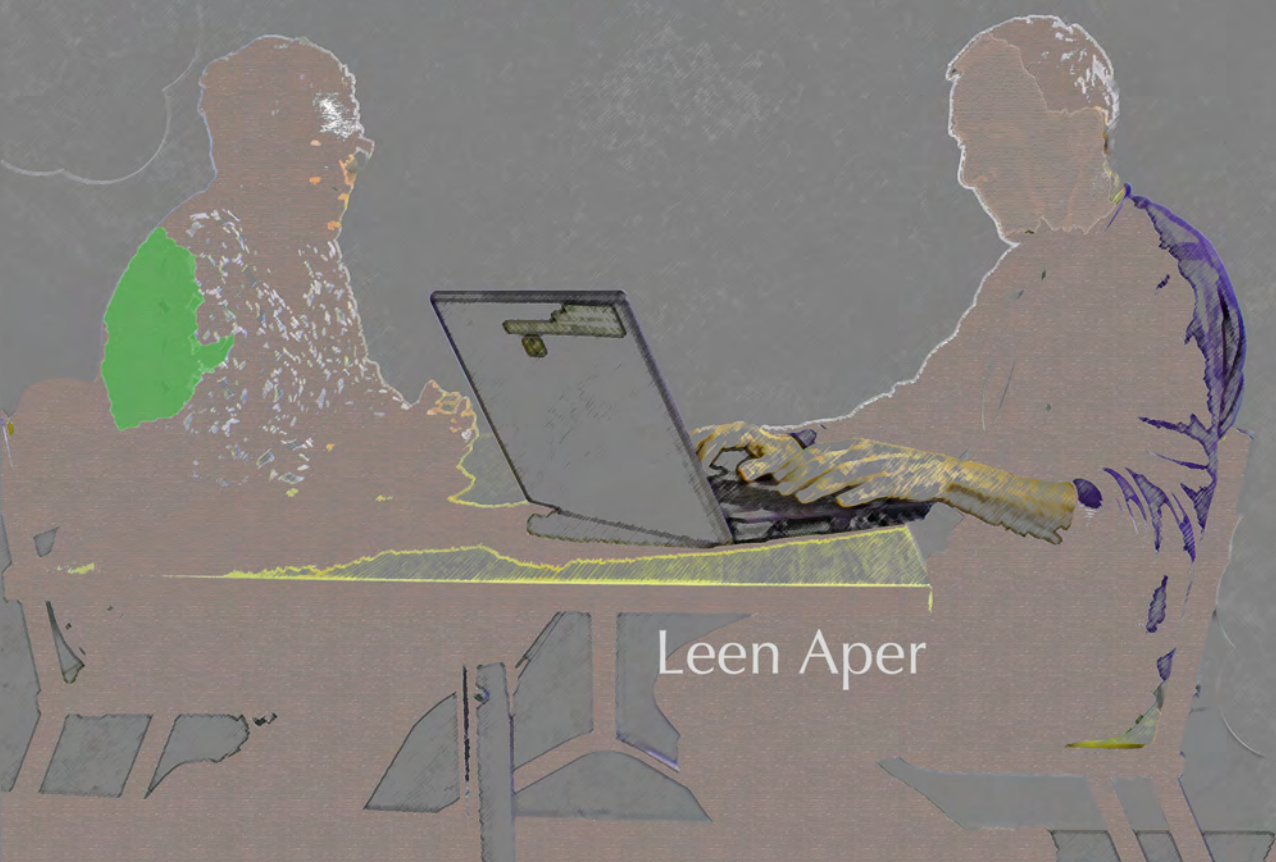


# TEACHING AND LEARNING THE ART OF CONDUCTING CONSULTATIONS

Exploring effective and efficient training opportunities  
within the medical curriculum



Leen Aper

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Gent, 9 juni 2015



# **Teaching and learning the art of conducting consultations**

Exploring effective and efficient training opportunities within the medical curriculum

PhD-Thesis

Faculty of medicine and health sciences

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Thesis submitted to obtain the degree of Doctor in Medical Sciences

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## Chapter 1: Introduction







*“Education is not an affair of telling and being told  
but an active and constructive process. ...  
The self is not something ready-made  
but something in continuous formation  
through choice of action.”  
Dewey*

Conducting consultations represents a core competence of the medical profession (1-3). For decades, consultation skills (e.g. history taking, communication, physical examination and clinical reasoning) have been taught to medical students. At the time when medical education was founded wholly on apprenticeship principles (4), students learned consultation skills by “seeing one, doing one, and teaching one”. Although learners may learn different components of a task at different times, they are exposed to the whole task from the outset. As a result, apprenticeship education directly addresses the problem of integrating component skills into fluent task performance and there is no problem about transfer because a whole task is learned in situ. Lave and Wenger (1991) described this process as “situated learning” (4). The Flexner reforms of 1910 added a preparatory education in biomedical science to medical students’ apprenticeship education (5). Inspired by Balint (1963) (6), general practitioners in the UK, recognized some 50 years later that the learning trajectory followed by medical students and qualified doctors did not adequately equip them to interact with patients. They started to develop communication education. First general practitioners (GP) postgraduate curricula and then undergraduate curricula introduced communication skills training (7,8). Communication education was later sanctioned as a core component of undergraduate medical curricula by policy statement such as the UK General Medical Council’s influential first edition of “Tomorrow’s Doctors” (9). Medical knowledge, history-taking and physical examination skills continued to be taught by practitioners alongside communication skills training by psychologists in clinical skills laboratories using simulated patients as learning resource (10-15). Practitioners focused on the content of consultations; psychologists focused on their processes. Only students continuously crossed the boundaries between those two different approaches (16). This resulted in low transfer of communication skills from training setting to medical practice (17-19). Therefore it was being argued that the medical content and the consultation process should be taught together (20-23). This thesis aims to contribute to this debate by exploring effective and efficient training opportunities within the medical curriculum to learn integrated consultations to medical students.

In this chapter, we describe the consultation competence, embedded within competence-based medical education and the challenges it poses both in teaching and learning conducting consultations to medical students. We explain how learning theories and instructional design models contribute to the teaching and learning of conducting consultations. Afterwards, we describe more into detail design based research, introduce the overall aim of this thesis and conclude with an outline of this thesis.

## **The consultation as vehicle for medical care**

In general a consultation entails the process starting from a specific problem of the patient whereby the physician appeals upon his/her expertise to end up with a differential diagnosis, further investigation or treatment and aftercare (23). The quantity, quality and accuracy of information the physician elicits is determined within this physician patient contact and affects both the physicians' clinical reasoning and the care of the patient (24). Besides determining the accuracy of the diagnosis the consultation is the vehicle to inform the patient while establishing and maintaining the doctor-patient relationship (3). The quality of the doctor-patient relationship affects the different aspects of patient care – the diagnostic process, treatment decisions, adherence to recommendations, and patient and physician satisfaction (25). Within this relation the paternalistic role of the physician, as described in the traditional biomedical model, has become historical (26). Today, a physician must explore the patients' ideas, emotions and expectations (27). Illingworth describes patient-centeredness as a philosophy of care which focuses both on the patient as a whole with his/her individual preferences within a specific context and on shared decision making (28). Preparing students to conduct consultations in a medically adequate and patient-centered way is an important objective of medical education.

## **The challenge of teaching integrated consultations**

### **Competence-based medical education**

Curricula have shifted from a focus on mere provision of knowledge and skills towards a competence-based approach of education (16). Competence-based medical curricula have the advantage of adopting a holistic approach in teaching students the professional behaviour that makes a doctor competent within the philosophy of lifelong learning, from medical students to junior doctors to medical specialists

(29-31). A competence is defined as an integration of knowledge, skills and (professional) attitudes (32). The literature describes specific consultation sub-skills as competences: history taking competence (33), communication competence (32,34), diagnostic competence (35,36) (known as clinical reasoning) or the more general clinical competence, referring to the capability to perform all duties directly related to patient care (37). An over-focus on individual competences within medical curricula might lead to fragmentation of whole patient care (16). For example for communication skills, Silverman (2009) pointed out that if medical curricula do not teach these skills in an integrated way, students will perceive this competence as “*a separate entity divorced from “real medicine”—an inessential frill rather than a basic skill relevant to all encounters with patients*” (38). In view of this critique, this thesis defines integrated consultations as a cluster in which the different competences, mentioned above, converge.

### **Training based on a consultation model**

Medical students find it difficult to pay attention to both the consultation process and the medical content (22). To support students in this challenge of integrating the consultation process with the medical content adequately the literature describes several consultation models (20-23,39-43). In Table 1.1 we give an historical overview of the phases and components in the different consultation models. This overview shows that all models comprise comparable tasks and skills within a consultation: initiating the session, building a relationship, gathering verbal and/or physical information, explanation and planning with shared decision making and closing the session. All models are meant to help students to improve their efficiency and effectiveness as a physician (22). The Calgary-Cambridge approach, developed by Kurtz and Silverman (1996) as a practical communication tool, is a benchmark for doctor patient communication (39). Starting from this ‘communication oriented’ model we searched the literature for a model in which attention for both the medical content and consultation process is chronologically embedded. Veening *et al.* (2009) organized the consultation in seven phases and clearly described within every phase the distinction between “the medical content track” and “the communication interaction track” (23) (see Box 1.1).

**Box 1.1: Two tracks within the consultation according to Veening, Gans & Kuks (2009) (23)**

1. Introduction	
<i>Medical content:</i> first impressions, first hypothesis, relevant patient history, main complaint	<i>Communication interaction:</i> introduction, contact
2. Define reason for patients' attendance, including ideas, concerns and expectations and exploration of main problem	
<i>Medical content:</i> questioning main complaint: first problem list and differential diagnosis	<i>Communication interaction:</i> exploration, reason for attendance and emotions
3. History taking	
<i>Medical content:</i> second problem list and differential diagnosis	<i>Communication interaction:</i> asking questions in a logical sequence
4. Physical examination	
<i>Medical content:</i> third problem list and differential diagnosis	<i>Communication interaction:</i> explaining and performing of physical examination as way of interaction
5. Explanation of findings, diagnosis, further research	
<i>Medical content:</i> initiating and conducting further research, diagnostic conclusion	<i>Communication interaction:</i> explaining the findings, possible diagnosis and further research
6. Explanation of findings, treatment and planning	
<i>Medical content:</i> a) edit treatment plan b) initiate and perform treatment	<i>Communication interaction:</i> a) achieve shared understanding b) provide correct amount/type of information
7. Closing the session	
<i>Medical content:</i> report, refer, planning of new consultations	<i>Communication interaction:</i> closing the session in an understandable language, giving perspective

The literature contains many more models to teach and learn a consultation (44,45). This thesis is orientated on an integration of the Calgary-Cambridge approach (1996) and the model of Veening *et al.* (2009) (23,39).

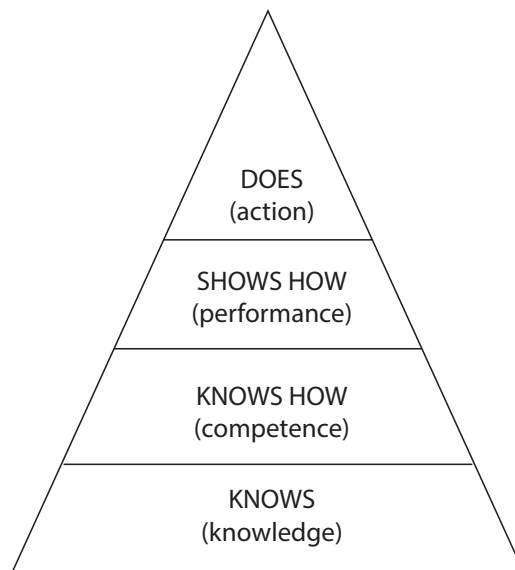


<p>3. Formulating the problem (communication of findings plus the interpretation thereof by the GP and the response of the patient)</p>	<p>Doctor and patients consider the condition and detail treatment or further investigation</p>	<p>4. Achieve shared understanding of the problems with the patient</p>	<p>3. Handover (giving patient responsibility, negotiating and influencing)</p>	<p>3. Patient education and motivation</p>	<p>Information about the contents of the advice The effect and relevance and the patients' assessment of the advice given</p>	<p>4. Explanation and planning (provide correct amount/type of information, aiding accurate recall/understanding, achieve shared understanding including patients' perspective)</p>	<p>6. Interaction: negotiation on what to do</p>	<p>3. Closing for each issue present: why an issue, differential diagnosis, history and physical findings</p>	<p>Phase 5: Explanation of findings, diagnosis, further research</p>
<p>4. Therapeutic phase (discussion of possible solutions and coming to a decision)</p>	<p>The consultation is terminated</p>	<p>5. Involve the patient in management</p>	<p>4. Safety-net (checking you've not missed anything, making contingency plan)</p>	<p>Obstacles to compliance with the advice</p>	<p>7. Converting insight into action: from consultation to everyday life</p>	<p>5. Closing the session (summary, contract, safety netting, final check)</p>	<p>8. Agreement check (safety-netting, prolonging)</p>	<p>treatment and rationale Common ground</p>	<p>Phase 6: Explanation of findings, treatment and planning</p>
		<p>6. Use time and resources appropriately</p>	<p>5. Housekeeping (looking after yourself between patients)</p>				<p>9. Leave from consultation: time for reflection</p>	<p>Summarize</p>	<p>Phase 7: Closing the session</p>

## Reaching the level of doing

Within undergraduate medical curricula different educational methods are used teaching students the communication part of the models as presented in Table 1.1 (46): e.g. lectures, observations, paper cases, role play with peers, video recording of real consultations, role play with simulated patients, practice with real patients or actors, group discussions (47-50). Literature about the development and implementation of instructional programs teaching students communication skills integrated with medical content is scarce (24,38,49). Kneebone et al. (2002) describe an integrated approach for teaching communication and practical skills whereby for example a simulated tissue skin pad (with a previously inflicted wound) was strapped to a simulated patient's upper limb (51). Van Weel et al. (2013) describe a longitudinal clinical training program in communication and consultation skills (52). Van Weel et al. (2013) and Widyadana et al. (2010) emphasize that students experience the need for sufficient preclinical training with simulated or real patients, in which communication and medical content are integrated (52,53). Interactive methods within communication and integrated consultation training, using experiential learning such as role-play with simulated patients, have proven to be effective training methods (48,54). Those methods work at the "shows how" level and try to facilitate the transfer to the level of "doing" within Millers' pyramid (1990) (see Figure 1.1) (55).

*Figure 1.1: Millers' pyramid*





However, literature on the transition of medical students from pre-clinical to clinical training demonstrates that the step from “shows how” to “does” is a rather complex one (56-59). Within the consultation students have to address both the medical track – integrating their medical knowledge – and the patient track - communication with the patient – into an end to end process. Managing this integration requires sustained deliberate practice. Silverman et al. (2009) state in a nutshell which educational components are essential within that practice: active small group or 1:1 learning, observation of learners, video or audio recording and review, well-intentioned feedback and rehearsal (38). However, these are time-consuming labor-intensive activities, creating a practical challenge for medical curricula to provide enough training opportunities. This was the starting point of this thesis to explore effective and efficient consultation training formats within the medical curriculum.

The preceding paragraphs have outlined both the importance and challenges of learning and teaching the art of conducting consultations. In the following paragraphs we will explain specific learning theories and instructional design theories that are represented in ongoing debates on integration of complex tasks, and we elaborate our theoretical orientation with design based research. The latter has strongly influenced the origin and evolution of this thesis.

## **Theoretical orientation**

### **Perspective on learning**

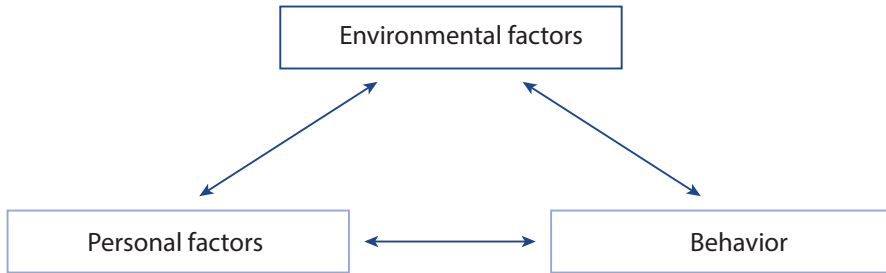
Complex learning tasks, such as conducting consultations, are characterized by a lengthy process in which mental effort must be taken into account (60). Students must have the courage to start practicing complex tasks and the confidence that it will work out whereby the concept of self-efficacy is hypothesized as a main determinant of students' motivation to learn (61). Self-efficacy is defined as the judgment of the actual ability to successfully perform specific tasks. This concept differs from self-concept or self-confidence. Self-concept is the description of one's attributes and the evaluation of those attributes compared with others (62). Self-confidence refers to a more general level at which an individual believes he or she will be successful; it does not relate to specific abilities (63). Bandura is convinced that students will be more active, effortful, and effective learners when they have high self-efficacy beliefs in their ability to complete academic tasks successfully (63). Moreover, some studies report a positive association between self-efficacy and performance (64,65).

The construct of self-efficacy must be situated within the social cognitive theory. The social cognitive learning theory combines elements of the cognitivist perspective and the social cultural perspective on learning. As outlined in Box 1.2, these different theoretical perspectives have influenced the pedagogy of medical education with both an individual focus and some overlap on learning and teaching (66,67). Within the social cognitive learning theory learning is described as an interaction of environmental factors (e.g. physical setting, resources), personal factors (e.g. beliefs, expectations, attitudes) and behavior (individual actions, verbal statements) (see figure 1.2). Instruction should be designed within that triangle in a way that helps students to develop and sustain their self-efficacy in specific complex tasks. Finally, our search for efficient and effective training opportunities for conducting consultations brings us to instructional design theories and design based research.

***Box 1.2: Theoretical perspectives on learning that have influenced the pedagogy of medical education (66,67)***

<b>Learning theories</b>	<b>Implications for medical education</b>
Behaviorism	Learning is manifested as changes in observable behavior primary influenced by stimulation of the environment through the formulation of specific learning outcomes and positive reinforcements.
Cognitivism	Learning is influenced by the individual's capacity to obtain and analyze information through memory, prior knowledge and experience with attention for adjusted cognitive load.
Constructivism	Learning is the result of using prior knowledge to create a personal interpretation of experiences and this knowledge evolves over time due to sharing of multiple perspectives within the social environment: the learner constructs and reconstructs based on reflection and abstraction.
Social cultural theories	Learning by observation and imitation is important, the learner interacts with the environment as a member of a community of practice characterized by reciprocal relations.

*Figure 1.2: Social cognitive learning perspective of Bandura (1997) (63)*



### **Instructional design theories**

Instructional design theories focus on the design and development of courses to help students acquire and transfer complex competences (68). In educational literature there are many examples of instructional design models that have been developed: the cognitive apprenticeship model (69), situated learning (4) or constructivist learning environments (70). All of them focus on authentic learning tasks (i.e. real life tasks or simulated tasks) to achieve meaningful learning. These tasks provide the learner with opportunities to connect directly with the real world (67). Exposing students to the whole task from the outset is instrumental in helping them to coordinate the integration of the different skills and facilitates the transfer to real practice with its variety of problem situations (71). However, authentic learning tasks are characterized by an enormous cognitive load for novices. The literature defines different types of cognitive load: intrinsic cognitive load, extraneous load and germane load. Intrinsic cognitive load is related to the complexity of the task and the expertise of the learner. Extraneous cognitive load is caused by the way information is presented to the learner. Germane load refers to the effort of the learner to manage the learning processes that deal with the intrinsic cognitive load. Van Merriënboer and Sweller (2010) formulated specific instructional design guidelines for health professional education to manage complex learning tasks taking into account these different types of cognitive load (72). Managing the intrinsic load is possible by reducing the complexity of the task (from simple to complex strategy) or the environment (from low to high fidelity/ from simulated to real practice). Providing adjusted guidance or giving a worked example is helpful to decrease the extraneous load and optimize the germane load.

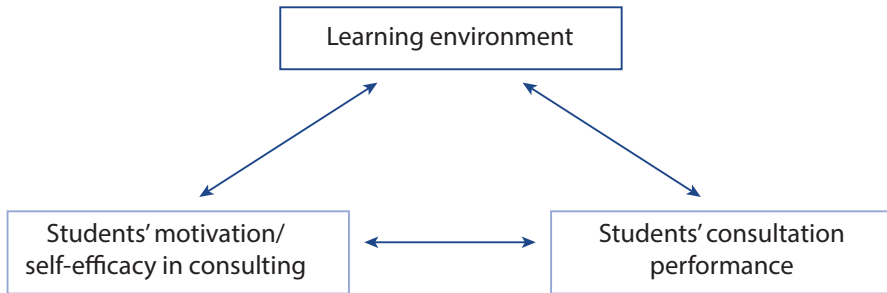
## Design based research

Design-based research is defined as *“a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories.”* (73). This research method is ideally suited to support medical curricula with specific practical problems for example creating enough small group training opportunities in a context of increasing number of students, and financial and staff constraints. Therefore, this thesis is conceptually orientated on this research method. It allowed the collaboration between the designers and the participants and underlines the interaction between the design and the local situation. Research that is situated in a real educational context guarantees that the results can be effectively used to assess, inform and improve practice in that specific context (74). Furthermore, this method admitted a cyclic research process and flexible use of research methods the moment new needs and issues emerged from the data.

## Aim of this thesis

Medical curricula should aim to design and provide training in which medical students can learn to conduct complete consultations. This whole task learning contributes to the debate around teaching communication integrated with clinical skills through the implementation of clinical experiences. This thesis wants to broaden our understanding of teaching and learning the art of conducting consultations in medical curricula. Therefore, we operationalized the social cognitive perspective on learning within this thesis as an interaction of the learning environment, students' motivation/self-efficacy in the field of conducting consultation and students' consultation performance (see Figure 1.3). We aim to develop and evaluate feasible training formats for learning how to conduct consultations.

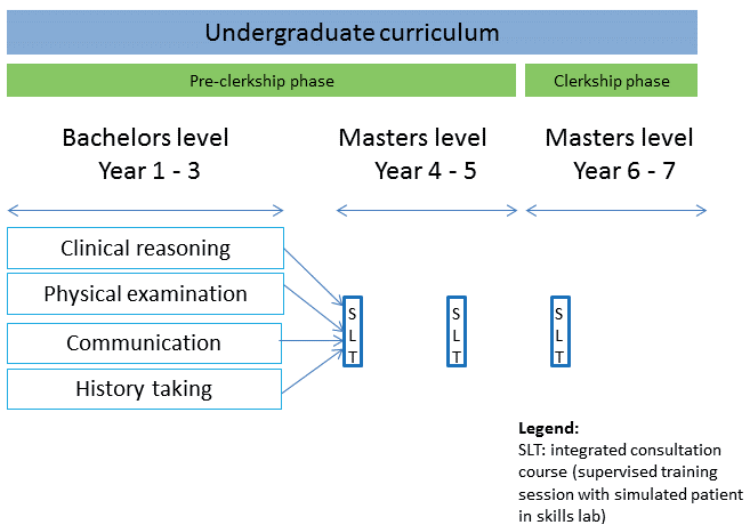
**Figure 1.3: Social cognitive learning perspective on conducting integrated consultations**



## Context

At the time of this research project (2009-2014), the medical program at Ghent University consisted of a bachelor phase of three years and a four year master phase. Consultation skills are taught progressively. During the three bachelor years, medical students receive separate courses in clinical reasoning, physical examination skills, communication and history taking. Additionally, in the master phase students are prepared for real patient contacts through an integrated consultation course over years 4-6.

**Figure 1.4: Overview consultation training sessions within the medical curriculum at Ghent University (anno 2008-2009)**



When this research was initiated the integrated consultation course within the skills lab (SLT) consisted of one training format that students participated in every master year (see Figure 1.4). This training format entailed three sessions of each 40 minutes whereby students practice with standardized simulated patients in groups of three supervised by physicians using a consultation model as theoretical guideline. This model, visualizing the parallel processes within the consultation, entails an integration of the phases as described by Veening *et al.* (2009) and the Calgary Cambridge guide (1996) (*supra* Table 1.1) (23,39). Within each session the consultation is divided into three parts: opening/history taking – physical examination – diagnosis, treatment and planning. Each student is responsible for one of those parts. This ensures that students stay attentive during the entire session. Feedback starts with a self-reflection activity, followed by feedback from the two peers and the supervising physicians on the students' skills in interviewing, history-taking, physical examination and decision making and in communicating with patients.

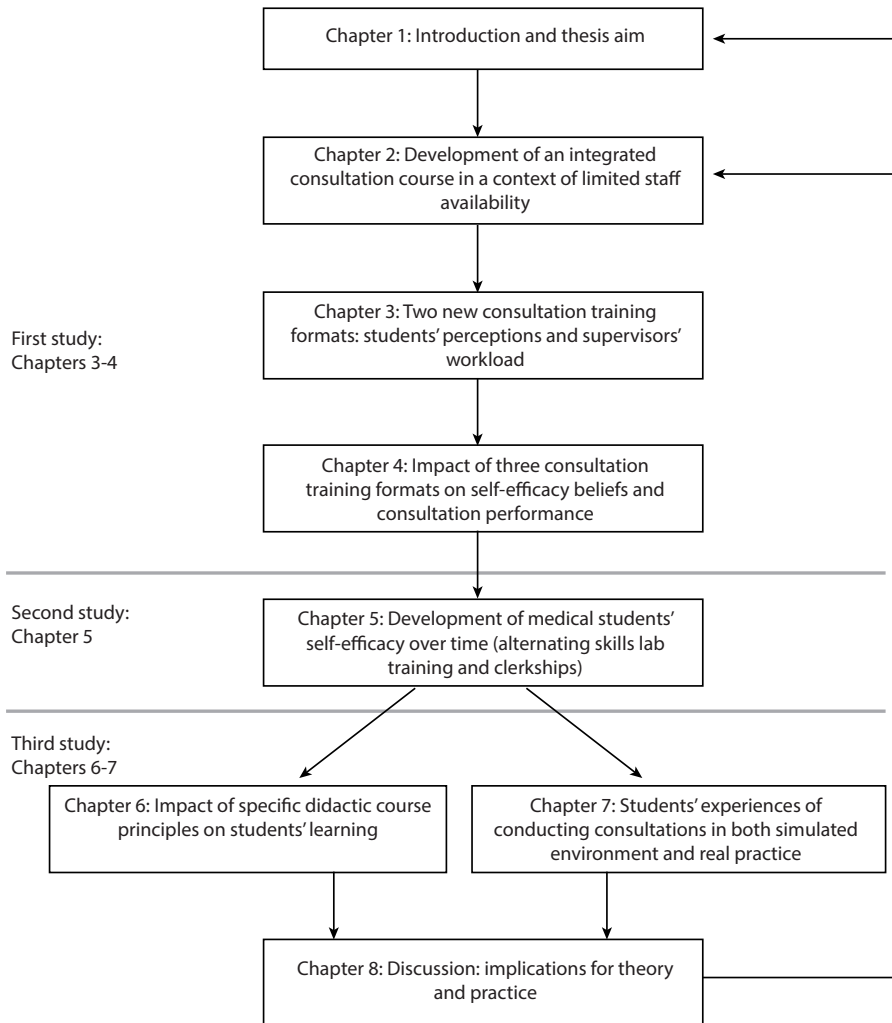
## Thesis outline

This thesis starts with an introduction which sketches the theme of teaching consultations in undergraduate medical curricula, outlines the arguments for researching this field from a design based perspective and further introduces the aim of this thesis (Chapter 1). Chapter 2 describes the development of two alternative training formats next to the 'traditional' supervised training format within the integrated consultation course at Ghent university. Figure 1.5 visualizes an overview of the different studies and the cyclic process from which they arise. The first study analyses both students' perceptions and efficiency of the three training formats, in particular the traditional supervised training, a new electronic format and a new independent training; and focuses on the differential impact of these three training formats on students' self-efficacy and consultation competence. The results of this first study are reported in Chapters 3 and 4. The positive impact of the independent training format on students' self-efficacy beliefs made us wonder how self-efficacy evolved within the continuum of skills lab sessions and clerkships. In the second study students' self-efficacy beliefs are analyzed over time while students rotated over skills lab training sessions and partial clerkships (Chapter 5). Quantitative results showing the negative impact of clerkships and positive impact of skills lab training sessions on students' self-efficacy beliefs led to an in depth qualitative analysis. In the next study focus groups were set up to explore students' experiences on specific didactic elements of the integrated consultation training course and the dilemmas

and challenges students encounter when conducting consultations with simulated and real patients. The results of this third study are presented in Chapters 6 and 7. In Chapter 8 the main findings and conclusions of the previous chapters are combined and summarized in order to answer the overall research question of this thesis. In this final chapter we also discuss the limitations of the study. The thesis concludes with a discussion of the theoretical implications of the findings, implications for practice and suggestions for future research.

Chapters 3 to 7 are published as studies in international scientific journals. So each study is written to be read on its own; repetition and overlap across chapters are inevitable.

**Figure 1.5: Overview of the thesis**





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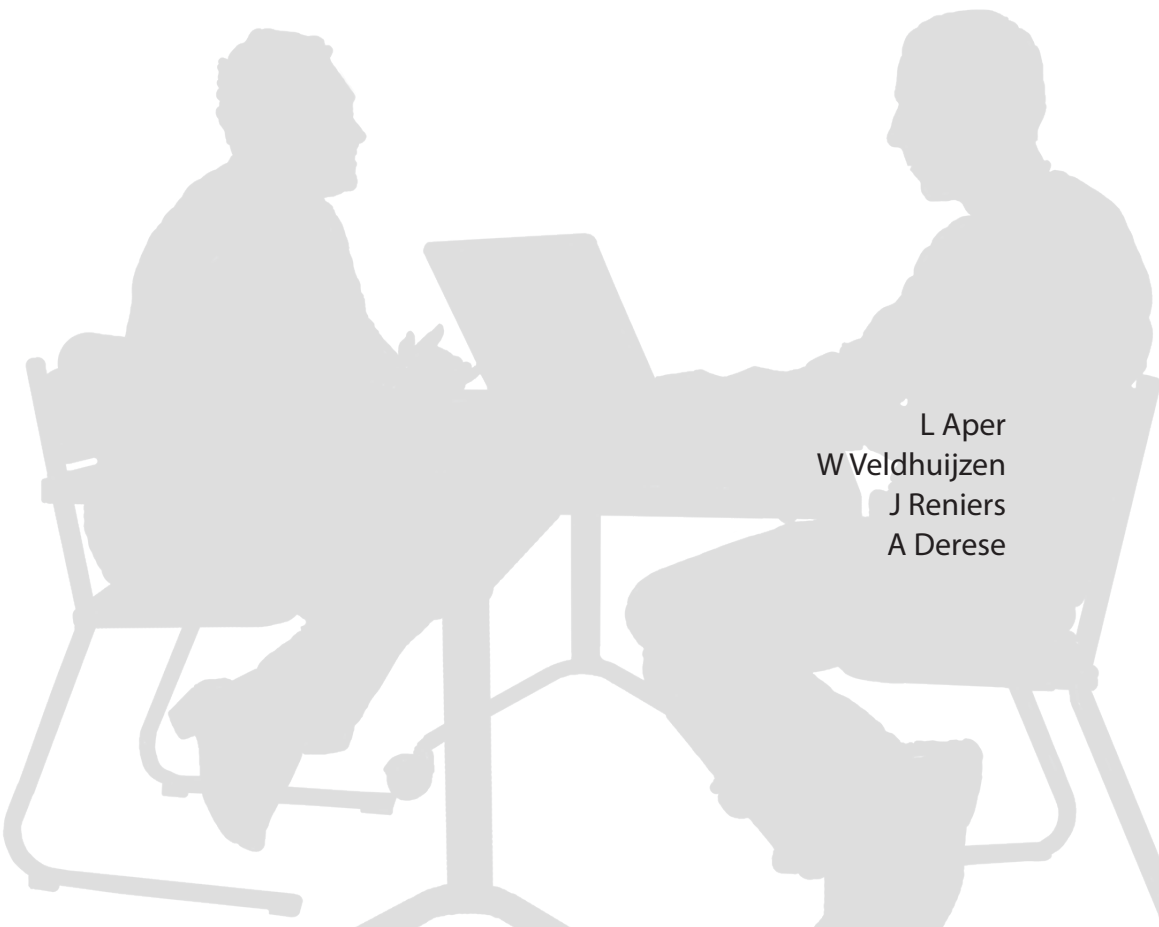
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**Chapter 2:  
Development of an integrated consultation course  
in a context of limited staff availability**



L Aper  
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## Abstract

### Background

The integrated consultation course at Ghent University consists of a supervised training format whereby students incorporate the different consultation sub-skills (i.e. clinical reasoning, communication, physical examination skills and history taking) during a role-play with a simulated patient. Because of its complexity, students experience the need for more training opportunities. However, the supervised training entails an extensive supervisors' workload and cannot be expanded in a context of an increasing number of students, and financial and staff constraints. Therefore alternative training formats are sought to intensify the integrated consultation course.

### Method

A design-based research project was set up whereby a development team conducted a literature search looking for good practices of teaching consultation skills in undergraduate medical curricula. The results from the literature were combined and integrated with the experience based knowledge and conceptions of the three skills lab supervisors/general practitioners to expand the integrated consultation course.

### Results

Three important topics emerged from the literature search: (1) authentic but complex learning, (2) teaching methods within medical curricula and (3) specific pedagogical principles. Discussion of these three topics within the development team resulted in a teaching method that consisted of an independent role-play with feedback from simulated patients and peers and an e-learning module based on video fragments and answering guiding questions.

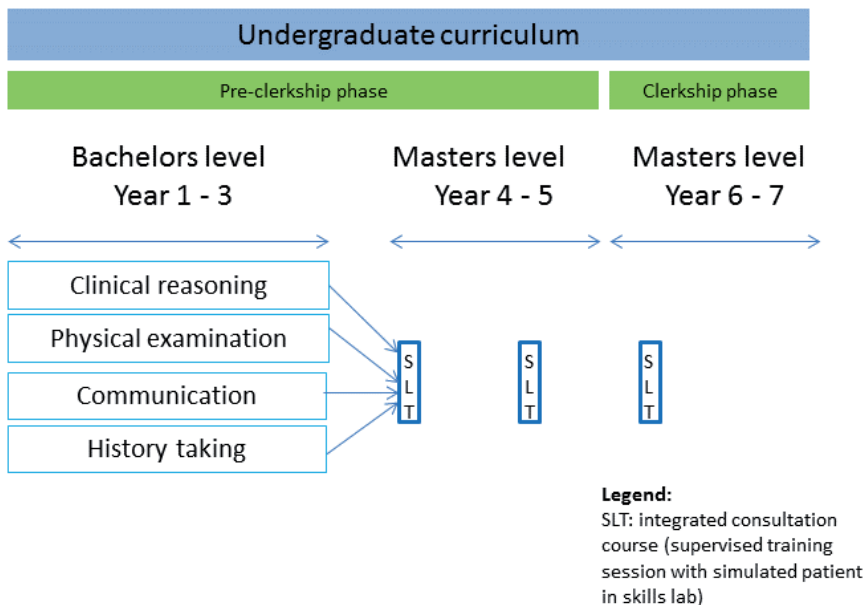
### Discussion

After applying three instructional guidelines (i.e. moving from partial tasks to whole tasks, working from low to high fidelity environment with increasing students' responsibility and decreasing supervisors' support) and four pedagogical principles (i.e. learning by doing, learning through observation, immediate feedback and reflection), it is equally important to start an evaluation of the implementation of the two alternative training formats.

## Background

At the medical faculty of Ghent University, consultation skills are taught progressively. During the three bachelor years, medical students receive separate courses in communication and clinical skills. Subsequently, a consultation training in the first, second and third master prepares students for patient contact during clerkships (see Figure 2.1). This consultation training, gradually launched since 2004, consists of a supervised training format whereby groups of three students carry out three consultations with a simulated patient and receive feedback from a supervising physician. Within those consultations students have to incorporate the different consultation sub-skills: clinical reasoning, communication, physical examination skills and history taking. Because of the complexity of this integration, students experience the need for more training opportunities. Offering more sessions of the supervised training format for all students is not possible because of the intensive supervisor workload (2,15 hour for each student) in a context of an increasing number of students, and financial and staff constraints. Therefore alternative training formats are sought to intensify the integrated consultation course.

*Figure 2.1: Undergraduate medical curriculum design of the integrated consultation course anno 2008*



## Methods

### Study design

A design-based research project was set up to expand the integrated consultation course. This method is ideally suited to support medical curricula in improving educational practices and is characterized by a collaboration among researchers and practitioners in real-world settings (1). At first, a development team conducted a literature search looking for good practices of teaching consultation skills in undergraduate medical curricula, keeping the financial and staff constraints of the local context in mind. Afterwards, this team developed two alternative training formats using specific pedagogical principles derived from the literature.

### Context

At Ghent University medical students run through a seven-year integrated contextual undergraduate medical curriculum based on a mixture of conventional learning formats and problem based learning (2). In year 1–3, students attend theoretical courses and separate training sessions in communication skills, history taking, physical examination skills and clinical reasoning. The communication curriculum is based on the five axioms of Watzlawick (3): (A) One cannot not communicate. (B) Every communication has a content and relationship aspect such that the latter classifies the former and is therefore a meta-communication. (C) The nature of a relationship is dependent on the punctuation of the partners' communication procedures. (D) Human communication involves both digital and analogic modalities. (E) Inter-human communication procedures are either symmetric or complementary, depending on whether the relationship of the partners is based on differences or parity. In years 4 and 5, students practice complete consultations within an integrated consultation course with simulated patients interspersed with observational clerkships (see Fig. 1). Parallel to this integrated consultation trajectory, 4<sup>th</sup> and 5<sup>th</sup> year students continue to practice the individual consultations skills separately. For example, interactions with higher emotional charge during specific communication skills training or problem-based lectures that focus on the clinical reasoning component. In years 6 and 7, students are on fulltime clerkships with both supervised and independent real patient contacts, every 3 to 6 weeks supported by reflection days where students return to the university campus.

The integrated consultation course started in a supervised training format in which students participate in three consecutive sessions in adjacent rooms. Each session of 40 minutes entails a full consultation with a standardized simulated patient and is supervised by a physician. The consultation process is divided into three parts: opening/history taking – physical examination – diagnosis, treatment and planning. Students are divided in groups of three whereby each student is responsible for one part of the consultation. During the first training all the important content elements (history taking, differential diagnosis, physical examinations, therapy and planning) are discussed with the students before they start the role-play with the simulation patient. This is important to prevent students' insecurity about medical content from interfering with patient communication. Feedback starts with self-reflection of the students, followed by feedback of the supervising physician about his/her skills in interviewing, history-taking, physical examination and decision making and in communicating with the patient. Students participate consecutively in three sessions and switch each session to another part of the consultation, so that they have practiced a whole consultation at the end. Dividing the consultation over three students within one session ensures that all three students actively participate through the entire session without being overloaded.

### **Development of two alternative training formats**

We started our literature search with four recent core articles in the domain of teaching consultation skills (4-7) and used these as a starting point for a snowball search of earlier publications on integrated consultation courses. Additionally we undertook a search in Pubmed using the following terms:

- text-words: "teaching medical/clinical interview\*, integration of consultation skills, complex learning, authentic learning, pedagogical principles, instructional guidelines "
- MeSH: Clinical Competence\* Communication\* Curriculum\* Education, Medical Undergraduate\*Physician-Patient Relations\* Teaching/methods\* Programmed Instruction as Topic Feedback Interviews as Topic/methods Medical History taking\* Patient Simulation

The development team consisted of three skills lab supervisors/general practitioners and one educationalist/researcher. The first researcher read the articles and abstracts and selected those with specific information on pedagogical principles and educational formats. In a first meeting of the development team the educationalist/

researcher briefed the members on the important findings of the selected articles. These results were discussed and integrated with the experience based knowledge and conceptions of the three skills lab supervisors. In follow up brainstorming meetings the development team set up a plan for alternative training formats taking into account both the theoretical principles and the feasibility within the local context. Supplementary, in between the meetings of the development team feedback of a student representative, who conferred with the educationalist, was integrated.

## Results

### Results from the literature study

Three important topics emerged from the literature search: authentic but complex learning, teaching methods within medical curricula and specific pedagogical principles. Underneath the results are described narratively.

#### *Authentic but complex learning*

Medical education literature emphasizes the importance of authentic learning tasks (i.e. real life tasks or simulated tasks) because it leads to the development of applied knowledge, skills and positively influences affects such as confidence, motivation and a sense of belonging (8). Motivation is considered as a key to learning (9) whereby self-efficacy or the judgment of the actual ability to successfully perform specific tasks is hypothesized as a main determinant of students' motivation to learn (10). However, authentic learning tasks are characterized by an enormous cognitive load for novices. As described in Chapter 1 the literature defines different types of cognitive load: intrinsic cognitive load, extraneous load and germane load. Intrinsic cognitive load is related to the complexity of the task and the expertise of the learner. Extraneous cognitive load is caused by the way information is presented to the learner. Germane load refers to the effort of the learner to manage the learning processes that deal with the intrinsic cognitive load. Van Merriënboer and Sweller (2010) described and illustrated fifteen design guidelines that help to reduce the extraneous load, to manage the intrinsic load and to optimize the germane load (11). For example managing the intrinsic load is possible by reducing the complexity of the task (from simple to complex strategy) or the environment (from low to high fidelity/ from simulated to real practice). Providing adjusted guidance or giving a worked example is helpful to decrease the extraneous load and optimize the germane load.

### ***Teaching methods within medical curricula***

Medical education literature shows us that since 1960 several educational methods are used to teach medical students consultations skills: lectures, observations, paper cases, role play with peers, video recording of real consultations, role play with simulated patients, practice with real patients or actors, group discussions (12-18). Over the last decades, these traditional teaching methods are elaborated with e-learning formats (19). These have the advantage that students can learn anytime anywhere with a minimum of supervisors' workload (20), using a standardized content and taking into account individual characteristics of the learner (21,22). All these instructional approaches differ in the extent to which, and the way feedback is delivered.

### ***Specific pedagogical principles***

In view of developing complex competences – such as the consultation competence – four pedagogical principles are important to take into account: students must get the opportunity to (a) learn by doing (b) to learn through observation (c) to receive immediate feedback and (d) to reflect on their behavior.

Experience-based learning defines participation in practice as the process whereby medical students learn from experience (8). Depending on a learner's level of proficiency and the complexity of the clinical situation, students' participation may contribute to practice by doing (i.e. taking a blood pressure) or is limited to observation (8). The importance of learning through observation is emphasized in social cognitive literature, whereby learners' behavior can change through observing behaviors of experts or peers and the consequences of those behaviors (27). Finally, available meta-analysis research judging educational outcomes points at effect sizes of 0.73 of "giving regular feedback" on achievement in teaching and learning processes (23, 24). Bokken *et al.* (2009) discussed a variety of training formats where simulated patients give feedback (6). This feedback is often on clinical skills such as history taking and physical examination. But communication skills are also part of the feedback domain of simulated patients. However, feedback of simulated patients should be in the first place feedback from the patient's perspective (6). Kneebone *et al.* (2002) and McManus *et al.* (1993) also describe an educational program whereby students practice their consultation skills and get feedback from simulated patients (25,26). In both settings, feedback starts with a self-reflection activity: "What was good? What could be improved?" (25,26).

## **From theory to practice**

After detailed discussion within the development team which specific design guidelines of van Merriënboer and Sweller (2010) would be most relevant, the following three were chosen to expand the integrated consultation course: firstly, moving from partial tasks (for example asking students to perform a physical examination on a simulated patient) to the whole task of an integrated consultation; secondly, increasing students' responsibility by starting within low fidelity environments and gradually evolving to high fidelity environments; thirdly, gradually decreasing the supervisors' support over time (11).

From the different teaching methods summarized above lectures, independent role-play and e-learning were the most obvious to choose due to the fact we focused on training formats with the least staff hours. Keeping our four pedagogical principles in mind, whereby students (a) learn by doing (b) learn through observation (c) receive immediate feedback and (d) reflect on their behavior, we decided that lectures are not an appropriate training format to learn to conduct integrated consultations. Therefore we chose to develop a teaching method that consisted of an independent role-play and an e-learning module.

## **Educational training formats based on pedagogical insights in a context of limited staff availability**

The expanded integrated consultation course entails the integration of the three instructional guidelines (moving from partial tasks to whole tasks, increasing students' responsibility and fading supervisors' support) whereby the specific pedagogic principles of learning by doing, learning through observation, immediate feedback and reflection are operationalized in the two new training formats (see Table 2.1).



**Table 2.1: Visualization of the instructional guidelines with the integrated consultation course and application of pedagogic principles in the training formats**

<b>Instructional guidelines</b>	<b>Application integrated consultation course</b>
Moving from partial tasks to whole tasks	From three years bachelor training (years 1-3) in separate skills to integrated consultations in the master training (years 4-6)
Moving from low to high fidelity environments with increasing students' responsibility	From being responsible for one part of the consultation to being responsible for a whole consultation From working with simulated patients to working with real patients
Decreasing supervisors' support	From intensive preparation with supervisor during the consultation to debriefing with supervisor at the end of the consultation or after the independent training
<b>Pedagogical principles</b>	<b>Application specific training format</b>
Learning by doing	Independent training: responsible for a whole consultation themselves and responsible for observing and giving feedback to peers
Immediate feedback	E-learning training: standardized feedback Independent training: feedback by simulated patient and peer; debriefing with supervisors immediately afterwards
Learning through observation	E-learning training: observation of expert consultations Independent training: observation of peer consultations
Reflection	E-learning training: students evaluate their own answers after reading the standardized feedback Independent training: the student-physician is asked to carry out a self-reflection on his/her own performance: "What did I do well? What could have been done better?"

### ***New format 1: E-learning training***

The electronic learning environment aims to offer students the opportunity to learn through observation within a low fidelity environment, to receive immediate feedback and to reflect on their performance. Students are responsible for judging the consultation process and content on accuracy (see Figure 2.2-2.4).

The student observes – individually – three consultations subdivided into small fragments (opening/history taking – physical examination – diagnosis, treatment

and planning). After this observation, open-ended questions prompt the student about the various consultation dimensions: the consultation structure, the physician patient interaction and the clinical content: Is the history complete? What physical examinations would you perform? What is your diagnosis or differential diagnosis? In view of each question, an input box is provided for the student to type in his/her answer. When the student proceeds with the consultation, his/her reply is saved, immediately followed by standardized feedback whereby the student is asked to evaluate his/her own answers and afterwards has the opportunity to observe a 'correct' consultation.

**Figure 2.2: Introduction of the online case**

Beste student

Aan de hand van deze online casus kan je de **structuur van het consultmodel** inoefenen. Gebruik deze consultstructuur ook als leidraad.


Je krijgt een consult te zien waarbij de interactie tussen de arts en de patiënt in beeld komt. [Heb oog voor volgende twee aspecten:](#)

1. de inhoudelijke elementen van het consult (volledigheid van de anamnese, keuze bij het klinisch onderzoek, komen tot een diagnose, ...)
2. het communicatieve luik (de manier waarop de arts met de patiënt omgaat)

Het gericht bekijken van de filmpjes geeft je de mogelijkheid om te leren door observatie. Probeer kritisch te kijken en bewust na te denken over wat goed loopt in het consult en wat beter kan. Wat zou jij als arts doen in die situatie? Deze oefening vormt ook een voorbereiding op het kritisch observeren tijdens de voltijdse stage in master 3.

Je formuleert eerst een antwoord op de open vraag. Zodra je verder klikt verschijnt er onmiddellijk feedback waarbij je gevraagd wordt jezelf te evalueren door aan te vinken of dit antwoord overeenkomt met wat je zelf neerschreef. **Wees eerlijk voor jezelf bij het aanvinken van de antwoorden** zodat je in het eindrapport na het doorlopen van de casus een waarheidsgetrouw beeld kan terugvinden over je eigen prestatie.

Uw resultaten van deze casus worden bijgehouden.



**Figure 2.3: Patient information**

**CASUS 1**  
**Patiëntdossier**

Mevr. Francine Martens

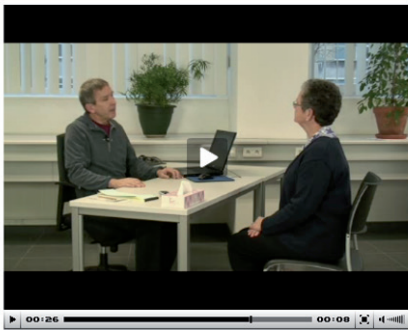
57 jaar, weduwe op prepensioen  
hypertensie waarvoor atenolol 100mg  
3 jaar geleden gestopt met roken (totaal 15 pakjaren)  
geen alcohol  
labo 6 maand geleden: glycemie nl, cholesterol 250 mg/dl met HDL 50 mg/dl en LDL 160 mg/dl



**Figure 2.4: Film fragments interspersed with open-ended questions**

Start van de consultatie:

**Probeer steeds een antwoord te formuleren in de twee invulvelden, anders kan je niet verder.**



**Vraag 1: Wat zou je nu zeggen of vragen?**  
Doe dit in twee zinnen.

**Vraag 2: Waarom stel je deze vraag?**

***New format 2: Independent training with simulated patients***

In line with the instructional guideline of van Merriënboer and Sweller students' learning must gradually take place in more high fidelity environments whereby students conduct consultations with simulated patients or real patients, learn through observation, receive immediate feedback and are triggered to reflect on their behavior.

During the independent training format students train in pairs without skills lab supervisor. Students' responsibility increases because each student conducts a full consultation with a simulated patient, while their peer observes. The simulated patient gives direct feedback from his/her (patient's) perspective, using an observation checklist. To maximize the learning effect of patient feedback, we trained simulated patients not to give feedback on the consultation structure, the physical examination or the clinical content of the consultation. For those "medical" aspects we ask the (observing) peer student to give feedback based on a checklist. Each part of the consultation (intake/history taking, physical examination and explanation and planning) is followed by a standardized feedback procedure. Feedback starts with a self-reflection activity, carried out by the student-physician focusing on his/her own performance: "What did I do well? What could have been done better?" Next, the simulated patient gives feedback from the patient's perspective: "How did he/she experience the consultation? Does he/she agree with the student's reflection?". Finally, the observing student gives feedback about the structure of the consultation and the clinical content. Before the physical examination and before the explanation and planning part both students discuss how to handle this phase of the consultation. The simulated patient ends this preparation by giving the students a standard answer on paper. In this way the student-physician is able to continue the consultation with the correct information. After this first consultation, students switch roles in another room with a new simulated patient. After the two consultations eight students sit together with one skills lab supervisor to debrief and reflect about the clinical content, the physical examination, the consultation structure and the interaction with the simulated patient. The skills lab supervisors, all general practitioners with a male-female ratio of 3:1, are trained in the consultation model and experienced in supervising the traditional training format.

***Adaption of the traditional supervised training format***

After creating the two new training formats, the development team decided to continue the traditional training format in year 6. In contrast with year 4 and 5, where each student is responsible for one part of the consultation with intensive supervisor support, students are now responsible for a whole consultation with a simulated patient and only receive feedback from their supervisor at the end.

**Discussion**

To ensure high quality learning in a context of limited staff availability the following instructional guidelines are needed: moving from partial tasks to whole tasks, working from low to high fidelity environment with increasing students' responsibility and decreasing supervisors' support. Furthermore, within the development of specific training formats four pedagogical principles were taken into account: learning by doing, learning through observation, immediate feedback and reflection. After implementing these training formats in practice, it is equally important to evaluate the learning effect on the consultation performance, the impact on students' motivation and self-efficacy and students' perceptions of the specific pedagogical principles.

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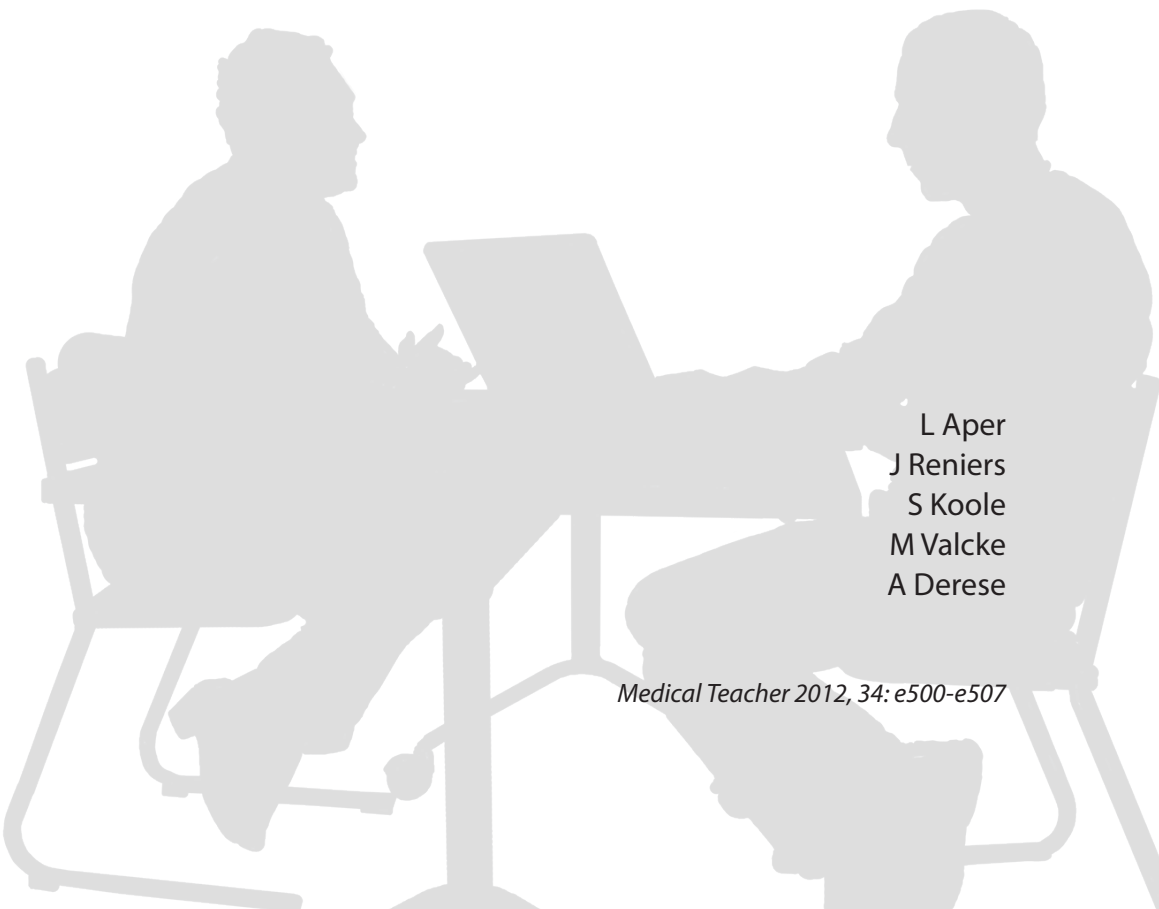
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**Chapter 3:**  
**Two new consultation training formats: students’  
perceptions of the independent training with  
simulated patients and the e-learning module**



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## Abstract

### Introduction

Patient-centered consultations are a key to good medical care. Preparing students for this complex competence is a core objective of medical education. At Ghent University, consultation skills training runs throughout the master phase (years 4-6) whereby three training formats aim to integrate communication skills, clinical reasoning, history taking and physical examination. We evaluated two new training formats in comparison with the existing format addressing the following research questions: 1) How do students perceive the three training formats? 2) Do patient feedback and mutual observation within the independent session result in a learning effect? 3) Do the two new training formats entail a reduced supervisors' workload?

### Method

A pilot study among fifth year students compared the traditional training format and two new training formats, an independent training in which simulated patients give feedback from a patients' perspective and students give peer feedback on structure and content of the consultation and an e-learning module in which students observe consultation fragments online answering questions throughout. Students evaluated the training formats by completing a questionnaire. Observation lists completed by simulated patients were used to determine any learning effects within the independent training.

### Results

The evaluation yielded significant differences between the three training formats whereby only the e-learning modules scored significantly lower compared to the supervised and independent training. No significant differences were found between the supervised and independent training format. Simulated patient ratings of student-doctor performance increased significantly during the independent session. Supervisors' workload was reduced within both new training formats. However, creating a variety of online cases and follow-up training of simulated patients within the independent format remains time and labor intensive.

## Discussion

Students found the two new training formats valuable with special preferences for the independent training. Within the latter, students felt satisfied about their performance. However, the closing group session with a supervisor showed that students overestimated their performance within the independent session. Further studies should investigate long term learning effects and optimal placement of both new training formats in the curriculum.

## Introduction

Conducting consultations is a core competence of the medical profession (1-3). Nowadays, the consultation with a patient entails more than solving the medical problem. It is about improving the patients' well-being in his/her personal context (4). The term "patient-centered consultations" has found his entrance in medical education and is until now still an important subject of research (5-7). The paternalistic role of the physician within the traditional biomedical model has become historical (8). A physician must pay attention to the clinical symptoms of the patient but also explore the patients' ideas, emotions and expectations (9). Illingworth (2010) describes patient-centeredness as a philosophy of care which focuses both on the patient as a whole with his/her individual preferences within a specific context and on shared decision making (6). Several studies emphasize the positive impact of patient-centered consultations on patient satisfaction, compliance and patient health outcomes (10-11). Silverman *et al.* (2006) emphasize that patient-centeredness and communication should get equal attention within medical education as other clinical competences, such as physical examination skills (11). Since 1960 several education methods are used to teach medical students consultations skills: lectures, observations, paper cases, role play with peers, video recording of real consultations, role play with simulated patients, practice with real patients or actors, group discussions (12-18).

Within the medical curriculum of Ghent University, consultation skills are taught progressively. During the three bachelor years, medical students receive separate courses in communication/history taking, clinical reasoning and physical examination skills. Subsequently, in the first, second and third master an integrated consultation course prepares students for real patient contact during clerkships. This consultation training incorporates different skills: clinical reasoning, communication, history taking and physical examination skills. Within the 'traditional' training format of the integrated consultation course, groups of three students carry out three consultations with a simulated patient and receive feedback from a supervising physician using a consultation model as theoretical guideline. One session entails 40 minutes, whereby the consultation is divided in three parts: intake/history taking, physical examination, explanation and planning and closing the session. Each student performs one of those three parts to ensure all students remain involved during the entire session. Feedback starts with a self-reflection activity, followed by feedback from two peers and the supervising physicians on the student's interviewing skills, history-taking, communication, physical examination and decision making, and on his or her in-

teraction with the patient. Carroll and Monroe (1979) emphasize the importance of direct observation and immediate feedback when learning to consult (10).

Because of the complexity of integrated consultation skills, students at Ghent University asked for more training opportunities. Expanding the 'traditional' training format was not possible because of the intensive workload for the supervisors of this small group teaching format (2,15 hour for each student) in a context of increasing number of students, and financial and staff constraints. Therefore alternative training formats were sought to intensify the integrated consultation course. In our search to develop alternative training approaches, special attention was paid to observational learning and receiving immediate feedback, as suggested by Carroll and Monroe (1979) (10). So both an independent training was set up whereby students carry out two consultations without supervision and receive feedback from a simulated patient and a peer student. And an e-learning module was created whereby students observe three consultations divided in little film fragments prompted by questions in between with immediate feedback afterwards.

Reviewing the literature, Bokken *et al.* (2009) discussed a variety of training formats wherein simulated patients give feedback (19). This feedback is often on clinical skills such as history taking and physical examination. But communication skills are also part of the feedback domain of simulated patients. Bokken *et al.* (2009) suggest that feedback of simulated patients should be in the first place feedback from the patients' perspective. However, only a minority of the studies reported about this form of simulated patients' feedback (10 out of 49 studies). At Queen's University Medical School in Canada simulated patients give feedback to students using a checklist (20). This checklist contains 18 items, e.g. "Did the student introduce himself/herself? Were the questions clear? Did the student explain the results of the clinical tests in relation to your symptoms?" Kneebone *et al.* and McManus *et al.* describe an educational program whereby students practice their consultation skills and got feedback from simulated patients (21,22). In both settings, feedback starts with a self-reflection activity: "What was good? What could be improved?" Afterwards students got feedback from the simulated patient, a tutor and/or a peer. According to Bokken *et al.* (2009) in most consultation courses, which use patient feedback, a supervisor is present (8 out of 10 studies) (19). The supervisor is there to guide the session and to give feedback on the medical content.

An e-learning has the advantage students can learn anytime anywhere with less supervisors' workload (23), using a standardized content and taking into account

individual characteristics of the learner (24). Literature shows that e-training are often based on the observational learning theory using the dual-coding principle (25) (e.g. combination of text, figures, photo's, film) and providing immediate feedback. Observational learning explains how learners' behavior can change by observing behaviors of experts or peers and the consequences of those behaviors (26). Finally, providing immediate feedback within the e-learning module is important to ensure high-quality learning (27).

We created two alternative training formats taking into account those research findings. Within these training formats we aimed to reach the same educational goals as in the 'traditional' supervised training format. In the evaluation of this experiment the following questions were addressed:

- 1) How do students perceive the three different training formats?
- 2) Do patient feedback and observation by a peer in the independent training result in a learning effect?
- 3) Do the two new training formats entail a reduced supervisors' workload?

## Methods

### The new independent training format

Simulated patients giving direct feedback from the patients' perspective has a strong learning effect on students which cannot be created by a supervisor nor by a peer student. To maximize this effect it is preferable simulated patients do not give feedback on the consultation structure, the physical examination or the clinical content of a consultation. To evaluate the medical correctness of the consultation a second student observes and evaluates the consultation based on a checklist. Consultations are divided into three parts: intake/history taking, physical examination and explanation and planning. Each consultation part is followed by a standardized feedback procedure. Feedback starts with a self-reflection activity, carried out by the student-physician focusing on his/her own performance: "What did I do well? What could have been done better?" Next, the simulated patient gives feedback from the perspective of the patient: "Does he/she agree with the students' reflection? How did he/she experience the consultation?" To guide the feedback the simulated patient uses an observation sheet. Finally, the observing student gives feedback about the structure of the consultation and the clinical content. Before the physical



examination and before the explanation and planning part both students take some time to prepare together. The simulated patient ends this preparation by giving the students a standard answer on paper. So the student-physician is able to continue the consultation with the correct information. Each session lasts 40 minutes. During a second consultation, students switch roles. After the two consultations, a debriefing session is organized in small groups (8–12 students) guided by a physician in order to discuss the students' questions about the clinical content, the physical examination, the consultation structure or the interaction with the simulated patient. Up to now it is technically not possible to review the consultations on video.

### **The new e-learning module**

An interactive web environment was developed that positions the student in a "virtual" consultation setting. This setting starts in the waiting room of a general practitioner. The goal of the e-learning environment is to learn by observation: students observe – individually – three consultations, subdivided into small fragments (opening/history taking – physical examination – diagnosis, treatment and planning). The observation activity is guided by open-ended questions that prompt the student about the various consultation dimensions: the consultation structure, the physician patient interaction and the clinical content: Is the history complete? What physical examinations would you perform? What is your diagnosis or differential diagnosis? In view of each question, an input box is provided for the student to type in their answer. When the student proceeds with the consultation, his/her reply is saved and followed by immediate standardized feedback.

Table 4.1 shows the overlap and complementarity between the supervised training, the independent training and the e-learning module. Students spent 2,15 hour within the supervised training format, so both new training formats were set up within a similar time frame.

*Table 4.1: Operationalization of the educational goals within the specific training formats*

<b>Specific education goals</b>	<b>Supervised training (carousel of three stations)</b>	<b>Independent training (carousel of two stations with debriefing session in small group)</b>	<b>E-learning module (three consultations)</b>
<b>Students practice the consultation structure</b>	Each student conducts one part of the consultation in every session  Feedback of the supervisor	Each student conducts a complete consultation in one session  Feedback of a peer using a checklist for the structure of the consultation	Each student observes little fragments of the consultation, answers open ended questions
<b>Student practice specific clinical skills</b>	Feedback of the supervisor	Feedback of a peer using an observation sheet for the physical examination	The open ended questions focus on clinical skills
<b>Students practice communication skills, physician-patient interaction</b>	Feedback of the supervisor	Feedback of the simulated patient and peer	The open ended questions focus on communication skills
<b>Students learn by observation</b>	In each of the three sessions the student observes two peers playing a physician	In one session the student observes the peer as physician	The student observes a physician online
<b>Students discuss the clinical content of the consultation</b>	With two peers and a supervisor	With one peer	Students work online on individual basis
<b>Students learn the integration of the clinical content within the consultation (choice of clinical tests, diagnosis and therapy)</b>	Supervision and feedback of a supervisor	Discussion with peer; correct answers on paper  Possibility to ask questions in the debriefing session with supervisor	The computer program entails "correct" film fragments

<b>Students reflect on their own performance</b>	Supervisor stimulates reflection	Simulated patient stimulates reflection	The program asks the student to evaluate him/herself
<b>Students get acquainted with the patients' perspective</b>	Indirect feedback of the supervisor	Direct feedback of the simulated patient	Standardized feedback online
<b>Practical aspects</b>			
<b>Time frame</b>	Three sessions: 40 minutes each  2,15 hour	Two sessions of 40 minutes each followed by a debriefing session with a supervisor of 40 minutes  2,15 hour	Three cases: 40 minutes each
<b>Grouping</b>	Three students, one supervisor, one simulated patient	Two students, one simulated patient	One student, one computer
<b>Session moderator</b>	Supervisor	Simulated patient	No

### **Selection and training of simulated patients within the independent training**

Within this pilot phase simulated patients were selected on two criteria: a great deal of experience with playing standardized roles in the training format with supervisor and the ability to observe the performance of the students correctly and give correct feedback.

Within the independent training simulated patients perform four tasks. First, they play their standardized role as naturally as possible. Secondly, they observe the performance of the student and report their observations on an observation list after each consultation part. Thirdly, using their observations as a guide they give feedback to the student from their patients' perspective. Finally, the simulated patients moderate the session.

To fulfill these tasks adequately an intensive training program for simulated patients was set up. Eight simulated patients were trained in two groups. The training program consisted of five sessions of 4 hours: an introduction, two role play sessions with supervisors, an observation with more experienced simulated patients and a try-out role play with volunteer students. From the first training on simulated

patients got specific tools to give feedback using an observation list: "Does the student present him/herself? Do I get the time to tell my story? Does the physician use understandable language?"

### **Evaluation of the training formats**

A pilot study among fifth year students was set up whereby 60 students participated in the independent training with a debriefing session in a small group, 72 students participated in the traditional training format with supervisor and 64 students passed through the e-learning module. The time frame and cases of the three training formats were similar (tension headache, radiculopathy, meniscus tear, transient ischaemic attack). Immediately after each training students were asked to fill in a questionnaire which consisted of 10 items on a five point Likert scale) and 2 open ended questions (1.Do you have other specific remarks about content? 2.Do you have practical remarks concerning the training format?).

Within the independent training simulated patients fill in an observation sheet which helps to evaluate the student qualitatively on different consultation items (good, weak, bad). To measure the learning effect from the first session to the second session within the independent training these qualitative scores were converted in a grade (good 3/3, weak 2/3, bad 1/3). Due to organizational problems it was not possible to ask simulated patients for an evaluation of the student in the traditional training with supervisor. Those simulated patients were not trained to observe and give feedback. Furthermore, it is possible that the feedback of the supervisor would influence the opinion of the simulated patient.

### **Statistical analysis**

The results of the evaluation questionnaire and student observations of simulated patients were visualized using descriptive statistics (mean and standard deviations). Subsequently, depending on the outcomes of the Levene's test for the homogeneity of variance, a one-way ANOVA on the data of the evaluation questionnaire and independent t-test on the observation data of the simulated patients was carried out to test the differences between groups. Post hoc analysis was applied to get a pairwise comparison of the impact of particular interventions. Data were analyzed using SPSS v 17.0.

## Results

### Students' perceptions of the three training formats

Our results show significant differences between the e-learning module on the one hand and the training format with supervisor and independent training format on the other hand for all items (see Table 4.2). Except for item 7, "receiving immediate feedback" was present and positively evaluated within all three training formats. Table 4.2 shows the mean scores for each item. In particular, the supervised and independent trainings were useful for students, compared to the e-learning module, because they learned by doing and were able to practice their communication skills, the consultation structure, a well-structured history taking and performing physical examination accurately. The independent training did not differ significantly from the e-learning module on two items "Observing the way a physician conducts the history taking part, helps me to develop an own system." (item5) and "My knowledge about the structure of the consultation increased." (item10). We found it interesting to see the trend that within the independent training students scored both their performance and the usefulness of this format higher than the other two training formats. Though this difference is only significant comparing the independent training with the e-learning module.

*Table 4.2: Overview of mean scores of students' perceptions on the training formats*

Items (five point Likert scale)	Supervised training (n=68) Mean ± SD	Independent training (n=55) Mean ± SD	E-learning module (n=64) Mean ± SD	F-value
1. Doing these consultation sessions helped me to practice the consultation model.	4.69 ± 0.47 <sup>c</sup>	4.58 ± 0.50 <sup>c</sup>	4.13 ± 0.63 <sup>a,b</sup>	20,22**
2. Observing the doctor patient interaction helped me understand "the why of the consultation structure".	4.23 ± 0.60 <sup>c</sup>	4.11 ± 0.79 <sup>c</sup>	3.78 ± 0.74 <sup>a,b</sup>	7.07**
3. I practiced the communication part of the consultation.	4.50 ± 0.53 <sup>c</sup>	4.44 ± 0.57 <sup>c</sup>	3.23 ± 0.99 <sup>a,b</sup>	60.60**
4. The case clarified the relation between practice and consultation structure.	4.31 ± 0.63 <sup>c</sup>	4.09 ± 0.70 <sup>c</sup>	3.73 ± 0.79 <sup>a,b</sup>	11.10**

5. Observing the way a physician conducts the history taking part, helps me to develop an own system.	4.29 ± 0.65 <sup>c</sup>	4.13 ± 0.70	3.66 ± 0.86 <sup>a</sup>	12.93**
6. Looking for mistakes within the physical examination part helped me to refresh specific clinical tests.	4.38 ± 0.65 <sup>c</sup>	4.11 ± 0.83 <sup>c</sup>	3.97 ± 0.79 <sup>a,b</sup>	5.26**
7. I found the immediate feedback useful.	4.62 ± 0.55	4.49 ± 0.57	4.44 ± 0.69	1.54
8. I am satisfied about my performance.	3.57 ± 0.94 <sup>c</sup>	3.64 ± 0.68 <sup>c</sup>	2.83 ± 0.86 <sup>a,b</sup>	17.85**
9. I found this training useful.	4.51 ± 0.56 <sup>c</sup>	4.71 ± 0.50 <sup>c</sup>	3.67 ± 0.87 <sup>a,b</sup>	41.89**
10. My knowledge about the structure of the consultation increased.	4.18 ± 0.77 <sup>c</sup>	3.96 ± 0.77	3.84 ± 0.57 <sup>a</sup>	3.74*

Note: \*one-way ANOVA significant  $p < .05$  \*\* $p < .01$

<sup>a,b,c</sup> pairwise comparisons Bonferroni show significantly different mean values ( $p < .05$ )

<sup>a</sup>: significantly different from supervised training, <sup>b</sup>: significantly different from independent training <sup>c</sup>: significantly different from e-learning module

Qualitative data (responses to the open ended questions and information of the debriefing sessions) on the independent training and e-learning module are clustered on content. Box 4.1 and 4.2 show a few student reactions. In general, all students are positive about the instructional effectiveness of the new training formats. Observing and performing a complete consultation as a physician gives students insight in their own ability. Being able to participate several times within these training formats would give them the chance to improve and learn from their mistakes.

**Box 4.1: Clusters of qualitative remarks of students concerning content and practical organization of the independent training format**

**Cluster 1) Instructional effectiveness**

"The immediate feedback of both peer and simulated patients is very useful. It is both for clinical and communication skills very instructive."

"Very good format to practice communication and 'physician skills'!! Much better than theoretical lessons or practice in huge students groups"

"Very pleasant and useful form of education"

"This is the best way to practice"

"Very good format"

"Very useful to train consult and communication, good to receive feedback of the patient on how they experienced the consultation, that is honest"

**Cluster 2) Need for more practice**

"I find it a very useful experience, we should have these training sessions on a regular basis, it is such a crucial core competence that it is worth the energy to organize."

"We should have this kind of exercise more often to feel more confident during clerkships"

"More practice with simulated patients"

"More training opportunities"

**Cluster 3) Independent character**

"The absence of the supervisor stimulates the spontaneity, the peer dares to give critique without supervisor"

"Supervisor is not necessary"

"Strongly recommended!! The simulated patients were very helpful and well trained!"

"very pleasant and useful form of education!"

"Very good, the simulated patient replaces the physician"

**Box 4.2: Clusters of qualitative remarks of students concerning content and practical organization of the e-learning module**

**Cluster 1) Instructional effectiveness**

"It would be interesting to have such examples about common diseases, it is very useful to refresh medical history taking and clinical research (specific tests)."

"Good as preparation on the other skills lab sessions"

"Good idea, the content of the film fragments were at the appropriate level of knowledge!"

"I found it difficult to pay attention to both the communication part and the medical content of the consultation."

"This format stays a bit artificial. Practice with real patients would be more enriching."

"The immediate feedback and "correct" film fragments were very helpful but made it sometimes boring."

"I found this format useful to train the consultation structure but also to practice my communication skills more questions should focus on formulations to the patient."

**Cluster 2) Need for less cases**

"Three consultations is too long to keep my attention."

"It is hard to stay focused all the time, during the third case I did not perform well compared to the first"

"The session took too much time"

**Cluster 3) Online character**

"The website worked very well."

"The system did not work in my browser."

"My third case disappeared unexpectedly."

"Could I have the feedback on paper afterwards?"

**Learning effect by observing and giving feedback to peers**

The observation lists of the simulated patients shows that the student-physician of the first session scored significantly lower on specific items of the consultation compared to student-physician of the second session. For example, these student often forgot to present themselves, prompting the simulated patients to give the following feedback:

*"I would have appreciated to know your name, now I go home and cannot tell my husband who helped me"*



In the first session the student-physician also took less time to explore the idea or concern of the patient, who reacted:

*"It is a pity that I could not tell you my own idea about the headache. I did not get the chance because you immediately asked me to show the specific location of the pain. I still have the doubt that it might be a tumor."*

In the second session students switch roles whereby the observer of the first session becomes physician. Simulated patients scored both items above significantly higher in the second session. Table 4.3 also shows the other items of the consultation that are significantly better performed in practice: students explain the diagnosis in a more understandable language, students make reference at the end to the expectation of the patient.

**Table 4.3: Overview of mean scores of observation list items of 8 simulated patients of the independent training format**

Items from the observation list	Session 1 Mean $\pm$ SD (n=29)	Session 2 Mean $\pm$ SD (n=31)	t-value
1. The physician presents himself and asks my name.	2.28 $\pm$ 0.84	2.71 $\pm$ 0.58	-2.33*
2. I can tell my whole story.	1.83 $\pm$ 0.84	2.10 $\pm$ 0.86	-1.22
3. I'm given space to share my own idea/concern.	1.43 $\pm$ 0.68	1.86 $\pm$ 0.90	-2.05*
4. I can tell my expectation.	1.88 $\pm$ 0.86	1.82 $\pm$ 0.84	.26
5. The physician asks unambiguous questions.	2.68 $\pm$ 0.48	2.66 $\pm$ 0.57	.17
6. The physician asks my permission to start the physical examination.	2.58 $\pm$ 0.65	2.71 $\pm$ 0.66	-.72
7. The physician gives clear and correct guidelines to prepare the physical examination (clothes, ...).	2.52 $\pm$ 0.69	2.59 $\pm$ 0.66	-.38
8. The physician explains the specific test during the physical examination.	1.94 $\pm$ 0.74	2.17 $\pm$ 0.64	-1.23
9. I feel safe during the physical examination.	2.80 $\pm$ 0.48	2.82 $\pm$ 0.38	-.12
10. I get a clear and understandable explanation about the diagnosis.	2.19 $\pm$ 0.83	2.63 $\pm$ 0.71	-2.22*
11. The physician makes reference to my concern.	1.92 $\pm$ 0.87	1.97 $\pm$ 0.93	-.20
12. The physician makes reference to my expectation.	2.17 $\pm$ 0.82	2.79 $\pm$ 0.51	-3.46*
13. I get the opportunity to ask questions.	1.88 $\pm$ 0.77	2.16 $\pm$ 0.80	-1.33
14. The physician uses understandable language.	2.73 $\pm$ 0.53	2.79 $\pm$ 0.53	-.41

Note: \*Independent Students' t-test significant  $p < .05$

## Work load efficiency for supervisors

In the traditional training format with supervisor twenty-four students can practice per half day. Therefore sixteen supervisor hours and five simulated patients are needed (four simulated patients for four stations and one back-up). To let the same amount of students practice within the independent training with debriefing session in small group two supervisor hours and seven simulated patients are needed (six simulated patients for six stations and one back-up) (see Table 4.4). To prepare the simulated patients for the independent training more coaching is needed. Apart from practicing a new role (four supervisors hours/ two sessions) it takes five half day sessions to train simulated patients in giving feedback. Furthermore, the follow-up training of simulated patients remains time-consuming and labor-intensive: watching video recording in small group and discussing.

To create the e-learning module at first a scenario should be written starting from the specific learning goals in order to identify the specific film fragments that must be recorded. Both physician and simulated patient got a briefing and studied the script. Then, the shooting of the consultation room and physician waiting room must be set up. Once the film editing is done the consultation case can be put online.

**Table 4.4: Overview of supervisor workload**

Supervisor time	Supervised training	Independent training	E-learning module
Basic training simulated patients	4 hour (script training)	4 hours (script training) 20 hours (feedback training 5x half a day)	
Teaching time half a day (for 24 students) (for 216 students)	16 hours (4 supervisors for four sessions) 144 hours (16 hours x 9 half a days)	2 hours (debriefing session in small group) 18 hours (2 hours x 9 half a days)	
Simulated patient time	2 hours (boosting script)	2 hours (watching video-recording*)	2 hours script training 4 hours recording time
Further follow up for each simulated patient (for 216 students)	14 hours (for 7 simulated patients **)	20 hours (for 10 simulated patients**)	
Specific administration time for supervisor/medical educators			2 hours drafting the scenario/ 4 hours recording time/8 hours assembling film fragments and publishing online

Supervisor training	1 hour evaluation training using film fragments of a student consultation; observation and group discussion on how the consultation model is used by the student	1 hour scenario debriefing session	1 hour script training physician role/total preparation recording time
Total supervisor time	163 hours (with 7 simulated patients and 9 half days)	63 hours (with 10 simulated patients and 9 half days)	17 hours for one consultation case

Note: \*watching video recording entails a feedback moment for the simulated patient: boosting the script, remediating observation competencies and rephrasing feelings from their patients' perspective are addressed

\*\*5 and 7 simulated patients are respectively needed, to ensure a time-out

## Discussion

In this research two alternative training formats teaching consulting were set up and evaluated whereby students get acquainted with the patients' perspective and practice the consultation structure without supervisor.

### E-Learning

Our results show that students' evaluations on the educational value of the e-learning module are significantly lower compared to the supervised and independent training format. It is correct that the e-learning module deficits the aspect of "doing". Bloomfield *et al.* (2010) state that e-learning modules are mostly used for cognitive purposes and less for specific skills training (28). We agree with the qualitative feedback of students that the e-learning module is rather complementary, it cannot replace the other training formats: "Good as preparation on the other skills lab sessions". Literature on "Blended learning" emphasize that the combination of online learning as preparation on face-to-face education results in students who are more active with the course contents and increase a deeper learning and commitment of the students (29,30). So, we might infer from this that the online training can work as a good preparation for the independent training.

### Feedback of the simulated patient

Feedback is defined in the literature as "specific information about the comparison between a trainee's observed performance and a standard, given with the intent to

improve the trainee's performance." (31). Within the independent training, simulated patients use an observation checklist to provide specific guidelines and prevent superficial feedback. The results of this study show that students found receiving feedback from the patients' perspective useful: simulated patients pay attention to positive aspects and to specific *"points that can be improved"*. It is interesting to see that students defined the feedback of simulated patients as *"honest"*. Literature shows that not all feedback providers have similar impact on learning. An important aspect is the credibility of the provider to the recipient (32,33).

### **Training in pairs without supervisor**

In the independent training the peer student has an important task as an observer: observing and giving feedback. The observations of the simulated patients show that the student-physicians of the second session scored significantly higher on specific consultation items. So, this study shows the positive impact of a vicarious experiences on students' learning (34): being the observer of a successful/unsuccessful peer, involved in a consultation. Further research should focus on the long term learning effect. From the qualitative data we might conclude that the absence of a supervisor leads to a higher self-efficacy beliefs whereby students feel more free to give each other feedback. Follow-up research is needed to test this systematically.

### **Students' estimation of their performance**

During the debriefing session with supervisor within the independent format, the supervisor had access to the observation lists of the simulated patients and peers. Analyzing these lists showed that some students overestimated their performance during the two independent sessions with simulated patients. This might be explained by the fact that simulated patients especially give positive feedback from his/her perspective (35-37) and the observing peer is less critical due to a lack of clinical knowledge compared to a supervisor, who aims at a high standard for the communication part as well as for the medical content (32,33). Looking for the optimal placement of the independent training in the curriculum might prevent this problem of overestimation.

### **Supervisors' work load**

The independent training format and e-learning module reduced the workload of supervisors. Especially the e-learning module is less intense for supervisors (23) with

the advantage of a standardized content (24,25). Within the independent training coaching simulated patients effectively in giving feedback remains time-consuming and labor-intensive. Sufficient financial resources are needed. Further research in this area is recommended.

## **Conclusion**

We conclude that students found both the independent training and e-learning module useful to broaden the integrated consultation course. However, the supervised training remains important as first step. The e-learning module is a crucial step in preparing students “just in time” for the independent training. The latter is a logical next phase within the learning trajectory of students working autonomously. Furthermore, keeping the concept of ‘patient centered consultations’ in mind, feedback from the patients’ perspective has an important added value

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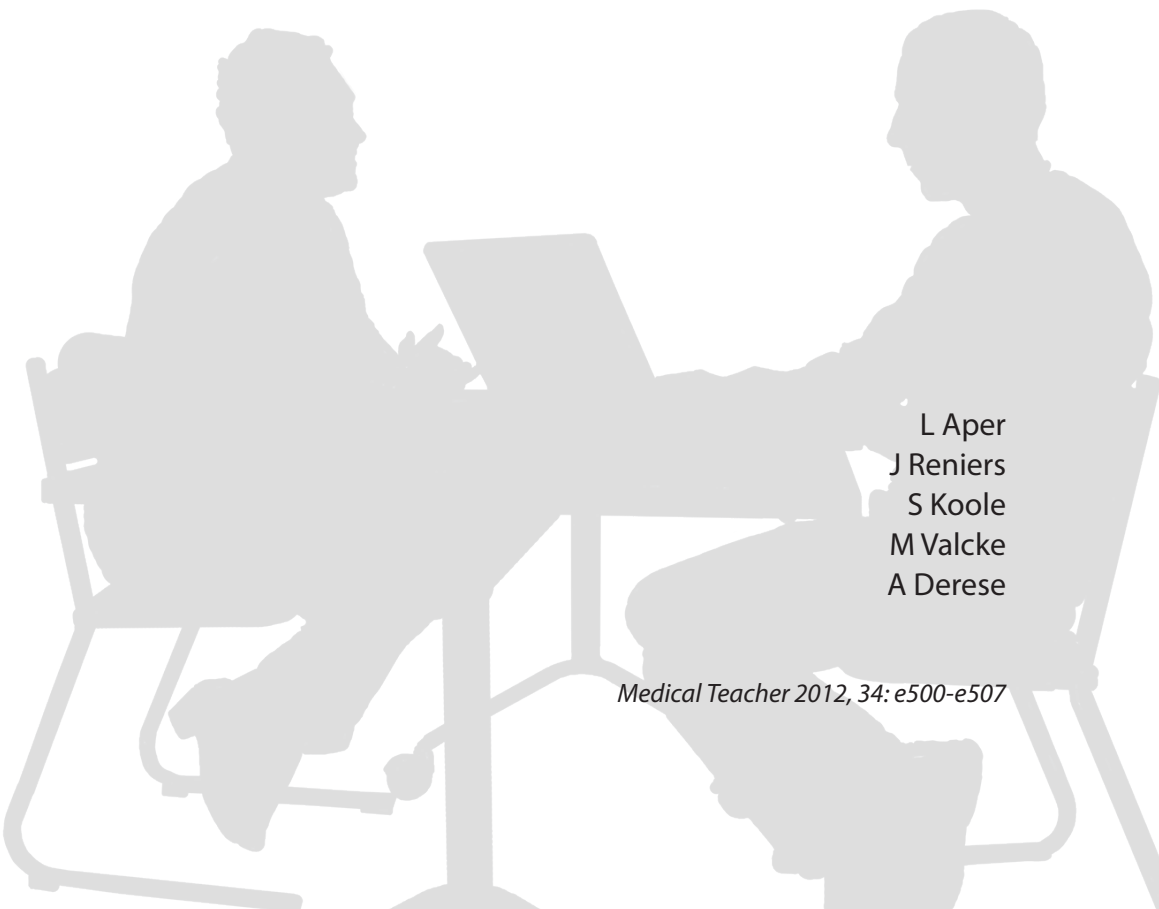
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**Chapter 4:**  
**Impact of three alternative consultation  
training formats on self-efficacy and consultation  
performance of medical students**



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## Abstract

### Background

Conducting a consultation is a core competence of medical professionals. Consultation training of medical students centers on communication, history taking, clinical reasoning and physical examination skills. The training incorporates practice with a standardized simulated patient and supervising physician, to prepare for real patient encounters. To meet the request for more training, while dealing with an increasing student population and limited staff availability, alternative formats of consultation training were developed and evaluated.

### Aim

To investigate the impact of three consultation training formats on students' self-efficacy beliefs and their consultation skills acquisition. The three formats comprised (1) the traditional training with supervising physician, (2) an independent training with feedback from simulated patients and peers and (3) an e-learning module based on video fragments and answering guiding questions.

### Methods

An experimental pre/posttest study was set up with random assignment of students to a training condition. The differential impact was tested on two dependent measures: self-efficacy and consultation performance. Self-efficacy was tested with a nine-item scale and the cognitive component of consultation performance was tested based on responses to a standardized video case.

### Results

The independent training has a significant positive effect on students' self-efficacy ( $p=.016$ ). The traditional training and the e-learning module did only positively influence the cognitive component of students' consultation performance ( $p<.001$  and  $p=.003$ ).

## Conclusions

Each consultation training contributes to the learning process in a different way. In order to achieve optimum learning effects, medical educators should be aware of the particular impact of specific trainings on the cognitive and motivational side of skills and pursue a balanced mixture of instructional formats.

## Practice points

- Conducting a consultation is a complex skill for undergraduate medical students, and paying attention to both the cognitive and the motivational side of a consultation setting is needed.
- Training formats with simulated patients and without direct supervision have a positive impact on students' self-efficacy beliefs.
- Feedback of experienced physicians is necessary to avoid students' misconceptions concerning their abilities.
- Students should be trained to observe consultations to be able to provide relevant feedback to peers.

## Introduction

Conducting a medical consultation is a key element of good medical care and therefore represents a core competence of the medical profession (1-3). State-of-the-art physician–patient consultation includes more than solving a medical problem. It also aims at improving the well-being of every patient in his/her own context: therefore often labeled as a “patient-centered” consult (4,5). A physician should pay attention to the symptoms of patients but also explore their underlying ideas, concerns and expectations and the impact of symptoms on their daily life (6-7). Undergraduate students need consultation training to develop this complex skill. In this introductory section, we first discuss the focus on self-efficacy as a key variable in the development of consultation competence. Next we move to the central role of feedback in consultation training approaches.

For decades, consultation skills have been taught to medical students (8). Different educational methods have been adopted: role playing with peers or simulated patients, discussion, video recording or real patient encounters (9-13). Numerous studies have focused on the differential effect of educational approaches that foster medical students’ consultation skills development (14-22). In the present study, we move beyond a focus on more consultation skills development. This is linked to a discussion about the connection between a choice for a specific educational method and conceptions about learning. Bandura (1997) describes learning as a triadic interaction of the environment (educational setting), personal factors (self-esteem, dependency, self-efficacy) and behavior of the learner (including cognitive processes) (23). To attain a competence, not only is the development of conditional knowledge and skills needed, but also related beliefs about one’s personal efficacy. Mavis (2001) and Artino *et al.* (2010) underscore the importance of this type of motivational beliefs (e.g. self-efficacy) and achievement emotions (e.g. enjoyment, anxiety and boredom) of medical students in view of their academic performance (24,25). Self-efficacy is defined as students’ judgments of their capabilities to successfully perform specific tasks (23).

Self-efficacy appears regularly in medical education research. For instance, studies investigated whether new educational methods have an impact on motivational variables such as self-confidence and self-efficacy. Comparable research is available in the field of clinical and pharmaco-therapeutic skills of final year medical students (26-29), family practitioners treating obesity (30), nurses and medical students car-

ing for difficult patients/situations (31-33) and the development of communication skills in nursing education (34). Research is scarce examining the effect of alternative educational methods for consultation skills and the impact on medical students' self-efficacy beliefs.

Alternative instructional approaches for consultation especially differ in the extent to which, and the way feedback is delivered. Carroll and Monroe (1979) stress the importance of feedback in learning consultation skills (17). Available meta-analysis research judging educational outcomes points at effect sizes of .73 of "giving regular feedback" on achievement in teaching and learning processes (35). The effect size (d) or "standard deviation units" refers to the number of standard deviations the distribution in the dependent variable moves left (negative impact) or right (positive impact) when comparing control and experimental groups. In view of developing complex competences – such as the consultation competence – next to the opportunity to practice, receiving immediate feedback is crucial to ensuring high quality learning. Alternative training approaches could help to provide feasible solutions to deliver adequate levels of feedback to learners.

At the medical faculty of Ghent University, consultation skills are taught progressively. During the three bachelor years, medical students receive separate courses in communication, history taking, clinical reasoning and physical examination skills. Subsequently, a consultation training in the first, second and third master prepares students for patient contact during clerkships. This consultation training, launched since 2004, incorporates different skills: clinical reasoning, communication, history taking, physical examination and treatment/patient management skills. Within this particular training format, groups of three students carry out three consultations with a simulated patient and receive feedback from a supervising physician. Because of the complexity of integrated consultation skills, students at Ghent University suggested to receive more intensive training. But, due to the increasing numbers of students, and financial and staff constraints, it was not feasible to expand the existing training approach. In 2010, two alternative training formats were developed to increase consultation training opportunities. But, in developing these alternative approaches, besides learning by doing special attention was paid to observational learning, reflection and receiving immediate feedback, as suggested by Carroll and Monroe (1979) (17). The first alternative training format can be described as an "independent training": students carry out two consultations without supervision and receive feedback from a simulated patient and from a peer student. A second alternative method is based on an "e-learning module": individual students observe

video fragments of a simulated consultation and answer open-ended questions, followed by automated immediate feedback. Yet, no evaluation was carried out to study the differential impact of the three available training formats. Starting from the premise that the improvement of self-efficacy beliefs will be associated with the development of better consultation skills (23), our main research questions are:

- What is the differential impact of three consultation training formats – with different feedback modes on the self-efficacy beliefs of undergraduate medical students?
- What is the differential impact of three consultation training formats on the cognitive development of the consultation skills (knowing what to do)?
- Is there a mediating effect of self-efficacy beliefs on the relationship between the three training formats and the cognitive development of consultation skills?

It was hypothesized that self-efficacy and the consultation skills will be fostered in every training condition.

## Method

A three-factor, randomized trial design was set up to test the differential impact of the three alternative training formats. The research population included all second year master medical students at Ghent University. All participants reflect a comparable level of prior knowledge, since they participated successfully during the previous year in the traditional consultation training format with a supervising physician. All students participated in an information session at the beginning of the semester and received a letter with a detailed overview of the sessions. Informed consent was obtained from all participants. Students were at random allocated to one of the three training conditions: 72 students participated in the traditional training format, 60 students in the independent training format and 64 students passed through the e-learning module. Ethical approval for the trial was obtained from the Ethical Committee of Ghent University Hospital.



## The educational intervention: The three training formats

*Traditional training.* Students – in groups of three – consecutively participate in three consultation sessions. Each session of 40 minutes entails a full consultation with a standardized simulated patient and is supervised by a physician. The consultation process is divided into three parts: opening/history taking – physical examination – diagnosis, treatment and planning. Each student is responsible for one part of the consultation. Feedback starts with a self-reflection activity, followed by feedback of the skills lab supervisor/general practitioner about his/her skills in interviewing, history-taking, communication, physical examination and decision making and about the interaction with the patient. Switching the role of the student–physician ensures that all three students actively participate in each consultation session.

*Alternative format 1: Independent training.* Students train in pairs without supervision. Each student conducts a full consultation with a simulated patient, while the second student observes and evaluates the consultation on the basis of a checklist. Similar to the traditional training approach, the session lasts 40 minutes and is divided into three parts. Each consultation part is followed by a standardized feedback procedure. Feedback starts with a self-reflection activity, carried out by the student-physician who focuses on his/her own performance: “What did I do well? What could have been better?” Next, the simulated patient gives feedback from the perspective of the patient: “Does he/she agree with the students’ reflection? How has he/she experienced the consultation?” An observation list helps the simulated patient to structure his/her feedback about the physician patient interaction. Finally the observing student gives feedback about the structuring of the consultation and about the clinical content. During a second consultation, students switch roles. After the two consultations, a debriefing session is organized with a skills lab supervisor/general practitioner in small groups (8–12 students) to discuss student questions (clinical content, physical examination, consultation structure, interaction with simulated patient). A scenario is written down for supervisors to guide this debriefing session whereby supervisors have the task to stimulate students to reflect on their experience with attention for students’ thinking, feeling and acting as a doctor. The following three aims are defined: (1) discussion of students’ medical content questions, (2) discussion of relation between consultation structure and practice and (3) the emotional experience as a student-physician within the independent format.

*Alternative format 2: E-learning module.* An interactive web environment was developed that positions the student in a “virtual” consultation setting. This setting

starts in the waiting room of a general practitioner. The goal of the online learning environment is to learn by observation: students observe – individually – three consultations recordings, subdivided into small fragments (opening/history taking – physical examination – diagnosis, treatment and planning). The observation activity is guided by open-ended questions that prompt the student about the various consultation dimensions: the consultation structure, the physician patient interaction and the clinical content: Is the history complete? What physical examinations would you perform? What is your diagnosis or differential diagnosis? In view of each question, an input box is provided for the student to type in their answer. When the student proceeds with the consultation, their reply is saved and followed by immediate standardized feedback.

### **Outcome measures**

The study used two outcome variables: students' self-efficacy regarding their involvement in the different parts of the consultation and the quality of the consultation activity. As to the latter, the focus is on the cognitive component of the consultation competence.

The students' self-efficacy was measured in a pre/post design with a nine-item scale. Figure 3.1 represents the instrument: the first eight items incorporate the main components of the consultation model. The ninth item measures a general self-efficacy level: "I am capable to properly perform a whole consultation." The construction of the scale was based on the design principles of Bandura (2006): self-efficacy items refer to specific behavior, are phrased in terms of "can do" and assess operative capabilities as they are perceived at that moment (36). For each item the students ranked their perceived self-efficacy on a 10-point Likert scale. The levels of confidence ranged from 0: "not at all confident" to 10 "completely confident".

The cognitive component of the consultation skills (consultation structure, clinical content) was measured on the basis of student responses to a video case before and after the intervention. This video case entailed a consultation that was periodically interrupted by a question to which students had to respond on paper: How would you proceed with the consultation? What history taking questions would you ask? What is your differential diagnosis? Which clinical examinations would

you perform? The student responses were corrected with an answer key by a member of the skills laboratory team.

**Figure 3.1: Instrument to measure students' self-efficacy**


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How confident do you feel at this moment to perform the various consultation components? Rate yourself on this scale (0: not at all certain to 10: very certain)

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**Opening of the consultation**

1. I can explore the patient's story.

0    1    2    3    4    5    6    7    8    9    10

2. I can listen to the cognitions (ideas) and emotions of the patient.

0    1    2    3    4    5    6    7    8    9    10

3. I can explore the patient's expectations.

0    1    2    3    4    5    6    7    8    9    10

**History taking**

4. I have a clear view of the questions you want to ask in relation to the different parts in history taking.

0    1    2    3    4    5    6    7    8    9    10

**Physical examination**

5. I can perform the physical examination systematically.

0    1    2    3    4    5    6    7    8    9    10

**Diagnosis, treatment and planning**

6. I can explain the diagnosis in an understandable language to the patient.

0    1    2    3    4    5    6    7    8    9    10

7. I can make the link to elements from the opening of the consultation: Why is this patient coming to me? What is the relevance of his ideas, emotions and expectations?

0    1    2    3    4    5    6    7    8    9    10

8. I can explain the follow-up measures of this consultation.

0    1    2    3    4    5    6    7    8    9    10

**General**

9. I'm capable to properly perform a complete consultation.

0    1    2    3    4    5    6    7    8    9    10

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## Data analysis

Power calculation using G\*Power 3.1.3 showed that a sample size of 158 students was needed to attain an effect size of 0.25 with 80% power at a significance level of .05 (37). After controlling the Levene's test for the homogeneity of variance an ANCOVA was carried out to test the differential impact of the alternative training formats on the two dependent variables, considering initial differences in the co-variables. Afterwards, post hoc analysis was applied to get a pairwise comparison of the impact of particular interventions. Additionally, to compare pre- and post-test measures within each treatment condition, paired-sample T-test were calculated for self-efficacy and the cognitive consultation skills scores. Data were analyzed using SPSS v 17.0.

## Results

### Participation

All second year master students, enrolled for the formal consultation training course, were invited to participate in the study. Of the 204 registered students in 2009–2010, 196 students participated in the experimental study. Eight students could not participate due to a foreign exchange for one semester with a host institution abroad.

### Students' self-efficacy

Cronbach's alpha was calculated to check the reliability (internal consistency) of the self-efficacy scale:  $\alpha = .89$  prior to the study, and  $\alpha = .84$  at the end of the study. In view of the analysis, two self-efficacy scores are considered: a cluster score for the items related to the eight consultation components and a score based on the single general self-efficacy item (item 9).

Do the alternative training formats have a differential impact on self-efficacy? An ANCOVA was calculated with the pretest measure of the particular self-efficacy variable as covariate. The ANCOVA shows that the variable condition has a significant effect on the posttest self-efficacy (eight sub items) after controlling for the effect of the pretest self-efficacy measurement ( $F(2, 192)=4.410; p=.013$ ). The same analyses were calculated taking the general self-efficacy item (item 9) as dependent variable and general pretest self-efficacy item as covariate. The ANCOVA results show that the variable condition has a significant effect on the general self-efficacy item after controlling for the effect of the pretest self-efficacy score ( $F(2, 192)=9.643; p<$

.0001). The post hoc test shows a positive effect of the independent training ( $p=.016$ ) compared to the traditional training and the independent training ( $p=.021$ ) compared to the e-learning module.

When calculating the paired-sample T-test for each training format with the components related self-efficacy score as outcome variable, only students in the independent training format ( $n=60$ ) show a significant increase in self-efficacy ( $p=.016$ ). In relation to the general efficacy score (item 9), comparable results are found for the impact of the specific training formats ( $p=.446$ ;  $p=.001$ ;  $p=.873$ ) respectively (see Table 3.1).

**Table 3.1. Self-efficacy scores before and after the three consultation training sessions**

Training format	N	M/10 (pre) ± SD	M/10 (post) ± SD	Δ	t-value	P one-tailed
8 sub-items						
Traditional training	72	6.56 ± .89	6.54 ± .99	-.02	.143	.886
Independent training	60	6.58 ± .97	6.98 ± .94	+.40	-2.493	.016*
E-learning module	64	6.36 ± .76	6.60 ± .79	+.24	-1.892	.063
General item 9						
Traditional training	72	6.17 ± 1.02	6.29 ± 1.05	+.12	-.767	.446
Independent training	60	5.98 ± 1.36	6.75 ± 1.27	+.77	-3.644	.001*
E-learning module	64	5.88 ± 1.12	5.84 ± 1.13	-.04	.160	.873

Notes: \*paired sample T-test significant at  $p < .05$  (0: not at all certain to 10 very certain)

### The cognitive component of students' consultation performance

Do the alternative training formats have a differential impact on students' cognitive consultation competence? To answer this question, ANCOVA was calculated with the pretest scores of the cognitive component as a covariate. The ANCOVA shows that the variable condition has a significant effect on the cognitive consultation competence after controlling for the effect of the pretest scores

( $F(2,192)=5.091$ ;  $p=.007$ ) between the training formats. Post hoc analysis results show that the average consultation test scores are significantly higher of students involved in the traditional training format ( $p=.039$ ) and the e-learning module ( $p=.008$ ), both compared to the independent training (see table 3.2).

Table 3.2 summarizes the results of the paired-sample T-test when assessing the three training groups separately. Both students of the traditional training format

( $p < .0001$ ) and the e-learning module ( $p = .003$ ) show a significant increase in their cognitive component of the consultation competence.

**Table 3.2. Test scores of the cognitive consultation component before and after the three consultation training sessions**

Training format	N	M/20 (pre) $\pm$ SD	M/20 (post) $\pm$ SD	$\Delta$	t-value	P
Traditional training	72	9.96 $\pm$ 2.14	11.56 $\pm$ 2.41	+1.60	-4.985	.0001*
Independent training	60	10.29 $\pm$ 1.99	10.48 $\pm$ 2.57	+.19	-0.478	.634
E-learning module	64	10.42 $\pm$ 2.84	11.85 $\pm$ 2.62	+1.43	-3.059	.003*

Note: \*paired sample T-test significant at  $p < .05$

### Mediating effect of students' self-efficacy beliefs

To study the mediating impact of self-efficacy measures on the impact of the three training formats, an analysis of covariance was carried out with the cognitive competence component score as the dependent variable and the difference between the posttest and pretest value of both self-efficacy scores as the covariate. The ANCOVA shows that the variable condition has a significant effect on the cognitive consultation competence after controlling for the effect of the difference in self-efficacy

scores ( $F(2,192) = 5.176$ ;  $p = .006$ ). Post hoc analysis results point out that the traditional training ( $p = .010$ ) and the e-learning module ( $p = .003$ ), compared to the independent training format, lead to a significant higher increase in the cognitive consultation component.

### Discussion

The goal of our research was to study the differential impact of three alternative consultation training formats on self-efficacy measures and the development of the consultation competence. The three training formats differed in the approach on learning by doing, observational learning and immediate feedback. The study operationalized as such the guidelines of Artino *et al.* (2010) that medical educators should consider the impact of their training formats and also focus on motivation and emotions of students (25). Next to consultation performance, self-efficacy was used as a variable to assess the impact of the three different training formats. The latter was based on the premise that improved self-efficacy leads to better consultation

skills (23). However, Caspi *et al.* (2006) demonstrated within the area of evidence based medicine a discrepancy between the students' confidence in their abilities (self-efficacy) and their actual performance (38). These authors stress that within this skills domain it is not sufficient to rely solely on self-perceived competence as a proxy for actual skills attainment. As a result, in the present study, besides self-efficacy beliefs, the cognitive component of the consultation skills before and after the educational intervention was also explicitly measured.

Our results show a significant positive impact of the independent training on self-efficacy of students. We attribute this to the characteristics of this training format. The training format seems to be aligned with *Bandura's main sources* (1997) influencing self-efficacy beliefs (23):

- (1) *A direct experience*: being the physician during a role-play for the duration of a complete consultation
- (2) *The vicarious experience*: being the observer of a successful/unsuccessful peer involved in a consultation session
- (3) *Verbal persuasion*: receiving positive feedback from a simulated patient and a peer
- (4) *Emotional arousal*: feeling free to express themselves without a supervising physician.

The fact that stronger self-efficacy beliefs are not immediately associated with higher cognitive performance scores can be explained by the absence of a physician who highlights the errors and puts these in the correct perspective. In the independent training format, simulated patients only give feedback from the perspective of a patient. Secondly, Pearce *et al.* (2009) found that students question whether their peers are able to evaluate their work which may result in large quality differences in the feedback provided by peer students (39). Boehler *et al.* (2006) confirmed that students who receive compliments instead of constructive feedback are happier but will perform less adequately during repeated testing (40). We therefore conclude that it remains important to train students to observe critically the consultation activities and to direct them to give constructive but very critical feedback to their peers without feeling shy, anxious or pedantic.

The question also arises why we do not find a comparable significant increase in self-efficacy after involvement in the traditional training format? Paskins and Peile (2010) emphasize the potential impact of confidence and fear in the complexity of simulation-based training (29). At Ghent University, students have few opportunities to practice intensively with a simulated patient. The presence of a supervising

physician gives additional pressure: students are nervous and want to perform well. The feedback of the physician has a strong impact, positively or negatively, on their confidence levels. With limited training possibilities, the critical 'negative' feedback of the supervising physician may lead to disappointment after the training, resulting in lower self-efficacy scores.

The traditional training and e-learning module did result in a significant increase of the cognitive consultation performance scores. For the traditional training, this reiterates the value of the involvement of an experienced physician: errors are put in the right perspective and nuances and bottleneck issues within the consultation can be clarified within a broader framework linked to practice. The results of the e-learning module also confirm available findings in the literature. Hong *et al.* (1996) claim a positive effect of computer-assisted learning on the clerk's level of knowledge (41). In another study we found that students score the educational value of the e-learning module significantly lower compared to the supervised and independent training format. So students are not aware of the advantage of this format on their cognitive consultation performance.

An important issue is to determine the position of alternative consultation training formats within the curriculum. We have to ensure that the positive impact of the independent training format does not lead to an overestimation of student's self-efficacy. The Self Determination Theory of Deci and Ryan (2000) puts forward three key elements for the personal development of students and obtaining optimal learning: autonomy, competence and relational connectedness (42). The independent training format meets the need towards autonomy (practice with simulated patient and a peer without a physician) and relational connectedness (positive atmosphere with an emphasis on constructive feedback from the simulated patient and peer). The feeling of competence can be affected by the placement of the training within the curriculum. Dubois *et al.* (2007) highlights the importance of feedback for students to realize what level of knowledge and ability they possess (27). If students start exercising autonomously too early without feedback of an experienced physician, they will easily assume they are doing well. Because of their lack of experience the feedback of their peers and their own self-reflection can lead to a false feeling of competence.

The present study reflects some limitations but also inspires directions for future research. First, we did not measure the overall quality of the consultation performance. The present results cannot be generalized as to the impact on real performance in



a consultation setting. Though some training formats did result in a positive impact on self-efficacy as measured immediately after the training, but no conclusions could be made as to the middle or long-term impact. We recognize that the positive effect of the e-learning module could have been influenced by partial similarities in the format of the test measuring the cognitive component of the consultations skills and the training format. Finally, the duration of the intervention was limited (one session of 2 hours 10 minutes for each student) and therefore the measured differences in outcome variables were rather small. We plan qualitative research to validate and corroborate the above results. Longer studies have to be set up to study the persisting and substantial impact of the alternative training formats. In particular, follow-up studies could also focus on the long-term development of the complex consultation competence.

## Conclusion

The results of this study suggest that the three consultation training formats contribute to the learning process, but in a different way. In response to the demand from students at Ghent University to get more training opportunities, two alternative training methods can be included in the curriculum for second year master students as an expansion next to the traditional method. The independent training has a positive effect on students' self-efficacy beliefs. The traditional training and e-learning module positively influence the cognitive component of students' consultation performance. It is therefore important to consider the best implementation of each approach within the medical curriculum. Medical educators should be aware of the impact of the training formats and consider, next to the impact on cognitive variables, the impact on motivational mediating variables also. The present results reiterate the value of the traditional training method with supervising physician. Feedback of experienced physicians is critical for students to find out what level of knowledge and skills they already possess. We believe that the traditional method is essential to establish a basis of consultation skills; students start with this training in the first and second master year. The independent training with feedback of the simulated patients/peers and the e-learning module are subsequently valuable but students should be sufficiently trained in critically observing consultations (with simulated patients or video fragments) and providing constructive feedback to their peers.

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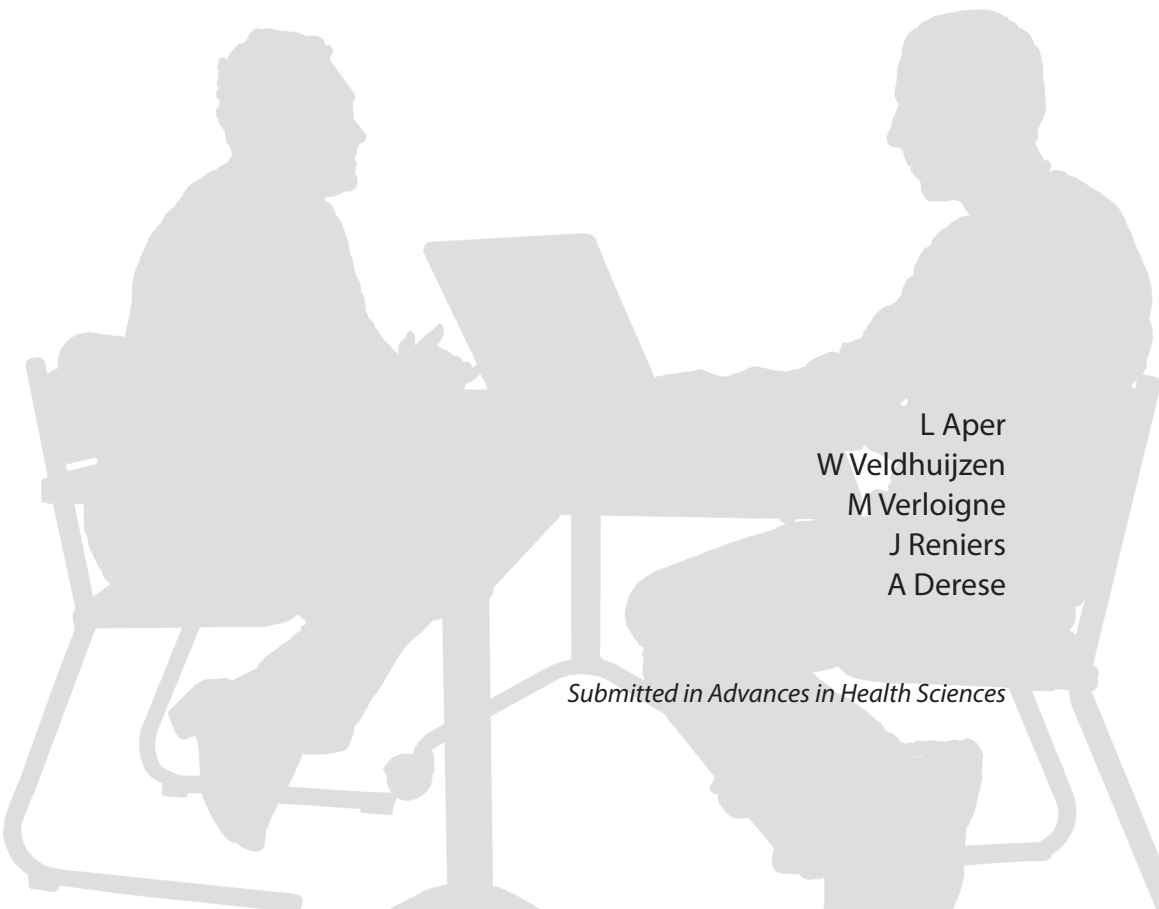
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**Chapter 5:**  
**“I feel capable of conducting a consultation”:**  
**development of medical students’ self-efficacy**



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*Submitted in Advances in Health Sciences*



## **Abstract**

### **Objective**

Medical students' self-efficacy is a main determinant of their motivation to learn. Because conducting consultations is a core task of the medical profession, this study investigated how students' self-efficacy for different consultations skills (e.g. communication skills, clinical technical skills, clinical reasoning skills) relate to each other, how self-efficacy changed within different learning environments and if this change was different for female and male students.

### **Methods**

A longitudinal cohort study was set up over a period of 17 months. Self-efficacy of specific consultation skills and integration of all skills were measured seven times, alternating between skills lab training and fulltime clerkships. Confirmatory factor analysis was applied and repeated Measures MANOVA was conducted.

### **Results**

Students' self-efficacy on exploratory and explanatory communication skills was significantly higher than their self-efficacy on clinical technical skills and integration of all skills. Individual students' self-efficacy generally increased over time, with a higher score after each skills lab session and a decrease during clerkships for all skills. Women scored their self-efficacy for all skills significantly lower compared to men. The change in self-efficacy of women for explanatory communication was significantly different compared to men.

### **Conclusions**

Training experiences in skills lab setting had an immediate positive impact on students' self-efficacy, but this impact decreased each time when students were on clerkships. The understanding of this varying self-efficacy can help clerkship supervisors in developing strategies to positively affect students' self-efficacy.



## Introduction

Conducting consultations is a core task of doctors. It is therefore essential that medical training prepares students for this task. To conduct consultations students have to integrate different skills into one moment (e.g. communication (1,2), diagnostic skills or clinical reasoning skills (3,4) and clinical technical skills, such as specific physical examinations and history taking (5-8). Integrating these skills is difficult for medical students. Learning to conduct consultations can therefore be defined as a complex learning task and is characterized by a lengthy process in which mental effort, and as a consequence motivation must be taken into account (9). Students' motivation to learn is guided by the questions: "Why am I doing this task?" and "Can I do this task?"(10). To answer the latter question students' control beliefs are relevant such as students' self-efficacy beliefs referring to their personal capabilities or skills to execute a task in a certain environment (11).

Bandura (1997) defined self-efficacy as "the beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations" (12). These beliefs of personal competence affect behavior (10). The self-efficacy theory of Bandura (1997) states that students will be more active, effortful, and effective learners when they have high self-efficacy beliefs for specific activities (12) because they address their work with more confidence. They will perform better but also obtain more well-being (13). This positive impact of self-efficacy on performance has been confirmed for medical students' academic performance (14,15).

Men generally score their self-efficacy higher than women but confidence may differ between genders depending on the type of skill or task involved (16). Especially women tend to have a high confidence level when tasks are perceived as gender-neutral or in the more 'traditionally feminine-type' skills (e.g. verbal or interpersonal) (16). They underestimate their abilities in the more 'traditionally masculine-type' skills or occupations (17), for example in the field of computing(18). Minter *et al.* (2005) found a trend of female surgical residents underestimating themselves, while male and female residents performed equally (19).

Prochaska (2009) stresses that self-efficacy is not a once-and-for-all ability but an evolving self-concept (20). Studies focusing on the change in self-efficacy beliefs for conducting consultations are rare. Only three previous studies have investigated the longitudinal change in self-efficacy beliefs of consultation related skills. Ammentorp *et al.* (2007) and Norgaard *et al.* (2012) reported positive effects of in vitro training on

the self-efficacy beliefs of health care professionals concerning their communication skills over a period of six months (21,22). Hecimovich and Volet (2012) reported that medical students' level of confidence in patient communication and clinical skills increased significantly over the duration of an internship (23). Other studies are cross-sectional in nature but also suggest students' or residents' confidence in clinical procedures (such as venipuncture) or communication skills increased significantly over training years (24,25). However, a cross-sectional study of Kaufman *et al.* (2001) measured students' self-efficacy regarding aspects of patient–doctor communication within three problem based learning sessions (first, second and fourth year students) (26). Self-efficacy scores were highest for the entering class, after which it dropped following an exposure to a skills class (second-year students) and increased for the fourth year class while they were in clinic. This study suggests that in clinic students can learn by doing, which gives them the opportunity to feel efficacious in specific consultation skills. On the contrary, Bombeke *et al.* (2012) found that the self-efficacy students gained during communication skills training faded in real practice (27). This qualitative study showed that medical students are often shocked by the disparities between the learning environments of communication skills training and real practice.

The studies above focused on the self-efficacy beliefs of specific consultation 'sub-skills' (24) whereby a lot of attention is paid to the confidence in communication skills (21-23,25-27). We did not find a study that focused on the whole task of conducting integrated consultations or how the self-efficacy beliefs of the different consultation skills relate to one another.

In conclusion, there is a lack of long-term longitudinal studies of students' self-efficacy for conducting consultations with attention to the impact of learning environments. Furthermore, studies how self- efficacy of the different consultation skills relate to each other and what the impact of gender is on self-efficacy of these skills are scarce. Therefore, this study focuses on:

- how students' self-efficacy beliefs for the skills necessary to conduct consultations (communication skills, clinical technical skills and clinical reasoning skills) relate to each other
- the longitudinal change in students' self-efficacy beliefs for these skills over different learning environments
- the longitudinal change in self-efficacy beliefs of male and female students

## Methods

### Self-efficacy instrument

A questionnaire was used, based on the design principles of Bandura (2006) to measure students' self-efficacy beliefs concerning the competence of conducting consultations: efficacy items refer to specific behavior, are phrased in terms of "can do" and assess operative capabilities as they are perceived at that moment (28). The questionnaire measured students' self-efficacy beliefs concerning the competence of conducting consultations and entailed eight items that address eight specific tasks within the consultation (see Table 5.1) (29). To perform these eight tasks three consultation skills are needed (i.e. exploratory communication, clinical technical skills and clinical reasoning integrated with explanatory communication). The 9<sup>th</sup> item of the questionnaire measures the self-efficacy to integrate all tasks: 'I am capable of performing a whole consultation.' Respondents indicate at a specific moment in time how confident they felt in their ability using a Likert-type scale ranging from 0 = 'not at all confident' to 10 = 'completely confident'. These items were discussed with the skills lab supervisors who are responsible for the integrated consultation course to ensure whether the instrument entails a representative reflection of the measured construct (content validity).

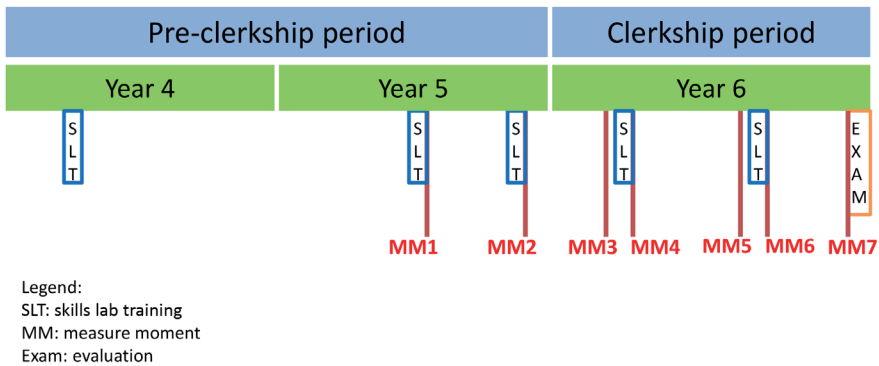
### Study design

Over a period of 17 months medical students' self-efficacy beliefs were measured seven times. Measurements were done both before and during clerkships, linked to skills lab training sessions and just before the exam (see Figure 5.1). This longitudinal cohort was approved by the Ethical Committee of Ghent University Hospital.

All fifth year medical students of Ghent University (n=204) who enrolled in the integrated consultation course, were invited to fill in the self-efficacy scale over a period of 17 months. The seven-year undergraduate medical curriculum at Ghent University is based on a mixture of conventional learning formats and problem based learning(30). In the bachelor phase (year 1 to 3), students attend separate training sessions in communication skills, history taking, clinical examination skills and clinical reasoning. Later on, in the master phase, students practice complete consultations within an integrated consultation course. In year 4-5, students participate in three mutually reinforcing training formats with simulated patients and immediate feedback interspersed with observational clerkships. In year 6 and 7, students are on

fulltime clerkships in three-week periods with both supervised and independent real patient contacts. In light of the suggestion of Bombeke *et al.* (2012) to organize structured rehearsal of integrated skills and set up reflective conversations in the clinical phase (26), students have the opportunity to practice their consultation skills once more in the skills lab. Depending the training format during year 5, students participated during the clerkship period in the online training, supervised training and/or independent training.

**Figure 5.1: Visualization of 7 measure moments (MM) within the master phase of the undergraduate medical curriculum with specific moments of skills lab training (SLT)**



## Statistical analysis

After replacing missing values using multiple imputation(31) we used descriptive statistics and compared means to screen the data and examine relationships between sets of variables and possible differences between gender. A confirmatory factor analysis using AMOS 22 was applied to assess the significance and fit of the model to the observed data. Our model consisted of the three earlier defined consultation skills (exploratory communication, clinical technical skills and clinical reasoning integrated with explanatory communication) as the latent variables. The eight scale items represented the indicator variables. To assess the internal consistency of the subscales and the higher-order scale, Cronbach's alpha was computed for each subscale. We also examined on which self-efficacy beliefs subscale students had the highest score throughout the whole measurement period. To do so, we conducted a Repeated Measures ANOVA with time as a within-factor (7 measurements) and the different types of SE beliefs (exploratory communication, technical skills and

explanatory communication integrated with clinical reasoning) as a between-factor. We will report the main effect of the between-factor in the results.

We performed power analysis with G\*Power 3.1.3. This enabled us to check whether our sample size yielded enough power (>90%) to detect a difference within the study population using Repeated Measures MANOVA, within factors with an effect of .20. With an  $\alpha$ -value of .05 the required total sample size was 81 (32). To investigate the change in the self-efficacy beliefs over time, a Repeated Measures MANOVA was conducted. For this purpose, we will report the time effect. To check if the change in the self-efficacy beliefs was different for males and females, students' gender was included as a between-factor. For this purpose, the interaction-effect between time and gender will be reported. We will also report the main effect of gender in the results.

## Results

### Participation

The study population consisted of 204 fifth year medical students, we were able to collect data from 196 students (96%) of which 122 respondents (60%) filled in the questionnaire 7 times. To detect possible differences between responders and non-responders we used the imputed dataset to compare the mean and pooled mean score of the self-efficacy beliefs on the consultation skills at the start and at the end of their trajectory. Furthermore we checked gender equity. No significant differences were found for these components. We rejected data from those 74 participants due to gross incompleteness (for example, respondents who did not fill out the questionnaire for an entire measure moment or a specific sub item). The remaining sample of 122 respondents consisted of 66% female and 34% male students. These respondents groups was still more than the calculated sample size (>81) to obtain enough power (>90%) when using Repeated Measures MANOVA within factors with an effect of .20.

### Investigating the subscales within the self-efficacy questionnaire

The confirmatory factor analysis showed a good fit of the model with the three consultation skills (e.g. exploratory communication skills, clinical technical skills, explanatory communication integrated with clinical reasoning) to the observed

data. However, the  $\chi^2$  was significant in the model ( $\chi^2(17)=55,375, p<.001$ ). This apparent lack of fit is not surprising because very small differences between expected and observed correlations in large samples can lead to a significant  $\chi^2$  (35). Other fit indexes showed good fits for the model: goodness of fit was high (GFI=.934) as well as the adjusted goodness of fit (AGFI=.860). The root mean square residual suggested a less good fit (RMSEA=.109). However, non-incremental fit indexes, such as Bentler-Bonett Normed Fit Index (NFI=.928) and the Comparative Fit Index (CFI=.948) confirmed these good fits. To confirm our three factor structure an exploratory factor analysis of principal components with varimax rotation was executed afterwards. Both the Kaiser-Meyer-Olkin Measure of Sampling Adequacy entails .82 and Bartlett's test of sphericity ( $\chi^2(28) = 756.65 p<.001$ ) indicate that in general a factor analysis is useful within our data. Standardized factor loadings for the model are represented in Table 5.1. An item with a factor loading higher than .60 on a factor was considered to load sufficiently high on the relevant factor. The Cronbach's alpha for each subscale were high enough,  $>.70$ , for the different subscales. The corrected item-total correlations were  $>.50$  for the items in each skill.

**Table 5.1: Exploratory factor analysis on the self-efficacy questionnaire**

Factor	1	2	3	h <sup>2</sup>
<b>Questionnaire item</b>	<b>Factor loadings</b>			
I feel capable of ...				
<i>Exploratory communication</i>				
1. exploring the patient's story.	0.89	-	-	0.79
2. listening to the cognitions (ideas) and emotions of the patient.	0.82	-	-	0.82
3. exploring the patient's expectations.	0.79	-	-	0.71
<i>Clinical technical skills</i>				
4. having a clear view of the questions I want to ask in relation to the different parts in history taking.	-	0.87	-	0.80
5. performing the physical examination systematically.	-	0.80	-	0.83
<i>Explanatory communication integrated with clinical reasoning</i>				
6. explaining the diagnosis in an understandable language to the patient.	-	-	0.86	0.82
7. making the link to elements from the opening of the consultation: Why is this patient coming to me? What is the relevance of his ideas, emotions and expectations?	-	-	0.83	0.73
8. explaining the follow-up measures of this consultation.	-	-	0.73	0.80
<b>Eigenvalue</b>	4.17	1.23	0.85	
<b>Factor variance</b>	52.16	16.06	10.67	
<b>Total variance</b>	52.16	68.22	78.89	
<b>Cronbach's alpha</b>	0.85	0.78	0.83	

Note: An item with a factor loading higher than .60 on a factor was considered to load sufficiently high on the relevant factor. The eigenvalues tells for each of the 3 factors, how much of the variance in the 9 items was captured by that factor. A factor with an eigenvalue of 1 has captured as much variance as there is in one variable. The Communalities (h<sup>2</sup>) shows what proportion of each variable's variance is shared with the factors which have been created. As reflected in the accumulated variance, the first three principal components explained more than 75% of the total variance.

### **Relation of the different consultation skills to each other**

Multivariate analyses indicated a significant difference in the self-efficacy beliefs according to the type of consultation skills ( $F(3,480)=11.65, p<.001$ ) over time with gender as covariate. Students scored their SE of exploratory communication significantly higher than the self-efficacy of their technical skills ( $p=.002$ ) and the integration of all skills ( $p=.004$ ) at all seven measure moments. Furthermore, students' self-efficacy beliefs of explanatory communication with clinical reasoning were significantly higher than the SE of technical skills ( $p<.001$ ) and integration of all skills ( $p<.001$ ).

### **Students' self-efficacy beliefs concerning the different consultation skills alternating different learning environments**

Figure 5.2 shows that students' self-efficacy beliefs for exploratory communication ( $F(6;726)= 4.34, p<.001$ ), technical skills ( $F(6;726)=9.71, p<.001$ ), explanatory communication integrated with clinical reasoning ( $F(6;726)=4.55, p<.001$ ) and integration of all skills ( $F(6;726)=13.37, p<.001$ ) gradually increased over time with significant differences between the different measure moments. In particular, students' SE for the integration of all skills was significantly higher in the end (MM6 and MM7) as compared to the start (MM1-MM3). Table 5.2 visualizes the mean scores of SE on the seven measure moments for the different skills.



Students' self-efficacy for communication was significantly higher after the final skills lab session (MM6) as compared to the first measure moment (MM1) and the measure moments done during clerkships (MM3 and MM5). Within this final skills lab session (MM6) students also reported significantly higher SE for their technical skills compared to the other measure moments (except from MM4). SE of explanatory communication integrated with clinical reasoning was significantly higher during skills lab training (MM4 and MM6) compared to the clerkships (MM3 and MM5). Finally, students scored their SE for the technical skills significantly lower during the exam period (MM7) as compared to the final skills lab session (MM6).

**Figure 5.2: Change in self-efficacy beliefs for the three consultation skills and for integration of all skills alternating skills lab training (SLT), clerkships and exam period (n=122)**

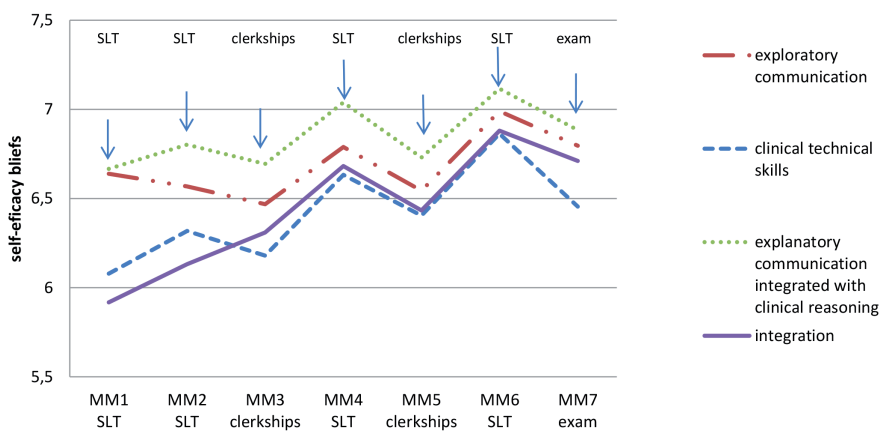


Table 5.2: Self-efficacy mean scores for the three consultation skills and for integration of all skills over time with interaction effect for gender

Consultation skills	Mean $\pm$ SD MM1 SLT	Mean $\pm$ SD MM2 SLT	Mean $\pm$ SD MM3 clerkship	Mean $\pm$ SD MM4 SLT	Mean $\pm$ SD MM5 clerkship	Mean $\pm$ SD MM6 SLT	Mean $\pm$ SD MM7 exam	Time (F-value)	Time* gender (F-value)
Exploratory communication	6.63 $\pm$ .96 <sup>f</sup> 1.31	6.58 $\pm$ 1.24	6.46 $\pm$ 1.06 <sup>f</sup>	6.79 $\pm$ 1.29	6.54 $\pm$ .97 <sup>f</sup>	6.98 $\pm$ .99 <sup>a,ce</sup>	6.78 $\pm$ 1.15	4.34**	1.20
Clinical technical skills	6.07 $\pm$ 1.31 <sup>df</sup>	6.31 $\pm$ 1.31 <sup>f</sup>	6.16 $\pm$ 1.08 <sup>df</sup>	6.62 $\pm$ 1.05 <sup>a,c</sup>	6.40 $\pm$ 1.04 <sup>f</sup>	6.86 $\pm$ 1.04 <sup>a,b,c,e,g</sup>	6.45 $\pm$ 1.21 <sup>f</sup>	9.71**	1.80
Explanatory communication integrated with clinical reasoning	6.67 $\pm$ 1.10 <sup>df</sup>	6.80 $\pm$ 1.25	6.67 $\pm$ 1.04 <sup>df</sup>	7.03 $\pm$ .87 <sup>a,c,e</sup>	6.71 $\pm$ .98 <sup>df</sup>	7.10 $\pm$ .93 <sup>a,c,e</sup>	6.87 $\pm$ 1.06	4.55**	3.25*
Integration of all skills	5.93 $\pm$ 1.21 <sup>c,d,e,f,g</sup>	6.13 $\pm$ 1.22 <sup>dg,f</sup>	6.29 $\pm$ 1.08 <sup>df,g</sup>	6.67 $\pm$ .92 <sup>a,b,c</sup>	6.42 $\pm$ .92 <sup>a,f</sup>	6.86 $\pm$ .95 <sup>a,b,b,c,d</sup>	6.70 $\pm$ 1.06 <sup>a,b,b,c</sup>	17.37**	1.30

\* $P < .05$  \*\* $P < .01$ . \*\*\* $P < .001$

<sup>a,b,c,d,e,f,g</sup> :

pairwise comparisons Bonferroni show significantly different mean values ( $P < .05$ )

<sup>a</sup> : significantly different from MM1, <sup>b</sup> : significantly different from MM2, <sup>c</sup> : significantly different from MM3, <sup>d</sup> : significantly different from MM4, <sup>e</sup> : significantly different from MM5, <sup>f</sup> : significantly different from MM6, <sup>g</sup> : significantly different from MM7

## Gender differences in self-efficacy beliefs

### *General impact of gender*

Overall, there was a significant difference in the self-efficacy beliefs according to gender ( $F(6,477)=4.51, p<.0001$ ). Female students scored their self-efficacy for all consultation skills significantly lower compared to male students ( $p<.001$ ), except at the moment of examination.

### *Differences in the change in self-efficacy beliefs for male versus female students*

Concerning the change in self-efficacy beliefs, our results show a significant interaction effect between time and gender for explanatory communication integrated with clinical reasoning ( $F(6;720)=3.25, p=.004$ ), but not for exploratory communication, technical skills and integration of all skills (see Table 5.3). This means that only the change in SE for explanatory communication integrated with clinical reasoning was different for male and female students. SE for explanatory communication integrated with clinical reasoning of female students was significantly higher during the last two skills lab sessions (MM4-MM6) and the exam (MM7) compared to the first measure moment (MM1) and the measurements during clerkships (MM3 and MM5). For male students, SE for explanatory communication integrated with clinical reasoning remained the same over time (see Table 5.3 and Figure 5.3).

**Table 5.3: Self-efficacy mean scores of male (n=41) and female students (n=81) over time for explanatory communication integrated with clinical reasoning skills**

Gender	Consultation skills	Mean ± SD MM1 SLT	Mean ± SD MM2 SLT	Mean ± SD MM3 clerkship	Mean ± SD MM4 SLT	Mean ± SD MM5 clerkship	Mean ± SD MM6 SLT	Mean ± SD MM7 exam	F-value
<b>Female students</b>	Explanatory communication integrated with clinical reasoning	6.42 ± .12 <sup>d,f,g</sup>	6.71 ± .14	6.51 ± .11 <sup>d,f,g</sup>	6.96 ± .10 <sup>a,c,e</sup>	6.56 ± .11 <sup>d,f,g</sup>	7.01 ± .10 <sup>a,c,e</sup>	6.95 ± .12 <sup>a,c,e</sup>	6.31***
<b>Male students</b>	Explanatory communication integrated with clinical reasoning	7.17 ± .90	6.98 ± 1.20	7.08 ± .86	7.20 ± .86	7.07 ± .84	7.33 ± .92	6.75 ± 1.38	1.67

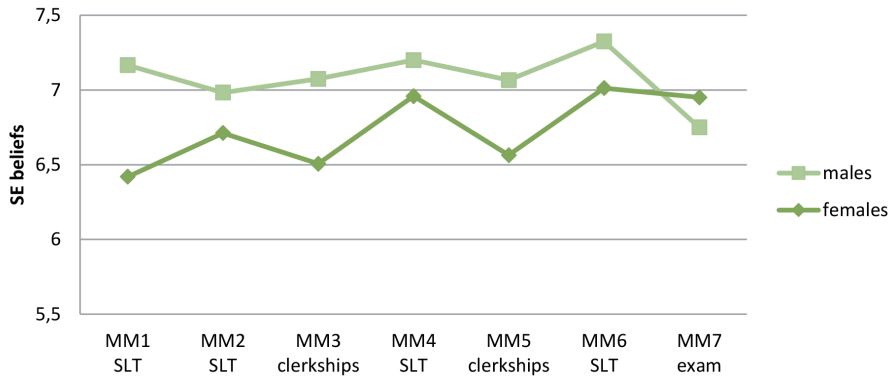
\*P < .05 \*\*P < .01. \*\*\*P < .001

<sup>a b c d e f g</sup>

: pairwise comparisons Bonferroni show significantly different mean values (P < .05)

<sup>a</sup> : significantly different from MM1, <sup>b</sup> : significantly different from MM2, <sup>c</sup> : significantly different from MM3, <sup>d</sup> : significantly different from MM4, <sup>e</sup> : significantly different from MM5, <sup>f</sup> : significantly different from MM6, <sup>g</sup> : significantly different from MM7

**Figure 5.3: Evolution of all self-efficacy beliefs for explanatory communication integrated with clinical reasoning skills for males and females over time**



## Discussion

Our study shows that the overall comparison of students' self-efficacy beliefs (SE) for the different skills shows that students scored their SE on exploratory communication and on explanatory communication integrated with clinical reasoning skills significantly higher than their SE on the technical skills and integration of all skills. Furthermore, students' SE for the four consultation skills increased over time whereby SE tends to be higher directly after skills lab training than during clerkships. Finally, a changing environment has more impact on the change in SE of female students for explanatory communication integrated with clinical reasoning as compared to male students.

The self-efficacy theory of Bandura states that students with high self-efficacy beliefs will be better performers because they will be more confident and invest more effort in specific activities (12). Our results show that students score their SE for communication (exploratory and explanatory) significantly higher than the technical skills and integration of all skills. However, the literature shows that students communicate inadequately during clerkships and make little or no progress or even decline in their communication skills (33-36). We may shed light on this seemingly incongruence between theory and findings, by what we found in another qualitative study. In this study both pre-clerkships and clerkship students considered improvement of their medical problem solving skills more relevant for delivering good patient care

than improvement of their patient communication because they considered the latter already sufficient (37). Hence their investment in learning was guided by the questions "Why am I doing this task? How can I improve myself?" and not so much by the answer on "Can I do this task?" (10). So it seems that in this situation which is characterized by a big task value, low self-efficacy beliefs seem to have a positive instead of a negative effect on students' effort to learn.

Several cross sectional studies show that students in higher years of the educational program have higher SE beliefs compared to younger students (24-25). This study indicates that the evolution in SE is not linear but is affected by the environment. In line with the findings of Ammentorp *et al.* (2007) and Norgaard *et al.* (2012), we found that fresh training experiences in the skills lab tended to have an immediate positive effect on medical students' SE for the three consultation skills and the integration of all skills (21,22), in particular for the technical skills and clinical reasoning. Bombeke *et al.* (2010) found that students' SE for communication faded in real practice because students were shocked by the disparities between what they were being taught and what doctors do in real practice (38). This might be a partial explanation of the decrease in students' SE for the consultation skills and integration of all skills during clerkships. Other possible explanations are: students have to work with real patients for the first time, often under time constraints (38,39) and therefore need more feedback and support (40). So during clerkships students will feel more "aware incompetent" as described by Maslow (1954) as compared to the skills lab setting where the task is adapted to the potential level of students' competence (41).

Gender literature shows that women tend to underestimate their abilities compared to men (16-19). This study indicates that the changing environment had more impact on the SE of female students for one specific consultation skill (i.e. explanatory communication integrated with clinical reasoning) compared to male students. Hecimovick and Volet (2012) also found that confidence in clinical skills was related to gender whereby male students rated their confidence in clinical skills higher than female students (23). Literature shows us that females are more sensitive to stress and their coping mechanism is more oriented on environmental support. When the latter is hierarchical, masculine and competition driven, women have more difficulty to regulate their negative emotions (such as stress or anxiety) than men (42,43). Historically, the field of medicine is defined as a "masculine" occupation (44,45). So, this may contribute in explaining the findings of this study. However, it remains unclear why the skills needed during the explanation and planning are related to gender and the skills needed to perform the other consultation parts not. A possible explanation

may be that this part of the consultation, experienced as difficult by students, poses a big challenge for students especially during clerkships, while the clinical reasoning process is being supported by supervisors during skills lab sessions. Hence female students lower SE scores during clerkships for diagnostic reasoning may represent an accurate estimation of themselves.

Some limitations need to be discussed. Within the present longitudinal cohort study medical students' self-efficacy beliefs concerning their consultation skills were only measured at one university. Furthermore, because in our questionnaire consultation skills are operationalized as tasks in the consultation, we did not measure each skill separately (i.e. clinical reasoning is only measured in combination with communication). Furthermore, taken into account the knowledge of 5<sup>th</sup> and 6<sup>th</sup> year undergraduate students, important elements of therapy and planning were discussed with the supervisor in advance, which made it more difficult to measure the aspect of clinical reasoning on its own. At last, it would have been even better to perform a face validity test using cognitive interviewing techniques in addition to the content validity.

To conclude, this study confirms that self-efficacy beliefs concerning the consultation skills generally increase over time, though not linearly due to a changing environment. Skills lab training has a positive impact on students' self-efficacy beliefs, whereas the clerkship environment leads to a decrease. This decrease might be explained by the fact that students experience consultations during clerkships as more complex compared to skills lab sessions that are adapted to the students' level of competence. Finally, women scored their self-efficacy beliefs for explanatory communication integrated with clinical reasoning significantly lower during clerkships compared to men.

## **Implications for research and practice**

Our findings show that students feel self-confident in their communication skills but are insecure about their technical skills. It would be interesting to analyze if students assess themselves correctly on the different consultation skills. In practice supervisors may adjust their personal feedback to help students realize what level of knowledge and ability they possess (46). This will help students in balancing their effort to learn and practice the different consultation skills correctly. Secondly, it would be relevant to investigate the task value of the different consultation skills as perceived by students and how this relates to their effort. Thirdly, taking into account the conflicting

outcomes in the literature on the association between students' self-efficacy and their performance (47-54), this association could be investigated by measuring students' consultation performance on the different consultation skills parallel with SE. Finally, the relation of gender differences for SE of the consultation skills must be investigated more in depth. For example, qualitative studies may set more light on the gender differences of SE for the different consultation skills that we found.

This study shows that skills lab training, clerkships and exam periods have a different impact on students' self-efficacy beliefs. Skills lab sessions are adjusted to the level of current development of students whereas real practice is far more complex and, thus, a bigger challenge for students. It is up to medical educators to make sure the challenge during clerkships remains constructive, building students' practical competence and positive state of mind instead of adversely affecting students' self-efficacy. Supported participation in practice at a level that is appropriate to the students' level of education must be the core condition for workplace learning(55).



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**Chapter 6:**  
**Managing the complexity of doing it all: an exploratory study on students' experiences when trained stepwise in conducting consultations**



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## Abstract

### Background

At most medical schools the components required to conduct a consultation, medical knowledge, communication, clinical reasoning and physical examination skills, are trained separately. Afterwards, all the knowledge and skills students acquired must be integrated into complete consultations, an art that lies at the heart of the medical profession. Inevitably, students experience conducting consultations as complex and challenging. Literature emphasizes the importance of three instructional design guidelines: moving from partial tasks to whole task learning, diminishing supervisors' support and gradually increasing students' responsibility. This study explores students' experiences of an integrated consultation course using these three instructional guidelines to support them in this difficult task.

### Methods

Six focus groups were conducted with 20 pre-clerkship and 19 clerkship students in total. Discussions were audiotaped, transcribed and analysed by Nvivo using the constant comparative strategy within a thematic analysis.

### Results

Conducting complete consultations motivated students in their learning process as future physician. Initially, students were very much focused on medical problem solving. Completing the whole task of a consultation obligated them to transfer their theoretical medical knowledge into applicable clinical knowledge on the spot. Furthermore, diminishing the support of a supervisor triggered students to reflect on their own actions but contrasted with their increased appreciation of critical feedback. Increasing students' responsibility stimulated their active learning but made some students feel overloaded. These students were anxious to miss patient information or not being able to take the right decisions or to answer patients' questions, which sometimes resulted in evasive coping techniques, such as talking faster to prevent the patient asking questions.



## Conclusion

The complex task of conducting complete consultations should be implemented early within medical curricula because students need time to organize their medical knowledge into applicable clinical knowledge. An integrated consultation course should comprise a step-by-step teaching strategy with a variety of supervisors' feedback modi, adapted to students' competence. Finally, students should be guided in formulating achievable standards to prevent them from feeling overloaded in practicing complete consultations with simulated or real patients.

## Background

In ambulatory care and family practice, meetings between doctors and patients are “consultations”. In acute hospital care, phrases like “seeing on rounds” or “conducting a complete history and physical examination” reflect a narrower focus on the integration of communication, clinical reasoning and physical examination skills (1,2). These doctor-patient contexts have several components in common: building rapport; identifying patients’ perspectives by exploring their ideas, concerns and expectations; obtaining information; clinical reasoning; making a diagnosis; and developing a management plan (3). Conducting a consultation is a complex competence because physicians have to integrate parallel processes of communication, history taking, technical examination and clinical reasoning. The learning process of this complex competence is also challenging, because all the medical knowledge and skills students acquired in other parts of the curriculum before, must be adopted and integrated.

Starting before 1910, this learning process was achieved naturally. Medical education was founded wholly on apprenticeship principles whereby students learned the complex competence of consulting by “seeing one, doing one, and teaching one” (4). Although those learners learned the different components of simple tasks at different times, they were exposed to the whole task of a consultation from the outset and did not have to integrate medical knowledge and skills acquired within other parts of the curriculum.

Later on, curricula changed because biomedical knowledge increased rapidly and therefore specific training became necessary. The Flexner reforms of 1910 added a preparatory education in biomedical science to medical students’ apprenticeship education (5). Inspired by Balint (1963) (6), general practitioners (GP) in the UK(7) started to develop communication education. First GP postgraduate curricula and then undergraduate curricula introduced communication skills training using simulated patients (8,9). Communication training was later sanctioned as a core component of undergraduate medical curricula by policy statements such as the UK General Medical Council’s influential first edition of “Tomorrow’s Doctors” (10). Medical knowledge, history-taking and physical examination skills continued to be taught by practitioners alongside communication skills training by educationalists in clinical skills laboratories using simulated patients. Practitioners focused on the content of consultations; educationalist and psychologists focused on their

processes. Only students continuously crossed the boundaries between those two different approaches.

Lately, it has been argued that content and process should be taught together to obtain a better transfer during clerkships. Therefore, Kurtz *et al.* (2003) advised to teach their communication model integrated with clinical reasoning and physical examination skills (11). Although there is a wealth of studies evaluating methods to train communication skills, clinical reasoning skills and physical examination skills separately, there is yet little empirical information on the best methods to learn the complex task of executing complete consultations.

In educational literature there are many examples of theoretical design models that have been developed to promote the learning of complex tasks. Van Merriënboer and Sweller (2010) developed specific instructional design guidelines to manage complex learning tasks (12). These authors state that the intrinsic load of a complex task can be managed by moving from simple to complex learning scenarios and working from low to high fidelity environments whereby the responsibility of students gradually increases. For example, asking students to perform a physical examination on a simulated patient can be defined as a simple learning scenario. Applying the complete consultation model is a complex learning scenario. Working with computer simulated patients is an example of a low fidelity environment with little responsibility for students. Later on, students' learning can take place in more high fidelity environments whereby students conduct consultations with simulated patients or with real patients. Furthermore, van Merriënboer and Sweller (2010) emphasize that novice learners ask different support than more experienced learners within complex tasks (12). For example, in the beginning students want to discuss all the important consultation elements of content in advance: What is your differential diagnosis? What do you want to explore in your physical examination? What are your findings and how would you proceed with this patient? Later on, this guidance will gradually decrease: during clerkships students might practice whole consultations with real patients and only receive feedback of their supervisor at the end.

Van Weel-Baumgarten *et al.* (2013) reported on their integrated consultation course in the curriculum program of Nijmegen University, Netherlands. They concluded that students highly rewarded the integrated clinical communication curriculum and due to their practice with simulated patients students felt positively prepared

for practice with real patients (13). By using questionnaires this study did not explore in depth why students appreciated this course. Which instructional design guidelines are essential within an integrated training course to make students feel prepared for the real practice? These questions are important for medical educators evaluating and adjusting their curriculum. Therefore, this study aimed to explore in depth how students experienced the integrated consultation course and how they are influenced by this step-wise teaching of the consultation competence using the following instructional guidelines (12):

- moving early from partial tasks to whole tasks
- starting with intensive support and gradually diminishing this support
- gradually raising the level of students' responsibility by working from low to high fidelity environments

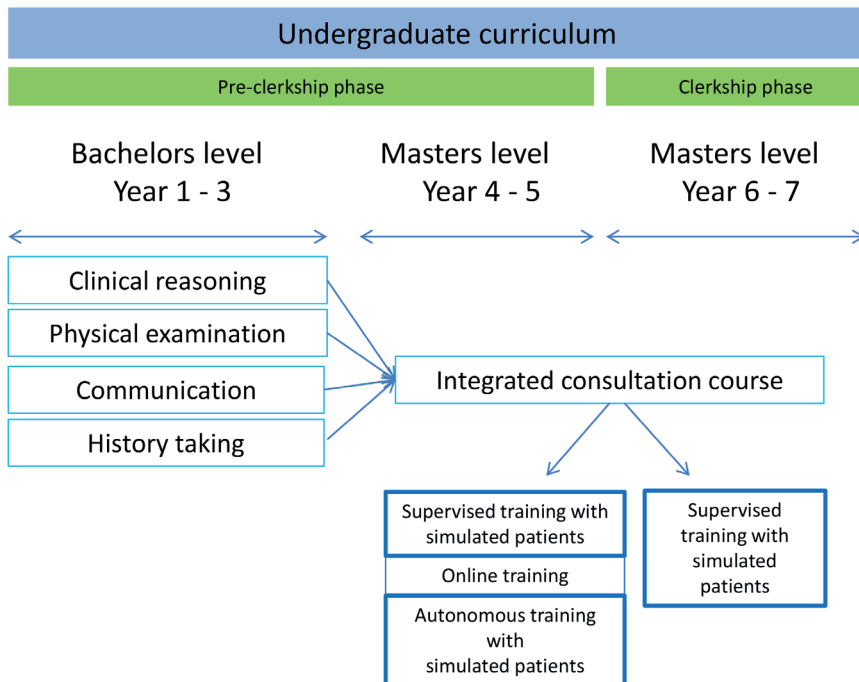
## Methods

### Context

The research was conducted in the medical education program of Ghent University, which lasts seven years; three years to bachelors level and four years to masters level. Graduates must then complete 2-5 years of residency in their chosen specialties before they can practice independently.

In the bachelor phase students attend training sessions in communication skills, physical examination skills, and clinical reasoning separately from one another. Afterwards they learn to integrate those different consultation skills in a total of fifteen simulated patient encounters during the integrated consultation course (see Figure 6.1).

**Figure 6.1: Undergraduate medical curriculum design from partial task to whole task learning**



## Integrated consultation course

In year 4-7 the integrated consultation course uses different mutually reinforcing training formats whereby supervisors' support gradually decreases and students' responsibility increases (see Table 6.1). Students start with supervised trainings, moderated by a faculty member (general practitioner/skills lab supervisor). Then they participate in an e-learning module to prepare for the unsupervised training sessions where they only receive feedback from simulated patients and peers. Year 5 entails observational clerkships whereby students watch from the side. In year 6-7 students are on fulltime clerkships in periods of three weeks practicing on real patients under the guidance of clinical supervisors. In between these clerkships students participate once more in training sessions supervised by faculty staff.

*Table 6.1: Description of the training formats of the integrated consultation course*

Training format	Description
<b>1.Supervised training with simulated patients (year 4 - 6)</b>	Students practice full consultations with simulated patients in groups of three. Each student is responsible for one part of the consultation (opening/history taking – physical examination – diagnosis, treatment and planning) whereby the student can rely on the supervising physician and peers for help. Afterwards students start with a self-reflection activity, followed by feedback from two peers and supervisor.
<b>2.E-learning module (year 5)</b>	An interactive web environment positions students individually in “virtual” consultations. Students are responsible for judging the consultation process and content on accuracy. The observation of small film fragments is guided by open-ended questions that prompt students about the various dimensions of consultations. Students type their answers in an input box and immediate, standardized feedback follows.
<b>3.Independent training with simulated patients (year 5)</b>	Students train in pairs without supervision. Each of them conducts a full consultation with a simulated patient, while their peer observes. Feedback starts with a self-reflection activity followed by feedback of the simulated patient and peer. After the two consultations, a debriefing session take place with a physician (8–12 students) to discuss students' questions.
<b>4.Clerkship training with real patients (year 6 - 7)</b>	Especially during emergency, GP training, Pediatrics and Internal Medicine clerkships students practice partial or full consultations with real patients, often in a separate room. Afterwards students debrief their clinical supervisor and observe the end of the consultation.

## Study design

This is a design based research in which we explore, qualitatively, how students experienced a theory-informed curriculum design (14-16) i.e. an integrated consultation course based on the instructional design guidelines of van Merriënboer and Sweller (2010) (12). We chose two student groups within the learning trajectory to obtain a diversity of opinions: Year 5 students, who participated in the pre-clerkship training formats of the integrated consultation course, but who had seen clinical practice only as observers. Year 6 students, who were in their clerkships and practiced on real patients for about one year.

## Research team

The methodology of design based research is characterized by a collaboration among researchers and practitioners in real-world settings (16). So, the research team consisted of one researcher/educationalists (LA) and three medical doctors with ample experience in medical education either in communication training as researcher (WV) or in medical skills and consultation training of students within the undergraduate medical curriculum (WV, JR, AD).

## Recruitment

We approached all year 5 and 6 medical students at Ghent University by email (n=411). Eighteen students registered on this first call. Students were informed we aimed to recruit respondents with a range of scores on the individual consultation skills and permission to access their individual consultation scores was asked. Supplementary LA approached individual students face-to-face to reach a balance in both male/female ratio and a mix in low and high scores on their clinical or communication skills. Table 6.2 visualizes gender equity within the different focus groups. Within this 'purposive' sampling, participation was voluntary and all participants gave written informed consent.

*Table 6.2: Characteristics of student focus groups*

	FG1	FG2	FG3	FG4	FG5	FG6	Total
Academic year	6	5	5	5	6	6	
Participants n	6	5	8	7	6	7	39
Male/female n	3/3	¼	3/5	2/5	2/4	3/4	14/25

## Data collection

We chose to explore students' experiences in focus groups so they could build on one another's experiences. The focus groups lasted about 90 minutes and took place during lunchtime on days when students were on campus. At the beginning, the moderator (JR) assured students that full confidentiality was guaranteed. As observer, LA kept detailed field notes during each session. During the focus groups students discussed positive and negative experiences of the time related phases within the integrated consultation course. These time related phases are a consequence of implementing the three instructional guidelines in our curriculum. The discussions were audiotaped and transcribed verbatim. Focus groups were scheduled until saturation was reached.

## Analysis

Transcripts were entered into NVivo Version 8 (QSR, Doncaster, Australia). An iterative process of analysis is done in line with the principles of thematic analysis (17). All phrases related to the integrated consultation course were coded. The process of creating codes was both pre-set, created prior to data collection, and open, created while transcripts were reviewed. The pre-set codes were based on the three instructional guidelines and other important didactic principles within the integrated consultation course (see Appendix I). The "emergent codes" stayed semantically close to participants' own words. Next, these codes were organized in themes of interrelated codes using a constant comparative strategy in order to develop conceptualization of possible relations. All the transcripts were analyzed independently by the first two authors (LA and JR), who discussed any differences in codes after each analysis of a transcript until consensus was reached to develop a single codebook for use in the rest of the analyses. To broaden the interpretation AD and WV both coded parts of the discussions. LA, JR and WV established the relationship between the resulting themes and the instructional guidelines and discussed this in depth.



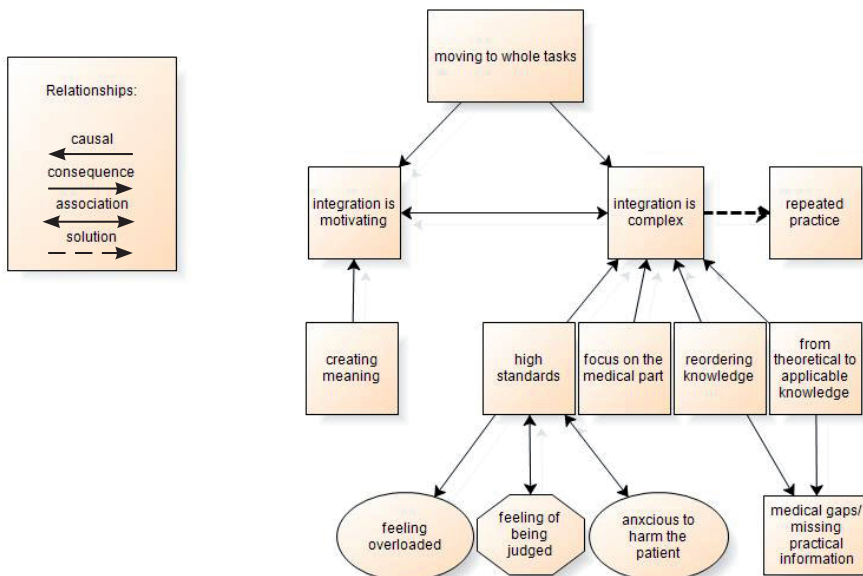
## Results

### Participation

Twenty pre-clerkship students participated in three focus groups (PC FG 1-3) and nineteen clerkship students participated in another three focus groups (C FG 1-3). Mean duration of the focus group sessions was 90 minutes. All sessions were characterized by animated discussions. We organized the results in relation to the descriptions of students' experiences according to the underlying instructional guidelines of the integrated consultation course whereby the different key concepts of each didactic principle are schematically visualized in three figures. These key concepts of each didactic principle are depicted by a specific shape (respectively rectangle, ellipse or octagon). The different shapes within the figures make it possible to show the inter- and intra-relationships between the results. However, we are aware that distinguishing these three instructional guidelines is more or less artificial because they are interrelated within our curriculum. Furthermore, to enrich the results we choose explicitly to integrate specific quotes which illustrate the essence of the 'lived' emotions, thoughts and experiences of the students.

### Moving from partial tasks to the whole task of a consultation

Figure 6.2: Scheme of moving to the whole task of a consultation



After practicing communication skills, physical examination skills, and clinical reasoning separately in the previous years, students felt motivated to integrate their consultation skills within the structure of a complete consultation with simulated patients. As can be seen in Figure 6.2, this motivation is nourished by the fact that students found integrating content and process of the consultation more meaningful than doing any one of its components separately: *“The big difference is that during consultation training you have the clinical context. You have to examine the patient and make a diagnosis. In communication [training] it is less important what you say, the focus is on the way you tell it.”* (PC FG2) *“The integrated consultation course should start earlier, even if you do not possess the necessary theoretical and practical knowledge, then you already know: ok, that is how it works ...”* (PC FG2). However, performing the whole task of a consultation was complex and frustrating, because students set high standards for themselves. Even later, they also became aware that their primary focus was more on the medical part than on the patient and that they had to transfer their theoretical knowledge into applicable clinical knowledge on the spot. Students described repeated practice of conducting consultations as a solution to get a grip on these difficulties (see Figure 6.2).

### ***Developing the ability to manage all consultation skills at once***

At first, students found it hard to integrate their clinical thinking and communication with the patient into a technically proficient interview *“... give me some time ... I will get to the questions that are essential for that complaint but not in that one moment of speaking”* (PC FG3). Mastering the medical side of the consultation, i.e. in particular clinical reasoning and physical examination, was perceived as more important and challenging by students. So during the whole task of performing a consultation students were very much focused on: *“What should I ask? ... you ask several things about abdominal complaints ... Do I forget something? Does the sequence of my questions make any sense?”* (PC FG2). In another example during the e-learning module, students could address both medical content and communication process. Still they were particularly focused on their medical knowledge and clinical reasoning: *“I was preoccupied with the symptoms of the disease ...”* (C FG2) *“I found it useful to sharpen my clinical reasoning ...”* (C FG1). More advanced students found themselves paying more attention to their communication skills during the unsupervised training or during clerkships: *“ ... when I felt confident about the content of the consultation I could focus more on my communication with the patient”* (C FG3). Only after repeated practice students underscored that their primary focus on the medical part seemed

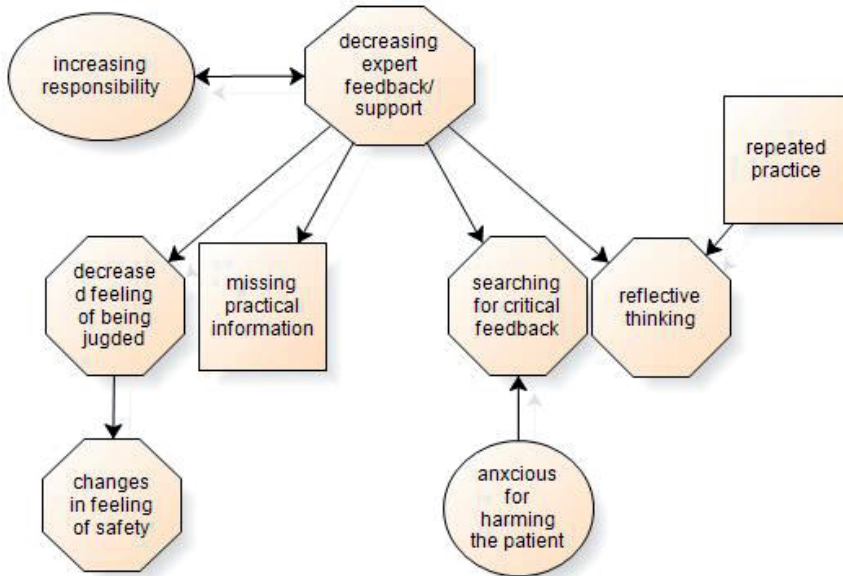
to regulate itself and they were able to sufficiently manage the consultation skills simultaneously. Overall, our results show students set high standards for themselves and were very much focused on performing as an expert with extensive medical knowledge rather than as a novice at the start of a long learning trajectory. For example, during some clerkships students got plenty of time to question a patient on their own but were afraid this would result in a non-focused strategy: “... *too much time leads to the risk of not being efficient in targeting the most important questions first*” (C FG1).

### ***Transferring theoretical medical knowledge into applicable clinical knowledge***

Conducting complete consultations forced students to reorder their medical knowledge: “... *in [studying] theory ... you always got the diagnosis and underneath all the symptoms ... too little we make the reverse link ... in a consultation ... the patient just tells you some symptoms ... you have to check other symptoms ... on the basis of a differential diagnosis ...*” (PC FG2). So, pre-clerkship students became aware that their pre-clerkship education had been too theoretical and divorced from practice to be easily applicable into real consultations. “*Often after lectures I do understand a disease but I ask my friends: what do I do when I see a real patient? What investigations do I plan? How to be sure of the diagnosis? That has not been explained clearly... the way we do it in consultation training we would remember it more easily... now we just memorize it* (PC FG1).” As a consequence, students became aware of the gaps in their medical knowledge as future physicians. Students had difficulties developing a differential diagnosis “*at this point you ask a few standard questions “fever? How long? ... without having a diagnosis in your mind ...*” (PC FG2) or distinguishing the most relevant complaints: “*What is important?*” (C FG2). Students looked forward to be able to prioritize: “... *during history taking I ask very broad questions ... my medical thinking is not focused enough compared to my supervisors*” (C FG1) “*I hope the clerkships bring a kind of relief in all the flat courses we had ... what is the most common?*” (PC FG3). At the end of a consultation the hands-on side of medicine needed to be addressed whereby pre-clerkship students realized they missed a lot of practical knowledge about planning and referring: “*A woman with a meniscus tear ... should I first call an orthopedic surgeon or should I arrange an MRI scan? ... the simulated patient asked me “Doctor, what will happen at first?” ...*” (PC FG1).

## Gradual decrease in supervisors' feedback/support

Figure 6.3: Scheme of decreasing supervisors' feedback/support



The integrated consultation course started with sessions whereby students can rely on a supervisor for feedback and support. Especially in the beginning, students found the support of a supervisor important when they had difficulties to continue the consultation or failed in their clinical reasoning: *"when we were working with simulated patients for the first time and got lost, I felt confident I could rely on the supervisor. We got feedback and could start again"* (PC FG2). *"... but it is important that there is someone next to you indicating what you are doing well or what went wrong."* (C FG2). Contrary to our expectations, students indicated at the same time that they found it challenging to be closely supervised and judged by a physician. This resulted for students in an unsafe environment with feelings of insecurity: *"Every word we said and every logical step we took was overheard and could be wrong. That caused stress."* (PC FG3). Decreasing the presence of a supervisor resulted in a decreased feeling of being judged, which in turn created a more safe learning environment for students (see Figure 6.3). Furthermore, the shift from supervisors' support/feedback to online support and to feedback of simulated patients and peers triggered students to reflect spontaneously on their own actions and to appreciate the value of critical feedback.

### **Trigger to reflective thinking**

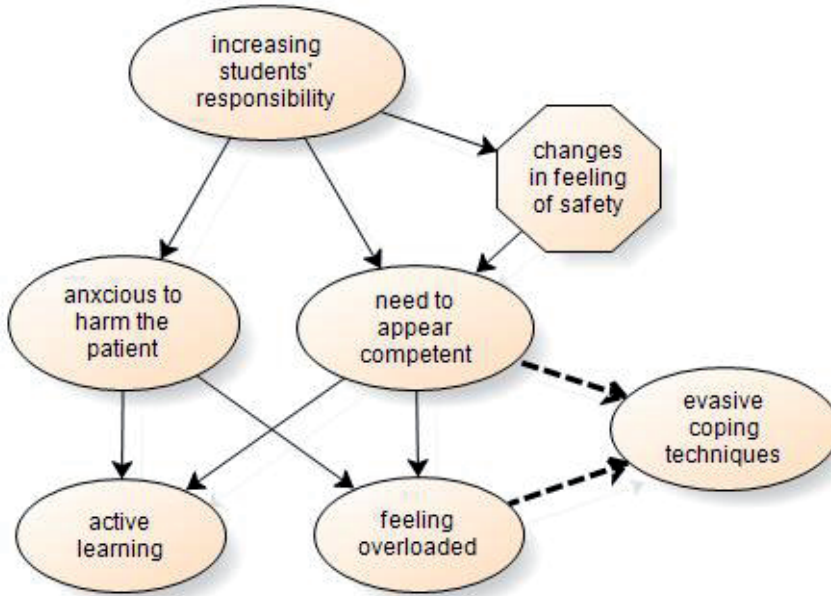
Decreasing supervisors' support made students aware it was up to themselves to reflect spontaneously on their actions and to be self-critical: *"I have spent 18 weeks in the same emergency department, ... you have your own routine where nobody is watching. Often the consultation is not as it should be, but no one gives feedback. It is up to yourself to think about your own performance."* (C FG3) Especially, during clerkships this reflection resulted in tapping other resources: students indicated the e-learning was useful at that time to practice their clinical reasoning or to correct themselves on specific physical examination tests. However, students admitted that reflecting required effort: *"If you see the doctor after your own intervention, you can evaluate very quickly what you forgot, what you did differently and where you should pay attention to next time."* But the question whether these observed actions are also correct requires an additional effort (C FG3).

### **Appreciation of critical feedback**

Pre-clerkship students felt very insecure about their consultation competence and these respondents indicated they needed a physician who highlighted the positive aspects of their performance, with only a limited amount of negative feedback. The critical feedback they sometimes received had a huge impact on the confidence of pre-clerkship students who felt vulnerable: *...I got negative feedback ... and it left me with a bad feeling: "Was it that bad?"... because ... you remember the negative points and positive aspects are said loosely in between: "ah, that was ok, that did you do well."* (PC FG1). After repeated practice with a supervisor, pre-clerkship students became more self-confident. But the shift to electronic support and peer feedback included pro's and con's. The electronic support was appreciated because it helped students to be attentive to the different steps of a consultation: *"the feedback for me had a kind of alarming effect ... Did I know it all? I may not forget this and that ..."* (PC FG3). Concerning the peer feedback, students indicated they missed the level of medical accuracy: *"My fellow students did not know more than me ... or sometimes I did not trust the reflections of my peer."* (PC FG1). So, the moment supervisors' support decreased, students missed their feedback, because it might have helped them to correct errors or understand nuances in the consultation structure. Later on, when clerkship students experienced only minimal support of their clinical supervisors, they started actively searching for critical feedback: *"I always asked for critical remarks during clerkships ... only by receiving that [feedback] I can grow"* (C FG2).

## Gradual increase in students' responsibility

Figure 6.4: Scheme of increasing students' responsibility



The aim of the integrated consultation course is that students gradually learn to deal with responsibility by working from low to high fidelity environments. During the supervised sessions students appreciated the time-out discussion with the supervisor concerning the medical content *"I felt prepared to perform that part of the consultation with the simulated patient"*. During the e-learning module students indicated their sense of responsibility was less addressed because there was no real interaction with the patient. During the unsupervised training sessions students became responsible to integrate content and process in a consultation role play with a simulated patient. Students experienced these sessions as very close to reality, creating a large feeling of responsibility. Later on, this feeling of responsibility made students anxious not to harm the patient and made them feel the need to appear competent (see Figure 6.4). So, despite the preparation within the simulated setting, the transition towards having responsibility for real patients remained difficult. In year six students were immersed into the real world: *"It was a big step ... I was thrown immediately into the emergency room ... and suddenly I had to start doing everything myself. ... you are stunned ..."*(CFG1).

As Figure 6.4 visualizes, the anxiousness to harm the patient and the need to appear competent had the advantage of stimulating active learning but unfortunately, some students felt overloaded even within this gradual teaching approach.

### ***Stimulating active learning***

Throughout the medical curriculum students were accustomed to follow theoretical lessons and passively observing physicians. Increasing students' responsibility made pre-clerkship students understand that being able to reproduce their theoretical knowledge was not enough, they needed to apply this knowledge: "... *how do I make a correct diagnosis? ... until now I was just memorizing ...*"(PC FG2). During the e-learning module students evaluated their medical knowledge "... *I could test myself ... "Would I have asked those questions too?.* (PC FG1)" But the responsibility towards real patients during clerkship training activated students' thinking process the most: "... *I started to make little lists of what I should ask ...*"(C FG1).

### ***Feeling overloaded***

Apparently, even with our stepwise teaching approach of increasing students' responsibility, some respondents still felt overloaded. Students wanted to appear competent but were anxious to miss important information, not to be able to answer patients' questions or not to take the right decisions: "*I find the unsupervised training very valuable, ... but I experienced also a feeling of insecurity, it is up to me to make the decisions*" (PC FG1). "*It is with extremes, ... one clerkship I got responsibility for the therapy ... It was my very first clerkship, I was not ready for it yet ...*" (CFG3). Some students who had difficulties with this responsibility when they acted autonomously were adopting evasive coping techniques as a solution, even within the simulated setting: "*I started talking very fast with my patient hoping she wouldn't ask me any further questions*" (PC FG1)

## Discussion

### Main results

This study explores three instructional principles based on the guidelines of van Merriënboer and Sweller (2010) (12) (i.e. moving early from partial tasks to whole tasks, gradually diminishing the supervisors' support, gradually raising the level of responsibility of students by working from low to high fidelity environments) within an integrated consultation course where students learn the process of conducting consultations. Implementing the whole task of consulting with real patients within medical curricula makes students aware that they have to reorganize their medical knowledge and transfer their theoretical medical knowledge into applicable clinical knowledge. Furthermore, it stimulates students' active learning and triggers their reflective thinking. Within this stepwise teaching approach managing the consultation skills simultaneously remains difficult, because students set high standards for themselves with the risk of feeling overloaded. Initially, students have their primary focus on the medical part of the consultation (e.g. having extensive medical knowledge, being able to recognize the most important symptoms, focusing their history taking sufficiently) with high expectations about time efficiency. Furthermore, students are vulnerable and afraid of receiving negative feedback. However, after repeated practice they are able to perform the basics of the consultation process and want to refine their competence by explicitly asking for critical feedback.

### Comparison to the literature

Our results show that dealing with the complexity of a complete consultation forces students to transfer their theoretical medical knowledge into applicable clinical knowledge. This is in line with Prince *et al.* (2005) that students do not seem to have the appropriate knowledge readily available (18). Our respondents agree that the clinical practice called for a different type of clinical knowledge as compared to what they acquired during pre-clinical training. Furthermore, the focus group discussions tell us that students experience their thinking process is not quick enough to pose the right questions in relation to a particular complaint. Mandin *et al.* (1997) stress the fact that the inability to recall information stored in memory is due to lack of cognitive organization and understanding (19), which supports students' perceived need to reorganize information. Therefore, Prince *et al.* (2005) and Bombeke *et al.* (2012) suggest that the pre-clerkship curriculum should organize structured rehearsal



of integrated skills and set up reflective conversations in the clinical phase (18,20).

Earlier studies state that working with simulated patients eases the transition to real patients contact within medical curricula (5,21). Nevertheless, our study shows that conducting consultations with real patients remains a difficult transition, that entails a huge jump in responsibility for students, but also activates their thinking process the most. We agree with Bokken *et al.* (2010) and Spencer *et al.* (2000) who state that real patients make a more profound impression on students (22) and therefore promote the relevance of students' learning (23).

Our results show that students set high standards for themselves when they are exposed to the experience of performing a consultation for the first time. This can be explained by the fact that learning to conduct complete consultations is a moment of transfer whereby students have to deal with new expectations and new responsibilities (24). This is implicated in the research of Verdonk *et al.* (2014) who indicate that medical students perceive the medical culture as hierarchical and competitive where they have to present themselves continuously as professional and self-confident (25).

Finally, our findings demonstrate the dilemma that exists between diminishing the supervisors' support when the consultation competence of students grows, and the need of students for critical feedback when they are able to perform the basics of consulting in a context of increasing responsibility. Similar to our results, Bok *et al.* (2013) have found that during clinical clerkships, students actively seek feedback when they have responsibilities in patient care (26). Other studies have shown that the feedback of a supervisor, who is standing higher in clinical hierarchy, is perceived by medical students as better compared to feedback from peers or paramedical staff (27,28).

## **Limitations**

Despite the interesting findings of this study some of its limitations need to be addressed. In the present study only a specific student sample was included from one university in Belgium. However, using well defined instructional design guidelines within our research question make our findings relevant for other universities who might wish to integrate these instructional guidelines within their own training formats. The concept of 'early' moving from partial to whole tasks learning can be interpreted differently within every medical curriculum. In our curriculum 'early'

means starting two years before clerkships (year 4), which is a bit late in the curriculum compared to other universities. Maastricht University for example, already starts with whole task learning in year 1 (29). Further research can involve other participants like educational staff and clinical supervisors as their complementary experiences might enrich our understanding of the gains and pitfalls as students learn to integrate the complex task of performing a consultation.

## Conclusion

Moving early to whole task learning of consultations within medical curricula with decreasing supervisors' support and increasing students' responsibility had several advantages. Students' initial primary focus on the medical part regulated itself and students were motivated to pay attention to their communication skills. Furthermore, students became aware they should transfer their theoretical knowledge into applicable clinical knowledge. They were stimulated in their active learning and triggered in their reflective thinking. Paradoxically, starting with intensive supervisors' support and diminishing this support gradually did not match with students' needs for critical feedback. A variety of supervisors' feedback modi, adapted to students' consultation competence, should be provided. But, even within this step by step teaching approach the transition to being responsible for real patients remained difficult and overwhelming for some students. Supervisors should help students in formulating achievable standards throughout their learning trajectory to prevent them from feeling overloaded and adopting evasive coping techniques.

## Implications

- This study emphasizes the importance of incorporating the practice of complete consultations early within medical curricula, in order to give students the time to reorganize their knowledge before they are immersed into the real world.
- Instead of decreasing supervision during the integrated consultation course, it is important to explore how supervisors' feedback can remain present and adaptive to the competence of the students during their learning trajectory. Video recording of students' consultations can offer a solution whereby students decide on which part of the consultation they want feedback from a supervisor.
- The fact that conducting consultations with real patients activates students' thinking process the most, underlines the importance of sufficient pre-clinical

training opportunities with real patients and real decisions in a safe environment (30). However, a huge effort is expected from supervisors to achieve specific learning goals in these real patients contacts. Ideally, a tailor-made student approach with different supervisors' feedback modi is needed, but logistically difficult to achieve.

- This study shows that students seem to have difficulty to realize they are at the start of a long learning trajectory in consulting whereby they gradually transfer theoretical knowledge into applicable knowledge. Medical students may benefit from Jacobson who describes in essence what the beginning of a learning trajectory in consulting is about: "within the utility of the medical student interview ... the biggest gift is time ... these early experiences will shape the clinicians we will become. The skills of patience and empathy are inherent, but ... need practice ... a medical student has ample opportunity to practice these important skills ..." (31).

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**Chapter 7:**  
**“Should I prioritize medical problem solving or  
attentive listening?”; the dilemmas and  
challenges that medical students experience  
when learning to conduct consultations.**



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## **Abstract**

### **Objective**

Communication skills can be trained alongside clinical reasoning, history taking or clinical examination skills. This is advocated as a solution to the low transfer of communication skills. Still, students have to integrate the knowledge/skills acquired during different curriculum parts in patient consultations at some point. How do medical students experience these integrated consultations within a simulated environment and in real practice when dealing with responsibility?

### **Methods**

Six focus groups were conducted with (pre-)/clerkship students.

### **Results**

Students were motivated to practice integrated consultations with simulated patients and felt like ‘real physicians’. However, their focus on medical problem solving drew attention away from improving their communication skills. Responsibility for real patients triggered students’ identity development. This identity formation guided the development of an own consultation style, a process that was hampered by conflicting demands of role models.

### **Conclusion**

Practicing complete consultations results in the dilemma of prioritizing medical problem solving above attention for patient communication. Integrated consultation training advances this dilemma to the pre-clerkship period. During clerkships this dilemma is heightened because real patients trigger empathy and responsibility, which invites students to define their role as doctor.

### **Practice implications**

When training integrated consultations, educators should pay attention to students’ learning priorities and support the development of students’ professional identity.

## Introduction

Meetings between doctors and patients lie at the heart of medical practice (1). Such meetings are “consultations” in which doctor-patient communication has been designated as “the main ingredient of medical care” (2). Good communication improves patient satisfaction (3), compliance, patient health outcomes (4), and utilization of health care resources (5). Therefore, communication skills programs are provided during undergraduate and postgraduate medical education. However, the quality of doctor-patient communication in practice varies (6,7).

Several studies point out a low transfer of communication skills from training setting to medical practice (8-10). Medical students tend to lose patient-centered attitudes as they progress through medical school, especially during clinical clerkships (11-14). To enhance the teaching of communication skills and stimulate the effective application in medical practice, Kurtz *et al.* (2003) and Cary *et al.* (2013) emphasize the importance of communication skills training alongside training of the other consultation skills: clinical reasoning, history taking and clinical examination skills (15, 16). When and how medical students learn to integrate the different consultations skills depends on the overall curriculum design. The latter is characterized by a great variety: e.g. conventional, case-based, problem-based or fully integrated experience based curricula (17,19). However, in all these curricula students have to transfer the knowledge and skills acquired during different parts of the medical curriculum in integrated consultations with patients at some point. As a consequence consultation skills training is often characterized by two periods of transfer. Firstly, medical students transfer the skills and knowledge, learned within the different parts of the medical curriculum, in integrated consultations, often with simulated patients. Secondly, students transfer their consultation skills from integrated practice within a simulated environment to real practice and need to deal with medical responsibility.

Available research about this first transfer period shows that students appreciate sufficient pre-clinical training, in which communication and medical content is integrated, because they feel better prepared for clerkships (20,21). We did not find studies on how students experience conducting complete consultations.

The second transfer period, often described as the transition from theoretical training to clerkships, has been investigated by several authors, who described this period as stressful for medical students (14,22-23). Students have difficulties applying theoretical knowledge in clinical practice (24). They experience problems with performing

clinical procedures (21) and their communication skills decline during clerkships (14). None of these studies focused on the complexity of conducting complete consultations whereby students are responsible for the whole consultation process.

Integrated consultation practice with simulated patients and real patients are transfer periods with new challenges and new responsibilities. Therefore, students need new coping strategies (25) and develop new habits. These strategies and habits can either promote or block further growth (26). The low transfer of communication skills suggests the sub-optimal use of these transfer periods. Hence, it is important to investigate them and explore how their use may be improved, because acquired bad habits are difficult to correct later on (27).

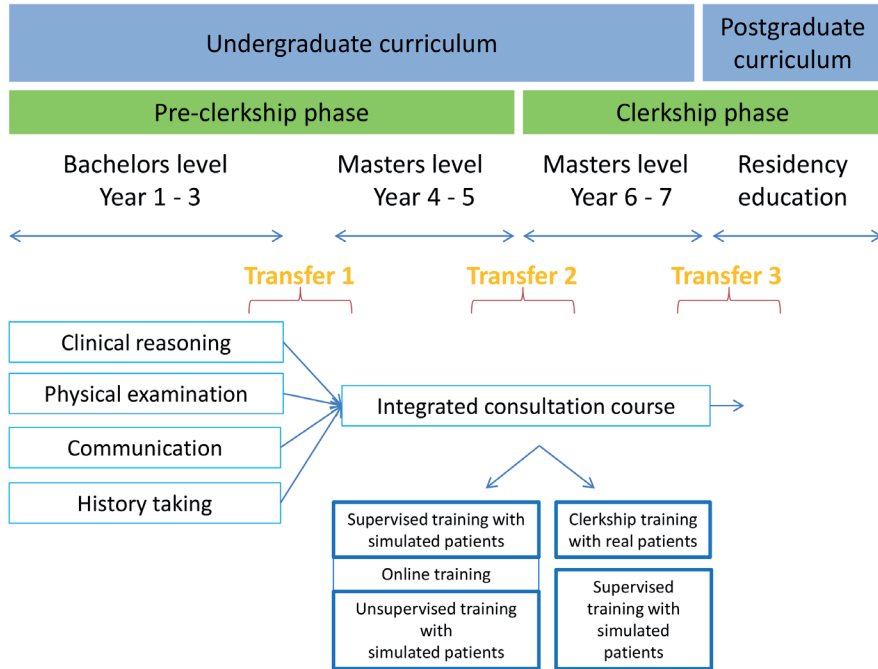
This qualitative study explores how students experience conducting complete consultations during those two transfer periods within one medical curriculum. The research questions were: 1) How do students experience integrating their consultation skills within a simulated environment? 2) How do students experience integrating their consultation skills in real practice when dealing with medical responsibility?

## Methods

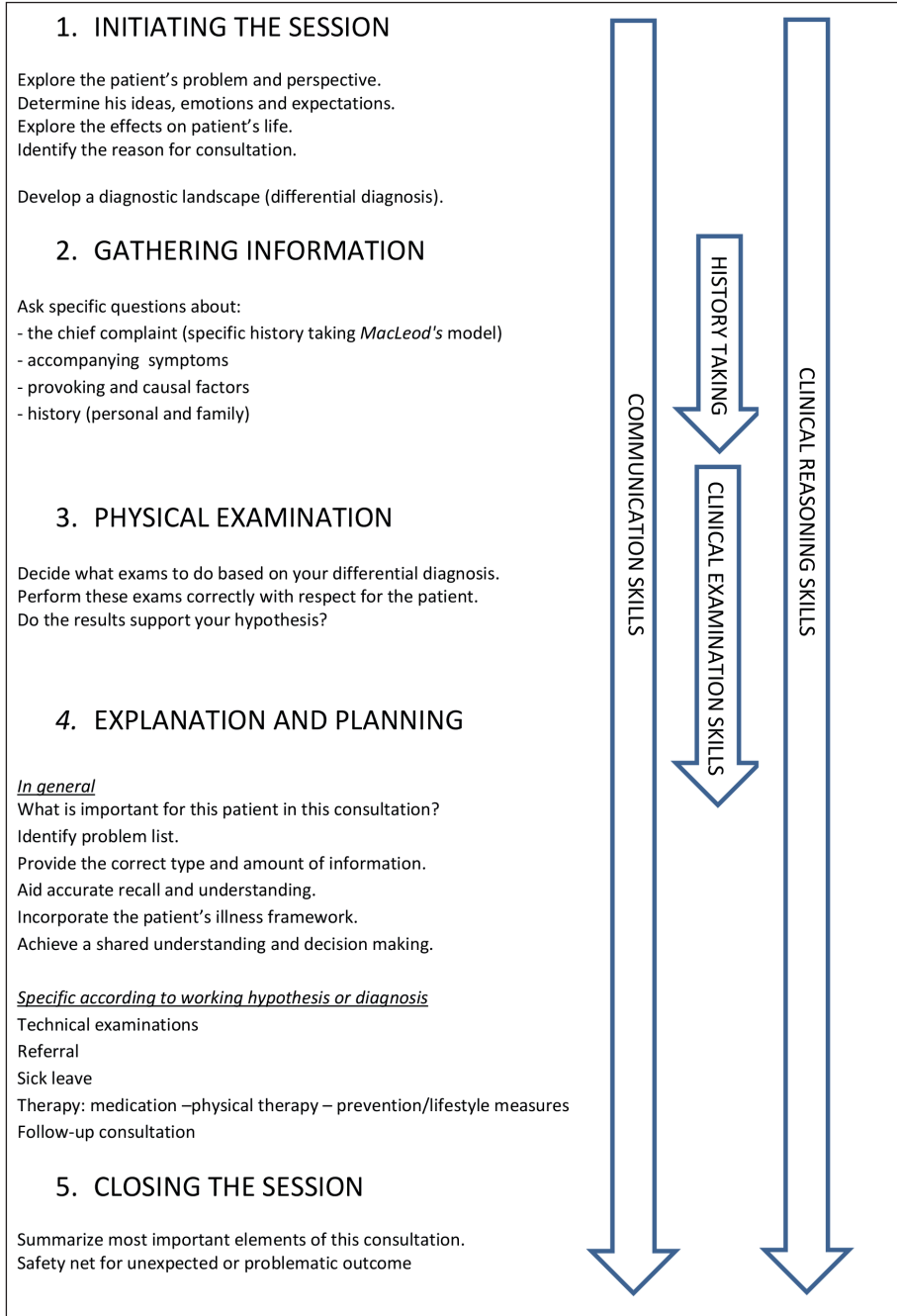
### Context

Consultation training courses are characterized by a great variety in teaching methodology and timing, dependent on the overall curriculum design (conventional, problem based, case-based or experience based). Therefore we describe the seven-year integrated contextual undergraduate medical curriculum at Ghent University which is based on a mixture of conventional learning formats and problem based learning (17). In year 1 to 3, students attend separate training sessions communication skills, clinical examination skills, and clinical reasoning. In year 4 and 5, students practice complete consultations within an integrated consultation course, which uses three mutually reinforcing training formats with simulated patients and immediate feedback interspersed with observational clerkships (see Figure 7.1). In year 6 and 7, students are on fulltime clerkships in three week periods with both supervised and independent real patient contacts. In between these clerkships, students have the opportunity to practice once more their consultation skills within the skills lab.

**Figure 7.1: Curriculum design from non-integrated practice, integrated practice with simulated patients to integrated practice with real patients**



**Box 7.1: The consultation model visualizing the parallel processes within consultations based on an integration of the Calgary-Cambridge approach (1996) (28) and the model of Veening et al. (2009) (29)**



Every training format uses the consultation model shown in Box 7.1, that guides students through the parallel processes within a consultation. In this process communication skills, clinical reasoning, history taking and clinical examination skills are needed:

- Communication skills are necessary to talk with the patient in order to build up a therapeutic relationship and exchange information in a constructive dialogue. Communication skills are active during the entire consultation process.
- Clinical reasoning skills are needed to develop a differential diagnosis (diagnostic landscape) and know the therapeutic consequences for the patient. The process of clinical reasoning starts the moment the physician meets the patient (30) and these skills remain active till the end of the consultation to give clinical information to the patient, based on the diagnosis, and plan ahead for additional investigations, referral and/or treatment.
- History taking skills focus on knowing which information is relevant to ask in order to clarify or exclude all aspects of the differential diagnosis. History taking skills are needed after the initiation of the consultation and before the clinical examination.
- Clinical examination skills are necessary to know which specific clinical tests are needed to test the remaining differential diagnosis after the history taking part and are essential to perform the physical examination accurately.

Each part of the consultation contains different tasks (see Box 1). Some tasks require only one type of consultation skills, e.g. communication skills are needed to determine the patients' ideas, emotions and expectations. Other tasks need an integration of several types of consultation skills for example to incorporate the patient's illness framework within the explanation and planning part both communication skills and clinical reasoning skills are needed.

### **Study design**

This study chose to explore, qualitatively, how students experienced two transfer periods within their learning trajectory. The two student groups were chosen because they were best able to answer the research questions. Pre-clerkship students were

in the pre-clinical, instructional stage (Year 5), and received integrated consultation training with simulated patients, described as transfer 1. These students only observed consultations with real patients. Clerkships students put their consultation skills into practice with real patients and were in the stage of transfer 2 (Year 6).

## Recruitment

We approached all year 5 and 6 medical students at Ghent University by email (n=411). Eighteen students registered on this first call. Students were informed we aimed to recruit respondents with a range of scores on the individual consultation skills and permission to access their individual consultation scores was asked. Supplementary LA approached individual students face-to-face to reach a balance in both male/female ratio and a mix in low and high scores on their clinical or communication skills. Table 6.2 visualizes gender equity within the different focus groups. Within this ‘purposive’ sampling participation was voluntary and all participants gave written, informed consent.

*Table 7.1: Characteristics of student focus groups*

	FG1	FG2	FG3	FG4	FG5	FG6	Total
Academic year	6	5	5	5	6	6	
Participants n	6	5	8	7	6	7	39
Male/female n	3/3	1/4	3/5	2/5	2/4	3/4	14/25

## Data collection

We used focus groups to explore students’ experiences so they could build on each other’s experiences. At the beginning, the moderator (JR) assured students that the research was about their personal experiences; there were no right or wrong answers and full confidentiality would be maintained. LA observed each session and kept detailed field notes. The moderator was a skills lab teacher and the observer was a researcher, unfamiliar to the students. The discussions were audiotaped and transcribed verbatim. Focus groups were scheduled until saturation was reached.

## Analysis

Transcripts were entered into NVivo Version 10 and analyzed using a constant comparative approach (28). Two researchers analyzed all the interviews (JR and LA) inde-



pendently using an open coding strategy, supported by a third and fourth researcher (AD and WV). The open coding kept semantically close to participants' own words. The researchers compared their coding, resolving any differences by discussion until consensus was reached. LA continued the process of constant comparison to form larger categories. She, JR, TD and WV established relationships between the categories, and identified central themes in relation to the research questions.

## Results

Twenty pre-clerkship students participated in three focus groups (PC\_FG) and nineteen clerkships students participated in three other focus groups (C\_FG). The discussions lasted about 90 minutes. The third focus groups within both student groups did not yield new information. We organized the results in relation to the research questions (Box 2).

### *Box 7.2: Summary of results*

#### **Experiences with practicing integrated consultations in the pre-clerkship phase**

1. Respondents were very motivated to conduct clinical consultations with simulated patients in a competent and empathic way. It enabled them to feel like a 'real' physician for the first time.
2. Fulfilling the medical demands of consultations whilst communicating empathically with patients was challenging, because students:
  - encountered the dilemma of whether they should prioritize their attention for the consultation structure and their medical thinking above their attention for communication with the patient
  - experienced the trained consultation model as unnatural
  - felt a difference between faculty role models and role models observed in practice

#### **Experiences with practicing integrated consultations in the clerkship phase**

1. Respondents experienced a large gap between their communication skills, in which they felt confident, and their medical thinking, which was characterized by a lot of uncertainty.

2. Real patients triggered empathy and responsibility, which invited students to define their task as a doctor and activated their identity process strongly.
3. Respondents followed different ways of developing their own consultation style; some students
  - adopt the consultation model as norm
  - adopt experienced clinicians as norm
  - actively develop their own norm by evaluating the effect of applying the consultation model or the behavior of experienced clinicians

## **Experiences with practicing integrated consultations in the pre-clerkship phase**

### ***Practicing complete consultations with simulated patients is motivating***

Integrating the various consultation skills by conducting complete consultations was motivating for several reasons: it showed *“that we are making progress”* and laid out the *“trajectory I still have to follow to become a physician.”* (PC\_FG3\_S3) Furthermore, it was very important because *“it was the first time I have felt like a real doctor in five years.”* (PC\_FG1\_S5)

Practicing a complete consultation triggered respondents to reflect on how well they performed the various consultation skills. Unconsciously, they evaluated how far they had evolved towards a ‘real’ doctor. Students said they considered themselves good communicators: *“... I can properly convey my message with respect for the patients’ needs ...”* (PC\_FG1\_S2). Putting their medical knowledge to work strongly motivated them: *“being able to solve the problem during a consultation so you can say: ah, my theoretical knowledge is OK and that is motivating.”*(PC\_FG3\_S1)

Finally, during simulated practice students learned to deal with medical responsibility: *“You just have to learn to swim. Even when you are stuck you have to continue because it is your consultation. And that’s what you will have to do later.”* (PC\_FG3\_S1).

### **Conducting complete consultations is challenging**

#### *A. Dilemma between the consultation structure, medical thinking, and patient communication*

Integrating consultations was challenging because it was *“so complex and everything rushes through your head.”* (PC\_FG2\_S3) Respondents prioritized focusing on the consultation structure and managing their knowledge *“asking the right questions”* (PC\_FG3\_S3) that it hindered their communication: *“... if your medical track is not 100% correct, it influences your patient track: ... when I miss some medical knowledge in the consultation ... and the patient is going to ask me ... I’m trying to avoid he would ask it by talking faster myself ...”* (PC\_FG1\_S4)

When consultations did not run smoothly, respondents tended to blame their medical knowledge: *“... patients feel understood if I talk to them, but the medical part, I feel very insecure about the therapy ... ”* (PC\_FG1\_S2) *“... you think: Gosh, if my theory was better structured in my head, I would feel more confident. (PC\_FG3\_S5)*

Students’ attention was primarily focused on actions, i.e. the medical and communicative actions they needed to perform to conduct a consultation. Hence, the more ‘receptive’ communication skills, such as attentive listening, were repressed: *“... you are so busy ... I have asked that and should now ask ... in fact you should build on what the patient says, but you have not listened to it”* (PC\_FG3\_S6). So respondents found that building one part of a doctor’s identity – being ‘knowledgeable’ – was at odds with another part of their identity – being present and supportive for the patient.

#### *B. The unnaturalness of the trained consultation model*

Many respondents initially felt resistant to the consultation model because they struggled with the formulation of specific consultation components, e.g. asking patients their expectations. Towards the end of the integrated consultation course, several respondents appreciated the model more *“The model has to become part of yourself... the more you practice the more fun it gets ...”* (PC\_FG3\_S3). It helped students to explore patients’ complaints and structure their history taking. Students mentioned that *“it is important to use the consultation model ... otherwise you would miss important information”* (PC\_FG3\_S1).

Students’ own experiences as patients influenced what they perceived as necessary in their physician-patient contact: *“If I have an idea or expectation, the doctor does*

*not have to ask me, I will tell him myself.” (PC\_FG1\_S3) Furthermore, students’ own perceptions of what doctors do, “focusing on the medical part” (PC\_FG2\_S7), and what patients expect from doctors, were sometimes at odds with the consultation model: “Asking the patients’ expectations or ideas is strange ... the patient will think “you are the doctor, you are going to tell me ... should I trust this doctor ...?” (PC\_FG1\_S5) “My mom went to a new doctor ... she found it strange the doctor asked her what she thought it could be ...” (PC\_FG2\_S4). However, students were able to reflect on these experiences: the same student remarked later on: “... but afterwards I noticed ... my mom was well cared for.”*

### C. *Differences between faculty role models and role models observed in practice*

Pre-clerkship students experienced a difference in culture between the faculty setting and the observational clerkships. *“I have the impression ... in practice ... empathy towards the patient loses force ...” (PC\_FG1\_S2). Students more often saw general practitioners applying the communication component of the consultation model than specialists. “I literally heard from a specialist ...: for empathy you go to the general practitioner, I will solve your problem ...” (PC\_FG1\_S4). “... exploring the patients’ emotions ... one half does, the other half not.” (PC\_FG1\_S2). Furthermore, respondents observed clinicians who added other aspects to their consultation structure, which students considered as valuable. For example, some doctors paid attention to the specific family context “a sixteen year old boy with a muscle tear ... you know the parents want to divorce ... so the doctor asked “and how is it at home?” ... as a GP you know them and have a better sense of what’s best” (PC\_FG1\_S1).*

## **Experiences with practicing integrated consultations in the clerkship phase**

### ***Confidence gap between communication skills and medical thinking with real patients***

Transitioning into clerkships after five theoretical years was very motivating because students could finally apply their consultation skills to real patients. Students did not want to fail on important matters that could harm real patients. Real patients triggered empathy and students were motivated to be helpful, but they were also *“afraid the patient would ask you something” (C\_FG3\_S5) they could not answer.*

Students' primary focus was still on whether or not they possessed all the medical skills: "... our medical track should be better ..." (C\_FG2\_S6) "... we ask very broadly ... we are not yet sufficiently knowledgeable to be specific ..." (C\_FG1\_S5). This resulted in decreased attention to the effects of their communication skills. Their confidence in their communication skills, as described in the pre-clerkship phase, remained: "our communication is good, even better than some clinicians I observed ..." (C\_FG1\_S1).

Furthermore, several students experienced the consultation model as a powerful tool and 'life jacket'. It helped them to be patient-centered and to structure the medical content: "It is a complete model and even when I am deviating and don't know how to continue, I still remember the structure and think: 'I have asked this, and forgotten that; so I can continue.'" (C\_FG1\_S1), especially "with patients where you have no idea what it could be ..." (C\_FG2\_S4).

### **Defining the task of a doctor**

Students were confronted with a variety of role models who made different choices in their consultation style. Having a more active role as a clerk brought respondents much closer to deciding what kind of doctor they wanted to be themselves, so they could translate this into their actions. Whereas pre-clerkship students observed the differences, clerkships students started asking questions or considered a different approach for themselves. For example, many clinicians gave priority to solving the medical problem. For some students, it was evident: "... specialists are asked for their specialty ... so what do they look for: respiratory parameters, cardiovascular parameters ... those persons want to handle the specific problem." (C\_FG1\_S5) Other respondents questioned this task definition "they do a consultation with focus on the physical complaints ... when I asked "Was the patient not worried?" the doctor answered "you shouldn't think too much about that" ..." (C\_FG2\_S3) "... I saw patients leaving the consultation room with a feeling as if they still needed to talk about something ... they still had some doubts ... that was disappointing ... I wanted to call them back ..." (C\_FG2\_S1) Some doctors considered the patients' wellbeing as primary aim of their medical care and spent more time listening to the patients' story. "... I saw a patient who came in tears and left the room with a smile in twenty minutes ... very empathic ... it was an older clinician ..." (C\_FG2\_S4).

### **Obtaining an own consultation style**

Observing consultations between their supervisors and patients after respondents had tried their hands allowed respondents to evaluate their own consultations. Sometimes students used the consultation model as a norm against which behavior was judged. At other times, experienced clinicians were positioned as frame of reference, whereby some students felt torn because the trained consultation model and the supervisors' behavior in practice differed. A third group of respondents referred to the effect on the patient when reflecting on the quality of consultations during clerkships. These students seem to be least hindered by the incongruence between their role models. The three norms that students used to judge the quality of consultations during clerkships are discussed in more detail below. Finally, we explain that discussions became emotional with some students defending clinicians and their behavior, and other students denouncing them.

#### *A. Consultation model as norm*

Respondents noted that the consultation model made them communication-oriented and attentive to contextual information from patients. They used this model to evaluate the quality of their and their supervisors' consultations. Some had seen the consultation model being used: *“I have seen really good doctors: an older physician did inquire about ideas and concerns. I didn't expect this at all. (C\_FG1\_S6).* But mostly it was not: *“... the physicians I observed do not explore explicitly the ideas, concerns, and expectations but just focus on physical complaints, that is a deficit ...” (C\_FG2\_S5).*

#### *B. Experienced clinicians as norm*

Physicians' behavior often differed from what respondents had trained to do. There were four reasons why respondents imitated the alternative consultation style of clinicians they observed. Firstly, some students were convinced that you have to follow a role model: *“on a department ... everything is new ... you imitate the consultation style of your supervisor ... you do not forget what you have learned before but you do not apply it in practice ...” (C\_FG3\_S2).* Secondly, there were students who argued that what a role model did was good: *“my general practitioner took 5 minutes for each patient ... a waiting room full of patients ... he was a very good doctor ... I admire him a lot” (C\_FG1\_S6)* Thirdly, students were inclined to imitate the consultation style of their supervisors because this was required of them, or because they were even interrupted when they did it differently: *“In cardiology they expected that you only inquired about six or seven major symptoms and conducted a physical examination.”*

(C\_FG3\_S7) *"I was once talking with a patient when the physician said: "No, ... you have to take control over the consultation and ask very specific questions, ... ." (C\_FG1\_S4). Finally, time pressure forced students to take experienced clinicians as a norm: "I would not do it like that if I had more time ... but you just have to do it the way your supervisor does it ..."* (C\_FG2\_S5).

#### C. Focusing on the effect of using a specific consultation style

For some respondents it was very motivating to see the effect of a specific consultation style on patients: *"I saw beautiful consultations ... a doctor who could not do anything [medical] for the patient ... just giving a good explanation ... the patient was satisfied and went home without prescription. ..."* (C\_FG1\_S6). These respondents recognized the difficulty of good communication: *"I would like to reach that level [of communication] ..."* The effects that were valued by respondents mirrored what kind of doctor they wanted to be. Students who mainly focused on solving medical problems praised the efficiency of clinicians *"... they are able to ask very specific questions ... which we still forget."* (C\_FG1\_S5). For students who valued the caring aspect of consultations, using open questions and asking ideas, concerns, and expectations - experienced as unnecessary and unnatural by other students - came into its own with real patients: *"I found it so nice to see. People come here and expect something: "we have heard from the neighbor". ... they are worried about it. ... it is important to explore the ideas, concerns, and expectations, that is confirmed to me."* (C\_FG1\_S6) *"... during emergency clerkship I experienced the importance of starting with open questions to the patient ... otherwise you will miss some parts."* (C\_FG1\_S3) Some respondents were able to adapt the consultation model to the need of individual patients: *"Some patients don't appreciate you asking all different kind of questions ... 'stop asking me questions and start to examine me' ... so I combined the physical examination with asking my questions ..."* (C\_FG1\_S6).

#### D. Choosing between faculty role models and clerkship role models

The discussions became emotional when students described the behavior of their clinical supervisors. Some students defended the clinicians and their behavior *"... they do their job, it is not wrong what they do ..."* (C\_FG2\_S6), and other students denounced them *"communication ... with specialists, it is a catastrophe ..."* (C\_FG3\_S4)

“... I do not find doctors are interested in our trained consultation model ...” (C\_FG2\_S3). This gave the impression of students positioning themselves in a struggle between two opposing camps, their educators at the university versus their clinical supervisors. Despite our attempts to appear as a neutral party, we researchers were placed in the university camp by the students, as is suggested by the following quotation “I actually find it a pity for you guys that the consultation model we learn here, is used so little in practice” (C\_FG3\_S1).

## Discussion

This study investigated within one medical curriculum the experiences of undergraduate medical students who were learning to conduct consultations. Integrating communication, clinical reasoning skills, history taking and clinical examination was experienced as challenging. Performing complete consultations allowed students to experience the task of a real doctor and to develop their professional identity, which they found motivating. Integrating consultation skills within a simulated environment and conducting consultations with real patients were each characterized by their own difficulties. During consultations with simulated patients, students became aware that their efforts to be ‘knowledgeable’– were at odds with being an attentive listener. In general, students felt confident in their communication with patients, but were very insecure about their medical thinking. When students became responsible for real patients, this confidence gap remained. Furthermore, students were actively struggling with the difference between faculty role models and clerkship role models. Students used different norms to judge the quality of observed and performed consultations:

- were the consultations in line with the consultation model?
- were the consultations similar to those of their clinical supervisors?
- which effect did the consultations have on the patient?

Because the consultation model and supervisors’ behavior were often at odds, students felt torn between conflicting demands. Students who referred to the effect on the patient when evaluating communication seemed to be least disturbed by this.

Kurtz *et al.* (2003) (15) state that integrating content and process within the consultation will improve the transfer of communication skills. However, our results show that integrating all the consultation skills and knowledge, learned within the different parts of the medical curriculum, in one consultation is a complicated process.



Although the literature shows that students feel better prepared for clinical practice after integrated consultation skills training, we discovered three impediments to implementing communication skills during an integrated course. Firstly, many students considered solving the medical problem the core task of a doctor. These students found clinical reasoning and clinical examination skills the most important part of a consultation, because these skills are instrumental in their responsibilities as a medical expert. Current consultation models have been critiqued for not taking into account the medical responsibility of physicians, which inherently creates a hierarchy within the consultation (31,32). That our consultation model does not sufficiently succeed in helping our students dealing with the combination of this hierarchy with its accompanying responsibilities and serving the patients' needs, may be one of the causes students perceived parts of our model as unnatural. Secondly, most students felt confident in their communication skills and did not devote much attention to improving them. Despite the fact that the UK General Medical Council's influential first edition of "Tomorrow's Doctors" sanctioned patient-centered communication as a core component of medical curricula (33), students observed role-models using a less patient-centered style. This reaffirmed students' proclivity to put their communication skills into the background. However, the more complex and difficult to treat situations were, the more students acknowledged the importance of good communication skills. So confronting students on a regular basis with situations whereby diseases and symptoms are not clearly biomedical or where straightforward medical solutions are missing, will favor their eagerness to learn patient-centered communication. Finally, students who wanted to improve their communication skills, experienced a 'mental dissonance' between different consultation skills. Being focused on medical reasoning left little space for more 'receptive' communication skills (e.g. attentive listening or unraveling patients' nonverbal cues). The cognitive load of these skills within the consultation process must be taken into account in order to avoid novice learners are forced to simplify their tasks (34).

In medical education, attention on identity formation is increasing (35-37). A strong professional identity enables students to practice "professional demeanour", which facilitates providing responsible care (37). The emotional reactions of clerkships students when defending or denouncing clinician behaviors, let us assume that these students struggle actively with their identity formation. They actively struggled with the question: "what kind of doctor do I want to be?" when internalizing their own consultation style practicing on patients or observing supervisors. "Internalization" is the process in which certain externally imposed 'social rules' or

norms become people's 'own norms' by their own choice (38). Hence, students may internalize norms by copying the behavior of role models of the group they want to belong to. This is in line with the fifth of the six phases within the development of a moral judgment of Kohlberg whereby the personal conviction is subordinate to the community's opinion: “good is what makes as many people as possible happy” (39). So students may change their style based on the principle “what the majority says is true”: students may first follow the faculty role models but afterwards copy the behavior of clinical supervisors. Moreover, our results suggest that students find themselves in a loyalty conflict in which two disagreeing groups expect others [in our case the students] to support them (40). A loyalty conflict and its demands to choose sides often cause insecurity (40), which might hinder students to progress to the sixth phase of Kohlberg in order to develop an internal guideline (41). In this highest phase, personal views are more important than democratically established opinions (39). By then, people get the space and freedom to think for themselves and rise above the group in order to develop their own style. In addition to this six phase model, the care-based morality added the role of care and responsibility for others (39). The learner ideally focuses on the consequences of his/her actions for others and takes perspective: “How would I react if they did that to me?” (41). Our results indicate that a minority of students reflect on the effect on the patient of a certain consultation style. These students were able to analyze behavior in order to decide for themselves what is best.

## **Strengths and limitations**

The two student groups were the ideal match to explore students' experiences on conducting complete consultations. Pre-clerkship students were selected to share their actual experiences with simulated patients. Clerkships students were able to provide answers to our research question concerning transfer with real patients. Although the data were gathered within one university, the team of authors included three different nationalities, which diversified the perspectives of the team of analysts.

Limitations are that our study was cross-sectional in nature and not longitudinal, so our findings do not reflect the evolution of the same student group over time. In addition our integrated consultation course using simulated patients in year 4 and 5 and real patients in year 6 is an integrated contextual model of teaching, that is likely to differ from other curricula. Both the moment of transfer 1 and transfer

2 may be relatively late at our university compared to the ideal situation. This will naturally have influenced our students' experiences, but it does not lessen the validity of the finding that integration is both motivating and challenging for students. Furthermore, we did not expect students would view the undergraduate curriculum as consisting of two opposing camps. Because of the pragmatic choice to organize the focus groups on the university campus and the fact that the moderator was a skills lab teacher, students might have been reluctant to say that they favored the behavior of experienced clinicians over the trained consultation model.

## Conclusion

Integrated consultations with simulated patients motivated students and triggered their identity development. However, students did not invest much effort in improving their communication skills with real patients during clerkships due to their focus on medical problem solving and their confidence in their communication skills. Practicing consultations with real patients allowed students to develop their own consultation style, but conflicting demands of faculty and clerkship role models resulted in different outcomes. Some students copied the behavior of their clinical supervisors, while others stuck to the model they learned in the consultation training. An ideal few made an informed choice based on the effect of their consultation style on the patient.

## Practice Implications

We make four recommendations concerning the effect of integrated consultation training and medical students' identity formation.

1. In the initial stage, integrated consultation training in the pre-clerkship phase seems to shift students' attention away from communication skills to medical problem solving. Nevertheless, we support starting integrated training early in the curriculum in a variety of situations with attention for real patient contacts. It is crucial that students can practice with simple medical problems. Otherwise it is very likely that students will feel overloaded during clerkships and then their insecurity in the medical domain and managing the consultation may draw attention away from communication issues when interacting with real patients. This may lead to students ignor-

ing the needs, expectations and emotions of patients. This habit might be difficult to drop once it has been acquired.

2. Integrating consultation skills made students reflect on their identity as doctors. Medical educators may embrace this moment to support the development of an authentic and robust professional identity.
3. It is important to encourage students to come to the last phase of Kohlberg. In this phase, observing the effect of specific consultation skills and personal views activate the development of a personal consultation style and enables students to make informed choices (37). We suggest doing this by explicitly discussing the effects of different communication strategies, instead of promoting a single model as the right strategy (42). Additionally, faculty staff and clinical supervisors must be able to reflect on the strengths and limitations of their own beliefs and habits. In order to follow the advice of Frost and Regehr: *“Rather than insisting that students become like “us,” we should help to inform and structure their negotiations in a more sophisticated way so that all students are able to construct identities as physicians ...”*(43).
4. Our results show that real patients trigger empathy (44) and identity formation in students. To avoid the development of bad habits during clerkships, this empathy should be used to develop good relationships with patients. Currently, medical curricula fail to produce empathic doctors (8,9). This may be due to the fact that students feel overloaded in clinical practice, experience insufficient support, do not have longitudinal relations with patients, and do not show the behaviour that was trained before (11-14). It is important to solve this problem, e.g. by introducing longitudinal clerkships (45-46). Longitudinal clerkships might lessen the burden on clerkships students and support them in developing meaningful relations with patients.

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## Chapter 8: Discussion





## Background

*“As a beginning student, a consultation is so complex and everything rushes through your head.” Pre-clerkship student*

*“You just have to learn to swim. Even when you are stuck you have to continue because it is your consultation. And that’s what you will have to do later.” Pre-clerkship student*

*“During the consultation you want to know the solution as soon as possible, you jump into that clinical mode ... I should learn to start with exploring what is important for the patient.” Pre-clerkship student*

*“I saw beautiful consultations ... a doctor who could not do anything [medical] for the patient ... just giving a good explanation ... the patient was satisfied ... I would like to reach that level ... ” Clerkship student*

The quotations above show the complexity of conducting consultations as experienced by undergraduate students. So acquiring this complex competence, with attention for both content and process, requires a lot of training. It is a challenge for medical curricula to provide a variety of effective and efficient training formats. The studies within this thesis aimed to explore the effectiveness and efficiency of three training formats in teaching students the art of conducting consultations and to acquire insight in how students learn this complex competence over different phases of the undergraduate curriculum.

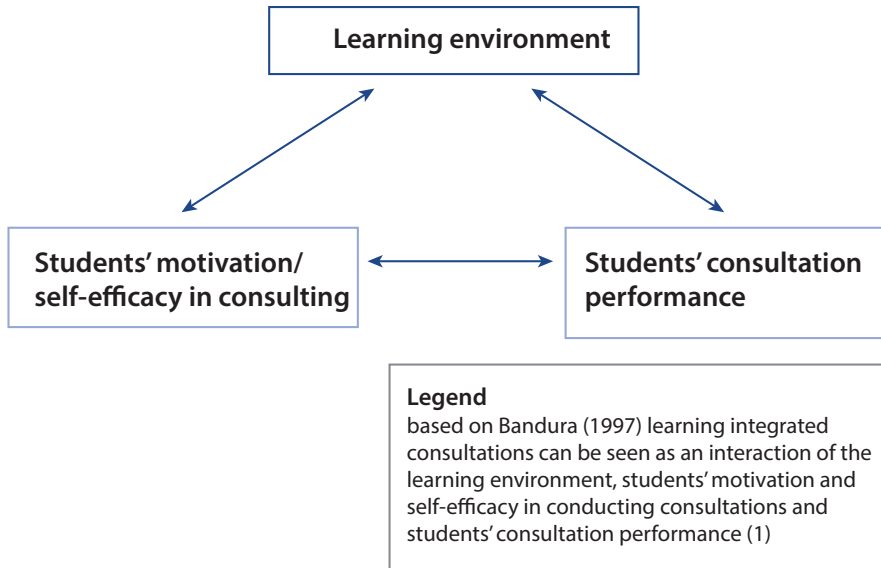
This chapter will combine the main findings of the individual research projects into a concluding perspective of what this thesis learned us on teaching and learning integrated consultations. By doing so, the central aim of this thesis will be answered. Furthermore, we will discuss the methodological strengths and limitations of this thesis and end with implications for practice and suggestions for future research. Participants quotations are presented in italic.

## A concluding perspective

This paragraph will present a concluding perspective on what this thesis learned us in the context of conducting integrated consultations in the medical curriculum. We use Bandura’s theoretical perspective on learning, presented in chapter 1 in which learning is described as an interaction of the learning environment, students’

motivation/self-efficacy in conducting consultations and students' consultation performance (see Figure 8.1) (1).

**Figure 8.1: Social cognitive perspective on learning to conduct integrated consultations**



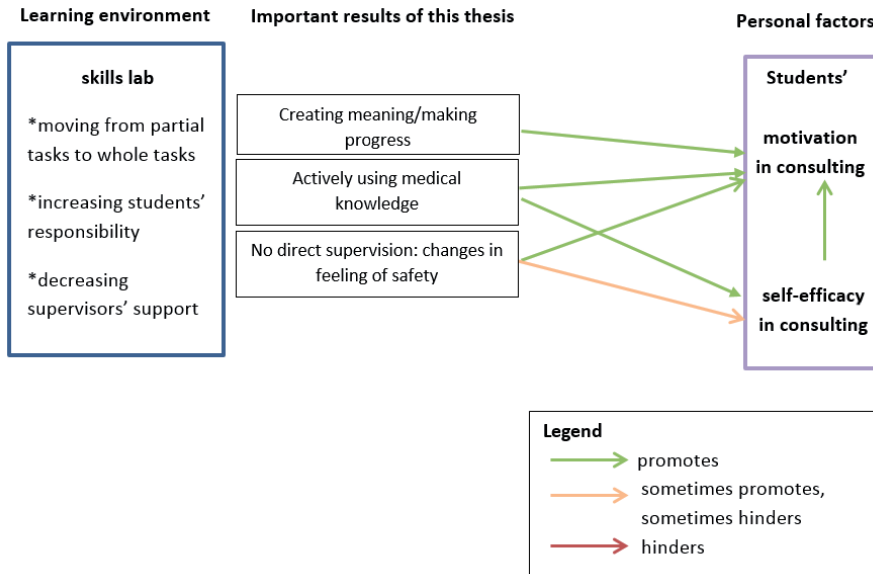
To build up this theoretical perspective we first discuss the findings of the different studies for each interaction individually: (A) interaction between the learning environment and students' motivation/self-efficacy in consulting, (B) interaction between the learning environment and students' consultation performance and (C) interaction between students' motivation/self-efficacy in consulting and students' consultation performance.

### **Learning to conduct integrated consultations: interaction between the learning environment and students' motivation/self-efficacy in conducting consultations**

The skills lab environment, and -more specifically- as applied within this thesis, structuring this environment according to the three instructional guidelines of van Merriënboer and Sweller (i.e. moving from partial to whole tasks, working from low to high fidelity environments with increasing students' responsibility and decreasing

supervisors' support) (2), affects students' motivation and self-efficacy in conducting consultations (see figure 8.2).

**Figure 8.2: Interaction between the skills lab environment and students' motivation/self-efficacy in conducting consultations**

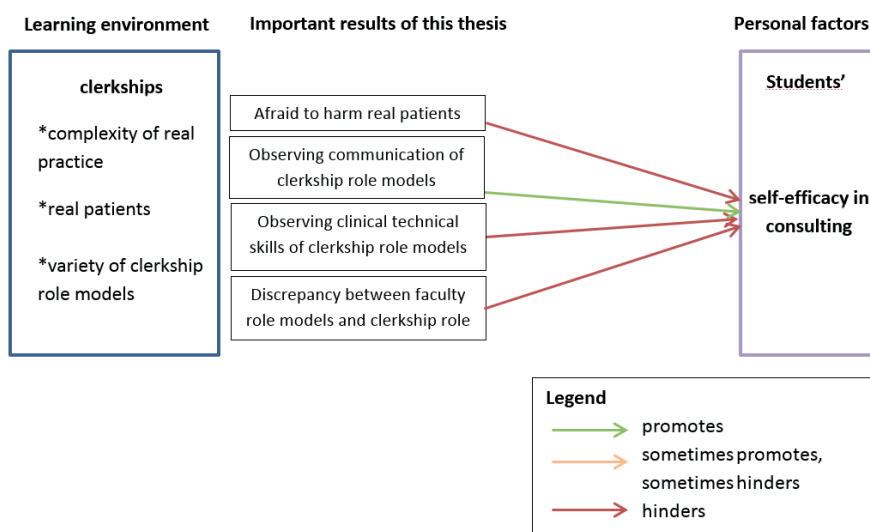


Moving from partial to the whole task of integrated consultations is experienced as motivating by students to practice (see chapter 7). Students feel they are making progress while they proceed during their medical curriculum. Furthermore, conducting complete consultations with simulated patients activates students' medical knowledge; moreover the feeling of being able to solve the patients' problem using this theoretical knowledge motivates and satisfies them (see chapter 6).

Apparently, increasing students' responsibility gradually and decreasing supervisors' support within the skills lab environment affects students' motivation positively: students feel more safe and dare to experiment with trial and error (see chapter 3 and 6). More specifically, the independent training influences students' self-efficacy positively. This may be because this format is in alignment with the *four influencing sources of Bandura (1)*: (a) *directly experiencing* to be the physician during a role-play for the duration of a complete consultation (b) *a vicarious experience* through being the observer of a successful/unsuccessful peer involved consultation (c) *verbal persuasion*: receiving positive feedback from a simulated patient and a peer (d) *emo-*

*tional arousal*: feeling free to express themselves without a supervising physician. In a curriculum context where students have only few opportunities to practice and are not used to being observed and receiving personal feedback, the presence of a supervisor influences the *verbal persuasion and emotional arousal* negatively, which leads to lower self-efficacy scores (see chapter 4). Additionally, the qualitative findings of chapter 6 show that from the start of the integrated consultation course students want to perform well and that – in a context of not used to being observed – the critical ‘negative’ teachers’ feedback leads to disappointment: “*you remember the negative points and positive aspects are said loosely in between: “ah, that was ok, that did you do well.”*” Though, organizing sessions without supervisor but with encouraging feedback from simulated patients and peers seems to lead to the risk of overestimation of themselves in some students (see chapter 3).

**Figure 8.3: Interaction between the clerkship environment and students’ self-efficacy in conducting consultations**



Whereas the skills lab environment has an overall positive impact on students’ self-efficacy beliefs, the clerkship environment leads to a decrease (see chapter 5). As visualized in figure 8.3 this decrease might be explained by the fact that students experience conducting consultations during clerkships with real patients and surrounded by a variety of clerkship role models as more complex (3) compared to skills lab sessions whereby the patients’ problem is adapted to the students’ actual level of competence. Hence, during clerkships the real patient context is more complicated:

the patient comes with several problems or has a complicated history and comes for a follow up consultation. Working with real patients increases students' feeling of responsibility enormous. This is because students' behavior may have consequences for the patient; students are afraid to harm patients and therefore set high standards for themselves (see chapter 6). When students compare themselves with their clinical supervisors, some students evaluate their communication competence positively and feel confident (see chapter 6 and 7). This might be explained by the fact that the current students have a better communication training than their clerkship role models. This increases students' self-efficacy but also creates the pitfall of unlearning because even non-communicative clinicians seems to be successful (4-7): *"I have the impression ... in practice ... empathy towards the patient loses force ..."* *"I literally heard from a specialist ...: for empathy you go to the general practitioner, I will solve your problem ..."*. Observing the clerkship role models on the domain of clinical reasoning influences students' self-efficacy beliefs negatively: *"... our medical track should be better ..."* *"... we ask very broad questions ... we are not yet sufficiently knowledgeable to be specific ..."*. Students are confronted with the fact they miss the routine of daily practice, which is frustrating. Finally, the discrepancy between how faculty role models and clerkships role models act during the consultation regarding both the patient communication and the clinical technical skills, influences students' self-efficacy in consulting negatively (see chapter 5).

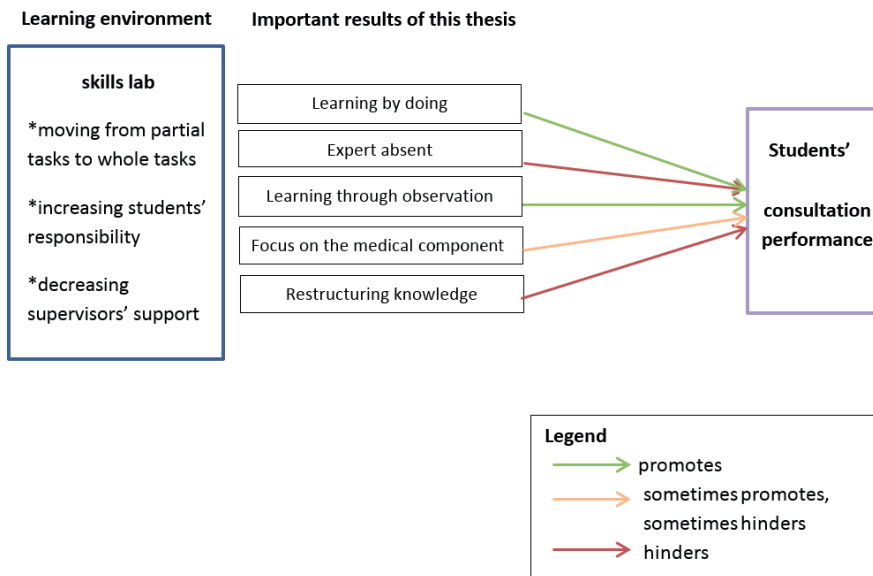
In conclusion, structuring the environment according to moving to whole tasks, increasing students' responsibility and decreasing supervisors' support has a positive impact on students' motivation and self-efficacy to conduct consultations. To prevent over- or underestimation of students' self-efficacy beliefs within more challenging environments, such as clerkships, an adjusted balance between students' responsibility and supervisors' support is needed. The skills lab environment might focus even more on increasing students' responsibility by using real patients or the clerkship environment might select specific patients taking into account the students' competence level and train their supervisors thoroughly in adjusting their support to what students learned before.



## Learning to conduct integrated consultations: interaction between the learning environment and students' consultation performance

As visualised in figure 8.4, during the integrated consultation course students' performance is positively affected by increasing students' responsibility through practicing with simulated patients or observing peers and experts (see chapter 3).

**Figure 8.4: Interaction between the skills lab environment and students' consultation performance**

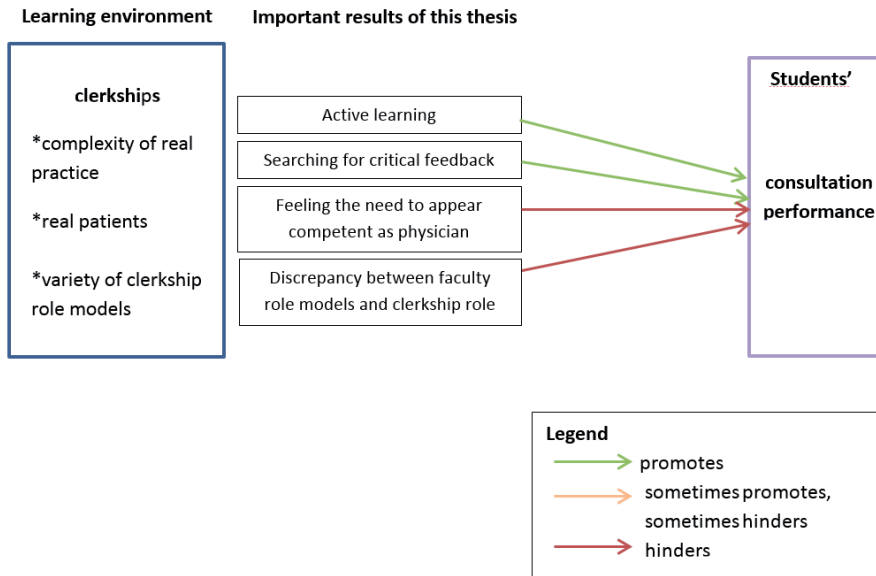


When learning by doing in role-play with simulated patients, students report, especially at the start, the need of intensive supervisors' support (see chapter 6). Within the independent training, some students experience their peers as less skilled to help them improve their consultation performance: *"My fellow students did not know more than me ... or sometimes I did not trust the reflections of my peer."* Expert feedback within the supervised training or within the e-learning module puts errors in the right perspective and clarifies nuances or bottleneck issues of the consultation (see chapter 3). Van Weel et al. (2013) and Hong et al. (1996) confirmed the positive impact of expert feedback face to face or online (8,9). A lot of students perceive the supervisor as a "benchmark", to tell them what went well and what they could have done better, rather than a mirror who poses questions and triggers them to reflect. Another aspect what students do not sufficiently perceive, is the indirect impact of

learning through observation on their performance. Both the vicarious experience within the independent training format and observing imperfect consultation behaviour in the e-learning module improved students' consultation competence on the "know what" level (see chapter 3 and 4). Literature has demonstrated the effectiveness of the e-learning module on students' knowledge level several times (9,10). However, students are not always aware of this advantage. The results in chapter 3 show that students rate the usefulness of the e-learning module low as compared to the other two formats. It might be a natural reflex of students to focus on 'practice' as the most effective learning activity to acquire the competence of conducting consultations. Hence, students should be encouraged to reflect on the planned and unplanned learning effect of both observation and actual practice of consultations (11). It is up to medical educators to inform the students of the merits of the different training formats.

Furthermore, the results presented in this thesis underpin that students have a stronger focus on the medical content of the consultation than on the interaction process with patient when moving from partial tasks to the whole consultation task. For example, students have to transfer their theoretical knowledge into applicable clinical knowledge: "*... in lectures ... you are always presented with a disease and then all the symptoms ... too rarely we start from the opposite; ... in a consultation ... the patient presents you with symptoms ... you have to check for other symptoms ... based on a differential diagnosis ...*". As a consequence students' reasoning is slow compared to their (experienced) supervisors. Mandin et al. (1997) stress the fact that the inability to recall information stored in memory is due to lack of cognitive organization and understanding (12). So, integrated consultation courses stimulate the building of relevant knowledge frameworks, starting from clinical cases (13-15).

**Figure 8.5: Interaction between the clerkship environment and students' consultation performance**



At last, clerkships where students start to work with real patients entail more responsibility for students which activates their learning (see Figure 8.5): “... I started to make little lists of what I should ask ...” and triggers students to search for critical feedback “I always asked for critical remarks during clerkships ... only by receiving that [feedback] I can grow”. Ryan and Deci’s (2000) Self-Determination Theory (SDT) states that autonomy, competence and relatedness are the basic human psychological needs, that when fostered in social contexts, promote positive learning experiences (16). However, the qualitative findings of chapter 6 show that those three components are not always in balance during clerkships. Within the autonomy with real patients, students want to appear competent as physicians, but receiving this autonomy without being properly prepared or supervised, results in students feeling overloaded and incompetent. This affects students’ performance negatively: some students start to adopt evasive coping techniques such as talking faster to the patient in order to prevent the latter asking them questions. Furthermore, skills lab supervisors put a lot of effort in creating a safe and trusting relation with students (relatedness), whereas clerkship role models do not always have the time to build such a relationship. However, students give a lot of credit to their clerkship supervisors, often perceived as ‘real physicians’ and put more effort themselves in building a relationship with these

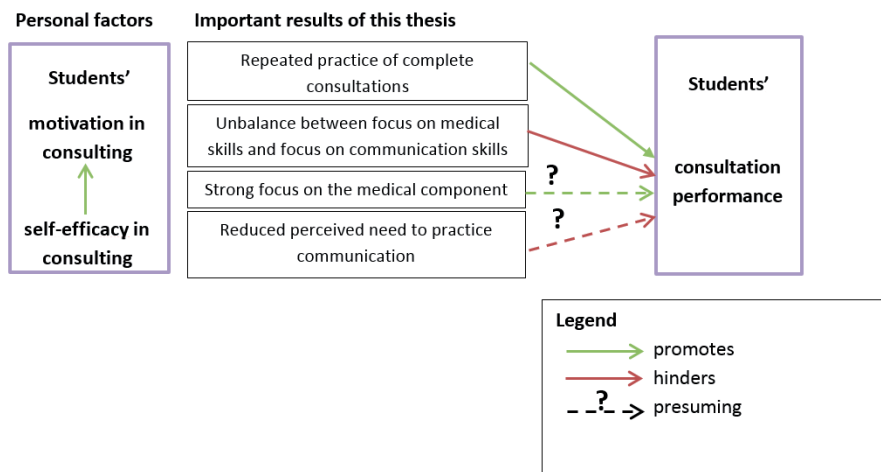
supervisors: “my general practitioner took 5 minutes for each patient ... a waiting room full of patients ... he was a very good doctor ... I admire him a lot”.

In conclusion, to improve students’ performance in conducting consultations the following might be useful measures in both the skills lab environment and the clerkship environment: offering various opportunities to learn by doing with a progressive independency in content and process; reflecting on students’ performance within a safe and trusting supervisors’ relationship; participating in vicarious experiences and informing students of the goals and advantages of the training formats, whereby faculty and clerkship supervisors proclaim the same message.

### **Learning to conduct integrated consultations: interaction between students’ motivation/self-efficacy in conducting consultations and students’ consultation performance**

In the literature self-efficacy is hypothesized as a main determinant of students’ motivation to learn (17,18). It is therefore likely that when students believe they have the skills to conduct consultations, their consultations will be more effective and efficient.

**Figure 8.6: Interaction between students’ motivation/self-efficacy in conducting consultations and students’ consultation performance**



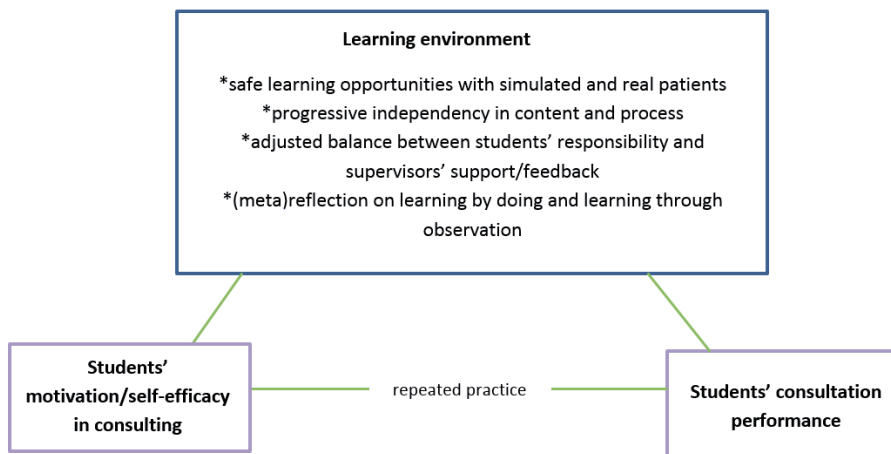
However, figure 8.6 shows that improving students' performance is only possible when students have the time to practice complete consultations repeatedly: "... *the more you practice the more fun it gets ...*" (see chapter 7). Interestingly, this thesis shows that students score their self-efficacy beliefs of communication skills both during intake and explanation and planning significantly higher compared to their technical skills and the integration of all skills (see chapter 5). The qualitative findings of chapter 7 delve deeper into this issue showing that students experience an unbalance between a strong focus on their medical skills and a limited focus on their communication skills. More 'receptive' communication skills, such as attentive listening, are suppressed: "... *you are so busy... I have asked that and should now ask... in fact you should build on what the patient says, but you have not listened to it*". Other studies underpin this finding whereby students' anxiety concerning the medical component of the consultation leads them to cut off the patient in order to start a focused medical inquiry rather than understand the patients' perspective during an open intake (19). Furthermore, this thesis shows that students' high self-efficacy beliefs in their communication skills negatively influence their perceived need to practice their communication skills. This reduced need to practice communication might very well have a negative effect on their performance, supported by literature that students do not perform that well on patient communication (20-22). Vice versa, students' strong focus on the medical component could affect the medical part of their performance positively. So, in contrast with the literature (17,23), low self-efficacy beliefs in combination with a high perceived value of the task, in this case are clinical technical skills the core competence of a physician, seems to positively affect students' motivation to learn and consequently their consultation performance.

In conclusion, students are more motivated in medical problem solving and the specific clinical skills as they consider these as the most important and difficult to master. This investment might positively affect their performance on that part of the consultation. Students' overestimation of their communication skills seems to negatively affect their motivation to improve their communication, which might have a negative effect on their communication performance over time.

## In summary: the social cognitive perspective on learning to conduct integrated consultations

We summarize the above findings within the complete model of Bandura and adapt the three instructional guidelines of van Merriënboer and Sweller to the context of conducting integrated consultations. To enhance students' motivation/self-efficacy in integrated consultations and students' consultation performance it would be helpful that both skills lab and clerkship settings provide multiple **safe learning opportunities in a variety of situations combining real and simulated patients** (see Figure 8.7).

*Figure 8.7: Concluding perspective on learning to conduct integrated consultations*



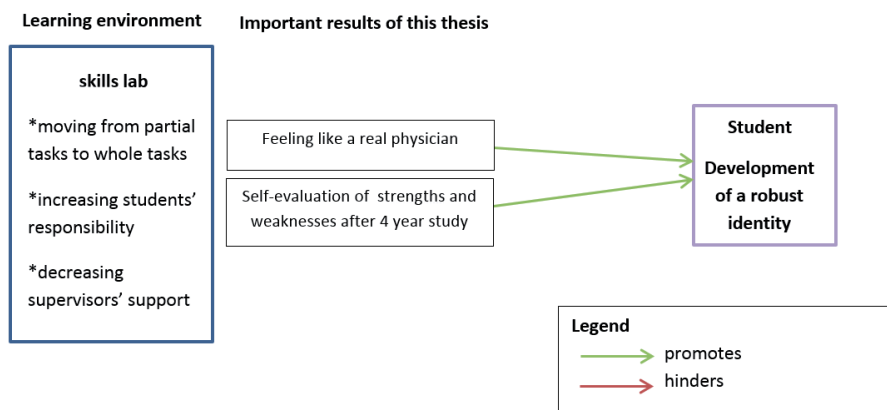
**Progressive independency in content and process** might prevent that students' insecurity about medical content during the consultation would interfere with their doctor-patient communication. Furthermore, at the start of learning the complex competence of conducting consultations, positive constructive **feedback of supervisors, simulated patients and peers** is helpful. This thesis shows that the moment students master the basics of consulting and experience the enormous responsibility of working with real patients during clerkships, they **are looking for critical expert feedback** themselves in order to improve their performance. So, at that point within the learning trajectory of teaching students complex competences, such as conducting integrated consultations, the didactic principle of fading guidance is not applicable. Finally, it would be helpful that both skills lab and clerkships environments stimulate students in a **meta-reflection on learning by doing and**

**learning through observation.** Students underestimate the impact of observing behavior and its consequences on their own learning. However, this skill will become more important during clerkships to compare their own performance with that of role models and filter personal learning objectives. Finally, students might be able to adjust their self-efficacy in consulting and consultation performance through **repeated practice** in a deliberately constructed context taking into account the above aspects.

### Identity development as missing component

Monrouxe (2010) stated that medical education is as much about learning to talk and act like a doctor as it is about learning the content of the medical curriculum (24). So in our search to explore effective and efficient training opportunities within the medical curriculum to learn undergraduate students how to perform integrated consultations, it is not surprising that the concept of identity pops up. The Faculty of Medicine of McGill University defined the medical professional identity as “a representation of self, achieved in stages over time during which the characteristics, values, and norms of the medical profession are internalized, resulting in an individual thinking, acting and feeling like a physician” (25). Figure 8.8 shows the impact of the skills lab environment on students’ identity development.

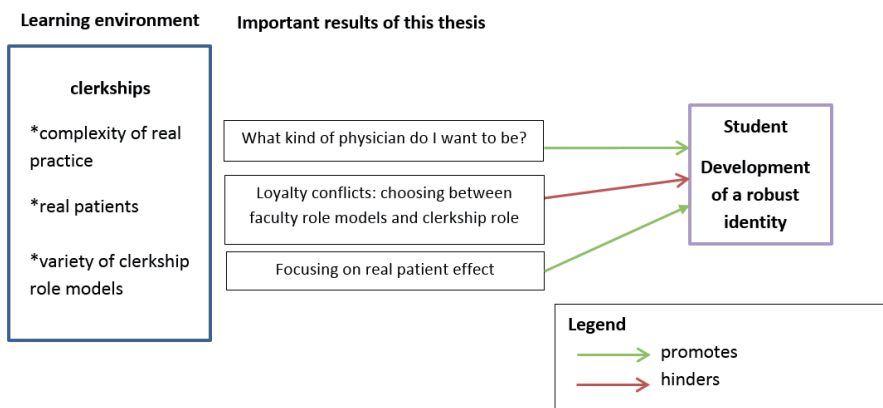
**Figure 8.8: Interaction between the skills lab environment and students’ identity development**



Moving from partial tasks to the whole consultation task for the first time within the integrated consultation course is an important step for students in developing their

identity as a physician: “*it was the first time I have felt like a real doctor in five years.*” (see chapter 7). Early clinical experiences help medical students to discover what it means to be a doctor and to learn to act as a professional (26,27). More specifically, increasing students’ responsibility through practicing a complete consultation triggers students to reflect on how well they performed the various consultation sub-skills. Unconsciously, students evaluate how far they had evolved towards a ‘real’ doctor. Students said they considered themselves good communicators: “... *I can properly convey my message with respect for the patients’ needs ...*” or became aware of their theoretical gaps and lack of practical knowledge (see chapter 6). As mentioned above, students’ focus on medical problem solving drew their attention away from improving their communication skills. Previous studies also showed that students consider the competence in technical skills to be the distinguishing characteristics between doctors and other people (28). This makes mastering these skills crucial for students, to be able to feel to be a ‘real’ doctor. Hence, they prioritize these skills, above relational skills, in which they feel competent already. Later on, we see that this kind of ‘area demarcation’ continues whereby the different specialties identify themselves with a specific set of technical acts that must be seen as ‘their’ core business.

**Figure 8.9: Interaction between the clerkship environment and students’ identity development**



The moment students start to work with real patients and observe a variety of role models who make different choices in their consultation style, they start asking questions concerning their identity (see Figure 8.9). More specifically, students wondered what kind of doctor they wanted to be themselves? (see chapter 7). Unfortunately



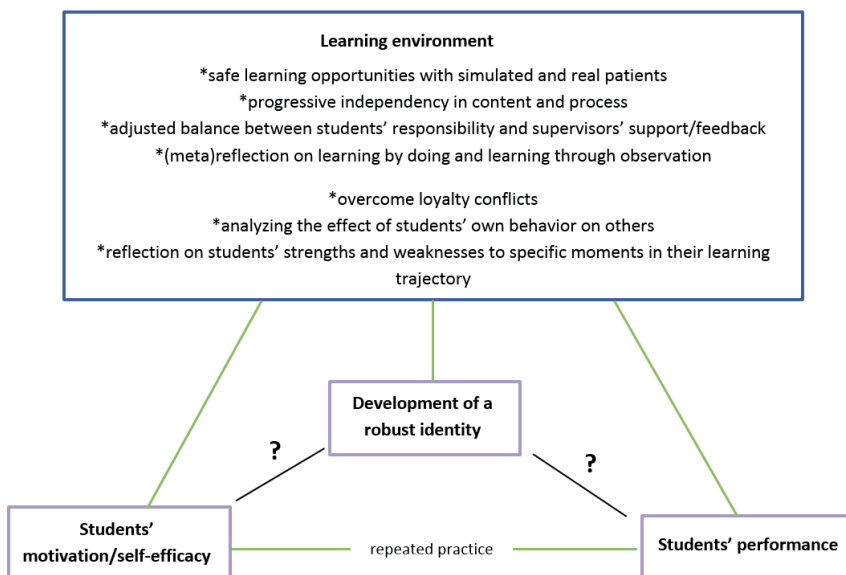
students sometimes find themselves in a loyalty conflict between what they have been taught within the integrated consultation course (new academic developments such as the consultation model) and what their clerkship role models do because these two disagreeing groups expect students to display their consultation style. Loyalty conflicts are known to cause insecurity (29) and therefore likely to negatively affect the development and internalization of an own consultation style. It seems therefore helpful when students are stimulated in a value free learning environment to reflect on the effect on the patient of a certain consultation style; so that they can decide for themselves what is best and transcend the loyalty conflict in order to develop an own consultation style.

In conclusion, conducting a complete consultation for the first time with simulated patients and with real patients gives an extra boost to students' identity development. Medical curricula may embrace this moment to not only teach students a specific consultation model but also to support students in the development of an authentic and robust professional identity.

### **In summary: elaborated social cognitive perspective on learning to conduct integrated consultations**

We expand the original social cognitive perspective with the development of a robust identity (see Figure 8.10).

*Figure 8.10: Elaborated perspective on learning to conduct integrated consultations*



This thesis makes **the loyalty conflicts** within medical curricula explicit. Our results show that these conflicts negatively influence students' identity development because students find it difficult -as novice- to be a pioneer of (new) academic developments. Furthermore, it seems that conducting integrated consultations in the skills lab is more than learning to master and internalize a specific consultation model, it is also **analyzing the effect of once own consultation behavior on the patient in order to develop an own consultation style**, whereby every interaction with a patient is something individually which makes it a lifelong process of self-improvement (30). Finally, conducting complete consultations seems to trigger students to **reflect on their strengths and weaknesses in relation to specific moments in their learning trajectory**, which gives a boost to their identity development. Students become aware of the tension between content and process. If the content becomes complex, the communication with the patient is at hazard. This conflict is to some extent inevitable in a complex learning process, whereby inexperienced students/trainees are yet unable to pay attention to all aspects at once. Within this tension students are very much focused on whether they have sufficient medical knowledge. However, a lack of knowledge cannot be compensated by smart clinical reasoning or good communication. It is inherent to medicine to handle situations in which the physician does not know or does not have to know all the facts. So in our opinion teaching students the art of consulting is also helping students to feel comfortable with a degree of uncertainty.

## Strengths and limitations

The strengths of this thesis are its relevance of focusing on the complex topic of integration, applying instructional design principles into real educational practice and its methodological variety.

First, the research topic is relevant and timely. In several international publications the importance of teaching content and process together has been strongly emphasized (31-34). However, the way medical curricula try to address this in practice varies considerably (35-36). Furthermore, little is written about the learning process students go through when starting to conduct consultations for the first time. Therefore, this thesis contributes to this debate of broadening the understanding of teaching and learning the art of conducting consultations in medical curricula.

A second strength is the fact that we combined the literature on instructional design principles (knowledge-for-practice) with the expert knowledge and preferences of

our skills lab supervisors (knowledge-in-practice) in order to enrich the integrated consultation course. This resulted in the development of two alternative training formats which are successfully incorporated within the medical curriculum at Ghent University. This illustrates its relevance for the real educational context.

The methodological variety is reflected in the use of both quantitative and qualitative methods to explore the effectiveness of the training formats (study 1 and 2). The cross-sectional (study 1) and longitudinal design (study 2) add to the reliability of the thesis' outcomes. Qualitative methods were used to gain a detailed understanding of how students learn to conduct integrated consultations and to provide depth, detail and nuance to the research issues (study 3).

Together with the strengths of this research project, there are important limitations that need to be considered: the generalizability of the results and potential sources of bias.

A first limitation is that our studies took place in one particular university and in one type of curriculum with its specific limitations (e.g. the integrated consultation course and fulltime clerkship periods start relatively late compared to the ideal situation). However, by describing the development of the integrated consultation course with its specific training formats within our curriculum from various angles, we enable readers to judge to what degree our findings are transferable to other settings.

Secondly, sources of potential bias are always important to consider. The qualitative data of study 3 presented in chapter 6 and 7 may be sensitive to interpretation bias, due to the researchers' involvement with the development of the educational training formats and the limited amount of respondents, which participated on a voluntary basis. Involving co-authors from two other universities helped us to identify possible preconceptions and make them explicit. Furthermore, within the experimental study of chapter 4 using three randomized intervention groups, one could argue it is necessary to have a control group. Though it was not the aim of our study to know if the training formats work but to know if the new formats work better than the existing format. Finally, to investigate the association between students' self-efficacy beliefs and their performance, students' consultation performance must have been measured parallel with the different self-efficacy measure moments both in skills lab and in clerkship settings.

## Implications for practice

The concluding perspective on learning to conduct integrated consultations entails some practical implications for medical education.

- It is important to prevent students from adopting evasive coping techniques in order to disguise knowledge deficits. Therefore medical curricula should not work linear from learning separate skills over practice with simulated patients to practice with real patients but use a spiral model of alternating between these educational formats throughout the entire curriculum. Ultimately real patients are essential to challenge students' learning and make them aware of the complexity of medical practice. However, training students first with simulated patients in role-play makes it possible to isolate specific difficulties enabling students to gradually build up their competence, motivation and self-efficacy in conducting consultations.
- This thesis suggests that students' high self-efficacy in communication influences their effort to invest in practicing these skills. To prevent students overestimating their consultation performance, medical curricula (both the skills lab environment as the clerkship environment) should find a balance between alternately supervised and autonomous practice with ongoing constructive multi-source feedback. In order to achieve the latter, students should be trained in observing consultations and providing relevant feedback to their peers.
- Structuring the integrated consultation course within simulated environments according to moving from partial tasks to whole tasks, working from low to high fidelity environments with increasing students' responsibility and decreasing supervisors' support affects students' motivation/ self-efficacy in conducting consultations and students' consultation performance positively and are therefore useful to apply within other medical curricula.
- Within each of the three integrated consultation training formats the four pedagogical principles of learning by doing, learning through observation, immediate feedback and reflection were applied. To enrich the principle of reflection within the integrated consultation course even more, a training format whereby students observe and discuss their own consultations with

simulated patients on video would be useful. Hence, video recordings can be used to propel a guided reflection whereby students can learn to adjust their self-efficacy in consulting with their consultation performance and identify new learning objectives. This will motivate students to continue the use of video during postgraduate training where this thesis showed that students experience the need to get feedback on difficult situations even more.

- The position of clerkships students is inherently connected with obeying the clerkship role models. This period should not last longer as necessary, because it can hinder students' identity development and their critical attitude towards initiating change and new developments. Hence, within the apprenticeship model learners often do not get the space and freedom to think for themselves and transcend the routine of the environment. For example, a specific obstacle within postgraduate training is the fact the hospital is financing specialist trainees. So acting in alignment with the current way of working will be encouraged. This pressure might hinder the development of an own consultation style.
- Both faculty and clerkship supervisors should try to overcome the loyalty conflict in students between medical education and medical practice. Education is constantly in evolution so cooperation between clerkships and skill lab role models and organizing teach the teacher sessions remain crucial whereby time and financial resources should be mobilized. Furthermore, the development of communities of practice between teachers and learners as a trusted learning network in clinical practice has shown to improve teaching effectiveness (37).
- The research results presented in this thesis should be discussed with students in the integrated consultation course. This could encourage students to reflect on their current learning trajectory and empower them to take an active role in developing an own consultation style.

## Implications for future research

The concluding perspective and practical implications yield numerous possibilities for future research. As suggested in the elaborated social cognitive model, future research could clarify the impact of the learning environment on students' identity development. In this thesis we saw that some students copy the behavior of their clinical supervisors, others stick to the model they learned in the consultation training and an ideal few make an informed choice based on the effect of their consultation style on the patient. Involving other participants like clinical supervisors might enrich our understanding of how students develop their own consultation style during clerkships. For example discourse analysis offers a framework for the investigation of how much space faculty and clinical supervisors give to students to have a different opinion. This kind of approach could provide more insight on the support both learners and supervisors need in making the focus on identity formation more explicit. Furthermore, it would be interesting using the Self Determination Theory as theoretical perspective to examine motivational processes during students' identity formation within both the skills lab and clerkships environment. Our results indicate that both the skills lab and clerkship environments encounter varying problems to meet the need for competence, autonomy and relatedness. Within the component of relatedness the difference between intended and hidden curriculum is already known (38), however the loyalty conflict is something new. Further research could verify if this loyalty conflict is present at other universities with other differences between intended and hidden curriculum and clarify the link with students' identity development. Additionally, it would be interesting to explore how train the trainer programs could have an impact on the development of this relatedness and help to overcome the loyalty conflict.

The literature is convinced that increasing self-efficacy motivates students to try something new, which results in more learning experiences with better students' performances as a consequence (16). However, our findings indicate that low self-efficacy beliefs on the medical 'core' competences trigger students to invest more in clinical tasks than in communication. Exploring the conditions which positively affect investment in students' communication skills would be valuable.

Further research on the relation between self-efficacy of the different consultation sub-skills and students' consultation performance is needed. We agree that the complexity of the task may increase the error of assessment when students have to grade their own self-efficacy (39). Being able to reflect thoroughly will help students

to grade their self-efficacy correctly. Therefore, we also encourage further research on how students can be stimulated through reflection in adapting their self-efficacy beliefs.

## Conclusion

In this thesis we aimed to unravel the complex mechanism of teaching students the art of conducting consultations and to acquire insight in how students learn this competence from a social cognitive perspective within the medical curriculum. We have developed and evaluated an integrated consultation course with three training formats according to three instructional design principles (i.e. moving from partial tasks to whole tasks, working from low to high fidelity environment with increasing students' responsibility and decreasing supervisors' support). We have revealed how students learn consulting during the skills lab and clerkship environment whereby practicing complete consultations creates a dilemma of prioritizing medical problem solving above attention for patient communication. Moreover, we made explicit the loyalty conflict between medical education and actual practice that hinders students' identity development. We have elaborated the social cognitive framework with the component of developing a robust professional identity and adapted the instructional guidelines to the context of teaching students integrated consultations. We emphasize that medical educators should implement integrated consultations early within medical curricula because of its complexity. We hope that this thesis will inspire medical teachers and curriculum developers to further develop an integrated consultation course combining simulated patients and real patients in a structured environment with attention to students' motivation, self-efficacy, performance and identity development, in order to prepare students for real practice.

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## Summary





The aim of this thesis is to broaden our understanding of teaching and learning the art of conducting consultations in medical curricula. We conducted three empirical studies to explore quantitatively the effectiveness and efficiency of three integrated consultation training formats and to acquire a qualitative insight in how students learn this complex competence over different phases of the undergraduate curriculum.

## Chapter 1

Conducting consultations is a core competence of the medical profession. Historically, consultation skills are learned by “seeing one, doing one, and teaching one”. Later on, due to the educational reforms of Flexner (1910) and Balint (1963) respectively, a preparatory education in biomedical science and a communication skills training was introduced to medical students’ apprenticeship education. Medical knowledge, history-taking and physical examination skills continued to be taught by practitioners alongside communication skills training by psychologists. The moment students start to practice whole consultations, both content and process come together which makes it a complex process. To support students in the challenge of adequately integrating process and content several consultation models have been developed. All models include comparable components to provide structure to the consultation: initiating the session, gathering information, building a relationship and understanding the patients’ perspective, explanation and planning with shared decision making and closing the session. To help students improve their efficiency and effectiveness as a physician, clinical training programs in communication and consultation skills are set up using experiential learning such as role-play with simulated patients. This introductory chapter explains specific learning theories and instructional design theories that apply on learning communication integrated with clinical skills. To reveal effective and efficient integrated consultation training formats and to investigate in depth how students learn to conduct consultations within the continuum of skills lab education and clerkships, we operationalized the social cognitive perspective on learning as an interaction of the learning environment, students’ motivation/self-efficacy in conducting consultations and students’ consultation performance.

## Chapter 2

Chapter 2 describes the development of two new educational training formats expanding the integrated consultation course at Ghent University. Students experience the need for more training opportunities. Offering more sessions of the supervised training format for all students was not possible because of the intensive supervisor workload in a context of an increasing number of students, and financial and staff constraints. Therefore a design-based research project was set up, which is ideally suited to support medical curricula in improving educational practices and is characterized by a collaboration among researchers and practitioners in real-world settings. As start a literature search was conducted looking for good practices of teaching consultation skills in medical curricula. Using three specific instructional design principles (moving to whole tasks, working from low to high fidelity environment with increasing students' responsibility and decreasing supervisors' support) and four pedagogical principles (learning by doing, learning through observation, immediate feedback and reflection) derived from the literature, the development team chose to develop a teaching method that consisted of an independent role-play and an e-learning module. After implementing these training formats in practice, it is equally important to evaluate the learning effect on the consultation performance, the impact on students' motivation and self-efficacy in conducting consultations and their perceptions of the specific pedagogical principles. Chapter 3 to 7 present the studies that ensued.

## Chapter 3

In our first study we answer three questions: 1) How do students perceive the three training formats? 2) Do patient feedback and mutual observation within the independent training result in a learning effect? 3) Do the two new training formats entail a reduced supervisors' workload? The respondents were respectively 68 students, 55 students and 64 students, who completed a questionnaire evaluating the traditional training, the independent training and the e-learning module. Furthermore, observation lists completed by simulated patients were used to determine any learning effects within the independent training. Overall, students find both the independent training and the e-learning module useful to broaden the integrated consultation course. In both new training formats the supervisors' workload is reduced. However, creating a variety of online cases and follow-up training of simulated patients within the independent training remains time and labor intensive. Results of the one-way

ANOVA show that students score the educational value of the e-learning module significantly lower compared to the supervised training and independent training. The e-learning module is described as more complementary and important to prepare students “just in time” to participate better in the independent training. Within the independent training students experience the feedback from the patients’ perspective useful and honest because of the patients’ credibility. Furthermore, within this format students feel satisfied about their own performance. However, comparing these self-estimations with the observation lists of the simulated patients during the debriefing session with supervisor afterwards, reveals that some students overestimate their performance. This might be explained by the fact that the simulated patient emphasize positive feedback and that the observing peer is less critical due to a lack of clinical knowledge. Therefore, this chapter concludes that looking for the optimal place of the independent training within the curriculum is crucial to prevent this problem of overestimation.

## Chapter 4

In chapter 4 we focus on the impact of the three consultation training formats on students’ self-efficacy beliefs and their consultation competence on the “know what”-level. An experimental pre/posttest study was set up with random assignment of students to each training condition: 72 students participated in the traditional training format, 60 students in the independent training format and 64 students passed through the e-learning module. Self-efficacy was tested with a nine-item scale and the cognitive component of the consultation performance was tested based on responses to a standardized video case. The results of this study suggest that the three consultation training formats contribute to the learning process, but in a different way. The independent training has a positive effect on students’ self-efficacy beliefs. This influence might be explained by the fact that this format format is aligned with *Bandura’s main sources* influencing self-efficacy beliefs: (1) *a direct experience*: being the physician during a role-play for the duration of a complete consultation, (2) *the vicarious experience*: being the observer of a successful/unsuccessful peer involved in a consultation session, (3) *verbal persuasion*: receiving positive feedback from a simulated patient and a peer, (4) *emotional arousal*: feeling free to express themselves without a supervising physician. The traditional training and the e-learning module positively influence the cognitive component of students’ consultation performance, confirming the value of the involvement of an experienced physician and of computer-assisted learning on students’ competence level.



This chapter shows that the independent training results in a positive impact on self-efficacy as measured immediately after the training, but no conclusions could be made as to the middle or long-term impact. Therefore, we studied the changes in medical students' self-efficacy concerning their consultation competence over a longer period while they pass through different learning environments (see chapter 5).

## Chapter 5

Chapter 5 represents a longitudinal study which investigates the change in medical students' self-efficacy concerning their consultation competence over a 17-month-period within different learning environments and evaluates if this change was different for female and male students. A self-efficacy scale was filled in by 122 fifth year medical students seven times over a period of 17 months. The factor analysis of the self-efficacy questionnaire confirms the three consultation sub-skills within the scale: (A) exploratory communication skills, (B) clinical technical skills and (C) explanatory communication integrated with clinical reasoning. In the last component the communication prevails since all the important elements of therapy and planning are discussed with the supervisor in advance. The results show that students' self-efficacy on exploratory and explanatory communication skills are significantly higher than their self-efficacy on the clinical technical skills and integration of all sub-skills. Individual students' self-efficacy generally increases over time, with a higher score after each skills lab session and a small decrease during clerkships for all consultation sub-skills. This decrease might be explained by the fact that students experience consultations during clerkships as more complex compared to skills lab sessions which are adapted to the students' level of competence. The self-efficacy of females for explanatory communication integrated with clinical reasoning are more affected by a changing environment compared to males. Females are more sensitive to stress and their coping mechanism is more influenced by environmental support. When the latter is more hierarchical, masculine and competitive oriented, female students will have more difficulty coping with their negative emotions compared to males.

## Chapter 6

In our third study we focus on how students experienced the integrated consultation course using the following instructional design principles: (A) moving from partial tasks to whole task learning, (B) diminishing supervisors' support and (C)

working from low to high fidelity environments with gradual increase of students' responsibility. Six focus groups were conducted with 20 pre-clerkship and 19 clerkship students in total. We organized the results in relation to the descriptions of students' experiences according to the underlying instructional principles of the integrated consultation course. We found that conducting complete consultations motivates students in their learning process as future physicians. Initially, students are very much focused on medical problem solving. Completing the whole task of a consultation obligates them to transfer their theoretical medical knowledge into applicable clinical knowledge on the spot. Hence, clinical practice calls for a different type of clinical knowledge as compared to what students acquired during pre-clinical training. Furthermore, diminishing the support of a supervisor triggers students to reflect on their own actions but contrasts with their increased appreciation of critical feedback. Increasing students' responsibility stimulates their active learning but makes some students feel overloaded. These students are anxious about missing patient information or not being able to take the right decisions or to answer patients' questions. This sometimes results in evasive coping techniques, such as talking faster to prevent the patient asking questions. Our results show that students set high standards for themselves when they are exposed to the experience of performing a consultation for the first time. Learning to conduct complete consultations is a moment of transfer whereby students have to deal with new expectations and new responsibilities. Furthermore, most medical students perceive the medical culture as hierarchical and competitive where they have to present themselves continuously as professional and self-confident. Therefore, the complex task of conducting complete consultations should be implemented early within medical curricula, giving students enough time to organize their medical knowledge into applicable clinical knowledge. An integrated consultation course should comprise a step-by-step teaching strategy with a variety of supervisors' feedback modi, adapted to students' competence. Finally, students should be guided in formulating achievable standards to prevent them from feeling overloaded in conducting complete consultations with simulated or real patients.

## Chapter 7

In chapter 7, we focus on how medical students experience integrated consultations within a simulated environment and in real practice when dealing with responsibility. We analyzed six focus groups with 20 pre-clerkship and 19 clerkship students using a constant comparative approach. This approach allowed us to study how

undergraduate medical students experience the practice of integrated consultations in the pre-clerkship phase and in the clerkship phase. Both moments are defined as periods of transfer. Our results show that students felt motivated by practicing integrated consultations with simulated patients which triggered their identity development. Hence, students felt like 'real physicians' for the first time. However, practicing complete consultations creates a dilemma of prioritizing medical problem solving above attention for patient communication. Students do not invest much in improving their communication skills with real patients during clerkships due to their focus on medical problem solving and their confidence in their communication skills. The latter is confirmed in chapter 5.

Responsibility for real patients triggers students' identity development even more. Students question themselves: "what kind of doctor do I want to be?" when internalizing their own consultation style by practicing on patients or by observing supervisors. "Internalization" is the process whereby certain externally imposed 'social rules' or norms become people's 'own norms' by their own choice. However, this process is hampered by conflicting demands of faculty and clerkship role models. Some students copy the behavior of their clinical supervisors, while others stick to the model they learned in the consultation training. An ideal few make an informed choice based on the effect of their consultation style on the patient. By then, these students are allowed the space and freedom to think for themselves and rise above the environment in order to develop their own consultation style.

## Chapter 8

Chapters 3-7 present the empirical studies that, together, should clarify our understanding of teaching and learning conducting consultations. Chapter 8 forms the discussion chapter of this thesis in which we present and discuss our main findings. The social cognitive perspective on learning is used and elaborated to analyze the art of teaching and learning conducting consultations. **Learning to conduct integrated consultations takes place in the interaction of the learning environment, students' motivation/self-efficacy in conducting consultations and students' consultation performance whereby identity development plays a central role.**

Structuring the **learning environment** according to moving to whole tasks, working from low to high fidelity environments with increasing students' responsibility and decreasing supervisors' support has a positive impact on students' motivation and self-efficacy in conducting consultations. To prevent over- or underestimation

of students' self-efficacy beliefs within more challenging environments, such as clerkships, an adjusted balance between students' responsibility and supervisors' support is needed. Positive constructive feedback by supervisors, simulated patients and peers is helpful at the start with critical expert feedback later on when students master the basics.

Offering students enough opportunities to practice whereby students can learn by doing with progressive independency in content and process in a variety of situations (combining real and simulated patients) will positively affect their **motivation, self-efficacy and their consultation performance**. It might be helpful to provide time for guided reflection afterwards, to ensure vicarious experiences and to explain the goals and advantages of the training formats. Hence, the integrated consultation course makes students aware of the tension between content and process whereby students are very much focused on their medical knowledge. However, it is inherent to medicine to handle situations in which the physician does not know or does not have to know all the facts. So teaching students the art of consulting is also helping students to feel comfortable with a degree of uncertainty.

Conducting a complete consultation for the first time with simulated patients and with real patients gives an extra boost to **students' identity development**. Medical curricula should not only teach students a specific consultation model but also support the development of an authentic and robust professional identity. It is important to discuss with students the loyalty conflict they might experience between what has been taught in their medical curriculum and what currently happens in practice.

Taking into account these findings, what are the implications for practice and research? The implications for practice are embedded in interventions within medical curricula and clinical practice. Medical curricula should use a spiral model of alternating between learning separate skills, practice with simulated patients and practice with real patients throughout the entire curriculum with a balance between alternately supervised and autonomous practice. Furthermore, the use of video recordings to propel a guided reflection would enrich the integrated consultation course in the undergraduate curriculum and later on during postgraduate training. Finally, in an ideal situation education should be structured in a way that students feel at liberty to develop an own consultation style and implement new developments whereby clinical practice should evolve towards a community of practice.

In line with these recommendations, further research could focus on the impact of the learning environment on students' identity development whereby other par-

ticipants like clinical supervisors might enrich our understanding of how students develop their own consultation style during clerkships and what specific support both learners and supervisors need in making the focus on identity formation more explicit. Additionally, it would be interesting using the Self Determination Theory as theoretical perspective to examine motivational processes during students' identity formation within both the skills lab and clerkships environment with special focus on whether the loyalty conflict is present at other universities with other difference between intended and hidden curriculum. It would be valuable to explore how train the trainer programs could have an impact on the development of this relatedness and help to overcome the loyalty conflict.

Finally, further research could focus on exploring the conditions which positively affect the investment in students' communication skills, on the relation between self-efficacy of the different consultation sub-skills and students' consultation performance and on how students can be stimulated through reflection in adapting their self-efficacy beliefs.

## Samenvatting





## **De kunst van consultvoering (aan)leren**

### **Het exploreren van effectieve en efficiënte onderwijsvormen in het basiscurriculum van de opleiding geneeskunde**

Dit proefschrift beoogt een breder begrip van het (aan)leren van consultvoering in het basiscurriculum van de opleiding geneeskunde. Hiertoe hebben we drie empirische studies uitgevoerd: we gingen kwantitatief de effectiviteit en efficiëntie van drie didactische vormen na, we onderzochten de impact van de leeromgeving op het geloof in eigen kunnen omtrent consultvoering en verworven kwalitatief inzicht in hoe studenten deze complexe competentie aanleren doorheen de verschillende fasen van het basiscurriculum.

### **Hoofdstuk 1**

Consultvoering vormt een kerncompetentie van het artsberoep. Door de tijd heen leerden studenten de consultatievaardigheden door “see one, do one, and teach one”. Later, door de onderwijskundige hervormingen van respectievelijk Flexner (1910) en Balint (1963) kwam er voorafgaand aan de stages een voorbereidend programma in basiswetenschappen, alsook een specifieke training in communicatievaardigheden. De medische kennis, de anamnestiche vaardigheden en het lichamenlijk onderzoek werden onderricht door medische ervaringsdeskundigen, de communicatietrainingen door psychologen. Wanneer studenten starten met het inoefenen van hele consulten, komen inhoud en proces samen en verhoogt de complexiteit. Om studenten te ondersteunen in de uitdaging om inhoud en proces adequaat te integreren, werden er verschillende consultmodellen ontwikkeld. Deze modellen bevatten vergelijkbare componenten om het consult te structureren: kennismaking, contactlegging en aanleiding, informatie verzamelen, het patiëntperspectief begrijpen, een relatie opbouwen, uitleg, advies en planning in samenspraak met de patiënt en de afronding van het consult. Om studenten te helpen in hun efficiëntie en effectiviteit als arts, worden klinische trainingsprogramma’s opgezet om de communicatieve en consultatievaardigheden in te oefenen op basis van experimentele leerstrategieën zoals rollenspel met simulatiepatiënten. Het inleidend hoofdstuk licht specifieke leertheorieën en instructional design-theorieën toe. Dit proefschrift beoogt een breder begrip van het (aan)leren van consultvoering in het basiscurriculum van de opleiding geneeskunde. We vertrekken hierbij vanuit het sociaal-cognitief leerperspectief waarbij leren een interactie is tussen de leeromgeving, de motivatie



en het geloof in eigen kunnen van de studenten en hun consultatie prestatie. Op basis daarvan proberen we effectieve en efficiënte consultvoeringwerkvormen te ontwaren en dieper na te gaan hoe studenten consultvoering leren in het continuüm van skillslabonderwijs en stage.

## Hoofdstuk 2

Hoofdstuk 2 beschrijft de ontwikkeling van twee nieuwe onderwijskundige trainingsprogramma's ter uitbreiding van de geïntegreerde consultvoeringcursus aan de Universiteit Gent. Studenten hebben nood aan meer oefenmogelijkheden. Door de hoge supervisorwerklast binnen de bestaande training en een context van toenemende studentenaantallen en beperkte financiële middelen en personeelsequippe is het echter onmogelijk om alle studenten meer sessies van de gesuperviseerde werkvorm aan te bieden. Daarom werd een ontwerp-gebaseerd onderzoeksproject opgestart. Dit soort onderzoek is ideaal om medische opleidingen te ondersteunen in het verbeteren van hun onderwijskundige praktijk en maakt de samenwerking tussen onderzoekers en praktijkdeskundigen mogelijk. Eerst werd een literatuuronderzoek uitgevoerd met een focus op goede praktijkvoorbeelden om consultatievaardigheden in de medische basisopleiding aan te leren. Vervolgens koos het ontwikkelingsteam om twee werkvormen te ontwikkelen op basis van drie specifieke instructional design-richtlijnen (werken aan gehele taken, evolueren van lage naar hoge realiteitsgetrouwe omgevingen met toenemende studentenverantwoordelijkheid en afnemende begeleidersteun) en vier pedagogische principes (leren door te doen, leren door observatie, onmiddellijke feedback en reflectie) uit de literatuur. De twee nieuwe werkvormen bestaan enerzijds uit een zelfstandig rollenspel en anderzijds uit een elektronische leermodule. Nadat beide in de praktijk werden geïmplementeerd was het ook belangrijk om te evalueren wat het leereffect is op de consultatie prestatie, de impact op de motivatie en het geloof in eigen kunnen van de studenten en hun percepties omtrent de specifieke design principes. Hoofdstuk 3 tot 7 presenteren het onderzoek dat op deze vragen volgde.

## Hoofdstuk 3

In onze eerste studie proberen we drie vragen te beantwoorden: (1) Hoe ervaren studenten de drie consultatiewerkvormen? (2) Leidt het ontvangen van patiëntfeedback en wederzijdse observatie tot een leereffect in de zelfstandige training? (3) Omvatten de twee nieuwe werkvormen een gereduceerde werklast voor de

supervisors? De respondenten waren 68 studenten, 55 studenten en 64 studenten die een evaluerende vragenlijst beantwoordden over respectievelijk de traditionele training, de zelfstandige training en de elektronische module. Daarnaast werden de observatieformulieren, ingevuld door de simulatiepatiënten, gebruikt om het leereffect binnen de zelfstandige training na te gaan. In het algemeen vinden de studenten zowel de zelfstandige training als de elektronische module twee zinvolle werkvormen om de geïntegreerde consultatiecursus uit te bouwen. In beide werkvormen was de werklast voor de supervisors gereduceerd. Desalniettemin blijven het creëren van een variatie aan online casussen en het opvolgen van de simulatiepatiënten in de zelfstandige training tijds- en arbeidsintensief. Resultaten van de one-way-ANOVA tonen aan dat studenten de onderwijskundige waarde van de elektronische module significant lager scoren dan de gesuperviseerde training en de zelfstandige training. De elektronische module wordt veeleer beschreven als complementair en belangrijk ter voorbereiding van de zelfstandige training. In de zelfstandige training ervaren studenten de feedback van de simulatiepatiënten als zeer zinvol en eerlijk. Daarnaast voelen studenten zich tevreden over hun prestatie tijdens deze trainingsvorm. Wanneer we echter de observatielijst van de simulatiepatiënten analyseren tijdens de nabespreking met supervisor, stellen we vast dat sommige studenten hun prestatie tijdens de zelfstandige training overschatten. Dit kan verklaard worden door het feit dat simulatiepatiënten vooral de positieve feedback benadrukken en dat de observerende medestudent minder kritisch is door een gebrek aan medische kennis. Daarom besluit dit hoofdstuk dat, om overschatting te vermijden, een optimale positionering van de zelfstandige training in het curriculum cruciaal is.

## Hoofdstuk 4

In hoofdstuk 4 focussen we op de impact van drie consultatiewerkvormen op het geloof in eigen kunnen van de studenten en op de mate waarin het “weten wat”-niveau van de consultatievaardigheid verbetert. Een experimenteel pre- en postonderzoek werd opgezet en de studenten werden willekeurig toegewezen aan drie trainingscondities: 72 studenten participeerden in de traditionele werkvorm, 60 studenten in de zelfstandige werkvorm en 64 studenten namen deel aan de elektronische module. Het geloof in eigen kunnen werd gemeten met een 9-itemschaal en de cognitieve component van de consultcompetentie werd getest aan de hand van een gestandaardiseerde videocasus waarbij studenten tussentijds vragen beantwoordden. De resultaten van deze studie suggereren dat de drie consultatiewerkvormen elk op hun

manier bijdragen aan het leerproces. De zelfstandige werkvorm heeft een positief effect op het geloof in eigen kunnen van de studenten. Een mogelijke verklaring hiervoor is het feit dat deze werkvorm de *vier beïnvloedende bronnen van Bandura* integreert: (1) *een directe ervaring*: de arts zijn tijdens het rollenspel gedurende een hele consultatie, (2) *de plaatsvervangende ervaring*: de observator zijn van een (on)succesvolle medestudent in een consultatie, (3) *verbale overtuigingskracht*: positieve feedback ontvangen van een simulatiepatiënt en medestudent, (4) *emotionele opwindning*: zich vrij voelen om zich uit te drukken zonder superviserende arts. De traditionele werkvorm en de elektronische module hebben een positief effect op de cognitieve component van de consultatie competentie. Dit bevestigt het belang van een ervaren arts en computerondersteund leren voor het kennisniveau van de studenten. Dit hoofdstuk toont aan dat de zelfstandige training resulteert in een positieve impact op het geloof in eigen kunnen, dat onmiddellijk gemeten werd na de training zelf. Er kunnen echter geen besluiten worden genomen over de middel- tot langetermijnimpact. Daarom hebben we nadien de verandering in het geloof in eigen kunnen van de studenten voor de verschillende consultatie sub-vaardigheden onderzocht over een longitudinale periode binnen verschillende leeromgevingen (zie hoofdstuk 5).

## Hoofdstuk 5

Hoofdstuk 5 presenteert een longitudinale studie die de verandering in het geloof in eigen kunnen van medische studenten met betrekking tot hun consultatie-competentie onderzoekt over een periode van 17 maanden binnen verschillende leeromgevingen. Daarnaast evalueert de studie of deze verandering verschillend is voor vrouwelijke en mannelijke studenten. De schaal over het geloof in eigen kunnen werd door 122 vijfdejaars studenten geneeskunde zeven keer ingevuld over een periode van 17 maanden. De factoranalyse bevestigde de drie consultatie sub-vaardigheden: (A) explorerende communicatievaardigheden, (B) klinisch technische vaardigheden en (C) verklarende communicatievaardigheden geïntegreerd met klinisch redeneren. In de laatste component overweegt voor studenten de communicatie omdat alle inhoudelijke elementen rond therapie en planning meestal vooraf met de desbetreffende begeleider werden besproken. De resultaten laten zien dat studenten hun geloof in eigen kunnen op vlak van explorerende en verklarende communicatieve vaardigheden significant hoger scoren dan de klinisch technische vaardigheden en de integratie van alle consultvaardigheden samen. Globaal gezien neemt het individueel geloof in eigen kunnen toe over de tijd, met een hogere score

na elke skillslabsessie en een lichte daling tijdens de stages voor alle consult subvaardigheden. Deze daling zou verklaard kunnen worden door het feit dat studenten de consultaties tijdens de stages als meer complex ervaren in vergelijking met de skillslabsessies waar de consulten aangepast zijn aan het competentieniveau van de studenten. Het geloof in eigen kunnen voor de verklarende communicatievaardigheden geïntegreerd met klinisch redeneren wordt bij vrouwen meer beïnvloed door een veranderende omgeving dan bij mannen. Vrouwelijke studenten blijken gevoeliger te zijn voor stress en hun coping mechanismen worden meer beïnvloed door steun uit te omgeving. Als deze omgeving eerder hiërarchisch, mannelijk en competitief geïntegreerd is zullen vrouwelijke studenten meer moeilijkheden ervaren met de coping van negatieve emoties in vergelijking met mannelijke studenten.

## Hoofdstuk 6

De derde studie richt zich op hoe studenten de geïntegreerde consultatiecursus ervaren. Deze cursus maakt gebruik van drie design principes: (A) van afzonderlijke deeltaken naar gehele taken, (B) afbouwen van de supervisorondersteuning en (C) evolueren van lage naar hoge realiteitsgetrouwe omgevingen met geleidelijke toename van studentenverantwoordelijkheid. Zes focusgroepen werden uitgevoerd met 20 vijfdejaars- en 19 zesdejaarsstudenten in totaal. We organiseerden de resultaten in relatie tot de beschrijvingen van de ervaringen van studenten overeenkomstig met de onderliggende designprincipes. We stelden vast dat het voeren van gehele consulten studenten motiveert in hun leerproces als toekomstige artsen. Aanvankelijk zijn studenten heel erg gefocust op het oplossen van het medische probleem. Het volbrengen van een volledig consult verplicht studenten om hun theoretische medische kennis te transfereren naar onmiddellijk praktisch toepasbare klinische kennis. De klinische praktijk vraagt om een ander type klinische kennis in vergelijking dan hetgeen studenten verwerven tijdens de preklinische fase. Verder leidt het verminderen van de supervisorondersteuning tot reflectie over het eigen handelen. Dit staat echter in contrast met de toegenomen appreciatie voor kritische feedback tijdens de stages. Een toenemende verantwoordelijkheid van de studenten activeert hun leren maar leidt er ook toe dat sommige studenten zich overladen voelen. Deze studenten zijn bang dat ze belangrijke patiëntinformatie zouden missen waardoor ze niet in staat zouden zijn om de juiste beslissingen te nemen of te antwoorden op vragen van patiënten. Dit resulteert soms in vermijdingsgedrag zoals het sneller praten om te vermijden dat de patiënt vragen stelt. Onze resultaten tonen aan dat studenten hoge standaarden stellen voor zichzelf op het moment dat ze voor

de eerste keer een consult uitvoeren. Het leren uitvoeren van hele consultaties is eigenlijk een transfermoment waarbij studenten moeten leren omgaan met nieuwe verwachtingen en nieuwe verantwoordelijkheden. Daarnaast ervaren sommige studenten de medische cultuur als hiërarchisch en competitief en hebben ze het gevoel dat ze zichzelf continu moeten presenteren als professioneel en zelfzeker. Daarom zou de complexe taak van consultvoering redelijk vroeg in de medische curricula moeten geïmplementeerd worden, zodat studenten voldoende tijd krijgen om hun medische kennis te reorganiseren naar praktisch toepasbare klinische kennis. Een geïntegreerde consultvoeringcursus zou een stapsgewijze onderwijsstrategie moeten omvatten met een variëteit aan feedbackmodi, aangepast aan het competentieniveau van de studenten. Tot slot is het belangrijk studenten te begeleiden in het formuleren van haalbare standaarden bij volledige consultvoering met simulatiepatiënten en echte patiënten om te vermijden dat ze zich overladen voelen.

## Hoofdstuk 7

In hoofdstuk 7 richten we ons op hoe studenten het voeren van geïntegreerde consulten in een gesimuleerde omgeving en in de echte praktijk ervaren. We analyseerden 6 focusgroepen met 20 vijfdejaars- en 19 zesdejaarsstudenten op basis van de methode van constante vergelijking. Deze benadering laat toe om na te gaan hoe studenten uit de basisopleiding de uitvoering van gehele consulten ervaren in de preklinische fase en in de klinische fase. Beide momenten worden gedefinieerd als een transferperiode. Onze resultaten tonen aan dat studenten gemotiveerd zijn om geïntegreerde consulten te voeren met simulatiepatiënten. Deze ervaring prikkelt de identiteitsontwikkeling van de studenten omdat ze zich voor de eerste keer 'echt arts' voelen. Het voeren van gehele consulten creëert echter een dilemma waarbij het medische probleem oplossen prioriteit krijgt op de aandacht voor de communicatie met de patiënt. Door de sterke focus van studenten op hun probleemoplossend vermogen en hun zelfvertrouwen in hun communicatievaardigheden blijken studenten niet veel moeite te doen om hun communicatievaardigheden in te oefenen met echte patiënten tijdens de stages. Het groot geloof in eigen kunnen inzake communicatie wordt bevestigd in hoofdstuk 5.

De verantwoordelijkheid voor echte patiënten prikkelt de identiteitsontwikkeling bij studenten nog meer. Wanneer studenten tijdens het oefenen met echte patiënten of het observeren van supervisors een eigen consultstijl internaliseren, stellen ze

zichzelf de vraag: “welk soort arts wil ik zijn?”. Internalisatie is het proces waarbij bepaalde extern sociaal aangenomen regels of normen door eigen keuze persoonlijke normen worden. Dit proces wordt echter tegengewerkt door tegenstrijdige verwachtingen van de universitaire rolmodellen en de praktijkrolmodellen. Sommige studenten kopiëren het gedrag van de klinische supervisors, terwijl anderen vasthouden aan het aangeleerde model uit de basisopleiding. Een aantal studenten maakt een weloverwogen keuze gebaseerd op het effect van hun consultstijl op de patiënt. Op dat moment krijgen studenten de ruimte en vrijheid om voor zichzelf te denken en boven de omgeving uit te stijgen zodat ze hun eigen consultstijl kunnen ontwikkelen.

## Hoofdstuk 8

De hoofdstukken 3 tot 7 presenteren de empirische studies die het (aan)leren van consultvoering verhelderen. Hoofdstuk 8 presenteert een overkoepelende discussie over de belangrijkste bevindingen uit deze studies. Om het (aan)leren van consultvoering te analyseren werd het sociaal cognitief leerperspectief gebruikt en uitgebreid. **Het leren van geïntegreerde consultaties vindt plaats in de interactie tussen de leeromgeving, de motivatie en het geloof in eigen kunnen van de studenten en hun consultatieprestatie. Binnen deze interactie speelt de identiteitsontwikkeling een centrale rol.**

De **leeromgeving** structureren in overeenkomst met de drie design principes ((1) van afzonderlijke deeltaken naar gehele taken, (2) afbouwen van de supervisorondersteuning en (3) evolueren van lage naar hoge realiteitsgetrouwe omgevingen (met geleidelijke toename van studentenverantwoordelijkheid) heeft een positieve impact op de motivatie van studenten en hun geloof in eigen kunnen. Om te vermijden dat studenten zichzelf over- of onderschatten in meer uitdagende omgevingen zoals de stages, is het belangrijk een aangepast evenwicht te vinden tussen de verantwoordelijkheid van de studenten en de ondersteuning van de supervisors. Positieve, constructieve feedback van supervisors, simulatiepatiënten en medestudenten is zinvol bij de start van elk leerproces. Kritische expertfeedback wordt op het moment dat studenten een zekere basis beheersen belangrijker.

Om de **motivatie van studenten, hun geloof in eigen kunnen en hun consultatie prestatie** positief te beïnvloeden is het zinvol voldoende oefenmogelijkheden aan te bieden met een toenemende zelfstandigheid in inhoud en proces, binnen

gevarieerde situaties (combinatie van echte patiënten en simulatiepatiënten) en waarbij studenten al doende kunnen leren. Daarbij is het waardevol om tijd te voorzien voor begeleide reflectie, voor plaatsvervangende ervaringen en om de leerdoelen en voordelen van de werkvormen toe te lichten. De geïntegreerde consultvoeringcursus maakt studenten bewust van de spanning tussen inhoud en proces, waarbij studenten sterk focussen op hun medische kennis. Het is echter inherent aan geneeskunde dat artsen moeten handelen in situaties waar ze niet alles weten of niet alle feiten kennen. Het is dan ook nuttig om naast het aanleren van consultvoering, studenten te ondersteunen in het zich comfortabel voelen met een zekere mate van onzekerheid.

De eerste volledige consultvoering met simulatiepatiënten en met echte patiënten geeft een extra boost aan de **identiteitsontwikkeling** van studenten. Naast het aanleren van een consultmodel is het zinvol om studenten in de basisopleiding te ondersteunen in de ontwikkeling van een authentieke en robuuste identiteit. Daarbij is het belangrijk om met studenten het loyaliteitsconflict tussen wat hen werd aangeleerd in de basisopleiding en wat in de huidige praktijk wordt toegepast, te bespreken.

Wat zijn in het licht van deze bevindingen, de implicaties voor de praktijk en verder onderzoek? De praktische implicaties omvatten interventies die ingebed moeten worden zowel in het medisch curriculum als in de klinische praktijk. Medische curricula zouden gebruik moeten maken van een spiraalvormig model waarbij het aanleren van afzonderlijke vaardigheden, het oefenen met simulatiepatiënten en het oefenen met echte patiënten doorheen het hele curriculum afgewisseld wordt met een evenwicht tussen gesuperviseerde en autonome oefenpraktijken. Verder zou de geïntegreerde consultvoeringcursus in de basisopleiding geneeskunde en later de vervolgopleidingen verrijkt kunnen worden met het gebruik van video-opnames om een begeleide reflectie aan te wakkeren. Tot slot mag de 'leermeester-gezelverhouding' niet te lang duren zodat studenten in staat zijn om een eigen consultstijl te ontwikkelen en ze verandering naar aanleiding van nieuwe ontwikkelingen durven initiëren. Hierdoor kan de klinische praktijk evolueren naar een lerend netwerk.

Parallel aan deze aanbevelingen zou verder onderzoek zich kunnen richten op de impact van de leeromgeving op de identiteitsontwikkeling van studenten waarbij andere actoren, zoals klinische supervisors kunnen betrokken worden. Dit kan ons helpen om nog beter te begrijpen hoe studenten een eigen consultstijl ontwikkelen en welke specifieke steun zowel de lerenden als de supervisors nodig hebben in

het meer expliciet maken van de identiteitsvorming. Aanvullend, zou het interessant zijn om de zelfdeterminatietheorie (ZDT) te gebruiken als theoretisch perspectief om motivationele processen in de identiteitsvorming van studenten tijdens skills-labonderwijs en stages onder de loep te nemen. Hierbij kan er specifiek ingezoomd worden op het feit of het loyaliteitsconflict ook in andere universiteiten aanwezig is met andere verschillen tussen het formele en het verborgen curriculum. Verder zou het waardevol zijn om na te gaan hoe train the trainer-programma's een impact kunnen hebben op de "betrokkenheid" als bouwsteen binnen de ZDT, zodoende optimale groei te verzekeren en het loyaliteitsconflict te overstijgen.

Tot slot kan verder onderzoek zich ook richten op het exploreren van de condities die studenten aanzetten om te investeren in hun communicatieve vaardigheden, de relatie tussen het geloof in eigen kunnen omtrent de verschillende consultatie subvaardigheden en de consultatie prestatie van studenten en hoe studenten kunnen gestimuleerd worden tot reflectie om hun geloof in eigen kunnen aan te passen.





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## Curriculum Vitae





Leen Aper was born on April 25<sup>th</sup> 1985 in Ghent. She attended secondary education at Sint-Bavo humaniora in Ghent where she graduated in 2003. From 2003-2008 she studied Educational sciences at Ghent University. During her studies she combined the AILO to obtain her teacher certificate “diploma van geaggregeerde voor het secundair onderwijs - groep 2”. After graduating in 2008 she started working at the Faculty of Medicine and Health Sciences. From 2008-2014 she combined her work as a PhD student with different educational innovation projects at the Faculty of Medicine and Health Sciences. Due to these projects she has been involved in several educational developments: supporting portfolio learning, coaching tutors within problem based learning, introducing audio response systems, collecting experience on guidance and evaluation of master thesis’s, introducing peer to peer learning with intervision sessions, introducing peer assessment and blended learning and unrolling a mentorship within the undergraduate medical curriculum. She is married to Matthijs Vanommeslaeghe. They have one daughter and are expecting their second child.