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The clinical learning environment

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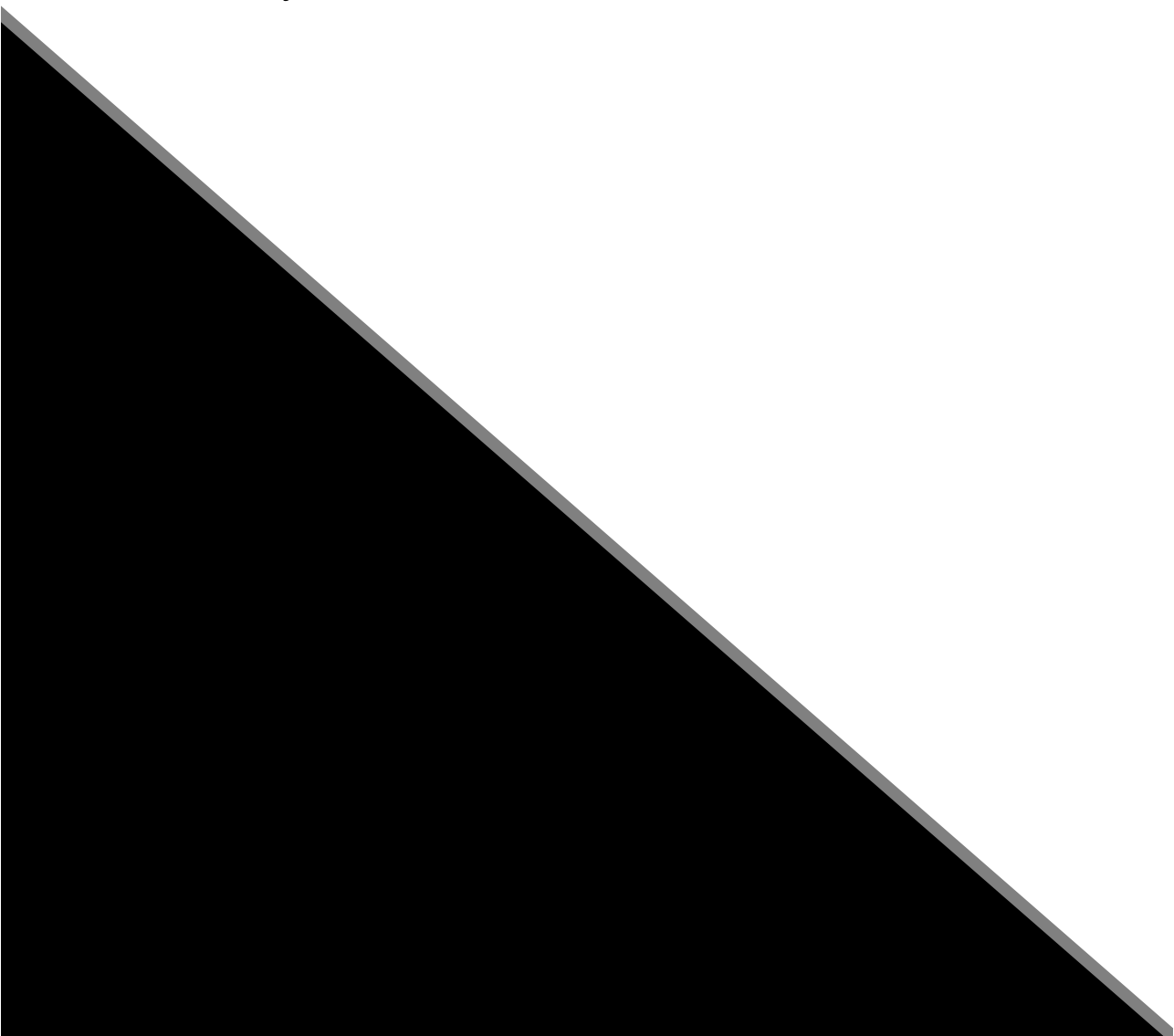
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Chapter 8

Summary



In *Chapter 1* the main theme of this dissertation – the clinical learning environment – is introduced and an outline of the dissertation is presented. Students' perceptions of their learning environment is of great importance to their learning process and influences both cognitive and affective learning outcomes. In this dissertation the focus is on three important aspects of the clinical learning environment: (1) the transition which students experience when they switch from pre-clinical to clinical training, (2) the relationship between the students' time allocations during clerkships and their perceptions of the quality of the clinical learning environment, and (3) the instructiveness of feedback during clinical training. Furthermore, the utility of the digital pen for providing students and faculty with suitable feedback is explored.

Chapter 2 reports on the perceived difficulty of the transition from pre-clinical to clinical training in a curriculum in which all skills training was offered in the years preceding the clerkships. During the transition period, students were on average satisfied with their knowledge levels, the usefulness of the pre-clinical curriculum and their cognitive and emotional adaptation to clinical training. Students were most satisfied with their skills levels and least satisfied with the workload they experienced. Regression analyses were executed to determine the relationship between the students' pre-clinical knowledge and skills levels, the perceived difficulty of the transition and the students' clinical performance. It was found that students' perceived transition difficulty did not relate to the students' knowledge and skills levels immediately before beginning their clinical training, nor to their clinical performance in their first clerkship. It was striking that the students' knowledge and skills levels at the start of their first clerkships did not influence the students' clinical performance after two clerkship weeks. However, the students' overall clinical performance in their first clerkship was influenced by the students' pre-clinical knowledge and skills levels. It was suggested that the limited influence of students' pre-clinical knowledge and skills levels on the students' clinical performance was partly caused by an overload of cognitive or emotional

information. This overload may interfere with the students' abilities to apply their pre-clinical knowledge and skills.

Chapter 3 concentrates on an innovative dual learning programme which was implemented in the fourth year of medical training and aimed at easing the transition from pre-clinical to clinical training. During the dual learning year, students completed four rotations in which five weeks of skills training and five-week clerkships alternated. The students thereby learned new skills in a training environment immediately before having to apply them in the clinical environment. The students thus experienced four mini-transitions from skills training periods to subsequent clerkships, instead of one major transition from pre-clinical training to clerkship. ANOVA trend analyses showed that throughout the dual learning year, students became increasingly satisfied with the workload they experienced and the skills they possessed, and they felt less stressed. Compared to the baseline measurement described in *Chapter 2*, students in the dual learning programme were more satisfied with the workload they experienced and were approximately equally satisfied with their skills levels. Therefore, it was concluded that dual learning is a promising innovation to ease the transition from pre-clinical to clinical training.

It is assumed that students' active participation in clerkship activities positively influences their learning. In *Chapter 4* the time students spent on eight clerkship activities was assessed and the students' perceptions of the quality of their clinical learning environment were measured by means of the Postgraduate Hospital Educational Environment Measure (PHEEM). Students spent nearly eight hours a day on the predefined clerkship activities. Most time was spent on observing doctors (40%), followed by participating in consultations without direct supervision (12%), other self-directed activities (11%) and clinical meetings (10%). Less time was spent on study (8%), unproductive activities such as waiting (7%), organized education (6%) and directly supervised activities (6%). Partial correlation analyses were used to analyse the relationship between the students' time allocations and their perceptions of the quality of their clinical learning

environment. The results showed that the more time students spent on observing doctors, consultations without direct supervision and directly supervised activities, the more positive they were about the quality of their clinical learning environment. None of the activities were negatively related to the perceived quality of the clinical learning environment. Consequently, the results suggested that the time students spent on activities involving direct patient contact is positively related to the students' perceptions of the quality of their learning environment.

In *Chapter 5* the instructiveness of feedback as perceived by the students is analysed using multilevel analysis. Students administered their individual feedback events over two clerkship weeks. They recorded who provided the feedback, whether the feedback was based on observation of behaviour, who initiated the feedback moment and the perceived instructiveness of the feedback moment. Overall, 68.3 percent of the feedback was provided by specialists, 22.5 percent by residents and 9.1 percent by nursing and paramedical staff. Furthermore, 38.5 percent of the feedback was based on behaviour that had been observed and 61.5 percent on behaviour that had not been observed by the supervisor who provided the feedback. Feedback was mostly based on the joint initiative of the student and supervisor (51.2 percent), followed by supervisor initiative (26.5 percent) and student initiative (22.3 percent). Because the dataset was hierarchically structured – with several feedback moments per student – a multilevel analysis was carried out. The multilevel model showed that the perceived instructiveness of feedback from specialists and residents did not differ significantly. Male students perceived feedback provided by nursing and paramedical staff to be least instructive. Feedback on behaviour that had been observed by the supervisor was perceived to be more instructive than feedback on behaviour that had not been observed. Furthermore, feedback provided at the supervisor's initiative was experienced as least instructive by male students.

Chapter 6 describes our experiences with the digital pen. When students' clinical skills are assessed, this is usually done using checklists. The detailed ratings and written feedback on these checklists could serve perfectly as feedback to students and faculty. However, due to administrative and logistic difficulties there is a risk of checklist data not being fully used. The digital pen is a device that transmits an examiner's handwritten notes to a database and an electronic file that is immediately available to students. All information written on checklists can thus be sent to student mailboxes and be stored in a database for quality assurance purposes. The digital pen was implemented in three stages. After several improvements were carried out, all data were correctly processed. Questionnaire results showed that examiners were satisfied with the digital pen. Moreover, the descriptive figures for item, examiner and case level were useful for quality assurance purposes.

In *Chapter 7* the most important research findings of this dissertation were summarised and discussed. Furthermore, methodological considerations and suggestions for further research were put forward.