Innovative interventions in an internal medicine clerkship: conquering challenges in the clinical learning environment

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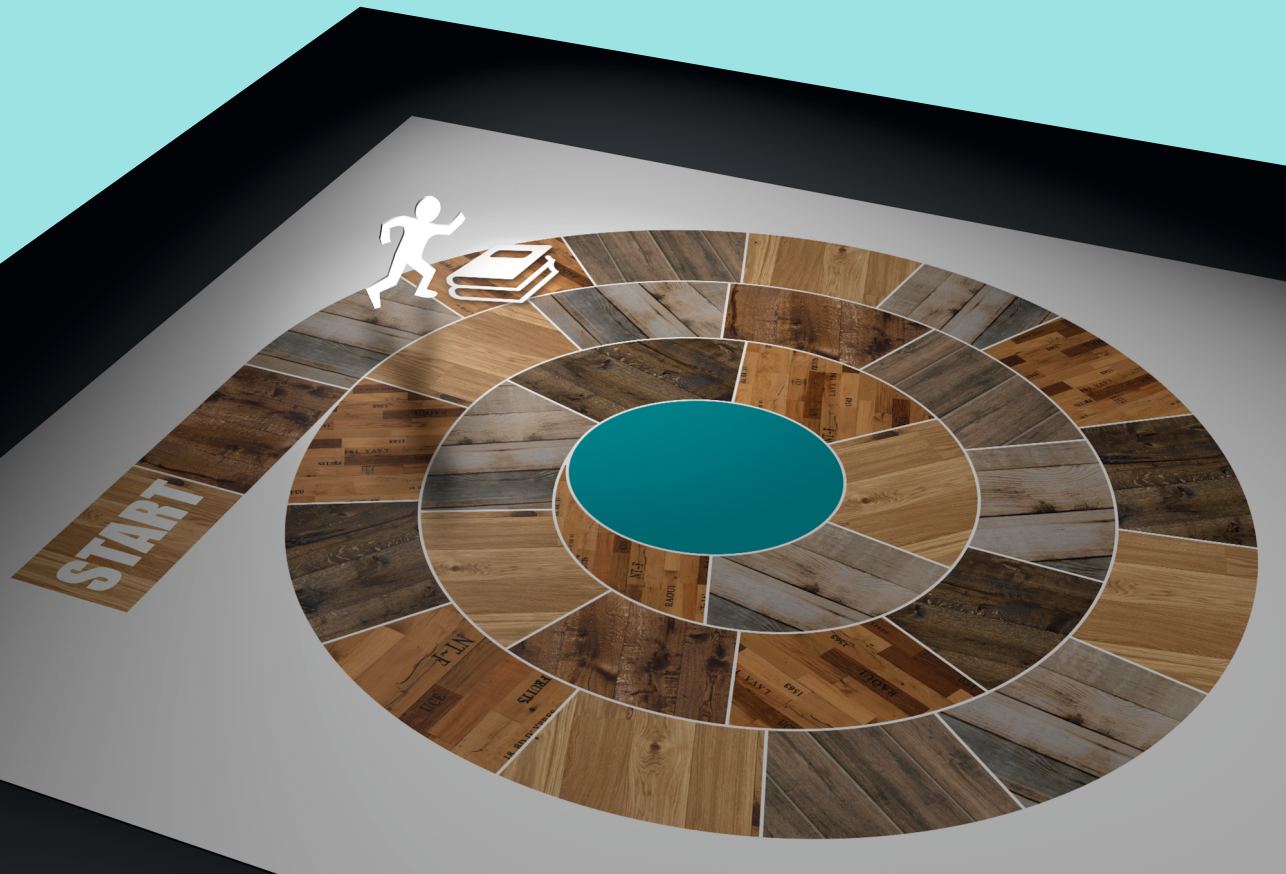
CHAPTER 1

Introduction and outline



Introduction

The clinical clerkships are a challenging learning experience dedicated to learning what it means to become a physician. Preceded by several years of studying and exams, the transition from preclinical to clinical training immerses the students into the real clinical practice of medicine. The clerkships are acknowledged to be overwhelming and demanding. Students may encounter stressful experiences within the dynamics of their learning environment, and they may face contending demands that also challenge their work-life balance.[1, 2]

By the end of their clerkships, we expect students to have become a competent physician. This is characterized by acquisition of the core competencies, based on 7 interrelated domains of competence: medical expert, communicator, collaborator, professional, leader, scholar and health advocate. Learners are expected to demonstrate achievement of these competencies before moving to the next step of training.[3]

Competence, however, is not just an achievement, it rather is a professional habit of lifelong learning.[4] Students are encouraged to be engaged in their learning process by establishing their own learning goals. Being goal-focused can be challenging since, most of all, students need to adapt to the hassles they encounter in the clinical workplace. As a clinical teacher and researcher in medical education, I think we share a responsibility with the students to optimize their learning process.

Research aim

The aim of **this thesis** was to investigate interventions within the physical, online, and virtual clinical learning environment, which included the following: 1). the development and investigation of a Clinical Teaching Unit (CTU), 2). the design and evaluation of a Small Private Online Course (SPOC), and 3). the development and investigation of virtual learning activities. Those interventions are needed for, indeed, *conquering the on-floor challenges in the clinical workplace,* which will be further illustrated in the following paragraphs.

Learning in the clinical context

A clinical learning environment involves three key elements: clinical work; learning; and environment.[5] Learning in this environment takes place through participation in actual patient care. Knowledge and skills are acquired from learning activities that can be either informal (implicit, unplanned and self-directed) or formal (goal oriented and structured).[6] Clinical workplace learning also depends on interprofessional and multidisciplinary learning, which means that it requires engagement with different healthcare professionals at different levels of experience.[7-11] However, traditional patient wards' primary aim is delivering patient care and not health profession education. This makes learning vulnerable to the dynamics of this environment. Teachers and learners may face many challenges such as time constraints, understaffing, and high expectations of clinical productivity, among others.[5, 12-14] This may not only jeopardize the continuity of the learning activities, but also adversely impact student's

observation, feedback and assessment.[15-18] In the end, this can negatively impact teaching of skills, clinical reasoning abilities and other core competencies. [16, 18-20]

The Clinical Teaching Unit

A way to organize health profession education is by means of a CTU. This concept was first defined in Canada in 1962.[21] It embraces a designated clinical area for patient care, clinical education and research. This could be an inpatient ward, where clinical learning is managed by dedicated teaching staff, such as clinical teachers. A CTU provides undergraduate and graduate medical education, and patient care, for learners of different professional levels, that are supervised by the attending medical staff.[21]

In **Chapter 2** we describe the development of such a CTU, by the implementation of interprofessional and multidisciplinary learning activities and the appointment of clinical teachers in an internal medicine inpatient ward. The intervention was evaluated with an online questionnaire among students, nurses, and physicians, being in different levels of their training or profession.

Blended learning

Clinical training can also be delivered in an online learning environment. Deliberate blending of face-to-face and web-based learning is referred to as blended learning.[22] The online component permits flexible learning, in terms of time and space and is more learnercentered.[23] Online social interaction helps learners to share knowledge and learning experiences with others through online discussion forums and collaborative assignments, even when they are geographically dispersed.[22]

A SPOC is one possible instrument to blend a learning program. A limited number of students, mostly on-campus, can enroll in such a course.[24] A medical SPOC can be organized around authentic clinical scenarios, to train clinical reasoning skills and other core competencies. When carefully designed, a SPOC can positively impact professional practice, and improve learning outcomes and the management of patients.[25-30]

Chapter 3 demonstrates the development of a blended curriculum by implementing a SPOC in the clerkship internal medicine. The theoretical framework of the SPOC was based on principles known to promote learning and students' motivation. The chapter elaborates on this theoretical framework and also demonstrates the students' first impressions of the course. A deeper investigation of the motivational impact of the SPOC on the students was evaluated by means of the intrinsic motivation inventory and small group interviews. This is described in **Chapter 4.**

Educational value of the interventions

The CTU and SPOC provided additional learning activities, mostly formal, both in the clinical and online environment, fundamentally changing the nature of the learning environment.

A way to analyze and classify learning activities is by analysis of the social-epistemological dimensions.[31] These dimensions describe teaching approaches as being more focused on individual learning or group learning, and whether knowledge is transmitted or constructed. **Chapter 5** illustrates a methodology to analyze the quality of the new teaching program by addressing active and collaborative learning activities in the internal medicine clerkship before and after the interventions.

The Virtual Clinic

In 2019, the COVID-19 pandemic threw a spanner in the works of clinical teaching. It had a tremendous impact on the feasibility and continuation of clinical medical training by measures restricting physical interaction between physicians in the field, their patients, and fellow medical students. It forced the clinical educators worldwide to rapidly move to develop methods of distant learning.[32-35]

A virtual clinic is a physical place that consists of a large modular room outside the hospital, that is directly affiliated to the patient wards. It provides alternative concepts of learning by using online and virtual techniques for remote clinical learning. The implementation and evaluation of several remote learning activities within a virtual clinic is presented in **Chapter 6.**

Finally, **Chapter 7** will discuss the findings and implications of the study outcomes.

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