaching styles to learning styles can significantly enhance academic achievement, student attitudes, and student behavior at the primary and secondary school level (Griggs & Dunn 1984; Smith & Renzulli 1984), at the college level (Brown 1978; Charkins et al. 1985)(2) The more thoroughly instructors understand the differences, the better chance they have of meeting the diverse learning needs of all of their students.

We were interested in learning the preferred learning styles using VARK Questionnaire of our first-year medical students as a source of information to guide curricular development so that we could develop appropriate learning approaches.

**Methods:** We administered the VARK questionnaire to our 206 first-year medical students to determine their preferred modes of information presentation. Each student could select multiple responses for each of 16 questions. Results were tallied for each of the learning modalities (V, A, R, and K) and/or combinations of modalities with a total of 168 responses used in the calculations. Students who had a minimum percentage of 25% in several categories reported multimodal learning. The number of students who preferred each mode of learning was divided by the total number of responses to determine the percentage of students in each category.

**Results:** A total of 168 students (81%) returned the questionnaire. Students who preferred multimodal and unimodal, where 1% of the students preferred quad modal, 28% preferred trimodal, 61% preferred bimodal, and 10% preferred unimodal.

**Conclusion:** Most students (90%) preferred multiple modes of information presentation. These students had a balanced set of preferences, which means they prefer information to arrive in a variety of modes. Thus most students may benefit from active learning strategies over the traditional lecture format. This brings us to conclusion that most students will learn effectively as long as the information is provided in mixed activities which involve visual, auditory, reading/writing, and kinesthetic activities. Therefore, all lecturers and instructors should adopt active learning strategies in order to accommodate medical students learning style which majorities are multimodal.

**Keywords:** learning style, learning strategies, effective learning

III-7.6 The First Fifties. Can We Achieve Acceptable Results in Vestibular Schwannoma Surgery from the Beginning?

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**Object:** Vestibular schwannoma surgery requires a profound knowledge of anatomy and long-standing experience of surgical skull base techniques as patients nowadays requests high quality results from any surgeon. This educes a dilemma for the young neurosurgeon as she/he is at the beginning of a learning curve. The presented series should prove if surgical results of young skull base surgeons are comparable respecting carefully planned educational steps.

**Methods:** The first fifty vestibular schwannomas of the first author were retrospectively evaluated concerning morbidity and mortality with an emphasis on functional cranial nerve preservation. The results were embedded in a timeline of educational steps starting with the internship in 1999.

**Results:** Fifty vestibular schwannomas were consecutively operated from July 2007 to January 2010. According to the Hannover Classification 14% were rated as T1, 18% T2, 46% T3 and in 21% a T4 tumour was present. The overall facial nerve preservation rate was 96%. 79% of patients with T1-3 tumours had no facial palsy at all, 15% had an excellent recovery of an initial palsy grade 3 according to the House & Brackman scale within the first three months after surgery. Hearing preservation in T1/2 schwannomas was achieved in 66%, in patients with T3 tumours in 56% and in large T4 tumours in 25%. Three patients suffered a CSF-fistula (6%), one patient died during the perioperative period due to cardiopulmonary problems (2%).

**Conclusions:** The results demonstrate that with careful established educational plans in skull base surgery excellent clinical and functional results can be achieved even by young neurosurgeons.
III-7.7 Research Forum Medical Education – Come Together, Share and Benefit

Schuettgelz-Brauns K, Breckwoldt J, Gaedike G (Dieter Scheflner Center for Medical Teaching and Educational Research, Assessment/Progress Test Medicine, Berlin)

Objectives: Charité - University Medical Centre, Berlin, is one of the largest medical faculties in Europe. Educational services are delivered to more than 7000 undergraduate students at 3 different campuses. Research activities in medical education are widespread and often isolated. Due to the size of the faculty and the distance between campuses we had to establish a network of interested researchers. This network aimed at promoting the exchange of ideas and knowledge in order to create a critical mass for interdisciplinary educational research by linking together the researchers actively working in the field.

Methods: We initiated a monthly forum to share knowledge and competencies in medical education research. Research projects, working hypotheses and preliminary results are discussed. News and key papers are presented. Workshops are available. A wikiblog enables members of the forum to participate in debates even if they had not been able to attend a meeting. Furthermore, the wikiblog contains contact persons for special topics in the field of medical education research at Charité. A mailing-list was created to facilitate the contact between the members.

Experiences: Since June 2010 monthly meetings with a median of 10 persons were held. Participants attended the meetings outside their regular working hours. 46 researchers signed in the mailing-list, and 25 registered in the wikiblog. Most information is distributed via mailing-list and during the meetings.

Perspectives: At present the project still is at the very beginning, but we feel that the need for a forum is justified by the number of participants and vivid discussions. Whether the project will promote fruitful cooperation remains to be seen.

III-7.8 Trained Peer Tutors Enhance the Cooperative Learning of Students in the Dissection Course

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Background: Student tutors in the dissection course are expected to meet high demands on their job. Therefore, we developed a combined technical and didactical training (Shiozawa, Hirt et al. 2010a). The combined training is well accepted by tutors and tutees (Shiozawa, Hirt et al. 2010b). However, this does not mean the tutor training has an effect. Deduced from the implemented learning goals of the tutor training, it is nearby to test if the tutors have an influence on student learning. We set up a randomized, controlled, single-blinded study with a quantitative cross-sectional analysis to assess and compare student learning behaviour.

Methods: Medical students coached by 10 trained or 10 untrained tutors were enlisted in the study (n=197). To receive an assertion on the students’ learning behaviour we employed the LIST questionnaire (Wild, Schiefele et al. 1992). A common factor analysis was calculated to extract dimensions. Factor scores of the extracted dimensions were calculated for both groups to estimate differences in learning behaviour.

Results: Factor analysis of the LIST questionnaire revealed eight factors explaining 47.57% of the overall variance. The eight factors comprise: deep learning (metacognition), attentiveness, learning organisation, cooperative learning, time management, learning effort, superficial learning (repetition) and learning environment. As internal consistency measure the factors achieve satisfactory values of 0.623 to 0.933 (Cronbach’s α). Comparing the factor scores of the extracted dimensions, students coached by trained tutors learn more with their fellow students (factor score in cooperative learning 0.194 vs. -0.205, p=0.018). Although not significant, students coached by trained tutors tend to be better organized in their learning (factor score in learning organisation 0.115 vs. -0.122, p=0.16).

Conclusion: Students coached by trained tutors present a different learning behaviour than students coached by untrained tutors, thus the tutors training can be considered effective. Students coached by trained tutors learn significantly more often in teams than their colleagues and tend to be better organized. Thus it seems reasonable to employ professional and didactically qualified tutors also for other subjects and courses.

8. **Medical Education: Incentives, Professionalism, Leadership**

**IV-8.1 Qualifying Training of Examiners: From Obligation to Motivation. The Benefit of Using an Instructional Film**

Barth, Gottfried Maria (Universitätsklinik für Psychiatrie und Psychotherapie, Eberhard-Karls-Universität Tübingen)

Modification by law of medical education with a new mode of state examination made it necessary to qualify examiners for implementing more valid and reliable examinations. Obligatory training of partially well versed examiners encountered much resistance and also beginners usual opposed against the obligation to train.

On the other hand briefing in new details of examination is necessary to avoid serious faults. But because of the general opposition against such training the transfer of the educational objective in performance of state examination was dissatisfying.

To improve acceptance of examiners qualification a diplomatic practise is necessary. The consideration of examiners expert knowledge as well as presenting important new details and legal consequences of disregarding rules of examination are important components of convincing trainees of the necessity of qualifying training.

An important part of the training is the use of an instructional film about an examination acted by performers following a script. The script includes common mistakes of the examinee as well as typical fault of the examiner. Afterwards every trainee has to evaluate performance by himself. Sampling of grades regularly shows great spreading from best to worst grades. This always convinces attendees of the imperative of training examination and grading.

Additionally the film demonstrates the importance of an active structuring of examination by the examiner and suggests to recognize some usual mistakes of students and to apply well-founded grades. Hence arises the importance of every examiner in spite of implanting of many new rules and structuring elements by this training. This also elevates acceptance of this qualifying examiner training.

Regarding the mentioned elements evaluation of examiners training by the participants improved very much. Many comments by the attendees document the change from obligation to motivation in joining this training. Also the use of the instructional film is often mentioned as very helpful. Consequently many new examiners ask for additional trainings joining their future experience in examination.

**IV-8.2 Which Kind of Diamond? Knowledge, Skills or Attitude? How to Train Personality Development**

Barth, Gottfried Maria (Universitätsklinik für Psychiatrie und Psychotherapie, Eberhard-Karls-Universität Tübingen)

There were great advances in the past few years in medical education particulary in training hard skills and knowledge including E-Teaching. Because of the strong scientific focus of work in German university hospitals it’s a legitimate question, if attitudes and doctors personality development also are sufficiently improved. Such educational objectives primarily must be taught by personal model.

It is necessary to improve awareness of university lecturers about their model of attitude, professionalism and personality which they implement in students – conscious or unconscious on both sides. This is possible within the obligatory didactical training on the way to postdoctoral lecture qualification.

Elements of this training of attitudes are reflection and training of well prepared und structured bed side teaching with focusing on doctors attitudes. The trainer in lecture qualification has also to incarnate the models he wants to teach such as active engagement and taking seriously needs of students an patients.

Within this context it is reasonable to implement ethical aspects of education. This transcends usual applied utilitarian arguments in medicine. Personal targeted ethical arguments such as Kant’s Kategorischer Imperativ or dialogical philosophers like Emmanuel Levinas are helpful orientations for doctors in daily work an education.

Application of such elements in lecturer training causes particular concern in most attendees. Following an improved evaluation of training in bed side teaching approved this practise.
IV-8.3 Integrating Student Representatives in the Quality Management of a Medical Faculty

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Aim and objectives: Due to the rising number of medical students and the increasing need of support caused for example by the decreasing average age of first year students, a mentoring system conducted by fellow students was established at the Medical Faculty in Tübingen. This by our students well accepted format was conferred to another student supporting system with the aim of quality improvement in terms of organizational structure and teaching (e.g. enabling to graduate in time): 48 students are elected by their fellows (2410 students) functioning as “semester representatives” (SR) with the major task of being first contact person for their fellows.

Additionally, functioning as a communicational structure saving personnel resources and time, a board called “Jour fixe of the student representatives” (JF) was implemented. SR, the Vice Dean of Medical Faculty, coordinators of the major subjects and the head of the deanship meet every month throughout the semester. The SR function as spokespersons for their fellows getting a prompt feedback regarding their needs. The aim of the study was to identify how SR experience and handle the JF, sense their role and duties, and what further support might help them to optimize their task.

Methods: All SR (48) were recruited via email to participate in focus group interviews. Eleven SR (semester range: 3–9; 8th/3rd, average semester in office 3.8) participated voluntarily in the study (23%) forming two separate focus groups with six and five SR respectively. The semi-structured interviews were conducted by the same facilitator (FB) between two meetings of the JF. The interviews (length 115 minutes) were conducted according to a guide created by the researchers. They were audio taped, transcribed verbatim, and de-identified. All transcripts were analyzed by content.

Results: Seven main themes emerged from the analysis of the transcripts consistently present across all focus groups:

(1) The JF offers contact persons (e.g. the responsible staff member in the deanship) and support (e.g. for discussions with other stakeholders). (2) The face-to-face contact alleviates the commitment between faculty and SR (e.g. offers possibilities for personal connections). (3) The regular meetings keep a continuous bond between all participants, especially in-between the SR of different semesters (e.g. helpful for learning reciprocally), (4) and advance transparency (e.g. concerning reasons for decision-making). (5) Nevertheless the JF shows structural limits (e.g. due to the decision-making power of the participants). (6) The SR need to prioritize and channel the requests of their fellows (e.g. sensing the current needs of the majority versus necessities of an individual student). (7) They have to lay down limits in which they can support their fellows (e.g. defining the amount of responsibility taken over).

Conclusions: Considering the results, the combined structure of SR and the JF seems to be an appropriate support system to improve the organizational quality of medical studies (e.g. communication flow between deanery and SR as well as among SR of different semesters). Triggered by the possibility of regular meetings and the mutual discussion of student’s needs a personal commitment is created which alleviates the communication between the students and their faculty. On the other hand this study shows that deeper analysis is needed to further define what can be expected of SR and to create other possible tools facilitating the contact with all subspecialties. Based on this knowledge the quality management of the faculty can be further optimised.

IV-8.4 Do Family Physicians Adequately Reflect on Their Learning and Practice in the Workplace as Part of Proposed Revalidation Process in the UK?

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Objectives: Revalidation for UK doctors is expected to be introduced in January 2013. These practitioners will be required to collect supporting information that demonstrates they reflect on their formal and informal work-based learning experiences and consequently maintain or improve their practice. The aim of the study was to identify evidence of reflective learning amongst family physicians who submitted supporting information for the proposed Royal College General Practitioners’ (RCGP) revalidation portfolio.

Methods: We invited 520 general practitioners (GPs) registered on two English and one Welsh primary care organisations’ (PCOs) performers’ lists to submit supporting information collected during the past year for the proposed RCGP revalidation portfolio. Ten of the 36 GP appraisers from two English PCOs rated the
Development of Outcome-Focused Competencies for a Bachelor-Programme Interprofessional Health Care / Interprofessionelle Gesundheitsversorgung

Mahler, Cornelia; Karstens, Sven; Roos, Marco; Szecsenyi, Joachim (University Hospital Heidelberg, Dept. General Practice and Health Services Research, Heidelberg)

Objectives: The health care systems in Germany and around the world are faced with demographic change and the need of providing health services in increasingly complex health care surroundings. A highly qualified workforce is needed to face the challenges ahead and to coordinate health care. Interprofessional collaboration is a possibility to achieve these aims and to improve health care outcomes. Various recent statements by the SVR 2007 (1) and 2009 (2) and the Robert Bosch Stiftung (2010) (3) aim to emphasize and move forward to more interprofessional collaboration. In addition there is evidence that Interprofessional Education strengthens interprofessional collaboration which can lead to improved health outcomes (4).

In Germany only few university programmes offer an academic degree for non-medical health professionals. The University of Heidelberg, Medical Faculty, decided to develop a bachelor programme integrating specific health professions (general nursing, geriatric nursing, paediatric nursing, midwifery, speech therapy, orthoptic, physiotherapy, radiotherapy assistants and laboratory assistants) and interprofessional qualifications into the curriculum. The CanMED roles for medical practice are recently also being applied in other health professions (5). This abstract describes the identification process of the outcome focused competencies for this bachelor degree.

Methods: The six-step curriculum model by Kern et al. (6) was applied. In the first step, for general needs assessment, an expert panel identified major tasks and health care fields for which the students should be qualified for. These results were transferred into a questionnaire and distributed among targeted learners as well as practitioners, experts and employers in different health care fields in order to rate relevance. Further individuals were interviewed to receive additional information and to generate further ideas.

Results: Thirteen different practice fields, five tasks and thirteen topics common to all health care professions were collected. The subsequent survey comprising 66 items was filled in by 139 targeted learners and 82 practitioners and experts. All identified practice fields were rated as relevant for future professional life. Top ratings were “supervising procedures” (targeted learners) and “interprofessional communication and coordination” (practitioners, experts and employers). The results were discussed and consented in the expert panel and learner outcomes/objectives for the bachelor programme were identified and categorized according to the CanMED roles. The professional competencies will be displayed.

A thorough needs assessment was performed setting the foundation for the further development of the curriculum. The identified competencies are in line with the five core-competencies defined by the WHO (2005) (7) which are necessary for interprofessional collaboration: Patient-centred care, Partnering, Quality improvement, Information and communication technology and Public health perspective. The application of the CanMED framework proved to be suitable. It may be used as a common terminology to help define interfaces with curricula of other health professions. The interprofessional development of the bachelor programme forwarded a deeper understanding of the health professionals for one other and can therefore be regarded as a first step in improving interprofessional collaboration.

Module 23 – How to Use Curriculum Development to Build a Team of Didactical Professionals

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**Background:** Today’s patient care is approached in a multidisciplinary and integrated way with an emphasis on the role of the general practitioner cooperating with subspecialists. This concept is reproduced in our newly designed interdisciplinary clinical year Module 23. For Module 23 eight interdisciplinary organ-oriented blocks were created. Each of them has to develop and organize the required courses for Module 23 on its own, supported by a central Module 23 organizational team and the team of the Section for Medical Education at the LMU Munich. The development and implementation of this new concept created the need of a team of numerous faculty members actively involved in the organization of the organ-oriented blocks. In order to keep up and further improve the high standards of the existing courses and course organization we needed to develop a system to train the involved members of faculty in didactical and organizational skills. We also wanted to ensure the communication among the new team members to facilitate a process of didactical professionalism on a broad basis.

**Methods:** Team meetings on a monthly basis were established to inform the involved faculty members about the next steps in the process of implementing Module 23 and to get feedback from the team members about upcoming challenges and achievements. In addition there has been a workshop of three days duration away from the daily clinical routine which fostered an interdisciplinary exchange of opinions on learning and assessment. The workshop program included didactical seminars, assessment trainings and discussions on the further development of the curriculum. Apart from the workshop we had a retreat for one day dedicated to the topics “learning goals” and “assessment”. An organization team consisting of the dean for medical education, two faculty representatives with master of medical education training, two physicians and one educationist was set. The latter three worked full time on this project and supported the organ teams with expertise, information and coordination.

In the progress of our curriculum development the structure of the monthly meetings changed. While the first meetings were predominantly used to inform the involved faculty members about upcoming deadlines, they got more interactive with time. The faculty members shared their experiences in developing and organizing new courses for Module 23 and best practice examples were presented to each other. Also some of the organ-oriented block teams decided to support each other in preparation of the assessment e.g. through corporate review of multiple choice questions.

**Conclusion:** Giving responsibility for the development, organization and implementation of Module 23 to numerous faculty members who were not didactical experts we created a need for knowledge about medical education. This was satisfied during regular team meetings workshops as well as individual counseling and lead to a new awareness for current issues of medical education not just among the highly involved faculty members of the Section for Medical Education but also the large part of clinical teachers.

How Far Away from the Goal? Measuring the Implementation of a Mission Statement for Faculty Development in Medical Education

Rotthoff, Thomas; Ostapczuk, Martin; De Bruin, Judith; Kröncke, Klaus D; Decking, Ulrich; Schneider, Matthias; Ritz-Timme, Stefanie (Medical Faculty, Deanary of Studies, Düsseldorf)

**Objectives:** The learning environment is usually examined by inventories such as the Dundee Ready Education environment Measure (DREEM) [1]. Mission statements (MS), however, are also said to be well suited [2]; yet hardly any study has tested the implementation of an MS for this purpose so far. We constructed a questionnaire for students and teachers from the teaching MS of HHU Medical Faculty to
measure its degree of implementation and to investigate by means of the DREEM to what extent the MS assesses the construct of learning environment.

**Methods:** 37 items on 3 subscales (students, teachers, studies) were derived from the MS and merged with the 50 DREEM items to one questionnaire (Q). The online survey was conducted voluntarily and anonymously with 1119 students and 258 teachers from all stages of the degree in summer term 2010. On item level, means and part-whole corrected discrimination-indices were determined. On test level, we assessed reliability by Cronbach’s alpha as well as convergent validity regarding the German version of the DREEM [3] and criterion validity regarding demographic variables.

**Results:** The dispersion of the item means was sufficient, and the discrimination-indices were highly positive for all items both in the student and in the teacher sample. Concerning the relationship between both groups, we found significant differences in their mutual perception. Similarly to the DREEM, the MSQ was highly reliable among students (α = .92) and teachers (α = .93). In both groups, MSQ and DREEM correlated positively and significantly (r = .79 and .80, each p < .001). On the subscales of the MSQ, both students rated teachers worse than teachers rated themselves, and students rated themselves better than teachers did. Clinical students estimated the implementation of the MS on all dimensions significantly worse than preclinical students. Preclinical teachers assessed the implementation of the MS partially more negatively than their clinical colleagues. Female students considered the MS significantly better implemented than male students and non-native students better than native speakers. Both with students and with teachers, we measured only a fair implementation of the MS.

Both groups perceived themselves more positively than the others perceived them [4]. Students and teachers do not seem to form a community. From the perspective of clinical students, the implementation of the MS was worse: preclinical students’ high expectations may have influenced their perception without being met in the subsequent progress of the studies. Irrespective of the gender, the cultural background seems to play a role, as non-native speakers considered the MS better implemented and assessed the learning environment by means of the DREEM better, too.

The transformation of an MS into an MSQ is suitable to gather information about its perceived implementation at a medical faculty with students and teachers. It shows areas for faculty development.

The sound psychometric characteristics of the MSQ in the present study and its high positive correlation with the DREEM indicate its suitability for the investigation of the learning environment.


Rotthoff T, Ostapczuk M, De Bruin J, Decking U, Schneider M, Ritz-Timme S. Assessing the learning environment of a faculty: Psychometric validation of the German version of the Dundee Ready Education Environment Measure (DREEM) with students and teachers (submitted)


**IV-8.8 The Differences Between Students’ and Teachers’ Evaluation of the Aachener Modellstudiengang Medizin in Conception, Dedication, Organisation and Overall Grade**

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**Objectives:** Do students and the teaching staff evaluate the same questions differently?

**Methods:** The questionnaire applied for both groups consists of 15 questions divided into 4 categories (6-point-scale): conception, dedication of the students/teachers, organisation and feedback and the overall grade. The questionnaire was analysed in two ways: First, differences between the students’ and teaching staff’s sample on the four bundles of questions were examined applying an analysis of variance. Second, students’ and teachers’ evaluations were compared using item by item measures of effects sizes (d).

**Results:** The results of the analysis of variance showed no significant differences between students and teachers when evaluations were aggregated for the four categories: conception (f = 0.54/p = 0.46), dedication (f = 1.11/p = 0.29), organisation (f = 1.97/p = 0.16) and overall grade (f = 1.85/p = 0.18). However, when analyses were based on the single items, differences were found in 7 questions from all four categories except of the overall grade. Within the conception category the item “Teachers respective I implement the new curriculum concept” was evaluated differently between students (M = 2.69, SD = 1.11)
and teachers (M = 1.87, SD = 0.89) with a medium sized effect (d = 0.73 CI: 0.40-1.06). In the clinical part of the curriculum, the dedication category was evaluated differently with d= 0.42 (CI: 0.03-0.80). The teachers’ mean rating of the students’ dedication in their 4th and 5th year of studies was 2.44 (SD = 1.26), whereas students rated teachers as less dedicated (M = 2.95, SD = 1.21). The item “The study course is organised well” within the organisation category showed a small effect (d = 0.34 CI (0.03-0.64)) between students’ (M = 2.43, SD = 1.31) and teachers’ (M = 2.87, SD=1.28) opinions. Finally there was virtually no difference between the overall grade given by the students (M = 2.24, SD = 0.94) and the teachers (M = 2.44, SD = 1.00) for the Aachener Modellstudiengang Medizin 2.25 (+/-0.944).

Limitations: An obvious limitation is the small sized sample of teachers (n = 51), which might have several reasons. Examples are timing of the evaluation, general workload, or limited familiarity with online evaluation systems as compared to the students (n = 457).

Discussion/Conclusion: The results of the present study showed, that differences between students’ and teachers’ evaluations of the Aachener Modellstudiengang Medizin could be found in a fine grained item by item analysis. These significant results would not have been detected if analysis would have been limited to the level of aggregated data. The results are of importance for further curriculum development because they focus on the perception of the reforming process. Sources of the differences revealed are twofold: students are generally more informed about the curriculum from the very beginning of their studies, whereas teachers are changing frequently and are often involved only in a part of the curriculum. These results indicate that the faculty could put more effort in informing teachers about the curricula changes.

IV-8.9 Does the Attitude Toward Psychiatry Change During Undergraduate Medical Education?

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Objectives: Prevalence of mental disorders is increasing worldwide and often causes severe impairment in daily life at any age. Due to the lack of young academics in medicine in Germany in general, but particularly in psychiatry / child and adolescent psychiatry, a major challenge for health care is the recruitment of specialists in psychiatry and child and adolescent psychiatry. Therefore the aim of our study is to examine the attitude toward psychiatry of medical students during undergraduate medical education.

Methods: At the University of Ulm, 695 medical students of all semesters participated in an online survey between October and December 2010. Attitudes towards psychiatry were measured using the ATP-35 (Attitudes Toward Psychiatry-35) in a German translation.

Results: With a mean ATP-35- score of 112.4 (± 8.0) attitudes toward psychiatry were generally positive (a score of 105 represents the medium). The means of the ATP-35-scores in different semesters ranged between 109,7 and 115,0, thus showing no significant differences between semesters, gender or age.

Conclusion: According to this first cross-over study, the stage of the medical training has no influence on attitudes toward psychiatry. Obviously the undergraduate medical education and in particular the teaching of psychiatry and child and adolescent psychiatry does not significantly alter the attitudes toward psychiatry.
A. Medical Teaching Network

A-1 Building a National Medical Teaching Network for Cooperation and Mutual Recognition Agreements of Qualifications in Medical Education

M. Lammerding-Köppel (on behalf of the colleagues listed below)

Needs Assessment: The growing number of qualification programmes in medical education in Germany and their importance for teaching, Habilitation, and professorial positions necessitate nationwide cooperation and mutual recognition agreements. Hitherto, no standards have been agreed upon and no standardized procedure has been devised for recognition of equivalency. For physicians and researchers in the process of Habilitation, this has proven problematic with regard to nationwide mobility. In the last years, the number of certificates from external institutions handed in for recognition through the Competence Centre for University Teaching in Medicine Baden-Württemberg has increased significantly. Because of the lack of standards, this has required a lot of time and resources for all involved.

Procedure: Following the Competence Centre’s needs assessment, representatives of important institutions were invited to Tübingen for a first preparatory meeting. The participants presented their programmes and courses (see the Survey of Qualification Programmes and Courses in Medical Education). Fundamental criteria for future mutual recognition agreements and a requirement profile were defined.

Results:
(1) A catalogue of criteria for mutual recognition in terms of either a (state) certificate or individual components has been defined.
(2) Through nationwide standardization, the recognition of qualifications in medical education for the purpose of Habilitation will be facilitated across universities and states.
(3) To achieve transparency, certificates should contain the following specifications in accordance with the requirement profile defined:
   - duration of course
   - content
   - methods
   - documentation of practical coursework (e.g. peer coaching, with duration)
   - ECTS credit points (desirable).
(4) The process of mutual recognition will become more efficient.
(5) The long-term aim is the establishment of a national certificate in medical education (Medizinischer Fakultätentag and Gesellschaft für Medizinische Ausbildung).

1 Participants of the initial meeting: Chair/moderation: Maria Lammerding-Köppel (Tuebingen), Christine Baatz, Meike Kreidler, Regine Zennß (all Tuebingen), Björn Böhmer (Regensburg), Jan Breckwoldt (Berlin), Peter Dieter (Dresden), Matthias Hofer (Düsseldorf), Hildegard Lieverscheidt (Bochum), Thorsten Schäfer (Bochum), Melanie Simon (Aachen), Christoph Stosch (Cologne)

A-2 Dozententraining der Fakultät für Medizin

PD Dr. P. Berberat, A. Hesse M.A. (Projektleitung, TUM MeDiCAL, München)

Hintergrund und Ziele: Das seit 2009 angebotene Dozententraining hat sich als eine bewährte und beliebte Form fakultätsinterner hochschuldidaktischer Fortbildung etabliert. Das Trainingskonzept wurde von Mitarbeitern der Fakultät in Kooperation mit Hochschuldidaktikern der TUM (PROLEHRE) entwickelt und verfolgt das Ziel, nachhaltige Verbesserung der Lehrqualität, interdisziplinäre Vernetzung des Lehrkörpers sowie Weiterentwicklung der Lehrkultur in der Fakultät zu fördern.

Zielgruppe: Lehrende der Fakultät für Medizin/TUM (primär Habilitanden und Oberärzte in der Lehre)

Curriculum – Struktur: Das Gesamtprogramm umfasst einen Stägigen Basiskurs (Dozententraining = Modul A), zwei kollegiale Hospitationen (Modul B 1+2), einen Vertiefungskurs (Modul C) und ein reflektierendes Abschlussgespräch. Die Aufbaumodule sind innerhalb eines Jahres nach Abschluss des Basiskurses zu absolvieren.

Curriculum - Inhalte und Umfang (65 AE): Modul A: Basiskurs (45 AE)
Modul B: Kollegiale Hospitation - Lehrberatung und Supervision (8 AE)
Modul C: Vertiefungskurs (min. 12 AE)

Ein Kurs der Wahl aus dem hochschuldidaktischen Fortbildungsprogramm unseres TUM-Partners PROLEHRE, künftig auch interne Fortbildungskurse der Fakultät für Medizin.

**Durchführung:** Der Ständige Basiskurs (Modul A) findet zweimal jährlich (Februar/März und September/Oktober) an einem auswärtigen Tagungsort statt, pro Kurs nehmen derzeit max. 24 Personen teil. Als Referenten werden professionelle Trainer und Dozenten der Fakultät mit medizindidaktischen Zusatzqualifikationen eingesetzt, zeitweise auch Gastdozenten.

**Zertifizierung.** Nach erfolgreicher Absolvierung aller Module erwerben die Teilnehmer das „Hochschulzertifikat Medizindidaktik (TUM)” (65 AE). Dieses kann auf das „ProfiLehre-Zertifikat (Bayern)” (120 AE) vollständig angerechnet werden.

**Beteiligung der Fakultät - demographische Daten:** An den 4 bisher abgehaltenen Basiskursen nahmen insgesamt 92 Teilnehmer teil. Fast alle Kliniken/Institute der Fakultät haben inzwischen 1 bis 8 Mitarbeiter zu den Kursen entsandt.

Verteilung nach akademischem Rang: Den größten Anteil bildeten mit 71 % Habilitanden, gefolgt von Privatdozenten (17%) und Mitarbeitern, die noch kein Habilitationsverfahren begonnen haben (12 %). Verteilung nach klinischem Rang: 42% der Gesamtgruppe waren Oberärzte bzw. leitende Oberärzte, 17% Fachärzte, 36 % Assistentärzte und 5% nicht-ärztliche Mitarbeiter der Fakultät. 76 % aller Teilnehmer waren männlich, 24 % - weiblich.

**DozentenFORUM:** Um das fakultäre Netzwerk zu stärken und die erworbenen Kompetenzen im Lehralltag nachhaltig zu verankern, treffen Dozententraining-Alumni 2 x pro Semester beim DozentenFORUM Medizin zusammen. Dieses hat Fortbildungsscharakter im Sinne der „Best Evidence Medical Education“ und bietet Gelegenheit zum Austausch über Erfahrungen und Lehrprojekte aus der Fakultät. Die Veranstaltung erfreut sich zunehmender Beliebtheit.

**EntwicklungsPerspektiven:** Das Gesamtkonzept des Dozententrainings wird von der Fakultät für Medizin kontinuierlich weiterentwickelt. Lehrende mit Ausbildung zum MME werden zunehmend in diesen Prozess involviert. In den kommenden Monaten wird eine systematische qualitative Befragung ehemaliger Teilnehmer durchgeführt, um erste Hinweise auf Nachhaltigkeitseffekte auf die Lehrqualität zu gewinnen.

**Projektleitung:** PD Dr. P. Berberat, A. Hesse M.A. (TUM MedICAL)

*1 AE = 45 Min.*

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**A-3 Concept, Experience and Results of the Medical Teaching Staff Qualification Programme in Bochum/North Rhine-Westphalia**

Hildegard Lieverscheidt, Herbert Rusche, Thorsten Schäfer (Medical Faculty, Ruhr-University Bochum, Center for Medical Education, Bochum)

In 2001 the Medical Faculty of the Ruhr-University Bochum started major reform projects to implement problem-based learning (PBL) in the preclinical studies (in 2002) and a new PBL curriculum parallel to the regular curriculum (in 2003). These activities led to the need to offer courses in curriculum planning and tutor trainings for PBL for the medical teaching staff.

From 2004 to 2006 a task force of the Study Deans’ Conference of the eight medical faculties in North Rhine-Westphalia (NRW) set up a course programme consisting of 4 fields (Planning, Teaching & Learning, Assessment & Evaluation, Miscellaneous) . We now offer a Certificate Course, which consists of 5 modules with a total workload of 120 hours. The certificate in medical didactics is given by the Chamber of Physicians (Ärztekammer) and the State Academy for Medical Education NRW, an association of the 8 universities with medical faculties. Teachers, who want to qualify further, can complete expansion modules offered by the Higher Education Network NRW, to achieve the Certificate in Higher Education with a workload of 200 hours.

There are 7 to 8 courses per year, offered by MeDiBo (Medizindidaktik Bochum; www.rub.de/medibo). Since 2001, about 600 participants have attended the courses, about 20 have completed the certificate in medical didactics in Bochum. The popularity grew steadily. Now, there are waiting lists for participation.

The courses in NRW are subject to strict quality criteria and are accepted mutually.
A-4  

„Frankfurter Arbeitsstelle für Medizindidaktik“ (FAM): From Idea to Implementation

Ochsendorf F, Sennekamp M, Gerdiken U (for the Didaktik AG Frankfurt/M*)

* Members of the Didaktik AG (Farzin Adili, Wilma Flajg, Ulrike Gerdiken, Susanne Gerhard-Szép, Lars Kandsberger, Getrud Klauer, Sandy Kujumishiev, Frank Nürnberg, Falk Ochsendorf (Klinikum d. J.W.Goethe-Universität, Klinik f. Dermatologie, Venerologie und Allergologie, Frankfurt)

Background: In Frankfurt a 2-day didactic course („FiTT“) was offered since 2002. It was compulsory for physicians who wanted to habilitate. Later other courses were introduced to prepare the tutors specifically for certain tasks in different disciplines. However, there was no structured approach.

Methods: In order to build up a structured curriculum with comparable standards to existing ones (Baden-Württemberg, Nordrhein-Westfalen) the „Didaktik-AG“ formed in 2008. It comprised the protagonists of the different teaching courses. During a retreat session the course contents, the didactic elements, an action plan and the responsibilities were set up. The plans were grounded on recommendations set up by the „Ausschuss Personal- und Organisationsentwicklung in der Lehre“ of the „Gesellschaft für Medizinische Ausbildung“ (see GMS Z Med Ausbild. 2006;23(4):Doc73; 2006;23(4):Doc72., 2008;25(2):Doc84; 2010;27(4):Doc629).

Results: In contrast to existing programs it was decided to introduce a compulsory 1 day basic course for every scientific colleague starting the career at the Frankfurt faculty of medicine. Thereafter it is possible to choose modules from three different areas of interest: organisation, didactic methods (obligatory), examination (obligatory) and complementary modules. To receive the certificate 120 hours (5 modules each with 24 units) have to be completed. In 2009 the groups worked out the contents and didactic scenarios. In 2010 the modules were peer-reviewed. The first base-module was held in October 2010. At the end of 2010 the faculty council decided to finance a secretary and scientific position for this institution. Favorable for the success of this activity were the following factors: the precursor success of didactic programs in other federal states with the compulsion to follow these developments, the general dissatisfaction of students and faculty with the local medical education, the wish of faculty members for such courses, a critical mass of protagonists, a motivated team and a large tolerance to frustrations.

A-5  

The “Train-the-Trainer”-Program of RWTH Aachen’s Medical Faculty – An Alignment to the Needs of Teachers in Medical Education

Simon, Melanie (Medizinische Fakultät der RWTH Aachen, RWTH Aachen, Aachen)

The Medical faculty of RWTH Aachen University offers a didactical training program to their teachers, which is adjusted to their needs in teaching medical students. All in all physicians and scientist can choose from fourteen different courses, which are offered once or twice a year. The organization and information lies within the responsibility of the dean’s office for study affairs. The topics of these training courses can be divided up into three sections: 1. teaching in large groups (plenary techniques, using power point etc.), 2. teaching in smaller groups (PbL etc.) and teaching with clinical background or practical skills (License to skill, teaching with simulated standardized patients etc.) These three sections reflect the main characteristics of the curriculum of the Aachener Modellstudiengang, which is a kind of a hybrid model including lectures, PbL, other small group lessons and clinical teaching. In nearly all of the trainings a visitation of a teaching unit by the other participants is embedded. This is very useful to develop an interdisciplinary networking between the teaching members of the medical faculty. So the participants get their certificate only if they held a teaching lesson and got the feedback by their colleagues and also gave feedback to the other colleagues of their group. Those certificates are given by the dean of study affairs and are admitted within the procedure of the postdoctoral lecture admission of the participants. This makes the “Train-the-Trainer”-Program of RWTH Aachen’s Medical faculty a part of its faculty development. Also trainings which are absolved at other faculties in North Rhine-Westphalia are admitted.

Additionally to these trainings there is also offered an introduction unit for all new members of the faculty to introduce into the special curriculum of the Aachener Modellstudiengang and the local facilities. (“How to teach within the Medical faculty of RWTH Aachen“). The members of the dean’s office for study affairs get their own teaching units to learn about curriculum development, Learning goals or different forms of exams. Most of the trainers of the program are recruited from the members of the postgraduate Master program Master of medical education of the medical faculty. The curriculum of the “train-the-Trainer”-Program is continually being reformed and rethought in the context of rapid advances in medical knowledge and linked to the professional development of all involved people.

We are now looking forwarded to cooperate not only with other faculties in North Rhine-Westphalia, but also with other faculties in Germany.
B. Competence Network Teaching in Medicine Baden-Württemberg

B-1 Competence Network Teaching in Medicine Baden-Württemberg: Success in Medical Teaching through Concentration, Cooperation, and Coordination

Lammerding-Köppel M (Tübingen), Biller S (Freiburg), Grab C (Ulm), Jünger J (Heidelberg), Obertacke U (Mannheim), Klüter H (Mannheim)

Aims: The main objective of the Competence Network Teaching in Medicine Baden-Württemberg is to ensure and improve the quality of teaching and assessment in medicine by developing obligatory guidelines, standards and supporting resources. Available expertise and resources are used collaboratively by the faculties. Furthering research projects into the theory and practice of teaching, we strive for a level of excellence that is exemplary beyond Baden-Württemberg.

Organisation: Teaching in medicine, evaluation, examinations, e-learning, and the final-year internship ("Praktisches Jahr") respectively are the specific research topics of the five Competence Centres. Each Centre is part of one of the Medical Faculties of Baden-Württemberg. The Competence Network’s main office, currently located in Tuebingen, coordinates the projects and presents the network at conferences and in the media. Regular project meetings are organized in cooperation with experts from the faculties.

Results: The Competence Network has developed and successfully implemented a series of projects to assure continuous improvement of the process, structure and outcome of teaching and assessment:

(1) A standardized qualification in university teaching in medicine (MQ I/MQ II) leading up to the State Certificate “Baden-Württemberg Zertifikat für Hochschuldidaktik in der Medizin (Certificate for University Teaching in Medicine)”, has been implemented statewide. MQ is required for Habilitation and for professorships.

(2) Examination guidelines for examiners and curriculum developers provide the basis for consistent examination design and implementation across the state.

(3) For examiners in the final examination M2, a certified training course has been implemented in order to render assessment more transparent, reliable, and valid.

(4) A consistent selection procedure for the qualifying examination (TMS: “Test für medizinische Studiengänge”) has been implemented successfully.

(5) Data collected in a statewide graduates survey is currently being analysed.

(6) Research in medical education (collaborative research projects, papers, conferences, etc.) is promoted by all faculties. Medical teachers are supported by the expertise and resources of the competence centres.

Conclusion: Both the universities and students profit from the synergy effects of the Network, from mandatory guidelines and the implementation of standards in teaching and assessment. The Network continuously strives to develop innovative projects in the area of medical teaching. Currently, two research projects investigate questions of teaching impact and of evaluation (transparency of and adaptations in reaction to evaluation results).

B-2 Stand Out with Outstanding Teaching: The Competence Centre for University Teaching in Medicine Baden-Württemberg

Baatz C, Lammerding-Köppel M (Competence Centre for University Teaching in Medicine Baden-Württemberg, University of Tübingen)

Aims: The Competence Centre for University Teaching in Medicine Baden-Württemberg at the University of Tübingen was founded in 2001 with the help of start-up funding from the State of Baden-Württemberg. Its aims are

(1) to assure and continuously enhance the quality of teaching;

(2) to provide sound, scientifically based guidance in the design and implementation of teaching and curriculum development;

(3) to develop and provide tailored courses for academic teachers, student tutors, doctoral students and students in medicine.

Organisation: At the core of the programme is a two-level standardized qualification programme for academic teachers in medicine (basic module: 120 hrs, advanced module: 80 hrs). Completion of the advanced module is recognized with the Baden-Württemberg Certificate for University Teaching in Medicine.
In addition, the Centre offers curriculum consultation and workshops for institutes and faculties in Germany and abroad, programmes for aspiring trainers in medical education, individual coaching, and support in devising a personal career development plan. For student tutors in medicine, the Centre offers a tailored qualification programme. The Centre’s programme also includes soft skills courses for doctoral students and undergraduates. All courses are offered in German and English. In addition, the Centre provides modules for Master and Bachelor courses nationally and internationally. Continuous research in medical education results in the development of mandatory guidelines and standards.

**Structure:** The Centre provides services for all five Faculties of Medicine in the State of Baden-Württemberg. It is part of the *Competence Network for Teaching in Medicine Baden-Württemberg*. Close collaboration is ensured by the Programme Representatives and the Deans of Medical Education in the Faculties. International experts on the Centre’s Scientific Advisory Council support and monitor the Centre’s work.

**Results:** International expert committees have attested the consistently excellent quality of the Centre’s work according to medical and educational standards. Participant surveys (2006 and 2009, basic and advanced courses) showed that

1. 82% of participants felt they were able to better fulfil their teaching duties after participating in the Centre’s programme;
2. 85% stated that the programme had substantially or even completely changed their teaching practices, particularly with respect to the preparation of content and choice of methods;
3. 75% achieved better student evaluations.

To date, there have been more than 4,800 course participations, more than 2,500 participants from Baden-Württemberg, 1,600 participants in the basic module, 2,200 in individual (advanced) courses, and more than 650 external participants. More than 750 students and doctoral students and more than 450 student tutors have participated in the Centre’s courses. More than 300 participants have been awarded the Baden-Württemberg Certificate for University Teaching in Medicine.

**Conclusion:** The Competence Centre for University Teaching in Medicine Baden-Württemberg provides a wide range of training and services in medical education, based on continuous research and accompanied by comprehensive quality assurance. Formal training for teaching in medicine is firmly established in the State of Baden-Württemberg and has become a standard requirement for professorships and other higher positions. In the future, the Centre will continue to strive for enhanced cooperation in medical education across universities and research institutes.

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**B-3 The Freiburg Competence Center for Evaluation of Teaching in Medicine Baden-Württemberg**

S. Biller, M. Giesler (Albert-Ludwigs-Universität Freiburg, Studiendekanat der Medizinischen Fakultät, Kompetenzzentrum Lehrevaluation in der Medizin Baden-Württemberg, Freiburg)

**Background:** The Freiburg Competence Center for Evaluation of Teaching in Medicine, Baden-Württemberg was founded in 2003. In 2007 it aligned with the four Baden-Württemberg Centers of Competence to the Network Teaching in Medicine, Baden-Württemberg. As all centers of competence it was promoted with public funds.

**Aim:** of the Network is ongoing development of medical education; the specific assignment of the Freiburg Competence Centre is to offer comprehensive and effective evaluation in medical education.

**Work:** The key activities of the Freiburg Competence Centre are: course evaluation, evaluation of teaching environment and graduate surveys. These activities are accompanied by research projects.

**Course evaluation:** Since the latest edition of the Medical Licensure Act (Approbationsordnung für Ärzte, ÄAppO, 2002) it is mandatory to evaluate all teaching activities. The federal law for universities requires the participation of students. In order to improve course evaluation the Freiburg Competence Centre and the network partners are working on guidelines and algorithms.

**Evaluation of teaching environment:** The teaching environment is surveyed continuously. By now we have e.g. data about students’ life- and course-situation as well as about special topics like library facilities, working environment or skills-lab offering. These data are helpful for decisions concerning curriculum development.

**Graduate surveys:** In autumn 2009 all graduates from the five Baden-Württemberg medical faculties in autumn 2007 or spring 2008 were requested to participate in a graduate survey. This survey was conducted in cooperation with the International Center for Higher Education Education Research (INCHER – Kassel). 514 graduates responded (response rate = 42%). Important information was found concerning medical study, career entry and employment.
**Research projects:** A central project of the Freiburg Competence Centre is to assess medical competencies. Therefore, we developed the Freiburg Questionnaire to Assess Competencies in Medicine (Freiburger Fragebogen zur Erfassung von Kompetenzen in der Medizin; FKM). The questionnaire includes 45 items representing nine domains that correspond to the CanMEDS roles. The reliability and validity of the questionnaire was tested. The FKM might be used as a screening tool e.g. in graduate surveys to identify weaknesses in the medical education curriculum.

**B-4 Competence Centre E-Learning in Medicine Baden-Württemberg**

Brachmann S, Eichner B, Grab C (Medizinische Fakultät, Kompetenzzentrum E-Learning in der Medizin, Ulm)

The Competence Centre E-Learning in Medicine, Baden-Württemberg, founded 2005, provides service features for the medical faculties in Baden-Württemberg, to integrate lasting computer based learning and teaching into the medical training to improve this quality. Medical issues could so be demonstrated both more comprehensible and always repeatable by multimedia-based and interactive learning media. The medical training could be extended more independent from areal condition and temporal demand.

The Competence Centre is member of the competence network "Teaching in Medicine". The competence network "Teaching in Medicine" is a network of the Medical Faculties of Baden-Württemberg. The Medical Faculties exchange the special competences developed at the individual locations and advance them to further optimize the teaching offer for the medicine studies at the universities of Baden-Württemberg.

**Important past and current projects:**
- E-Learning Curriculum: Database with marked e-learning content
- Area-wide lesson record
- E-Learning reward
- Demand and target audience analyse to evaluate the status quo: E-learning at the academy for healthcare professions at the university central clinic
- Provision of a LMS for the Medical Faculty at the university Ulm
- Introduction of an electric voting system: TED
- Development of a quality criteria catalogue for the valuation of e-learning content
- E-learning demand and usability analysis
- Development of a compliant- and ideamanagement-system for the students
- Development of a learning target catalogue
- Setup of an online advisory service

**Targets of the Competence centre:**
- Development and realisation of a long-range strategy for the medical teaching in Baden-Württemberg
- Build-up of a e-learning community at the universities, that means the creation and utilisation of common resources for the curricular medical education
- Development of e-competence, that means the media pedagogic qualifying of professors and students from the medical faculty.

**Tasks of the competence centre:**
- Integration of content
- Qualification of employees
- Stabilisation of technology.

**B-5 Kompetenzzentrum für Prüfungen in der Medizin Baden-Württemberg**

Jünger Jana, Schultz Jobst-Hendrik, Hochlehnert Achim (Kompetenzzentrum für Prüfungen in der Medizin/Baden-Württemberg, Heidelberg)


Insbesondere sollen die Entwicklung einheitlicher Prüfungsstandards, die Etablierung adäquater und reliable Prüfungsformate (z. B. praktisch-mündliche Prüfungen) und zur optimalen Nutzung personeller Ressourcen der interfakultäre Austausch von Prüfungsinhalten vorangetrieben werden.

B-6 Kompetenzzentrum Praktisches Jahr - Centre of Competency “Practice Year”

Narciss, Elisabeth; Obertacke, Udo; Wolter, Sigrid (Kompetenzzentrum „Praktisches Jahr“ in der Medizin, Mannheim)

The Centre of Competency “Practice Year” is one of five centres created at state level for the medical faculties in Baden-Württemberg. It started to work towards improving the quality of the final practice year for medical students (PJ) in December 2005, and is situated at the Medical Faculty Mannheim of Heidelberg University. The primary task was to restructure the PJ in response to the reform of the legislative regulations for state approval. This reform implied that from August 2006, the interim state exams during the theoretical clinical part of medical studies were cancelled and replaced by a comprehensive final exam (M2) including a theoretical and oral-practical part, which is held only after the PJ. Students therefore now have to prepare for the M2 parallel to their clinical practice. This change needed to be considered in the curriculum.

In the beginning, examiners as well as examinees had a high information demand on how to deal with the new structure. The Centre therefore offered a series of symposia:

- The first one took place before the first round of the new state exam in June 2006, and covered issues on contents and implementation of the M2 and discussed questions on exam preparation and its implications for the PJ. The second symposium in January 2007 reviewed the experience with the first round of M2s’ experience and how to further adapt the PJ to the new frame conditions. Apart from representatives from the state of Baden-Württemberg, a number of representatives from other German states contributed to this discussion. The last symposium was organized in Feb 2008 with a focus on reviewing the implications of the new M2 for the overall clinical study organisation.

In the following, we briefly present, what changes for medical students have been initiated and established by the Centre of Competency “Final Year”.

Before starting into the PJ: Comprehensive internal tests: Step-by-step, the Medical Faculty Mannheim introduced a range of internal tests: an OSCE for practical skills in surgery and written tests for the conservative clinical subjects, e.g. internal medicine or pharmacology. The aim of these tests is to support students in:

- Reviewing clinical subjects and applying knowledge in practice
- Preparing at a cognitive level for the PJ to be in a better position to link theory with the practical skills gained during the PJ
- Achieving a high level of knowledge before the PJ to have a good basis when preparing for the final state exam (M2)

Structured information about the PJ (oral presentations plus electronic platform): Since 2008, we offer a one-day introduction to the PJ, which details the activities and the frame conditions of the PJ. The respective clinical wards present themselves and answer students’ questions. In addition, students are introduced to using the PJ platform established in moodle, which present clinical cases for individual study. It offers the possibility to revise a wide range of clinical topics and cases independent of time and location, thus supporting students even when they do parts of their clinical practice outside the university clinic. This is not only useful for the practical clinical work, but also for preparing for the M2.

Interdisciplinary seminars during the PJ (Repetitoriums-Seminare): These seminars have also been established to encourage and improve learning during the PJ, both for future work as a clinician and the M2 preparation. Twice a week, a clinical patient is being presented, or alternatively, a ‘paper-case’ patient. Supported by clinically experienced lecturers, students “solve” this case interactively by deciding on the necessary diagnostic steps and the potential therapeutic actions. Throughout their PJ, students thus have the opportunity to review the most frequent and important diseases and learn to apply their knowledge in an individual case.
Revision of practical skills: Putting on sterile gloves? Interpret an X-ray picture or ECG? Stitching a wound? Ten essential medical skills are practised in small groups parallel to the seminars. Not only is this useful for future clinical work, but also for the practical part of the M2.

Pilot for the practice: log books: For both required PJ-tertials (surgery and internal medicine) and for most electives, the Centre developed log books, in which we defined the skills and competencies the students are expected to acquire. Various learning steps are detailed for all clinical “basics” from diagnostic approaches to the leading of a ward round: first by observing an experienced clinician, then by performing them oneself under supervision. On the one hand, students can thus measure their own progress in developing clinical skills and competencies. On the other hand, it gives their clinical supervisors a structured guide on what students are expected to learn.

M2-exam preparation and M2-examiners workshops: The Centre informs students in detail about the procedures and regulations of the written part as well as the oral-practical part of the M2. An essential activity to improve exam standards is the training of the examiners for the oral-practical part in a one-day workshop. Contents of this workshop have been agreed between all Medical Faculties in Baden-Württemberg. A doctoral research is under way to assess the reliability and validity of these oral-practical exams and the role of the structured questions in this.

Further qualification in teaching skills for academic staff: With the implementation of its model curriculum (MaReCuM), the Medical Faculty Mannheim has decided to make training of teaching skills a compulsory part for new academic staff (Habilitanden). Reacting to this, the Centre has developed a series of training courses in close cooperation with the Centre for teaching in medicine’ in Tübingen. The executive officer of the Centre is also the coordinator for this training programme.

Introducing a new model for the ’Practice Year’ to cover out-patient care: In the MaReCuM model curriculum, the practice year will be divided into four 'quartals’ from Aug 2011 instead of the usual ‘tertials’. This allows to introduce a new part “out-patient care” in reaction to the changes observed in medical care. Patients increasingly are diagnosed and treated without being admitted to the hospital, and to-be young doctors need to gain some experience in this care sector. Practical learning in this new ‘quartal’ is supported by a specially designed teaching programme.

Survey to assess the “Practice Year” at national level on request of the MFT: On behalf of the MFT (the German Association of Medical Faculties) the Centre carried out a survey including all medical students in their PJ in Germany in 2009. The most important results were:

- Structured approaches to learning during the PJ have been initiated by most Faculties.
- More than a quarter of students uses the PJ as an opportunity to spend at least one part of it abroad.

As a consequence of this survey, the MFT has initiated a working group headed by the Centre’s director, which has the tasks to develop a nationwide PJ-Curriculum and to implement a quality assurance scheme for the “Practice Year”.

PJ-Student satisfaction study in cooperation with OSI (University of Mannheim): An additional study assessed student satisfaction with the learning environment during the PJ and their perceived increase in knowledge. The study was designed and implemented by the Otto-Selz-Institut (University of Mannheim) with intensive support by the Centre. Results are reported elsewhere.
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