Students’ Attitude to Modern Teaching Principles in the Field of Traumatology

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Abstract
Introduction: This study evaluates the implementation of the reform study system HeiCuMed (Heidelberger Curriculum Medicinale) in the field of traumatology at the University of Heidelberg. Goals of the reform study system are in close relation to practical knowledge combined with improvement of social and communicative skills of the student.

Materials and Methods: At the end of the course, questionnaires are distributed which evaluate three different topics: whether specific goals of the reform study system are achieved, which type of lesson was able to achieve these goals and what was the most effective way to acquire the necessary knowledge. Relevance of answers are evaluated with points (1, 2 no relevance; 4, 5 high relevance; 3 neutral).

Results: One hundred and forty-eight students undergo traumatological education within the new reform study system. Feedback of questionnaires is 59%. Specific goals like “Recognition of problems” and “interdisciplinary thinking” are considered to be achieved. “Prioritization” and “self responsibility” are achieved to a lesser extent. “Bed-side teaching” and “integrated seminars” are considered as good types of teaching. “Problem-based learning (PBL) sessions” and “subject-oriented lectures” are considered inferior to reach the specific goals in the traumatological education. Less favourably received was “computer based learning”. Required knowledge for board examinations is thought to be acquired best with “classical self study”. Second best way is thought to be the teachers of the HeiCuMed team. “Student learning groups” and “final exam” are considered equal, however, acquisition of knowledge is considered limited. Acquisition of knowledge “from students involved in the HeiCuMed sessions” and “compulsory attendance” was considered negative.

Conclusions: The reform study system HeiCuMed in the field of traumatology is overall positively received. Improved motivation of students and self-competence are clearly visible.

Key Words
Teaching principles · Traumatology · Medical education · Heidelberger Curriculum Medicinale

Introduction
Most recent published board requirement for physicians stresses the importance of acquiring fundamental knowledge and skills in all fields of medicine hence guaranteeing high standards of public health services. Desired profile of future physicians should cover medical competence as well as communicative and social skills.

Heidelberg implemented early a substantial reform of its medical school. In 1999 Heidelberg University in cooperation with Harvard Medical School, Boston, MA, USA, started their project “Heidelberg Curriculum Medicinale” (HeiCuMed) followed by instructing teachers according to the new standards in teaching and learning [1]. In October 2001, HeiCuMed started with

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its preclinical part. By February 2003 this transformation process and therefore the implementation of HeiCuMed was completed [2, 3].

Goals of HeiCuMed were improvement of practical skills of the students as well as to improve social and communicative competence. Further goals were improvement of motivation and self-initiative of the students. Implementation of new teaching forms was accompanied by new equipments as well as new facilities.

HeiCuMed is a modular rotation program. Each clinical specialty offers so called “modules”, which are combined to so called “blocks”. Traumatology and orthopedic surgery offer one module together, therefore each providing a 1 week of teaching at their institution. Contents of the specific modules are organized by both traumatological and orthopedic surgeons.

In the following, we would like to present the structure and results of the evaluation of HeiCuMed in the field of traumatology in summer semester 2003.

**HeiCuMed and Traumatology**

Important goals of HeiCuMed are improvement of practical skills of the students as well as to improve motivation and self-initiative of the students. In order to reach these goals teaching practice in this field had to be reorganized and interdisciplinary teaching goals were defined. Teaching sessions are conducted in small learning groups, PBL sessions are integrated and electronic media support is implemented.

Clinical part of medical school contains a block including the topics of the first Board examination and four interdisciplinary clinical blocks (containing surgery amongst others) covering the topics of the second Board examination. At the end of this period a so-called “practical year” concludes medical education.

The HeiCuMed block “surgery” is divided into subject-specific modules offered in a rotating fashion throughout the teaching periods. All students are divided into five different groups consisting of a maximum of 34 students. Each group rotates through the traumatological/orthopedic module. Therefore, this module is offered five times, in a 2-week interval, with the same exact learning contents. The only difference is the subject-oriented main lecture, because the first week of the module is led by the orthopedics department and the second week by traumatologists (Table 1). Each group of students is divided further into smaller groups for PBL sessions, bedside teaching or practical courses in osteosynthesis.

**Subject-oriented main lecture** of all fields takes place in the morning for all students. Topics of these lectures are interdisciplinary to specific problems.

**PBL-Sessions** include about eight students under the supervision of one tutor. Real patient history is presented as a “paper case” including complete laboratory and radiological work-up. Students have to recognize and solve the problems of each case by themselves. Complex traumatological cases are therefore worked up in a chronological fashion including interdisciplinary approaches. At the end of the student sessions, the acquired knowledge within this group is summarized

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:15–9:15</td>
<td>Break</td>
<td></td>
<td>Lecture (L)</td>
<td>Break</td>
<td>Break</td>
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<tr>
<td>9:15–9:45</td>
<td>Break</td>
<td></td>
<td>Break</td>
<td>Break</td>
<td>Break</td>
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<tr>
<td>9:45–11:00</td>
<td>Evaluation of trauma patients, primary care and management of injuries (S)</td>
<td>Tutorials (PBL)</td>
<td>Fractures of proximal femur (S)</td>
<td>Tutorials (PBL)</td>
<td>Typical injuries in children</td>
</tr>
<tr>
<td>11:20–12:30</td>
<td>Hospital (BST)</td>
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<td>Hospital (BST)</td>
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<td>12:30–13:30</td>
<td>Break</td>
<td>Break</td>
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<tr>
<td>13:30–15:00</td>
<td>Classification of fractures and treatment of fractures of the lower extremity (S)</td>
<td>Classification of fractures and treatment of fractures of the upper extremity (S)</td>
<td>Practical training in osteosynthesis techniques alternatively: Defective healing, Correction (S)</td>
<td>Fat embolism, Thrombembolism (S)</td>
<td>Bone metabolism, healing of bones, osteitis (S)</td>
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<tr>
<td>15:00–16:00</td>
<td>Self-learning (CBT), sharing of experience</td>
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| Table 1. Time table. BST: bed-side teaching; L: lecture; PBL: problem-based learning/tutorials; S: seminar; CBT: computer-based training. |