



Universiteit
Leiden

The Netherlands

Exploring the maturation of medical educators and their beliefs about teaching and learning: the value of a personal educational mission

Ottenhoff-de Jonge, M.W.

Citation

Ottenhoff-de Jonge, M. W. (2023, November 29). *Exploring the maturation of medical educators and their beliefs about teaching and learning: the value of a personal educational mission*. Retrieved from <https://hdl.handle.net/1887/3665292>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3665292>

Note: To cite this publication please use the final published version (if applicable).

**EXPLORING THE MATURATION OF MEDICAL
EDUCATORS AND THEIR BELIEFS ABOUT
TEACHING AND LEARNING**

the value of a personal educational mission

Marleen W. Ottenhoff-de Jonge

Exploring the maturation of medical educators and their beliefs about teaching and learning

The value of a personal educational mission

Marleen W. Ottenhoff-de Jonge

Department of Public Health and Primary Care of the Leiden University Medical Centre

ISBN: 978-94-6483-348-5

Cover design and layout© evelienjagtman.com

Printing: Ridderprint; www.ridderprint.nl

© Marleen W. Ottenhoff-de Jonge 2023. All rights reserved.

The copyright of the articles has been transferred to the respective journals.

De uitgave van dit proefschrift is mede ondersteund door de J.E. Jurriaanse Stichting en de Nederlandse Vereniging voor Medisch Onderwijs (NVMO).

EXPLORING THE MATURATION OF MEDICAL EDUCATORS AND THEIR BELIEFS ABOUT TEACHING AND LEARNING

the value of a personal educational mission

Proefschrift

ter verkrijging van
de graad van doctor aan de Universiteit Leiden,
op gezag van rector magnificus prof.dr.ir. H. Bijl,
volgens besluit van het college voor promoties
te verdedigen op woensdag 29 november 2023
klokke 16.15 uur

door

Magdalena Wilhelmina Ottenhoff-de Jonge
geboren te Nuenen
in 1960

Promotores

Prof.dr. A.W.M. Kramer

Prof.dr. R.M. van der Rijst

Promotiecommissie

Prof.dr. F.W. Dekker

Prof.dr.ir. F.J.J.M. Janssen, ICLON, Universiteit Leiden

Prof.dr. D.H.J.M. Dolmans, Universiteit Maastricht

Prof.dr. K.M. Skeff, Stanford University School of Medicine, Stanford, USA

CONTENTS

Chapter 1	General introduction	9
Chapter 2	Medical educators' beliefs about teaching, learning, and knowledge: development of a new framework <i>BMC Medical Education 2021</i>	37
Chapter 3	From critic to inspirer: four profiles reveal the belief system and commitment to educational mission of medical academics <i>BMC Medical Education 2019</i>	69
Chapter 4	How learning-centred beliefs relate to awareness of educational identity and mission: an exploratory study among medical educators <i>Medical Teacher 2022</i>	103
Chapter 5	Maturing through awareness: an exploratory study into the development of educational competencies, identity, and mission of medical educators <i>Medical Teacher 2023</i>	127
Chapter 6	General discussion	155
Chapter 7	Summary	183
	Nederlandse samenvatting	191
	Dankwoord / Acknowledgements	199
	List of publications	201
	About the author / Over de auteur	203

‘Education is the most
powerful weapon which
you can use to
change the world’

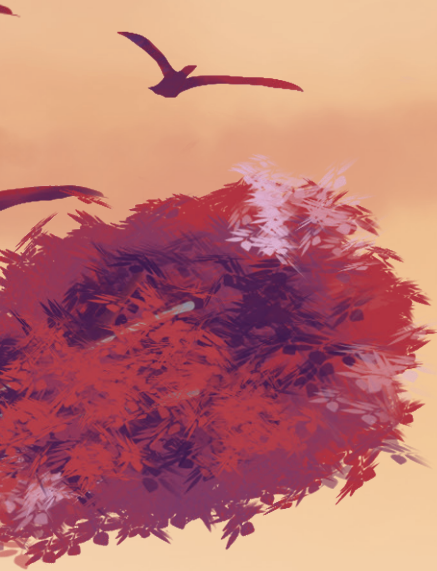
- *Nelson Mandela* -





Chapter 1

General introduction



GENERAL INTRODUCTION

Learning-centred education has gained ground in recent decades and is widely implemented in medical schools around the world.¹ An important reason for this innovation is that learning-centred education is associated with high-quality student learning.²⁻¹¹ A core characteristic of learning-centred education is its focus on facilitating student learning and development, as opposed to teaching-centred education with a mere focus on the structure of the content and its transmission by the teacher.^{e.g.1,12-16} This requires a different role from the medical educators responsible for the teaching: they need to act as facilitators of students' learning processes rather than focusing only on the transfer of factual knowledge.

To properly fulfil this role, educators need to become aware of their beliefs about teaching and learning, as beliefs are important drivers of behaviour.^{e.g.15-22} Indeed, any innovation in which the beliefs of educators responsible for its implementation do not align with the premise behind the innovation, is doomed to fail.^{23,24} However, we know that a substantial number of medical educators still hold beliefs about teaching and learning that are inconsistent with the learning-centred education context in which they work.^{e.g.25,26} To effectively encourage learning-centred teaching behaviours, we need to understand which factors influence educators' beliefs about the teaching and learning process. One of the factors associated with beliefs about teaching and learning is what educators believe about being a teacher.^{27,28} For example, the more personal views educators hold about themselves as teachers, such as their motivation or enjoyment as a teacher, are suggested to be influential to their beliefs about teaching and learning. The studies which suggest a relationship between beliefs about teaching and learning, and beliefs about being a teacher were carried out in higher education²⁷ and teacher education²⁸ contexts. Therefore, to determine whether such a relationship also exists in the medical education context, we will explore sequentially medical educators' beliefs about teaching and learning, and their beliefs about being a teacher, and subsequently relate these two areas of inquiry to each other. To prevent confusion between the two areas of inquiry we decided to reserve the term 'beliefs' for beliefs about teaching and learning, and to describe beliefs about being a teacher as 'perspectives on being a teacher.' We consider the terms 'beliefs' and 'perspectives' to be similar in meaning. If we can demonstrate a relationship between beliefs about teaching and learning, and perspectives on being a teacher, then it is useful to investigate whether educators' perspectives on being a teacher are fixed in time, or rather can develop over time towards a more explicit focus on supporting the student and their development.

To summarise, this study focuses on how medical educators working in learning-centred educational contexts can develop their perspectives on being a teacher, and how these perspectives relate to their beliefs about teaching and learning. This will provide insights into the development of medical educators, and may uncover important tools and strategies to facilitate faculty development in medical schools, benefitting the education of future health care professionals.

To give an introduction into the research of beliefs about teaching and learning, and perspectives on being a teacher, we will first define and describe terms commonly used in this research. This is followed by an overview of current insights into beliefs about teaching and learning including existing classifications of these beliefs. Subsequently, we will further elaborate on what is known about perspectives on being a teacher. We will describe a theoretical model, developed previously in teacher education, which we used to explore educators' perspectives on being a teacher. According to the model, beliefs are largely influenced by identity and mission as a teacher. However, little is known in the medical education research literature about the relationship between beliefs on the one hand and identity and mission on the other. This empirical gap is subsequently also addressed in our work: how medical educators' beliefs about teaching and learning are related to their educational identity and mission. Finally, since little is known about the development of medical educators' perspectives on being a teacher over time, we will discuss the need to increase our understanding of how educators develop their perspectives on being a teacher, to help promote the maturation of educators towards more learning-centred beliefs and behaviours.

Description of terms

Medical educator

A medical educator, according to the Glossary of Medical Education Terms, is a professional who focuses on the educational process necessary to transform students into physicians.²⁹ The term often refers to professionals who, in addition to teaching, fulfil other educational roles, such as curriculum design and evaluation, educational leadership and innovation, as well as research in education.³⁰ Since in this study we deliberately selected professionals with long-term teaching experience and multiple educational roles in medical schools, we have adopted the term 'medical educator' to describe the participants in our studies.

Learning-centred education versus teaching-centred education

Learning-centred education, more often referred to as student-centred or learner-centred education, has been defined in various ways.^{e.g.1,14,29,31-33} As a starting definition for this research, we have opted for the definition of Bremner,³⁴ because of its clarity and completeness. It states that learning-centred education is ‘a teaching approach in which learners cease to be passive receivers of knowledge and become active participants in their own learning process; learning is contextualised, meaningful, and based, wherever possible, around learners’ prior knowledge, needs and interests; finally, learning is dialogic and democratic, and learners have control with regards to what and how they learn.’ A learning-centred educational approach is in line with the concepts of self-regulated learning and life-long learning. Small group teaching sessions can be effective in encouraging students to construct their own meaning of the subject matter, and increase their conceptual understanding through active participation and collaboration.³⁵ Learning-centred education is the opposite of teaching-centred education, in which the teacher determines what is being taught and how it is to be learned. In teaching-centred education, formal lectures are important activities, and the students are more passive recipients of the knowledge presented. In this research we prefer ‘learning-centred’ education over ‘learner-centred’ education since in the discourse on educators’ beliefs about teaching and learning several studies emphasise that in learning-centred beliefs the focus is on the *learning* of the learner rather than on the learner themselves.^{e.g.16,27,36}

Definition and characteristics of educational beliefs

Beliefs can be defined as ‘psychologically held understandings, premises and propositions about the world that are felt to be true.’²⁰ Although there are still many discussions about the concept of ‘educational beliefs,’ the following characteristics are generally agreed upon in the educational research literature.^{17,20,28,34,37-39} Educational beliefs are generally deeply-rooted through the strong influence of teachers’ own (early) experiences as learners. They are resistant to change, even though change over time is achievable in response to significant experiences. Educational beliefs can sometimes be consciously present in the ‘foreground,’ but can also be unconsciously in the ‘background’ at other times. They are generally seen as key factors in influencing teaching practice, but nevertheless the relationships between beliefs and practices are complex and there are many cases where educators’ beliefs do not match their practice. Educators’ educational beliefs can concern all areas which are relevant to education. In this research we focus on educators’ beliefs about teaching and learning, and their beliefs about being a teacher, the latter of which we refer to as ‘perspectives on being a teacher.’

Beliefs about teaching and learning

Beliefs versus conceptions

Within the higher education research literature, ‘beliefs about teaching and learning’ and ‘conceptions of teaching and learning’ are the most common terms used to describe ideas or convictions that educators hold about teaching, learning, and knowledge. There is an overlap in how these two terms are described in the literature.¹² We have chosen the term beliefs about teaching and learning as the basis for this research for the following reasons. First, the two models that we use in our research both use the term beliefs rather than conceptions.^{16,28} Second, studies that use the term (change of) beliefs more often emphasise the importance of affect and emotion in the process of teaching and learning^{e.g.39,40} than studies that use the term conceptions. We anticipate that, in addition to cognitive aspects, affective aspects are indeed significant in the convictions that medical educators hold about teaching and learning, and aim to explicitly explore these affective aspects.

Beliefs about teaching and learning in higher education research literature

University educators’ beliefs about teaching and learning have been the subject of many studies over the past three decades.^{2-5,11,12,15,16,23,27,39,41-50} Most studies have in common that they consistently (though not uniformly: Pratt⁴⁷ is an exception) distinguish between teaching-centred and learning-centred beliefs. Learning-centred beliefs are also described as student-centred or learner-centred beliefs, and teaching-centred beliefs as teacher-centred beliefs. The description in Samuelowicz & Bain’s 1992 study¹⁵ clearly summarises the common findings and illustrates the distinction between teaching-centred and learning-centred beliefs which aligns well with the definition of learning-centred education *versus* teaching-centred education that we provided. They state that educators with teaching-centred beliefs view teaching as a one-way transmission of content information and believe that the content, by which is meant the knowledge, skills and attitude students need to acquire, is the content transmitted by the teacher. They see knowledge as ‘factual’ and as obtained from outside, and do not focus on the direct interaction between the content and the student (see Figure 1.1.A). In addition, they express learning outcomes in quantitative terms (a student will know more), do not take into account the students’ pre-existing conceptions, and see learning as oriented towards the content of a course. In contrast, educators with learning-centred beliefs view teaching as an activity aimed at changing students’ beliefs and conceptual understandings through a reciprocal teacher-student interaction to negotiate meaning. They see knowledge as constructed and personalised through experience, and are convinced that their

activities should enable students to construct their own meaning of the content and develop independent creative thinking (see Figure 1.1.B). In addition, they express learning outcomes in qualitative terms (a student will know differently, meaning gain new understandings), believe students' pre-existing beliefs should be the starting point of an interactive process of learning and teaching, and see learning as oriented towards the reality of the profession.

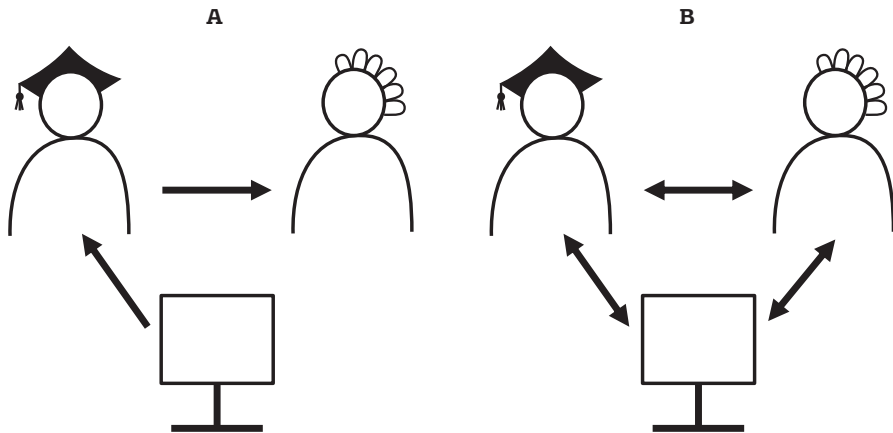


Figure 1.1. The relationship between teacher, student, and content, for teaching-centred beliefs (A) and learning-centred beliefs (B).

Learning-centred beliefs and their effect on student learning

Multiple studies show that educators with learning-centred beliefs appear to make choices in their teaching practice that lead to deeper learning among students.^{3-6,9-11,51} This is a *direct empirical* argument for why learning-centred beliefs are preferable in contemporary education. Other studies also provide an *indirect empirical* argument for why learning-centred beliefs lead to better quality learning among students. This is related to the way the beliefs about teaching and learning are categorised. Learning-centred beliefs are consistently viewed as more elaborate and representing a broader understanding of teaching than teaching-centred beliefs.^{e.g.12,18,27,36,50,52} For example, while educators with teaching-centred beliefs express the desired learning outcomes in quantitative terms rather than qualitative ones, educators with learning-centred beliefs are aware of both perspectives, and experience the quantitative outcome not so much as wrong but as incomplete. Thus, the indirect empirical argument is that educators with learning-centred beliefs are not only aware of the relevance of the content, but also and above all focus on their students' learning when designing and implementing teaching/learning activities. This increases

the likelihood of a deeper quality of student learning. In contrast, educators with teaching-centred beliefs focus only on the content and are less aware of the student's learning process. In addition to the two arguments described above, Schweisfurth³² provides two further arguments for why learning-centred beliefs are preferred in contemporary education. The first is an *economic* argument that states that students must develop higher-order skills such as critical thinking, flexibility and creativity in order to become and remain as competitive as possible in an ever-changing world. The second is an *emancipatory* argument that states that learning-centred education is a way of reducing the traditional power distance between teacher and student and thus contributes to a more equal, democratic and diverse society. In our view, both additional arguments are specifically relevant in the medical education context: the fast-changing and expanding medical scientific knowledge and availability of the internet and artificial intelligence as novel tools and sources of information demand that students develop these higher-order skills. Moreover, through a more equal relationship between teacher and student, a core competence such as collaboration can possibly be promoted, and in parallel also contribute to the development of a more equal and collaborative doctor-patient relationship.

Beliefs about teaching and learning in the medical education research literature

Studies exploring medical educators' beliefs about teaching and learning are limited.^{14,19,26,48,53-56} Moreover, most of these studies were not specifically executed in learning-centred education context. One of the few studies which explored medical educators' beliefs about teaching and learning in learning-centred curricula is that of Jacobs et al.^{14,56} who developed the 'COLT' (Conceptions Of Learning and Teaching) questionnaire. The COLT represents a novel, validated questionnaire for measuring educators' conceptions of learning and teaching in a learning-centred medical education context, and includes a 'teaching-centredness' scale. However, this instrument is less suitable for obtaining a more detailed understanding of the content of learning-centred beliefs. In addition, the eight items measuring teaching-centredness are all cognitive, thus providing no further insights into affective aspects of beliefs, which we expect to be highly relevant. Therefore we aimed to explore the beliefs about teaching and learning of medical educators working within a learning-centred education context in a further qualitative study.

Classifications of beliefs about teaching and learning

The studies of university educators' beliefs about teaching and learning have yielded an abundance of information about how educators conceptualise teaching. However, the ways in which the beliefs were determined and described are very diverse, making it difficult to compare the studies and their reported results. Moreover, there is a need for a classification that not only differentiates between teaching-centred *versus* learning-centred beliefs, but also provides a more detailed and sophisticated measurement scale to determine more precisely the degree of teaching-centredness and learning-centredness.

Samuelowicz & Bain's extended 2001 framework¹⁶ maintained the richness of global descriptions together with a systematic, comprehensive comparison of descriptions of categories of beliefs identified by researchers. The framework consists of a matrix and describes teaching beliefs in terms of belief orientations and belief dimensions (for convenience, we have provided the framework in Table 1.1). A belief orientation represents a global, composite set of beliefs about teaching, learning, and knowledge. In the framework, there are seven different belief orientations, indicated in the columns in the matrix, ranging from teaching-centred to learning-centred. These seven belief orientations are defined by nine belief dimensions, indicated in the rows in the matrix. Each dimension represents a different aspect of the belief orientations regarding teaching, learning, and knowledge. Within each dimension two to four beliefs can be distinguished. For example, the four beliefs listed within the dimension 'Teacher-student interaction' are: 'one-way from teacher to students,' 'two-way to maintain students' attention,' 'two-way to ensure/clarify understanding,' and 'two-way to negotiate meaning.' These beliefs are ordered on a continuum from teaching-centred to learning-centred.

Table 1.1. Samuelowicz & Bain Framework.¹⁶

Dimensions		Teaching- centred orientations					
		I. Imparting information		II. Transmitting structured knowledge		III. Providing and facilitating understanding	
1	Desired learning outcomes	Recall of atomised information	A	Reproductive understanding	A/b	Reproductive understanding	A/b
2	Expected use of knowledge	Within subject	A	Within subject for future use	A/b	Within subject for future use	A/b
3	Responsibility for organising or transforming knowledge	Teacher	A	Teacher	A	Teacher shows how knowledge can be used	A/b
4	Nature of knowledge	Externally constructed	A	Externally constructed	A	Externally constructed	A
5	Students' existing conceptions	Not taken into account	A	Not taken into account	A	Not taken into account	A
6	Teacher- student interaction	One-way; Teacher → students	A	Two-way to maintain students' attention	A/b	Two-way to ensure/ clarify understanding	B/a
7	Control of content	Teacher	A	Teacher	A	Teacher	A
8	Professional development	Not stressed	A	Not stressed	A	Not stressed	A
9	Interest and motivation	Teachers'	A	Teachers'	A	Teachers'	A

We considered two other classifications developed within higher education contexts to explore medical educators' beliefs about teaching and learning. The first⁵⁷ differentiates three belief orientations: teaching-centred, intermediate, and learning-centred. However, this classification is not based on a fixed set of dimensions, as a result of which it does not provide details about the way in which educators' beliefs have been classified. Therefore, this classification is less useful as an analytical tool. The other classification we considered⁵⁸ distinguishes ten different dimensions of beliefs about teaching, learning, and knowledge, structured into four groups. However, this classification only differentiates two belief orientations: teaching-centred and learning-

Learning- centred orientations								
IV. Helping student develop expertise		V. Preventing misunderstanding		VI. Negotiating understanding		VII. Encouraging knowledge creation		
Change in ways of thinking	B	Change in ways of thinking	B	Change in ways of thinking	B	Change in ways of thinking	B	
Interpretation of reality	B	Interpretation of reality	B	Interpretation of reality	B	Interpretation of reality	B	
Students & Teacher	B/a	Students	B	Students	B	Students	B	
Personalised	B	Personalised	B	Personalised	B	Personalised	B	
Not taken into account	A	Used to prevent common mistakes	B/a	Used as basis for conceptual change	B	Used as basis for conceptual change	B	
Two-way to negotiate meaning	B	Two-way to negotiate meaning	B	Two-way to negotiate meaning	B	Two-way to negotiate meaning	B	
Teacher	A	Teacher	A	Teacher	A	Students	B	
Stressed	B	Stressed	B	Stressed	B	Stressed	B	
Students'	B	Students'	B	Students'	B	Students'	B	

centred. This may result in too rough a classification, so that more subtle differences of beliefs about teaching and learning go unnoticed. Thus, to gain more insight into the content and structure of medical educators' beliefs about teaching and learning we decided to adopt the extended 2001 framework of Samuelowicz & Bain¹⁶ as the starting point for our study. This framework is not only comprehensive in its description of both belief dimensions and belief orientations, but it also uniquely incorporates two 'affective' dimensions (see Table 1.1, Dimensions 8 and 9). Even though emotions may be part of any belief dimension, emotions play a more important and explicit role in the affective belief dimensions. One of these is related to interest and motivation,

the other to students' professional development; the latter which we consider particularly important in the context of medical education and which has received much attention in recent medical education literature.^{e.g.59-61}

The framework of Samuelowicz & Bain¹⁶ was developed in contexts outside of medical education. Therefore, we aimed to adapt and validate this framework here in the medical education context.

Perspectives on being a teacher

Since there is evidence that a substantial number of educators in medical schools with learning-centred curricula still hold teaching-centred beliefs,^{e.g.25,26} we aimed to better understand which factors influence medical educators' beliefs about teaching and learning. A better understanding of these factors may provide clues as to how educators can be supported to develop learning-centred beliefs. One of the potential starting points in the search for influencing factors is to examine the educators' perspectives on being a teacher. The rationale for this premise is given by two studies from different educational contexts, i.e. higher education²⁷ and teacher education,²⁸ both of which relate beliefs about teaching and learning to perspectives on being a teacher. Åkerlind²⁷ explored perspectives on being a university teacher and concludes that 'a focus on academics' experience of teaching separated from their larger experience of being a teacher may encourage oversimplification of the phenomenon of university teaching, in particular in terms of academics' underlying intentions when teaching. There is more to the experience of being a teacher than simply teaching.' Within the field of teacher education, Korthagen^{28,62} developed a theoretical model which relates and integrates different perspectives on being a teacher, including a teacher's beliefs about teaching and learning. To explore what 'being a teacher' means for medical educators in relation to their beliefs about teaching and learning, we decided to take Korthagen's model (see Figure 1.2) as a starting point for the following reasons. First, the model has a holistic perspective on what it means to be a teacher, and also takes the educational context into account. Second, the model includes a teacher's identity, a concept that has received increasing attention recently within the medical education literature.^{e.g.63-65} Third, it includes a teacher's mission, defined as a teacher's source of inspiration and motivation. The concept of the 'underlying intentions' of a teacher²⁷ seems to be included in this 'mission' concept. By using Korthagen's model as a lens, we aimed to explore the variety of medical educators' perspectives on being a teacher.

We will first explain the model of Korthagen in more detail. Subsequently we will discuss what is known about the relationships between beliefs about teaching and learning, and those perspectives on being a teacher which are particularly relevant to a deeper understanding of beliefs about teaching and learning.

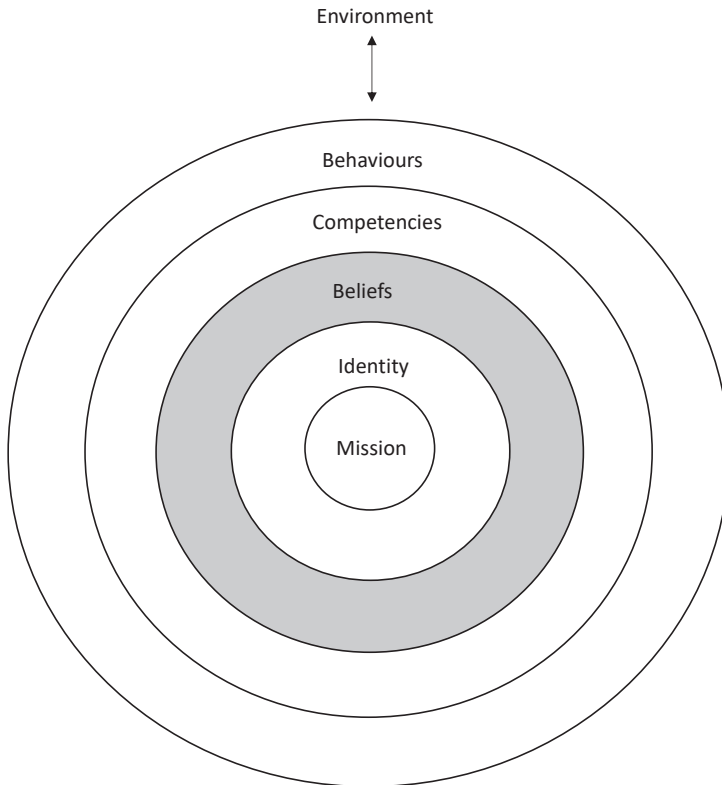


Figure 1.2. Holistic model about perspectives on being a teacher (Korthagen 2004).

Korthagen developed his model as a framework for reflection and development in the context of teacher education. The concentric onion model hypothesises that all levels influence each other. These levels, from periphery to core, are: (1) Environment, (2) Behaviours, (3) Competencies, (4) Beliefs, (5) Identity, and (6) Mission. The *environment*, the most peripheral level, can be defined as the context: external factors (such as the class or school) outside the teacher that influence their perspectives on being a teacher. The *behavioural* level refers to all concrete, observable behaviours or actions of the teacher. The level of *competencies* can be described as the integrated body of knowledge, skills and attitudes of the teacher. It represents a potential for behaviour and is not directly

observable. The level of *beliefs* refers to ideas or convictions teachers hold about teaching, learning, and knowledge. *Identity*, the next level, can be defined as how teachers perceive themselves and their professional roles. Even though the focus is on the ‘self,’ the perspective is relational, and largely determined by how relationships with significant others are viewed. Finally, the core level of the model, the level of *mission*, is defined as the source of inspiration, or even as what teachers see as their ‘personal calling in the world,’ which reflects a teacher’s deepest purpose and motives. A mission gives meaning to one’s professional existence by contributing to others (such as students or colleagues) within a larger context and therefore has a transpersonal characteristic. The question of ‘*who I am as a teacher*’ is related to a teacher’s identity, whereas the question of ‘*why I teach*’ is related to a teacher’s mission.

According to Korthagen,²⁸ a teacher’s identity takes the form of a ‘Gestalt,’ an ‘unconscious body of needs, images, feelings, values, role models, previous experiences and behavioural tendencies which together create a sense of identity.’ Thus, an educator may not always be aware of their educational identity. One of the goals of faculty development should be to help educators become *aware* of their educational identity, leading to a better self-understanding and enabling educators to make more conscious and thus better informed choices in their teaching behaviours. In our studies, we aimed to explore educators’ *awareness* of their identity, as articulated during the interviews, because it is the *awareness* of their educational identity which can ultimately lead to a change in teaching behaviours that are more consistent with the learning-centred educational context. Similarly, we aimed to explore educators’ *awareness* of their personal educational mission. Having explored educators’ different perspectives on being a teacher using Korthagen’s model, we intended to develop educator phenotypes, categories of educators with similar perspectives, to better understand why medical educators vary in their perspectives on being a teacher.

Since Korthagen argues that in the development as a teacher, problems at a specific level can best be approached by paying attention to more central levels, we assumed that the levels of identity and mission, which are central to the beliefs level, are particularly relevant to our understanding of factors influencing educators’ beliefs about teaching and learning. For that reason, we explored the relationship between educators’ beliefs about teaching and learning, and their awareness of their educational identity and mission.

Beliefs about teaching and learning in relation to awareness of educational identity and mission

While studies addressing medical educators' beliefs about teaching and learning are limited, even less is known about the relationship between beliefs and identity. Only a few studies have been reported that show a potential link between medical educators' beliefs and their educational identities.^{66,67} However, these studies focus on other aspects of beliefs rather than on beliefs about teaching and learning, exploring for example educators' normative beliefs. The notion of 'educational mission' has received even less attention in the medical education literature. Indeed, we know of only one study in the health professions exploring educators' missions. Steinert and Macdonald⁶⁸ focused on what teaching means for educators working in a clinical context. They described physicians' educational mission as 'being morally and socially motivated to teach, wanting to contribute to the next generation of physicians, which gave them a sense of personal fulfilment.' The finding that physician-educators who are aware of their educational mission experience personal fulfilment in their role as educators, underlines the potential relevance of an educator's educational mission. However, this study did not relate medical educators' missions to their beliefs about teaching and learning.

Thus, we aimed to relate medical educators' beliefs about teaching and learning to their awareness of their educational identity and mission. Beliefs about teaching and learning were analysed through the beliefs framework that we adapted to the medical education context, using the framework of Samuelowicz & Bain¹⁶ as a starting point. Awareness of educational identity and mission were analysed according to the educator phenotypes that we developed, using the model of Korthagen as a starting point.

Assuming a relationship between learning-centred beliefs and awareness of educational identity and mission, a next step is to gain insight into whether and how medical educators can *develop* their perspectives on being a teacher over time.

Maturation of medical educators: the development of perspectives on being a teacher

Further understanding of how medical educators develop their perspectives on being a teacher, i.e. their perspectives on the educational environment, their educational behaviours & competencies, identity, and mission, can be useful to help promote the maturation of educators towards more learning-centred beliefs and behaviours. We use the term 'to mature' to emphasise our viewpoint that the development of an educator is a holistic and ongoing process that takes place in the everyday work

setting. Most studies in medical education context have focused on the development of medical educators' competencies, in particular their pedagogical knowledge and skills.^{64,69} Until now, insights into the development of an identity and personal mission as a teacher are scarce.^{64,70} A limited number of studies explored the development of medical educators' educational identity, mostly in the context of longitudinal faculty development interventions.⁷¹⁻⁷³ However, informal learning opportunities in authentic settings are suggested to be at least as important for the development of medical educators as formal faculty development interventions.⁷⁴⁻⁷⁷ A few studies explored the development of medical educators' educational identity outside of a formal faculty development intervention. Browne et al.⁷⁸ and Cantillon et al.⁷⁹ determined the development of an educational identity in retrospect, as self-identified or self-perceived by the participants in their studies. Van Lankveld et al.⁸⁰ explored the development of an educational identity of beginning pre-clinical educators through a follow-up study, thus reducing the risk of recall bias. However, in Van Lankveld's study, the vast majority of educators were not involved in patient care. While not all educators in pre-clinical medical education have a medical background or are involved in patient care, the vast majority of educators are. Moreover, a recent review⁶⁵ concluded that educators who are involved in patient care 'reconcile' their educational identities with their identities as patient-care providers, thus implying a reciprocal influence of both identities. Therefore, we focused in our research in particular on educators who also have a patient-care role.

With regard to the development of medical educators' personal educational mission, the literature is even more limited: we know of no such research within the medical education context.

In summary, we aimed to explore if medical educators mature and develop their perspectives on being a teacher over time, and which factors they perceive as contributing to this maturation. Until now, insights into these processes were not available within a learning-centred medical education context. These findings can provide relevant input for faculty development to help support and foster the maturation of medical educators towards more learning-centred beliefs and behaviours.

Aim of this research and central research questions

Thus, the overarching aim of this research is to deepen our understanding of how medical educators working in learning-centred education contexts mature over time, in particular in their awareness of their educational identity and mission, and how this maturation relates to their beliefs about teaching and learning.

In order to reach this central goal, the following primary research questions have been formulated:

1. What are the content and structure of medical educators' beliefs about teaching and learning?
2. What is the variety of medical educators' perspectives on being a teacher? How can this variety be clustered into educator phenotypes?
3. How are medical educators' beliefs about teaching and learning related to the awareness of their educational identity and mission?
4. To what extent do medical educators mature in their perspectives on being a teacher over time, and which factors contribute to this maturation?

Outline of research with an overview of the studies

In order to answer the research questions formulated above, we performed qualitative studies, using an exploratory approach. In the study presented in Chapter 3, we included a quantitative analysis as a supportive tool to increase our understanding of the qualitative data. To obtain a broad diversity of beliefs, we recruited medical educators from two medical schools from two different continents, which therefore differed in educational and national culture and organisation. Leiden University Medical Centre (LUMC), the Netherlands, and Stanford University School of Medicine (SUSM), USA, are comparable in their emphasis on scientific education and had implemented reforms towards learning-centred education in the decade prior to the first interviews. In the period between the first interviews and the follow-up interviews (2008-2018) curriculum reform took place at LUMC. The curriculum maintained its learning-centred approach but placed more explicit emphasis on students' active learning. In addition, an intensive faculty development programme was implemented in which almost all LUMC participants participated. At SUSM, which already had an intensive faculty development programme, no major changes had been made to the preclinical curriculum or to faculty development programmes during this interval.

We intentionally chose to select educators who taught in a preclinical setting, as in this setting, learning-centred education is most clearly designed and implemented. Since beliefs about teaching and learning may vary according to the level of teaching,^{13,15,16} we also wanted to exclude difference in course level as an influencing factor. Another selection criterion was educators' educational involvement and perceived excellence. The rationale for this selection is that we are specifically interested in the beliefs of the 'best,' most respected -and therefore influential- educators.

The first research question, ‘What are the content and structure of medical educators’ beliefs about teaching and learning?’ is addressed in Chapter 2. To explore educators’ beliefs about teaching and learning, we performed semi-structured interviews (Dataset 1a) in the period of 2008-2010. Through a content analysis using the Samuelowicz & Bain¹⁶ framework as a starting point, we adapted and validated this higher education beliefs framework to the medical education context.

During these interviews we also explored (Dataset 1b) the educators’ perspectives on being a teacher, to answer our second research question: ‘What is the variety of medical educators’ perspectives on being a teacher?’ Chapter 3 presents the results of this study. We used Korthagen’s model to analyse and categorise the findings and subsequently clustered the participants into educator phenotypes.

To answer the third and fourth research questions, we repeated the interviews a decade after the initial ones (Datasets 2a and 2b) with the same participants who were still available, to re-examine their beliefs about teaching and learning as well as their perspectives on being a teacher.

Chapter 4 describes the results of the analysis (Datasets 2a and 2b) executed to answer the research question: ‘How are medical educators’ beliefs about teaching and learning related to the awareness of their educational identity and mission?’ We performed a deductive thematic analysis using the instruments developed in Chapters 2 and 3 to analyse educators’ awareness of their educational identity and mission, and their beliefs about teaching and learning, respectively. Subsequently, we examined the relationship between these two areas of inquiry.

Chapter 5 addresses the fourth research question: ‘To what extent do medical educators mature in perspectives on being a teacher over time, and which factors contribute to their maturation?’ In this follow-up study we used Dataset 1b (collected in the 2008-2010 period) and Dataset 2b (collected in 2018) to examine if educators had developed in their perspectives on being a teacher. Since educational beliefs are widely known to be resistant to change, we anticipated that educators’ perspectives on being a teacher might be similarly resistant to change, which argued for a lengthy interval between initial and follow-up interviews. We performed a deductive thematic analysis on both datasets using the educator phenotype model from Chapter 3, to determine which educators had matured in their perspectives on being a teacher. Next, we conducted a third interview (Dataset 3) with the educators who had developed in their perspectives on being

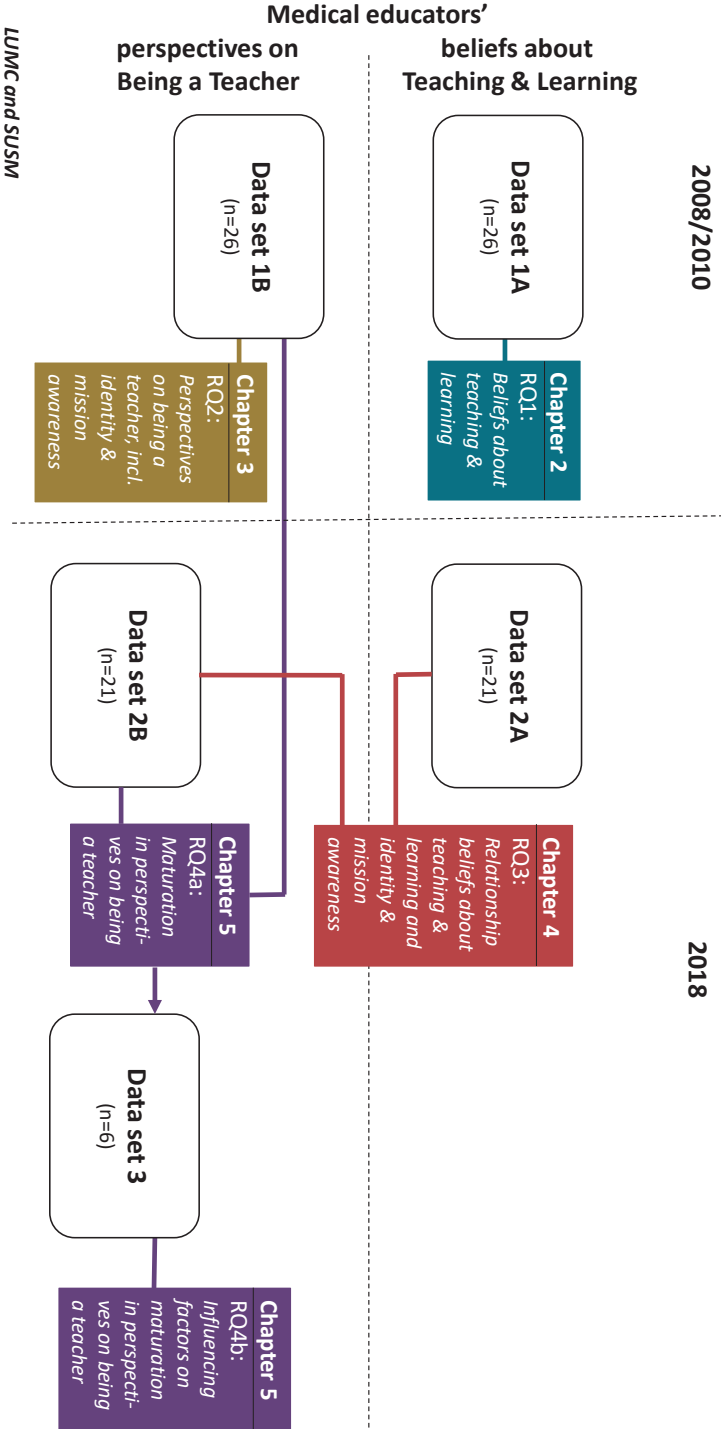


Figure 1.3. Overview of chapters in relation to perspectives on being a teacher and beliefs about teaching and learning, including the different research questions (RQs), and the datasets used to answer the RQs.
2008/2010; 2018 = years of data collection; RQ = research question; LUMC = Leiden University Medical Centre; SUSM = Stanford University School of Medicine.

a teacher. Having asked them to reflect on the differences between their answers at the two time intervals, we then performed an inductive content analysis on Dataset 3, to explore which factors these educators perceived as contributing to their maturation. Figure 1.3 provides an overview of the chapters, including the different research questions and the datasets used.

Finally, in the General Discussion in Chapter 6 we address and reflect on the main findings and overall conclusions of the research projects, including strengths, limitations, and suggestions for future research, and practical implications for faculty development.

The terminology in the various chapters does not always correspond to the description in this introduction. This is due to the fact that this research is based on separate articles published in peer-reviewed journals and specific characteristics in a particular study sometimes necessitated deviating terminology.

REFERENCES

1. McLean M, Gibbs T. Twelve tips to designing and implementing a learner-centred curriculum: Prevention is better than cure. *Med Teach*. 2010;32(3):225-230.
2. Gow L, Kember D. Conceptions of teaching and their relationship to student learning. *Br J Educ Psychol*. 1993;63(1):20-23.
3. Kember D, Gow L. Orientations to teaching and their effect on the quality of student learning. *J High Educ*. 1994;65(1):58-74.
4. Trigwell K, Prosser M, Waterhouse F. Relations between teachers' approaches to teaching and students' approaches to learning. *High Educ*. 1999;57-70.
5. Prosser M, Trigwell K. *Understanding learning and teaching: The experience in higher education*. SRHE and Open University Press; 1999:157-160.
6. Gibbs G, Coffey M. The impact of training of university teachers on their teaching skills, their approach to teaching and the approach to learning of their students. *Active Learn High Educ*. 2004;5(1):87-100.
7. Beausaert SA, Segers M, Wiltink DP. The influence of teachers' teaching approaches on students' learning approaches: The student perspective. *J Educ Res*. 2013;55(1):1-15.
8. Prosser M, Ramsden P, Trigwell K, Martin E. Dissonance in experience of teaching and its relation to the quality of student learning. *Stud High Educ*. 2003;28(1):37-48.
9. Prosser M, Trigwell K. Qualitative variation in approaches to university teaching and learning in large first-year classes. *High Educ*. 2014;67:783-795.
10. Uiboleht K, Karm M, Postareff L. The interplay between teachers' approaches to teaching, students' approaches to learning and learning outcomes: a qualitative multi-case study. *Learn Environ Res*. 2018;21:321-347.
11. Ho A, Watkins D, Kelly M. The conceptual change approach to improving teaching and learning: An evaluation of a Hong Kong staff development programme. *High Educ*. 2001;42(2):143-169.
12. Kember D. A reconceptualisation of the research into university academics' conceptions of teaching. *Learn Instr*. 1997;7(3):255-275.
13. Stenfors-Hayes T, Hult H, Dahlgren LO. What does it mean to be a good teacher and clinical supervisor in medical education? *Adv Health Sci Educ Theory Pract*. 2011;16(2):197-210. doi: 10.1007/s10459-010-9255-2
14. Jacobs JC. *Conceptions of learning and teaching in teachers: in student-centred curricula in medicine*. Vrije Universiteit Amsterdam; 2015.
15. Samuelowicz K, Bain JD. Conceptions of teaching held by academic teachers. *High Educ*. 1992;93-111.
16. Samuelowicz K, Bain JD. Revisiting Academics' Beliefs about Teaching and Learning. *High Educ*. 2001;41(3):299-325.
17. Pajares MF. Teachers' beliefs and educational research: Cleaning up a messy construct. *Rev Educ Res*. 1992;62(3):307-332.
18. Trigwell K, Prosser M. Changing approaches to teaching: A relational perspective. *Stud High Educ*. 1996;21(3):275-284.
19. Williams RG, Klamen DL. See one, do one, teach one--exploring the core teaching beliefs of medical school faculty. *Med Teach*. 2006;28(5):418-424.

20. Richardson V. The role of attitudes and beliefs in learning to teach. In: Sikula J, ed. *Handbook of research on teacher education*. MacMillan; 1996:102-119.
21. Hativa N, Barak R, Simhi E. Exemplary university teachers: Knowledge and beliefs regarding effective teaching dimensions and strategies. *J High Educ*. 2001;72(6):699-729.
22. Pratt DD. Conceptions of teaching. *Adult Educ Q*. 1992;42(4):203-220.
23. Kember D, Kwan K-P. Lecturers' approaches to teaching and their relationship to conceptions of good teaching. *Instr Sci*. 2000;28(5):469-490.
24. Verloop N, Van Driel J, Meijer P. Teacher knowledge and the knowledge base of teaching. *Int J Educ Res*. 2001;35(5):441-461.
25. Jacobs JC, van Luijk SJ, Galindo-Garre F, et al. Five teacher profiles in student-centred curricula based on their conceptions of learning and teaching. *BMC Med Educ*. 2014;14(1):1-10.
26. Calkins S, Johnson N, Light G. Changing conceptions of teaching in medical faculty. *Med Teach*. 2012;34(11):902-906.
27. Åkerlind GS. A new dimension to understanding university teaching. *Teach High Educ*. 2004;9(3):363-375.
28. Korthagen FAJ. In search of the essence of a good teacher: Towards a more holistic approach in teacher education. *Teach Teach Educ*. 2004;20(1):77-97.
29. Wojtczak A. *Glossary of medical education terms*. AMEE Dundee; 2003.
30. Steinert Y. Faculty development: on becoming a medical educator. *Med Teach*. 2012;34(1):74-76.
31. Lea SJ, Stephenson D, Troy J. Higher education students' attitudes to student-centred learning: beyond 'educational bulimia'? *Stud High Educ*. 2003;28(3):321-334.
32. Schweisfurth M. *Learner-centred education in international perspective: Whose pedagogy for whose development?* Routledge; 2013:21-36.
33. Starkey L. Three dimensions of student-centred education: a framework for policy and practice. *Crit Stud Educ*. 2019;60(3):375-390.
34. Bremner N. From learner-centred to learning-centred: Becoming a 'hybrid' practitioner. *Int J Educ Res*. 2019;97:53-64.
35. Crosby J. AMEE medical education guide No. 8. Learning in small groups. *Med Teach*. 1996;18:189-202.
36. Åkerlind GS. Growing and developing as a university teacher--variation in meaning. *Stud High Educ*. 2003;28(4):375-390.
37. Basturkmen H. Review of research into the correspondence between language teachers' stated beliefs and practices. *System*. 2012;40(2):282-295.
38. Phipps S, Borg S. Exploring tensions between teachers' grammar teaching beliefs and practices. *System*. 2009;37(3):380-390.
39. Samuelowicz K. *Academics' educational beliefs and teaching practices*. Griffith University Brisbane; 1999.
40. Ashton P, Gregoire-Gill M. At the heart of teaching: The role of emotion in changing teachers' beliefs. In: Rath J, McAninch A, eds. *Teacher beliefs and classroom performance: The impact of teacher education*. Vol 6. Ablex Publishing; 2003:99-122.
41. Dall'Alba G. Foreshadowing conceptions of teaching. In: Ross B, ed. *Research and Development in Higher education*. HERDSA; 1991:293-297

42. Dunkin MJ, Precians RP. Award-winning university teachers' concepts of teaching. *High Educ.* 1992;24:483-502.
43. Gibbs G. How can promoting excellent teachers promote excellent teaching? *Innov Educ Teach Int* 1995;32(1):74-81.
44. Martin E, Ramsden P. An expanding awareness: how lecturers change their understanding of teaching. In: Parer MS, ed. *Research and Development in Higher education*. HERDSA; 1992;15:148-155.
45. Norton L, Richardson T, Hartley J, Newstead S, Mayes J. Teachers' beliefs and intentions concerning teaching in higher education. *High Educ.* 2005;50:537-571.
46. Postareff L, Lindblom-Ylänne S, Nevgi A. The effect of pedagogical training on teaching in higher education. *Teach Teach Educ.* 2007;23(5):557-571.
47. Pratt DD. *Five perspectives on teaching in adult and higher education*. Krieger; 1998.
48. Pratt DD, Arseneau R, Collins JB. Reconsidering "good teaching" across the continuum of medical education. *J Contin Educ Health Prof.* 2001;21(2):70-81.
49. Prosser M, Trigwell K. Relations between perceptions of the teaching environment and approaches to teaching. *Br J Educ Psychol.* 1997;67(1):25-35.
50. Wood K. The experience of learning to teach: Changing student teachers' ways of understanding teaching. *J Curric Stud.* 2000;32(1):75-93.
51. Wilson K, Fowler J. Assessing the impact of learning environments on students' approaches to learning: Comparing conventional and action learning designs. *Assess Eval High Educ.* 2005;30(1):87-101.
52. Åkerlind GS. A phenomenographic approach to developing academics' understanding of the nature of teaching and learning. *Teach High Educ.* 2008;13(6):633-644.
53. Peeraer G, Donche V, De Winter BY, et al. Teaching conceptions and approaches to teaching of medical school faculty: the difference between how medical school teachers think about teaching and how they say that they do teach. *Med Teach.* 2011;33(7):e382-e387.
54. Jacobs JC, Wilschut J, van der Vleuten C, Scheele F, Croiset G, Kusurkar RA. An international study on teachers' conceptions of learning and teaching and corresponding teacher profiles. *Med Teach.* 2020;42(9):1000-1004.
55. Ross M. Conceptions of teaching: an illustrated review. *Clin teach.* 2017;14(1):8-14.
56. Jacobs JC, Van Luijk SJ, Van Berkel H, Van der Vleuten CP, Croiset G, Scheele F. Development of an instrument (the COLT) to measure conceptions on learning and teaching of teachers, in student-centred medical education. *Med Teach.* 2012;34(7):e483-e491.
57. Light G, Calkins S. The experience of faculty development: Patterns of variation in conceptions of teaching. *Int J Acad Dev.* 2008;13(1):27-40.
58. Postareff L, Lindblom-Ylänne S. Variation in teachers' descriptions of teaching: Broadening the understanding of teaching in higher education. *Learn Instr.* 2008;18(2):109-120.
59. Barnhoorn PC, Houtlosser M, Ottenhoff-de Jonge MW, Essers GT, Numans ME, Kramer AW. A practical framework for remediating unprofessional behavior and for developing professionalism competencies and a professional identity. *Med Teach.* 2019;41(3):303-308.
60. Brody H, Doukas D. Professionalism: a framework to guide medical education. *Med Educ.* 2014;48(10):980-987.

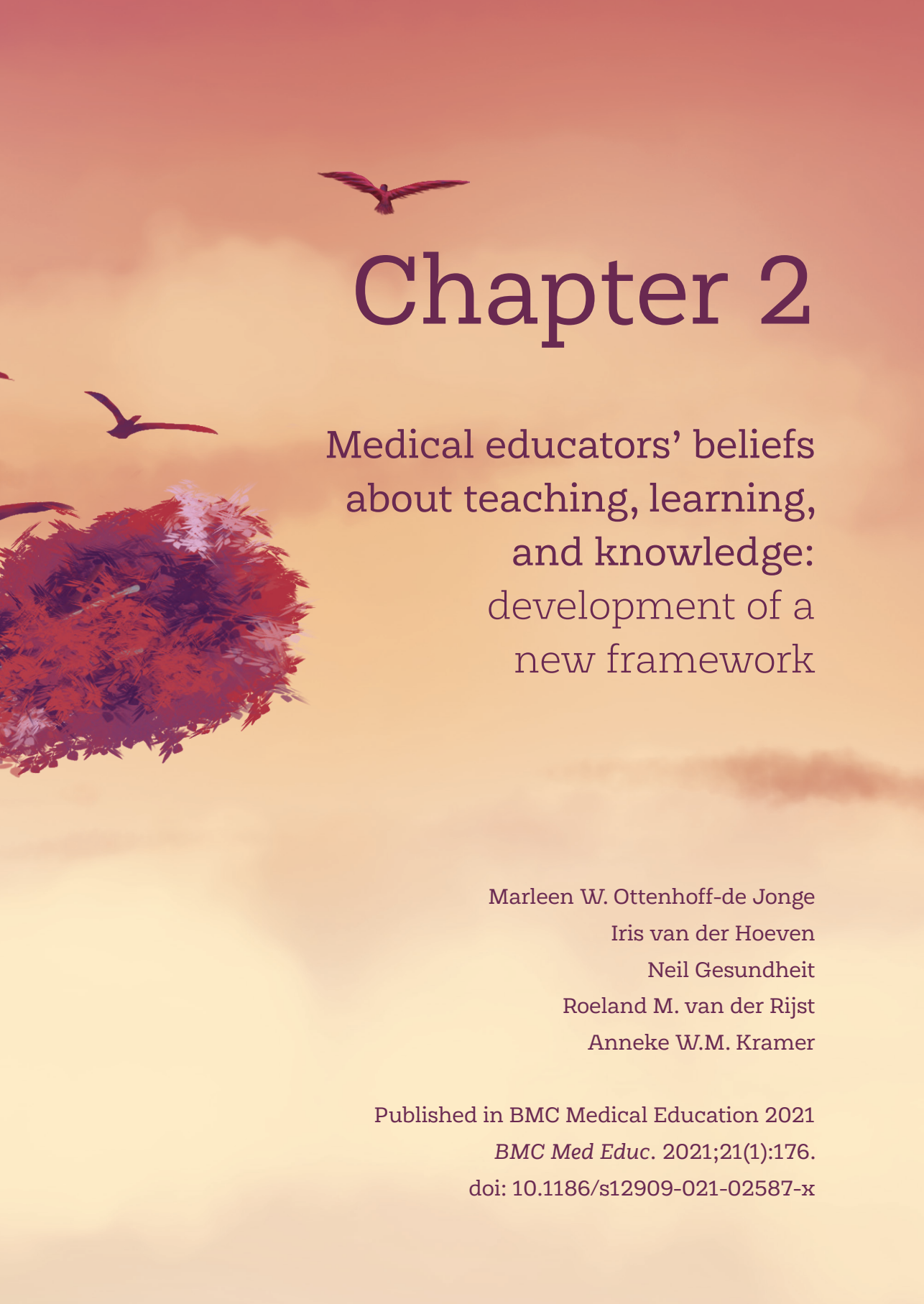
61. Cruess RL, Cruess SR, Boudreau JD, Snell L, Steinert Y. A schematic representation of the professional identity formation and socialization of medical students and residents: a guide for medical educators. *Acad Med*. 2015;90(6):718-725.
62. Korthagen F. Inconvenient truths about teacher learning: Towards professional development 3.0. *Teach Teach*. 2017;23(4):387-405.
63. van Lankveld T, Thampy H, Cantillon P, Horsburgh J, Kluijtmans M. Supporting a teacher identity in health professions education: AMEE Guide No. 132. *Med Teach*. 2021;43(2):124-136.
64. Steinert Y, O'Sullivan PS, Irby DM. Strengthening Teachers' Professional Identities Through Faculty Development. *Acad Med*. 2019;94(7):963-968.
65. Cantillon P, Dornan T, De Grave W. Becoming a clinical teacher: identity formation in context. *Acad Med*. 2019;94(10):1610-1618.
66. Taylor EW, Tisdell EJ, Gusic ME. Teaching beliefs of medical educators: perspectives on clinical teaching in pediatrics. *Med Teach*. 2007;29(4):371-376.
67. Dory V, Audétat M-C, Rees C. Beliefs, identities and educational practice: a Q methodology study of general practice supervisors. *Educ Prim Care*. 2015;26(2):66-78.
68. Steinert Y, Macdonald ME. Why physicians teach: giving back by paying it forward. *Med Educ*. 2015;49(8):773-782.
69. Steinert Y. Faculty development: from rubies to oak. *Med Teach*. 2020;42(4):429-435.
70. Trautwein C. Academics' identity development as teachers. *Teach High Educ*. 2018;23(8):995-1010.
71. Lieff S, Baker L, Mori B, Egan-Lee E, Chin K, Reeves S. Who am I? Key influences on the formation of academic identity within a faculty development program. *Med Teach*. 2012;34(3):e208-e215.
72. Armstrong EG, Barsion SJ. Using an outcomes-logic-model approach to evaluate a faculty development program for medical educators. *Acad Med*. 2006;81(5):483-488.
73. Onyura B, Ng SL, Baker LR, Lieff S, Millar B-A, Mori B. A mandala of faculty development: using theory-based evaluation to explore contexts, mechanisms and outcomes. *Adv Health Sci Educ Theory Pract*. 2017;22(1):165-186.
74. Jippes E, Steinert Y, Pols J, Achterkamp MC, van Engelen JM, Brand PL. How do social networks and faculty development courses affect clinical supervisors' adoption of a medical education innovation? An exploratory study. *Acad Med*. 2013;88(3):398-404.
75. Webster-Wright A. Reframing professional development through understanding authentic professional learning. *Rev Educ Res*. 2009;79(2):702-739.
76. O'Sullivan PS, Irby DM. Reframing research on faculty development. *Acad Med*. 2011;86(4):421-428.
77. Steinert Y, Mann K, Anderson B, et al. A systematic review of faculty development initiatives designed to enhance teaching effectiveness: A 10-year update: BEME Guide No. 40. *Med Teach*. 2016;38(8):769-786.
78. Browne J, Webb K, Bullock A. Making the leap to medical education: a qualitative study of medical educators' experiences. *Med Educ*. 2018;52(2):216-226.
79. Cantillon P, D'Eath M, De Grave W, Dornan T. How do clinicians become teachers? A communities of practice perspective. *Adv Health Sci Educ Theory Pract*. 2016;21(5):991-1008.

80. van Lankveld T, Schoonenboom J, Kusurkar R, Volman M, Beishuizen J, Croiset G. Integrating the teaching role into one's identity: a qualitative study of beginning undergraduate medical teachers. *Adv Health Sci Educ Theory Pract*. 2017;22(3):601-622.

‘In order to make
intellectual progress we
must recognize that knowledge
cannot be acquired by passively
receiving it from others:
rather, we must work our
way through problems’

- *Plato, as affirmed in Meno,
Theaetetus, and Sophist* -





Chapter 2

Medical educators' beliefs
about teaching, learning,
and knowledge:
development of a
new framework

Marleen W. Ottenhoff-de Jonge

Iris van der Hoeven

Neil Gesundheit

Roeland M. van der Rijst

Anneke W.M. Kramer

Published in BMC Medical Education 2021

BMC Med Educ. 2021;21(1):176.

doi: 10.1186/s12909-021-02587-x

ABSTRACT

Background

The educational beliefs of medical educators influence their teaching practices. Insight into these beliefs is important for medical schools to improve the quality of education they provide students and to guide faculty development.

Several studies in the field of higher education have explored the educational beliefs of educators, resulting in classifications that provide a structural basis for diverse beliefs. However, few classification studies have been conducted in the field of medical education. We propose a framework that describes faculty beliefs about teaching, learning, and knowledge which is specifically adapted to the medical education context. The proposed framework describes a matrix in which educational beliefs are organised two dimensionally into belief orientations and belief dimensions. The belief orientations range from teaching-centred to learning-centred; the belief dimensions represent qualitatively distinct aspects of beliefs, such as 'desired learning outcomes' and 'students' motivation.'

Methods

We conducted in-depth semi-structured interviews with 26 faculty members, all of whom were deeply involved in teaching, from two prominent medical schools. We used the original framework of Samuelowicz and Bain as a starting point for context-specific adaptation. The qualitative analysis consisted of relating relevant interview fragments to the Samuelowicz and Bain framework, while remaining open to potentially new beliefs identified during the interviews. A range of strategies were employed to ensure the quality of the results.

Results

We identified a new belief dimension and adapted or refined other dimensions to apply in the context of medical education. The belief orientations that have counterparts in the original Samuelowicz and Bain framework are described more precisely in the new framework. The new framework sharpens the boundary between teaching-centred and learning-centred belief orientations.

Conclusions

Our findings confirm the relevance of the structure of the original Samuelowicz and Bain beliefs framework. However, multiple adaptations and refinements were necessary to align the framework to the context of medical education. The refined belief dimensions and belief orientations enable a comprehensive description of the educational beliefs of medical educators. With these adaptations, the new framework provides a contemporary instrument to improve medical education and potentially assist in faculty development of medical educators.

BACKGROUND

The beliefs medical educators hold about teaching, learning, and knowledge determine to a large extent their teaching approaches.¹⁻⁵ Because personal educational beliefs drive educators' behaviour while teaching, these beliefs should be considered a starting point from which to improve the quality of education.^{6,7} Supporting this view, Kember and Kwan stated that fundamental changes to the quality of education rely on changes in educational beliefs.⁸ Thus, obtaining more insight into those beliefs is important for the quality of education and may help us to understand why education reform can be cumbersome and faculty development often falls short of changing pedagogical practices.⁹

Within the context of higher education a number of studies have explored the educational beliefs of educators and have proposed classification rubrics.^{2,6,8,10-15} Such classifications are useful to distinguish between beliefs in a structured way and provide insight into relevant aspects of educational beliefs. However, these classification studies have not been conducted in the field of medical education. Our study addresses a framework that can be used in learning-centred rather than teaching-centred curricula, since currently most medical curricula have adopted learning-centred approaches. We propose a beliefs framework to improve suitability in the context of contemporary medical education.

Belief orientations

Prior classification studies^{2,6,8,10-15} have classified beliefs as global orientations in a continuum, ranging from teaching-centred to learning-centred. While teaching-centred belief orientations focus on the transmission of defined content or knowledge, learning-centred belief orientations focus on students' conceptual understanding and development. Light and Calkins¹⁵ describe a classification differentiating three belief orientations: teaching-centred, intermediate, and learning-centred. However, they do not base their classification on a fixed set of 'dimensions,' by which is meant qualitatively different aspects of beliefs. Another classification proposed by Postareff and Lindblom-Ylänne¹¹ distinguishes ten different dimensions of beliefs about teaching, learning, and knowledge, structured into four groups. However, this study only differentiates the two belief orientations: teaching-centred and learning-centred.

Framework of educational beliefs

The primary reason that we chose the framework of Samuelowicz and Bain¹⁴ as the starting point for our study was that in higher education literature their

framework is the most extensive, with the broadest scope and content in both belief dimensions and belief orientations. The framework distinguishes seven belief orientations (see Addendum 2.1). It comprises a two-dimensional matrix ordered according to these belief orientations and belief dimensions. A belief orientation represents a global, composite set of beliefs. In the framework the belief orientations are organised as columns ranging from teaching-centred to learning-centred; qualitatively different belief dimensions appear as rows in the matrix and create distinctions between the belief orientations. Examples of belief dimensions are ‘desired learning outcomes’ or ‘students’ motivation.’ Within each dimension a range of beliefs can be distinguished. For example, the beliefs listed within the dimension ‘desired learning outcomes’ are ‘recall of atomised information,’ ‘reproductive understanding,’ and ‘change in ways of thinking,’ respectively, and are ordered on a continuum from teaching-centred to learning-centred. Thus each belief orientation can be further characterised by the belief dimensions. In our opinion, the Samuelowicz and Bain framework’s extensiveness does justice to the complexity and diversity of educators’ beliefs about teaching, learning, and knowledge.

A second reason why we chose this framework as a starting point is how the authors define ‘educational beliefs.’ According to their definition, beliefs are ‘typical or characteristic ways’ in which teaching, learning, and knowledge are viewed; they are closely related with practice and contain both cognitive and affective components. These beliefs can only be considered in a holistic way.¹⁶ Thus, the framework describes educators’ deeply rooted, characteristic ways of understanding teaching, and the close relationship between beliefs and practice increases the framework’s usefulness for faculty development interventions.

Finally, the framework uniquely includes a belief dimension related to students’ professional development, which is particularly significant in the context of medical education and has received much attention in recent medical education literature.¹⁷⁻¹⁹

Research aim and question

The original Samuelowicz and Bain framework was developed in contexts outside of medical education. Therefore, we aimed to adapt this framework to medical education contexts, in order to address the following research question:

What are the content and structure of the beliefs of educators about teaching, learning, and knowledge in medical education?

METHODS

In order to address our research question we conducted a qualitative study using in-depth semi-structured interviews. We interviewed 26 medical educators from two medical schools, all working on preclinical curriculum, with the aim to identify the participants' characteristic educational beliefs. We used a variety of strategies to enhance the quality of our results.²⁰

This study is part of a larger research project that explores the longitudinal development of the beliefs of medical educators about teaching, learning, knowledge, and teacher qualities. In this study we report outcomes of the baseline study conducted in 2008–2010 with regard to beliefs about teaching, learning, and knowledge.

Participants and setting

We opted for a wide variety of participants in our sampling. For this reason, two prominent medical schools from different continents were chosen. We selected thirteen faculty members from each school, five teaching basic science topics, five teaching clinical topics and three with roles at the highest educational administrative level with teaching experience, nearly all of them being physicians. One reason for focusing on physicians is that at both SUSM and LUMC, the majority of educators are physicians, including those who teach basic science subjects. Another reason is related to the belief dimension about student's professional development. Having a patient-care role next to the other academic roles, we anticipated that physicians may be more likely than non-physicians to model this aspect of the professional identity formation of students. Selection of participants took place on the recommendation of a senior educator and sub-dean from the respective medical schools, and was based on faculty members' active educational involvement, student evaluations of teaching performance, and teaching awards won by faculty. These selection criteria were chosen because we anticipated that the faculty participants would be most information-rich and their experiences illuminating (*critical case sampling*²¹). With the exception of one educator, all participants had at least ten years of teaching experience, with an average of 21 years. Only one out of the 26 originally selected medical educators was not able to participate and was replaced by another medical educator who met the criteria.

The two medical schools involved were Stanford University School of Medicine (SUSM), California, USA, and Leiden University Medical Centre (LUMC), Leiden, The Netherlands. Both schools can be classified as research-intensive

medical schools and had had their curricula redesigned in the decade prior to the interviews, adopting a more learning-centred approach. Learning-centred curricula have gained popularity worldwide in recent decades and are most common today in medical education.

Procedure

All interviews were conducted by the first author. We used the interview guide of Samuelowicz and Bain with open-ended questions concerning teaching, learning, and knowledge¹⁴ as a basis for the interview (see interview guide in Addendum 2.2). Where relevant, we explicitly asked participants to reflect on their small group teaching (classroom instruction within a structured module). Because some literature concludes that educational beliefs can be influenced by class size,²² we wanted to avoid participants answering the questions with exclusively large group lectures in mind. We expected the small group setting to give the most insightful information about participants' educational beliefs. To ensure that our findings would also be generalizable to other teaching formats, we added questions about whether the participants believed that the teaching format (small group *versus* large group *versus* one-on-one teaching) influenced their teaching or the students' learning. In this way we aimed to gain insight into the beliefs applicable to these educational settings. We also requested that participants focus on their preclinical teaching to rule out differences in course level as an influencing contextual factor, since beliefs may vary according to the level of teaching.^{13,22} Because we aimed to develop a comprehensive holistic image of the beliefs of the faculty participants, we asked them to illustrate their perspectives with examples from their teaching sessions and focused further exploration on the examples that were provided. The interviews of one-hour duration on average were audio-taped and transcribed verbatim. We tested both the interview protocol and the survey questions in a pilot study with three participants who did not contribute to the main study. One of these participants was bilingual. Using their comments, we improved the interview questions and were able to address potential language issues.

Ethics approval and consent to participate

This study was granted an ethics waiver by the Medical School Ethics Committee of the LUMC (reference C15.033/SH/sh). According to the same committee, formal written informed consent was not required. Similarly, the study was deemed as 'not involving human subjects research' by the Stanford University Human Subjects Committee and was exempt from human subjects oversight. The first author invited all the participants by e-mail or telephone, emphasising that participation was voluntary and anonymous. All participants gave oral consent.

Analysis

For the analysis of the data, we used the original Samuelowicz and Bain framework as a starting point for context-specific adaptation. The analysis consisted of relating relevant interview fragments to the original framework, while we explicitly remained open to ways to modify the framework based on additional beliefs, belief dimensions, or belief orientations identified.

First, each transcript was read and re-read to get an overall sense of the way in which teaching, learning, or knowledge was conceptualised. Then ‘areas of meaning,’ text fragments that related to participants’ educational beliefs, were identified. These text fragments were labelled according to the belief dimensions and beliefs of the original framework.¹⁴ Text fragments which did not match an existing belief dimension or belief were given a preliminary code based on the content of the interview fragment. Two team members (IvdH and MO) analysed each interview independently to enhance *credibility*,²⁰ using Atlas-ti qualitative data analysis software. After the initial coding, the two team members discussed the results. Demarcation rules between the dimensions as well as between the constituent beliefs within each dimension were fine-tuned during the iterative analysis process to enable consistent coding. Parallel to this process we discussed potential new dimensions with their constituent beliefs, grouping and re-grouping the preliminary coded text fragments. Repeated re-coding occurred, and the iterative process continued until all the dimensions and their constituent beliefs stabilised (‘code’ saturation, a technique to improve the *dependability* of the research²³). This happened after eighteen interviews. We frequently negotiated our data together with a third team member (RvdR) (*investigator triangulation*), looking for evidence and counter-evidence within the data, to reach consensus on all the identified text fragments and to reach agreement as to which dimension they belonged to as well as their constituent belief.

We determined a preliminary belief orientation of the participant holistically, i.e. based on the whole transcript, including all the labelled text fragments. To further confirm data *credibility*, the five interviews which IvdH and MO considered most difficult to reach consensus on were analysed independently by RvdR, and the results were negotiated within the research team. The remaining interviews were analysed by both IvdH and MO, who reached negotiated consensus. During this procedure some minor adaptations were made to belief descriptions. Finally, we re-read all the transcripts again to further ensure data *dependability*, and to confirm ‘meaning’ saturation,²³ that is, we checked if we had harvested all the new insights from the data. At the same time, we checked the consistency of the

overall belief orientation for each participant, using the final version of the new framework. The process and findings were discussed with the other members of the research team to enhance *confirmability*. Consensus was reached on the adaptation and refinement of the framework.

Quality strategies

Two other strategies were used to further confirm the quality of our results. First, we determined an inter-rater agreement of the participants' belief orientations with the help of an independent research assistant. This assistant was trained in the analysis procedure, using the new framework and codebook, to enable determination of inter-rater agreement (*confirmability by external rater*). Because the final belief orientations were determined holistically, we decided that we would compare the outcome at the level of the overall belief orientation rather than at the level of text fragments. The inter-rater agreement was determined on eighteen interviews through calculation of Cohen's Kappa.

Second, we provide illustrative interview fragments in the results section, including two narratives of participants with contrasting educational belief orientations (*thick description*, adding to the *transferability* of the findings). We chose one educator holding the most teaching-centred belief orientation (Orientation I), and one holding the most learning-centred belief orientation (Orientation VI).

RESULTS

The new framework

Although many beliefs described in the original Samuelowicz and Bain framework were also applicable in a medical education context, our data gave rise to new insights and allowed for refinements. The necessary adaptations in belief dimensions, including their constituent beliefs, and belief orientations will be described below.

Table 2.1. New framework of belief orientations defined by their constituent belief dimensions and beliefs.

Dimensions		Teaching- centred orientations					
		I. Imparting information		II. Transmitting structured knowledge		III. Providing and facilitating understanding	
1	Desired learning outcomes	Recall of atomised information	A	Reproductive understanding	A/b	Reproductive understanding	A/b
2	Expected use of knowledge	Within subject	A	Within subject for future use	A/b	Within subject for future use	A/b
3	Responsibility for transforming knowledge	Teacher	A	Teacher	A	Teacher shows how knowledge can be used	A/b
4	Nature of knowledge	Externally constructed, focus on information/ structured knowledge	A	Externally constructed, focus on information/ structured knowledge	A	Externally constructed, teacher shows how knowledge can be used in reality	A/b
5	Students' existing conceptions	Not taken into account	A	Not taken into account	A	Not taken into account	A
6	Teacher-student interaction	Not stressed	A	Reciprocal to maintain students' attention	A/b	Reciprocal to clarify understanding	B/a
7	Creation of a conducive learning environment	Not stressed	A	Not stressed	A	Stressed, to make the students feel at ease	A/b
8	Professional development	Not stressed	A	Not stressed	A	Certain competencies stressed	A/b
9	Students' motivation	Teacher tries to transmit motivation to students	A	Teacher tries to transmit motivation to students	A	Teacher is aware of students' intrinsic motivation	A/b

* bold text denotes necessary adaptations to the original framework

Learning- centred orientations					
IV. Helping student develop expertise		V. Sharing the responsibility for developing expertise		VI. Negotiating meaning	
Change in ways of thinking	B	Change in ways of thinking	B	Change in ways of thinking	B
Interpretation of reality	B	Interpretation of reality	B	Interpretation of reality	B
Teacher helps student	B/a	Students & teacher	B	Students & teacher	B
Personalised, focus on learning from reality	B	Personalised, focus on learning from reality	B	Personalised, focus on learning from reality	B
Used as basis for developing expertise	B/a	Used as basis for developing expertise	B/a	Used to negotiate meaning	B
Reciprocal to clarify understanding	B/a	Reciprocal to negotiate meaning	B	Reciprocal to negotiate meaning	B
Stressed, to help individual student	B/a	Stressed, to allow each individual student to learn	B	Stressed, to allow each individual student to learn	B
Stressed, teacher helps student in their professional development	B/a	Stressed, teacher fosters professional development of student	B	Stressed, teacher fosters professional development of student	B
Teacher is aware of individual differences in students' motivation	B/a	Teacher is aware of individual differences in students' motivation	B/a	Teacher fosters intrinsic motivation of the individual student to enhance the learning	B

The new framework (Table 2.1) is comprised of six belief orientations set out as columns, and nine belief dimensions set out as rows. The distinct belief orientations have been ordered from left to right according to the degree of learning-centredness and have been numbered from I to VI. The dimensions represent qualitatively distinct aspects of beliefs about teaching, learning, and knowledge. Within each dimension three or four different beliefs can be distinguished. To facilitate the descriptions, beliefs have been categorised as A (teaching-centred), A/b (teaching-centred but with learning-centred aspects), B/a (learning-centred but with teaching-centred aspects), and B (learning-centred). Each of the orientations is thus defined as a unique pattern of beliefs within nine belief dimensions. We have highlighted the divergence from the Samuelowicz and Bain framework in bold (see Table 2.1).

Belief dimensions and their constituent beliefs in the new framework

Table 2.2 summarises the changes needed within the dimensions. The dimensions adapted to fit our data are presented below in order of numbering.

Table 2.2. Comparison of the dimensions of the new framework and the Samuelowicz and Bain framework.

Dimensions:	Comparison of the new framework to the Samuelowicz and Bain framework:
1: Desired learning outcomes	identical
2: Expected use of knowledge	identical
3: Responsibility for transforming knowledge	description of learning-centred beliefs changed
4: Nature of knowledge	extended
5: Students' existing conceptions	description and categorisation of 2 beliefs changed
6: Teacher-student interaction	categorisation of 1 belief changed
7*: Control of content	removed
7: Creation of a conducive learning environment	new
8: Professional development	extended
9: Students' motivation	extended

* The original Dimension 7 has been removed and replaced by the newly distilled Dimension, see below.

Dimension 3: 'Responsibility for transforming knowledge'

In this dimension we made changes to the description of beliefs to better fit the content of our findings. We identified that in the most learning-centred orientations (Orientations V and VI) the transformation of knowledge was seen as a joint responsibility of teacher and student. In the original framework, this was labelled as the sole responsibility of the student.

Dimension 4: 'Nature of knowledge'

This dimension needed to be expanded from two to three beliefs. We identified a further distinction between the belief of 'knowledge being externally constructed.' Comparable to the original framework, some educators viewed knowledge as consisting of facts only, described as a 'database,' as necessary 'tools' of factual knowledge, coming from outside sources like books or literature, and not linked to the reality of patient care (coded as D4A).

Others, however, emphasised that this knowledge, even though externally constructed, should be related to patient care by the educator. They believed that the educator should explain how the 'factual knowledge' can be used (D4A/b):

First of all you have basic factual knowledge... I would say the next step is understanding why it is important to possess this knowledge (...) that you have to make a kind of doctor's reflection on it... like when the patient comes with this or that pain or this or that complaint, what is behind it (in basic knowledge);... the focus lies for me on the first steps. (D4A/b; L12)

Dimension 5: 'Students' existing conceptions'

This dimension needed an adjustment in the categorisation of the beliefs. In the original framework the transition from a teaching-centred to a learning-centred belief occurs between Orientations IV and V, and in our data between Orientations III and IV. In addition, our participants with a learning-centred belief with teaching-centred aspects (D5B/a) expressed a different aim for involving students' existing conceptions than described in the original framework. In the original framework, educators with a learning-centred belief with teaching-centred aspects (D5B/a) expressed the aim of preventing common misunderstandings by pointing them out to students and explaining why the established view is more suitable. In our data we found that educators with this belief (D5B/a) indicated instead that they involve students' existing conceptions to further develop the students' expertise. Thus, in comparison to the original framework, the emphasis in our findings is less on correcting misconceptions and more on activating preconceptions to develop expertise.

Interviewer: *What do the students bring to the learning process?*

Participant: *Knowledge, and experience. (...) Indeed, you should... make use of where the student is at this moment and take the next step further to learn new things.* (D5B/a; L01)

We labelled this fragment a learning-centred belief with teaching-centred aspects (D5B/a), because this participant, unlike participants with a teaching-centred belief (D5A), realises that students are not ‘empty vessels’ but come to a teaching session with their own knowledge and experience. The educator sees it as their responsibility to use and build on these and, together with the students, to further develop knowledge constructs.

Dimension 6: ‘Teacher-student interaction’

This dimension contains two learning-centred beliefs (D6B/a and D6B) that differ in the purpose of the teacher-student interaction: clarifying understanding (D6B/a) and negotiating meaning (D6B), respectively. In the original framework, the distinction between these two beliefs resided between Orientation III and IV. From our data we concluded that educators with a Belief Orientation IV, identical to those with a Belief Orientation III, believed that the purpose of the interaction was to clarify understanding. Thus the distinction between the two beliefs (D6B/a and D6B) was placed between Orientations IV and V in the new framework.

Dimension 7: ‘Control of content’*

In the new framework this dimension was removed because all of the participants expressed that the control of content was to be determined by the educator. Thus this dimension did not contribute to the classification.

Dimension 7: ‘Creation of a conducive learning environment’

We distilled this new dimension from our data, since we discovered that many participants believed that as an educator it is important to create an encouraging learning environment. Educators with the most teaching-centred belief orientations did not stress this or formulated this in a negative way (D7A). Within the most learning-centred orientations, educators explained that they created a positive, personal relationship with individual students to enable them to learn; the focus is on the learning process (D7B):

I think it's just really willingness to make the learning fun. You know the students, they like teachers who allow them to learn something new. If teachers just are trying to be nice and popular, they see through that. (D7B; S02)

In the teaching-centred orientation with learning-centred aspects (Orientation III) the aim of the educator when creating a conducive learning environment is to make students feel at ease (D7A/b), with a focus on the group of students as a whole; in the learning-centred orientation with teaching aspects (Orientation IV), the aim is to help students in their understanding with a focus on the person of the individual student (D7B/a):

To create an atmosphere in which students feel at ease ... to freely ask me questions. (D7A/b; L12)

I know them as an individual, I care about them and they have a safe place where they can respond. (D7B/a; S12)

The main difference between the two learning-centred beliefs (D7B/a and D7B) is the focus of the educator, which is on the person of the student (D7B/a) or on the learning process (D7B), respectively.

Dimension 8: 'Professional development'

In the original framework this dimension consisted of two dichotomous beliefs, while in our data four constituent beliefs could be extracted. Professional development within a medical context can be described as the development of the learner from the role of a student to that of a doctor. In the teaching-centred belief orientations the focus of the teaching is on the academic discipline and less on the professional development of the student. Thus, although some educators recognised the relevance of certain professional competencies, the teaching of these competencies was not primarily aimed at the development of students. The educators with a Belief Orientation I or II believed that students acquired some awareness of these competencies by the educator telling students about them (D8A).

What I always do is that now and again in the small group is I bring in general knowledge about our healthcare and the market forces ... I always try to bring in a few examples. Because I find that students should have a broader helicopter view of healthcare. (D8A; L05)

The educators with a Belief Orientation III were aware that a variety of professional competencies such as clinical reasoning, collaboration, communication, and professional attitude are important. For these educators, a small group is an appropriate environment to learn these competencies, or they believe some of these competencies can be demonstrated by being a role model (D8A/b).

I think that it's important to work together in small groups; cooperation between students is important ... that is important for doctors because they work in teams. So learning to work together, and learning to accept the roles that other people play, because there are often people who take the lead and there are people who hang back. That's all part of it. (D8A/b; L12)

In the learning-centred belief orientations the focus of the teaching is on the development of the student. Educators within the two most learning-centred belief orientations (Orientations V and VI) described the student's professional development as an educator's responsibility and emphasised the importance of fostering the learning or development of the student (D8B). Most participants holding this belief refer to multiple physician roles. In addition to being a clinical expert, the professional physician should also be a communicator, collaborator, leader, health advocate, and scholar (showing qualities such as critical thinking and lifelong learning).²⁴

...that if one runs a small group successfully to where people don't see that they necessarily must be the mirror image of each other but they capitalize on each other's strengths, then they actually can begin to be learning what they are going to do for a lifetime. So the power of the small group is the power of the professional behaviour that you hope continues forever; especially around team-work and respect – the whole.... (D8B; S05)

Educators within Orientation IV believed that they had an important role in the professional development of students, but were less outspoken about their responsibility in this process (D8B/a).

For the student, I think that what you especially want is that she/he really participates [in a workgroup]. Maybe it is also something that develops. It would of course be fantastic if after four years, students could take on the role of teacher. One of the things is of course teamwork in the hospital or another place where you work later; so these are skills which are totally essential. (D8B/a; L01)

Dimension 9: 'Students' motivation'

This dimension also needed to be expanded from two to four beliefs. In the two most teaching-centred orientations (Orientations I and II), educators focused on their own interests or enthusiasm, and believed that, consistent with their belief in transmitting knowledge, they also have to transmit their own motivation to the students (D9A):

I think [teaching] is trying to transmit information in a way that fosters interest in the audience. I think your goal ought to be to generate some excitement, to be excited about what you are teaching, and to be an effective communicator so you can share your excitement, your passion, and generate some enthusiasm in the audience. (D9A; S07)

In the teaching-centred orientation with learning-centred aspects (Orientation III), educators described their awareness of students' intrinsic motivation (D9A/b), acknowledging, for example, the enthusiasm of students. In the learning-centred orientation with teaching-centred aspects (Orientation IV) educators were aware of the *individual differences* in students' intrinsic motivation (D9B/a). These educators used phrases like wanting to learn about what the student is interested in, recognising where the student 'wants to get.'

If you consider that intrinsic motivation is most important, then those students who are intrinsically motivated will find their way themselves with a bit of help... I go along with what I think interests them. (D9A/b; L10)

Try to find something about what's their driver, what makes them tick, what makes them excited, what makes them feel like it's worth coming to class. And for some it's problem-solving, for some it's knowing something no one else knows..., different reasons, and not assuming that all [reasons] have to be the same. (D9B/a; S12)

In the most learning-centred orientation (Orientation VI), educators described their responsibility to find out what makes the learning of the individual student exciting, to invest in the person of the student and his/her passion, and to foster the motivation and interest of the student with the goal of enhancing the learning (D9B):

What I know about adult learning is that they do best when they are focused on what is important to them, and so if they have identified their own specific learning objectives, and we as the facilitator-teacher help them with that, then that is reinforcing and motivating. (D9B; S11)

Belief orientations in the new framework

The original framework's seventh, most learning-centred orientation, labelled 'Encouraging knowledge creation' was not observed in our data. Central to this orientation is the belief that students should be in control of the learning content; none of our participants expressed this belief.

We changed the label of the learning-centred Belief Orientation V from 'Preventing misunderstandings' to 'Sharing the responsibility for developing expertise.' Since our participants with an Orientation V emphasised connecting students' existing beliefs with the reality of the medical profession rather than correcting misconceptions, this better summarised the pattern of beliefs.

As in the original framework, the medical educators' focus in Orientations I to III was on the content and its transmission; hence, we conclude that these orientations are teaching-centred. In Orientations IV to VI the focus of the educators was on student learning and development, so we conclude these represent learning-centred belief orientations. The refinements of the dimensions resulted in a sharper demarcation between the orientations. The two belief orientations on either side of the teaching-centred *versus* learning-centred 'divide,' Orientations III and IV, share just one belief. In the original framework these two orientations shared two common beliefs. All other adjacent belief orientations share three to seven beliefs. In the original framework the other adjacent belief orientations shared six to eight beliefs.

Results of quality strategies

Comparison of the classification of the 18 interviews by the independent research-assistant with that of the authors resulted in a high inter-rater reliability of 0.85 (Cohen's Kappa). Final consensus was reached for the two interview transcripts that were rated differently. This result validates the framework, supporting that it is not dependent on the perspective of a single educational researcher.

As a final quality strategy we provide a *thick* description of two maximally contrasting belief orientations among our educators (Orientations I and VI). Only one educator in our study displayed an Orientation I; he is a clinician from

LUMC. Of the six educators who displayed an Orientation VI we selected the basic science educator to illustrate how a teacher with a learning-centred belief orientation teaches basic science topics. His educational beliefs contrasted with the beliefs of the other basic science educators. This educator worked at SUSM.

Dr A: teaching-centred Orientation I: *Imparting information*

In the narrative of Dr A, the spotlight is on the teacher, who puts a lot of effort into his teaching. What highlights Dr A's belief about teaching is his desire to 'transfer knowledge,' which he sees as a tool, and is first introduced from 'hardware,' such as books or electronic information. He emphasises the importance of memorising factual knowledge, as this is a prerequisite for clinical reasoning. 'You can look everything up, but I don't think it works like that in practice.' In his teaching he expects students to be well prepared and checks this by asking questions, for example, about anatomy. Students should be 'committed, diligent, and well-behaved.' He is worried about the attitude and lack of motivation that he observes in some students. He aims to make students take responsibility for working hard by being provocative. For example, he presents a patient case with a bad outcome due to a medical error. In addition to the importance of knowledge transfer, teaching to him means providing students with tips and tricks about how to drill down on the facts. He wants to be a role model, hoping that by demonstrating his own level of knowledge, students will be motivated: '(...) what you show then is that you know a lot. It would be very nice if that is motivating for the students. To ensure that you know a great deal about a certain subject.' A good teacher to him is someone who determines his own teaching goals and achieves them. When asked about what students bring to the learning process, he responds that he is often disappointed that students are so unresponsive. Yet he tries to convey his own motivation on the subject and in this way generate enthusiasm among the students.

Dr B: learning-centred Orientation VI: *Negotiating meaning*

In the narrative of Dr B, students are the main characters, and the focus is on their learning process. He has several aims which he hopes to achieve through his teaching. First that 'they learn the material' which is integrated into patient presentations, as 'they should be able to apply the material to patient care.' Second, he wants 'to introduce students to the idea of how they can learn in the future.' Therefore he spends a significant part of his course analysing medical articles so that students are able to read medical literature and understand its implications for patient care. Third, he aims to teach students to be sceptical and critical and 'to understand that the literature, the professor, or commonly accepted wisdom can be

wrong. So they get a lot of credit for pointing out that I'm wrong.' His assessments reflect the importance of being able to apply what they have learned: *'The idea is they have to be able to apply what they learn in the class to the patients and also to be able to extract information from the journal articles that they can apply. [...] If they try to memorise the course notes and take our final exam they won't do very well, because we ask for synthesis in our final exam.'* Dr B sees teaching as *'an alliance, a collaboration between the student and the teacher to learn.'* Knowledge for him is not only about the basic science material, but also about taking care of patients. He emphasises that a lot of reciprocal teaching occurs in his small group setting, and that by splitting the group up into pairs the teaching is *'completely interactive.'* He is clear that creating a supportive learning environment is a prerequisite for the learning to occur. Thus he emphasises the importance of continuity with the same teacher over a longer period of time in the learning process. *'They have to learn to trust me, that I won't make fun of them.'* He places effort into trying to make the learning fun, for example by using competition or games. He sees it as his responsibility to figure out how to engage the students: *'They come predisposed to learning and the reason is they have a very high incentive to learn because they are really concerned about preparing themselves to take care of patients in the near future and so they have a tremendous incentive to learn. But they're always demanding to know if it is meaningful or relevant.'*

The narratives as well as the results of the other implemented quality strategies support the utility of the new framework.

DISCUSSION

Our results confirm the relevance of the structure of the original Samuelowicz and Bain framework in the field of medical education. However, significant changes were required to adapt the framework to a medical education context. We will successively discuss the major changes in the belief dimensions, followed by the consequences for the belief orientations and for the boundaries between the belief orientations.

The most important change in the dimensions is the identification of the new dimension 'Creation of a conducive learning environment' (Dimension 7), which was not present in the original framework. We presume that this can be explained by our focusing on small group teaching during the interviews. In this context in which the student is assumed to be actively involved, it is likely that an

educator is more aware of the importance of a supportive learning environment. Other medical education literature highlights the importance of ‘nurturing’ or ‘respecting’ students,^{25,26} or emphasises the negative impact of learner neglect or frank mistreatment in the learning environment.^{27,28} However, only a single study classifying educational beliefs in the context of higher education¹¹ has previously recognised the relevance of a conducive learning environment to the educational beliefs of educators.

Secondly, within the dimension ‘Nature of knowledge’ (Dimension 4), we uncovered that a subgroup of medical educators view knowledge as externally constructed, but are also aware that the link to its applicability in the medical profession is important. This awareness may be due to the medical education context, in which most educators are often also involved in clinical work. This most likely encourages educators to link content knowledge to the practice of patient care. Relating meaning to a social reality is an important aspect of the epistemological view of knowledge as being co-constructed.^{29,30} The other relevant aspect of this epistemological view is that a learner conceptualises meaning from interaction with others. This view is also reflected in our data in the belief that the goal of teacher-student interaction is to negotiate meaning (D6B).

Within the dimension ‘Students’ existing conceptions’ (Dimension 5) we did not find support for the belief that students’ misunderstandings should be prevented, in contrast to what was described in the original framework. Instead, we found that some medical educators rather emphasise the importance of building on students’ preconceptions to develop expertise, and sometimes also of learning from students’ conceptions themselves. We hypothesise that this difference might reflect a more current, general awareness that not all preconceptions are misconceptions.³¹

Our results led us to expand the belief dimension concerning the professional development of the student (Dimension 8) from two to four distinct beliefs. Although it is possible that educators in other disciplines show clear beliefs about the development of students, we favour the hypothesis that this emphasis on professional development is due to the context of medical education. Other medical education studies have highlighted beliefs about the professional development of the student. In contrast to our findings, Stenfors-Hayes et al.,³² who compared the beliefs of medical educators working in a preclinical *versus* clinical context, uncovered the emphasis on the professional development of the students only within the clinical but not preclinical context. In two other studies,^{25,33} beliefs

about professional development were presented as separate from beliefs about teaching and learning. Our framework, however, integrates these beliefs as one of the dimensions of an educator's beliefs about teaching and learning.

The addition of two beliefs in the dimension (D9) 'Students' motivation' may have become apparent due to our explicit questions on small group teaching during the interviews. A small group enables an educator to pay attention to the individual student's intrinsic motivation, which is much more difficult in the setting of large-scale lectures. The most learning-centred belief that an educator should foster the intrinsic motivation of the student (D9B) is in line with other literature which indicates that fostering a student's intrinsic motivation is associated with deep learning.^{34,35}

These refinements add to the descriptive power of the new framework, because the expansion of the constituent beliefs within the dimensions enables a sharper demarcation between the adjacent belief orientations. In the original framework the distinction between some adjacent belief orientations was based on only one belief dimension. Our new framework extends this to at least two dimensions, which makes it possible to determine a medical educator's belief orientation more reliably.

Significantly, these refinements create a more clearly demarcated boundary between teaching-centred and learning-centred orientations. In the original framework the two adjacent orientations on either side of this boundary (Orientation III and IV, see Table 2.1) still shared two common beliefs, whereas in our new framework for medical education this has been reduced to only one out of nine beliefs. This is significant as it underlines the sharp boundary between a teaching-centred and learning-centred orientation, and reinforces Samuelowicz and Bain's notion¹⁴ that transition from a teaching-centred to a learning-centred belief orientation means a profound shift in which, according to the new framework, eight out of nine beliefs would be required to change. As the other adjacent belief orientations have three to seven beliefs in common, the differences between these orientations are more subtle, suggesting that these orientations form a continuum. These boundaries may also be easier to cross. In Kember's review article on teaching beliefs,⁶ a transitional belief orientation is proposed that would bridge the teaching-centred *versus* learning-centred orientations. However, our findings, like those of Kember and Kwan⁸ as well as Samuelowicz and Bain,¹⁴ do not support this bridging belief orientation.

Finally, the disappearance of the dimension ‘Control of content’ led to the absence of the original framework’s most learning-centred belief orientation (Orientation VII). Central to this orientation is the belief that students should be in control of the learning content. We attribute this disappearance to our preclinical context. This conclusion is consistent with the findings of Samuelowicz and Bain^{13,14} who identified this belief exclusively within a postgraduate teaching context.

One other finding merits comment: all beliefs orientations, both learning-centred and teaching-centred, were represented in our sample of participants. That a substantial number of educators did indeed have a teaching-centred belief orientation was surprising, given that the participants selected had been working within a learning-centred curriculum for at least a decade and had extensive experience and deep involvement in teaching. Obviously, in a learning-centred curriculum one would assume a learning-centred orientation to be most effective. Our findings emphasise that the development from a teaching-centred to a learning-centred belief orientation does not automatically take place when a curriculum is innovated towards learning-centredness³⁶; more intensive and targeted faculty development interventions may be required.

Limitations

The data for this study have been collected at two research-intensive medical schools which were both innovating towards a more learning-centred curriculum in the decade prior to the study. The participants’ limited experience with a learning-centred curriculum may limit the generalisability of our results. Research conducted in schools with a longer tradition of learning-centred curricula may reveal further refinements of learning-centred beliefs.

We deliberately selected educators with long-standing teaching experience. This may have created a bias in the distribution of the belief orientations. It is possible that less experienced educators would have displayed more teaching-centred belief orientations. However, all belief orientations were represented in our study.

In addition, the data were gathered a decade ago. It is possible that the beliefs of medical faculty have changed since then, due to new curriculum changes or ongoing faculty development interventions. Yet, the original framework was developed a decade before we conducted our study, and we conclude

that in those ten years the overall structure of the framework remained the same. Moreover, our data show that even a decade after the innovation to a learning-centred curriculum, multiple educators still hold a teaching-centred belief orientation. Thus, we expect that the proposed framework continues to be applicable.

Finally, we intentionally focused on the preclinical teaching context. Therefore, some caution is required when extending conclusions from our findings to other contexts. Indeed, a postgraduate setting, as opposed to our preclinical context, might uncover more learning-centred belief orientations, consistent with the findings of Samuelowicz and Bain.^{13,14}

Implications for teaching and future research

The sharp divide between teaching-centred and learning-centred belief orientations in the framework implies that a change from a teaching- to a learning-centred orientation is a major transition. Current literature emphasises that this transition is a prerequisite for a lasting change in teaching behaviour, which in turn influences student learning. In learning-centred curricula, one way that faculty development programmes could support educators in making this transition is by helping them to become aware of their beliefs. The new framework can make these beliefs more explicit and can encourage medical educators to revisit their beliefs about teaching, learning, and knowledge. The framework's dimensions can be used as an instrument for reflection and discussion about a medical educator's educational beliefs. The adaptations and extensions that this framework provides are those areas that are relevant to the context of learning-centred medical education. Reflecting on how to determine which knowledge is relevant to be acquired, how to create a positive learning climate, how to help the students in their professional development, and how to foster intrinsic student motivation, are of major importance for the quality of our education of future health professionals.

Further research is needed to investigate the extent to which the beliefs of medical educators can change and develop towards learning-centredness. For such a study, the presented framework can provide a useful instrument.

CONCLUSIONS

Our study was undertaken to describe and classify the beliefs of medical educators about teaching, learning, and knowledge. Insight into these beliefs is important for medical schools to improve the quality of education and can provide input for faculty development. Although our findings confirm the relevance of the structure of the original Samuelowicz & Bain beliefs framework, developed within higher education research,¹⁴ to the field of medical education, we find that significant adaptations and refinements were necessary to align the framework to a medical context. A new dimension ‘Creating a conducive learning environment’ was found, likely uncovered by our explicit questions about small group teaching which aims to encourage a student’s active participation. This emphasis on small group learning likely also explains the new addition of the constituent beliefs in the dimension ‘Students’ motivation.’ In addition, the extensions of the beliefs in the dimensions ‘Nature of knowledge’ and ‘Students’ professional development’ are related to the specific medical education context, with its focus on clinical knowledge and professional development. These four new or extended dimensions represent relevant new areas for faculty development. The newly identified and refined beliefs enable a more comprehensive description of the belief orientations of medical educators. As in the original framework, the belief orientations can be arranged on a continuum from teaching-centredness to learning-centredness. Our new framework sharpens the boundary between teaching-centred and learning-centred orientations. With the adaptations proposed herein, the new framework is a more contemporary instrument for faculty development to enable medical faculty to reflect on and revisit their beliefs about teaching, learning, and knowledge.

Acknowledgements

The authors wish to thank the medical educators who took part in this study, Prof. dr. Jelle Goeman and Dr. Bart Mertens for their advice on statistics, and Prof.dr. Yvonne Steinert for her worthwhile feedback on the manuscript.

REFERENCES

1. Pajares MF. Teachers' beliefs and educational research: Cleaning up a messy construct. *Rev Educ Res.* 1992;62(3):307-332.
2. Trigwell K, Prosser M. Changing approaches to teaching: A relational perspective. *Stud High Educ.* 1996;21(3):275-284.
3. Trigwell K, Prosser M, Waterhouse F. Relations between teachers' approaches to teaching and students' approaches to learning. *High Educ.* 1999;37(1):57-70.
4. Williams RG, Klamen DL. See one, do one, teach one—exploring the core teaching beliefs of medical school faculty. *Med Teach.* 2006;28(5):418-424.
5. Visser-Wijnveen GJ, Van Driel JH, Van der Rijst RM, Verloop N, Visser A. The relationship between academics' conceptions of knowledge, research and teaching—a metaphor study. *Teach High Educ.* 2009;14(6):673-686.
6. Kember D. A reconceptualisation of the research into university academics' conceptions of teaching. *Learn Instr.* 1997;7(3):255-275.
7. Richardson V. The role of attitudes and beliefs in learning to teach. In: Sikula J, ed. *Handbook of research on teacher education.* MacMillan; 1996:102-119.
8. Kember D, Kwan K-P. Lecturers' approaches to teaching and their relationship to conceptions of good teaching. *Instr Sci.* 2000;28(5):469-490.
9. Verloop N, Van Driel J, Meijer P. Teacher knowledge and the knowledge base of teaching. *Int J Educ Res.* 2001;35(5):441-461.
10. Kember D, Gow L. Orientations to teaching and their effect on the quality of student learning. *J High Educ.* 1994;65(1):58-74.
11. Postareff L, Lindblom-Ylänne S. Variation in teachers' descriptions of teaching: Broadening the understanding of teaching in higher education. *Learn Instr.* 2008;18(2):109-120.
12. Pratt DD. *Five perspectives on teaching in adult and higher education.* Krieger; 1998.
13. Samuelowicz K, Bain JD. Conceptions of teaching held by academic teachers. *High Educ.* 1992;24(1):93-111.
14. Samuelowicz K, Bain JD. Revisiting Academics' Beliefs about Teaching and Learning. *High Educ.* 2001;41(3):299-325.
15. Light G, Calkins S. The experience of faculty development: Patterns of variation in conceptions of teaching. *Int J Acad Dev.* 2008;13(1):27-40.
16. Samuelowicz K. *Academics' educational beliefs and teaching practices.* Griffith University Queensland; 1999.
17. Barnhoorn PC, Houtlosser M, Ottenhoff-de Jonge MW, Essers GT, Numans ME, Kramer AW. A practical framework for remediating unprofessional behavior and for developing professionalism competencies and a professional identity. *Med Teach.* 2019;41(3):303-308.
18. Brody H, Doukas D. Professionalism: a framework to guide medical education. *Med Educ.* 2014;48(10):980-987.
19. Cruess RL, Cruess SR, Boudreau JD, Snell L, Steinert Y. A schematic representation of the professional identity formation and socialization of medical students and residents: a guide for medical educators. *Acad Med.* 2015;90(6):718-725.

20. Frambach JM, van der Vleuten CP, Durning SJ. AM last page: Quality criteria in qualitative and quantitative research. *Acad Med*. 2013;88(4):552.
21. Kuper A, Lingard L, Levinson W. Critically appraising qualitative research. *BMJ*. 2008;337:a1035. doi: 10.1136/bmj.a1035
22. Prosser M, Trigwell K. Relations between perceptions of the teaching environment and approaches to teaching. *Br J Educ Psychol*. 1997;67(1):25-35.
23. Hennink MM, Kaiser BN, Marconi VC. Code saturation versus meaning saturation: how many interviews are enough? *Qual Health Res*. 2017;27(4):591-608.
24. Royal college of physicians and surgeons of Canada. CanMEDS: Better standards, better physicians, better care. Accessed July 2, 2019. <http://www.royalcollege.ca/rcsite/canmeds/canmeds-framework-e>
25. Pratt DD, Arseneau R, Collins JB. Reconsidering “good teaching” across the continuum of medical education. *J Contin Educ Health Prof*. 2001;21(2):70-81.
26. Taylor EW, Tisdell EJ, Gusic ME. Teaching beliefs of medical educators: perspectives on clinical teaching in pediatrics. *Med Teach*. 2007;29(4):371-376.
27. Buery-Joyner SD, Ryan MS, Santen SA, Borda A, Webb T, Cheifetz C. Beyond mistreatment: Learner neglect in the clinical teaching environment. *Med Teach*. 2019;41(8):949-955.
28. Kulaylat AN, Qin D, Sun SX, et al. Perceptions of mistreatment among trainees vary at different stages of clinical training. *BMC Med Educ*. 2017;17(1):1-6.
29. Saljo R. *Learning in the Learner's Perspective. I. Some Common-Sense Conceptions*. No. 76. ERIC Clearinghouse; 1979.
30. Tigchelaar A, Vermunt JD, Brouwer N. Patterns of development in second-career teachers' conceptions of learning and teaching. *Teach Teach Educ*. 2012;28(8):1163-1174.
31. Smith III JP, Disessa AA, Roschelle J. Misconceptions reconceived: A constructivist analysis of knowledge in transition. *J Learn Sci*. 1994;3(2):115-163.
32. Stenfors-Hayes T, Hult H, Dahlgren LO. What does it mean to be a good teacher and clinical supervisor in medical education? *Adv Health Sci Educ Theory Pract*. 2011;16(2):197-210. doi: 10.1007/s10459-010-9255-2
33. Jacobs JC. *Conceptions of learning and teaching in teachers: in student-centred curricula in Medicine*. Vrije Universiteit Amsterdam; 2015.
34. Deci EL, Ryan RM. The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychol Inq*. 2000;11(4):227-268.
35. Kusurkar RA, Croiset G, Ten Cate OTJ. Twelve tips to stimulate intrinsic motivation in students through autonomy-supportive classroom teaching derived from self-determination theory. *Med Teach*. 2011;33(12):978-982.
36. Jacobs JC, van Luijk SJ, Galindo-Garre F, et al. Five teacher profiles in student-centred curricula based on their conceptions of learning and teaching. *BMC Med Educ*. 2014;14:220. doi: 10.1186/1472-6920-14-220

ADDENDA

Addendum 2.1. Samuelowicz & Bain Framework: see Chapter 1, Table 1.1.

Addendum 2.2. Interview guide.

	Main questions
Questions related to teaching	Q 1 What do you aim to achieve through your teaching?
	Q 2 What is teaching?
	Q 3 Does the format of the small group influence your teaching? (as opposed to large group lectures/one-on-one teaching) How?
	Q 4 What do you see as your role and as your students' role in the teaching and learning process?
	Q 5 What do students bring to the learning process?
	Q 6 What makes somebody a good teacher?
Questions related to knowledge	Q 7 What is knowledge in your discipline?
Questions related to learning	Q 8 What is learning?
	Q 9 Does the format of the small group influence the students' learning? How?
	Q 10 How do you know that your students have learned something?
	Q 11 Do you assess what students have learned through the small group teaching? If so, how?
	Q 12 What were the most important ways in which your learning as a student was enhanced?
	Q 13 We have talked about teaching and learning; does your teaching influence student learning? How?
Question linking teaching and students' learning	

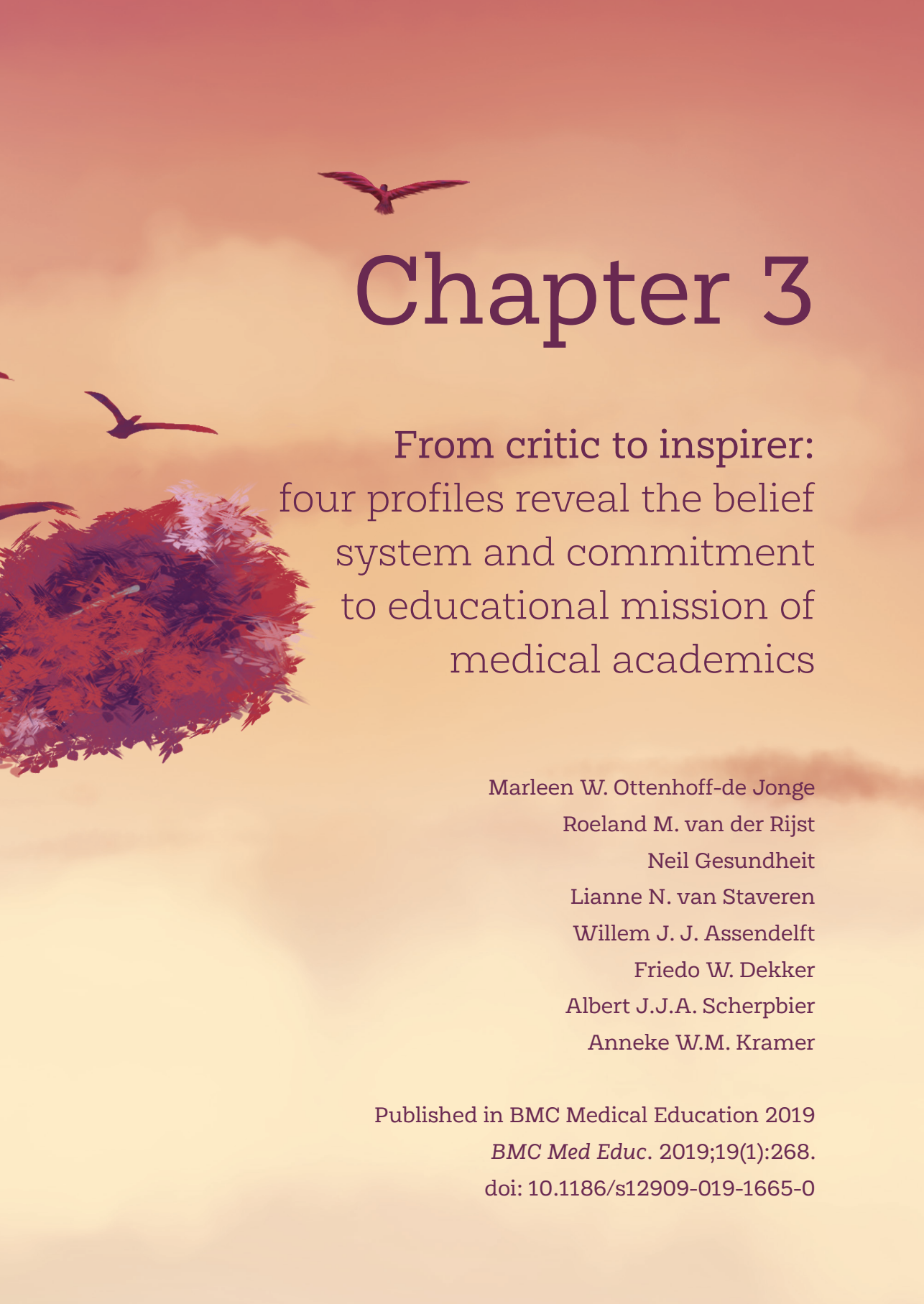
Supplementary questions

- Do you think you achieve your aims? If not, what happens in practice?
 - What, if anything, does prevent you from achieving your aims?
-
- Do you think about teaching in this way in all situations? If not, what are other ways in which you think about teaching?
 - What is your main concern when teaching?
-
- What are your and students' main responsibilities?
 - What do you do apart from telling students about something?
-
- What, if anything, do you see as main obstacles to good teaching?
-
- Where does knowledge come from?
 - Are there different types of knowledge?
 - Do you teach different types of knowledge in different ways? How? In particular, how do you teach relationship between theory and practice?
 - Do you ever modify your small group-teachings and if so, what does influence the changes you make?
-
- What does it mean to learn?
-
- What are the signs that students have learned something?
 - What distinguishes a competent/good student from a poor student?
 - If you asked your students at the end of the course 'what have you learned from this course?' what would you like your students to say?
 - Do you, and if so how, communicate to students what kind of learning you value?
-
- What does happen in the teaching process that prepares students for this assessment?
 - How were you made responsible for your own learning?
-
- What do you think has the biggest influence on students' learning?
 - What is the most important thing you do in small group teaching that influences ways in which students learn?
-

‘Now, what really makes a teacher
is love for the human child; for it
is love that transforms the social
duty of the educator into the higher
consciousness of a mission’

- *Maria Montessori* -





Chapter 3

From critic to inspirer:
four profiles reveal the belief
system and commitment
to educational mission of
medical academics

Marleen W. Ottenhoff-de Jonge

Roeland M. van der Rijst

Neil Gesundheit

Lianne N. van Staveren

Willem J. J. Assendelft

Friedo W. Dekker

Albert J.J.A. Scherpbier

Anneke W.M. Kramer

Published in BMC Medical Education 2019

BMC Med Educ. 2019;19(1):268.

doi: 10.1186/s12909-019-1665-0

ABSTRACT

Background

The educational beliefs of medical academics influence how they act in class and thus influence student learning. One component of these are beliefs academics hold about the qualities of teachers themselves. These teacher qualities range from behaviours and competencies to more personal attributes such as the teacher's identity and mission. However, it is unclear what medical academics believe to be key teacher qualities. Therefore, this study explored the variety of medical academics' beliefs about 'teacher qualities,' aiming to identify and characterise profiles of academics with similar beliefs.

Methods

We interviewed 26 expert academics from two medical schools to explore their beliefs about teacher qualities. A concentric onion-model focusing on teacher qualities was used to analyse and categorise the data deductively. Within each theme we developed subthemes inductively. To gain insight into the variety of beliefs we then clustered the participants into teacher profiles according to the themes. To better understand each of the profiles we carried out a quantitative study of the differences between profiles regarding subthemes, contextual and personal factors, and analysed statistical significance using Fisher's exact- and Student's t-tests for categorical and continuous data, respectively.

Results

Four profiles of medical academics were identified, corresponding to the most central theme that each participant had reflected on: the 'Inspirer,' 'Role model,' 'Practitioner,' and 'Critic.' The focus of the profiles varied from external constraining factors within the 'Critic' profile to affective personal qualities within the 'Role model' and 'Inspirer' profiles. The profiles could be regarded as hierarchically ordered by inclusiveness. Educational institute was the only significant factor related to the profiles.

Conclusions

Besides the relevance of affective teacher qualities, the 'Inspirer' profile demonstrates the importance of developing a clear mission as a teaching academic, centred around student learning and professional development. In our view, academics who inspire their students continue to be inspired themselves.

The practical implications are described for faculty development programmes, and for the potential value of using these profiles within medical schools. In the discourse on educational beliefs, the authors argue that more attention should be paid to affective qualities, in particular to explicating the educational mission of academics.

BACKGROUND

Most studies on educational beliefs until now have investigated the beliefs of academics from the perspective of teaching,¹⁻¹⁰ without paying attention to personal aspects of teachers. Focusing on academics' beliefs about teaching while leaving out their beliefs about *being* a teacher may result in too narrow an understanding of the phenomenon of academic teaching,^{11,12} and does not take into account aspects such as the personal motivation of academics for teaching.¹² Thus, in order to obtain a more complete picture of all aspects relevant to beliefs about teaching, this study focuses on the beliefs that academics hold about being a teacher. Since the teaching beliefs of academics influence student learning and learning outcomes, it is important to obtain further insight into these beliefs.¹⁻¹⁰

First we will define some of the terms used in this study. Next, we will discuss the current state of knowledge regarding beliefs about teaching, and introduce Korthagen's model which was developed to enable reflection on teachers' beliefs about being a teacher and which we use to analyse our data.

Educational 'beliefs' refer to conceptions or convictions about aspects of education, such as teaching, learning, knowledge, students, or teacher qualities. The term 'beliefs' is generally used for those convictions that are formed early in life, are deeply rooted, and are harder to change than conceptions.¹³ They are closely related to practice and can consist of both cognitive and affective aspects.¹⁴ An example of a cognitive aspect is what teachers believe about desired learning outcomes, which may vary from recall of atomised information to a change in a student's way of thinking. An example of an affective aspect is the role of interest and motivation in learning: some academics believe this to be teacher-initiated, while others believe it to be student-initiated.¹⁴ Several terms are used to describe the personal aspects of being a teaching academic. We chose to use the term 'teacher qualities': an academic's behaviours and competencies as well as the more personal attributes such as an academic's identity and mission, both tangible and intangible, relevant to the functioning of a teaching academic. Academics in a medical context have not only an educational role, but other roles as well: those of clinician, researcher and/or administrator. Therefore, we have opted to describe medical teachers working in an academic context as 'academics.'

The beliefs that academics hold about teaching and student learning have been investigated in a number of studies. While the outcomes of the studies differ in certain aspects, there is a consensus that teaching beliefs can be

grouped broadly into teacher- or content-centred *versus* student- or learning centred teaching beliefs.^{8,11,12} Central in a teacher-centred beliefs orientation is the focus of the academic towards knowledge transmission and the person of the academic and his/her teaching strategies, and in a student-centred teaching beliefs orientation towards the students' conceptual understanding and the person of the students and their development.¹²

A student-centred beliefs orientation is widely regarded as more developed than a teacher-centred orientation.^{8,12} Academics holding a teacher-centred orientation are likely to use a lecturing approach, even in small group sessions, whereas those with a student-centred orientation will use more interactive teaching methods. A student-centred orientation focuses on enhancing the learning of the student, even when teaching content. A prevalence of academics with a student-centred orientation leads to a deeper approach to learning, while a teacher-centred orientation leads to a more surface approach to learning.⁸

Several factors, both contextual and personal, have been reported as being associated with teaching beliefs. Contextual factors described in the literature as being associated with teaching beliefs are level of the course,⁵ and discipline. The 'hard' disciplines,¹⁵ such as engineering or physics, are more often associated with a teacher-centred beliefs orientation, while in disciplines where attitudes and personal skills are more important, such as humanities or social sciences, student-centred orientations typically predominate.^{5,16-20} Other contextual factors reported are appreciation of teaching by the department,²¹ and the educational history and culture of the institute.²²

A number of personal factors is associated with teaching beliefs. In some studies female teachers^{20,22,23} or experienced teachers^{24,25} are more likely to show a student-centred beliefs orientation, in another study this is not confirmed.²⁶ Other personal factors reported are educational role (teaching role only *versus* combined with educational management/ development and/ or research) and type of educational task (lectures only *versus* mix).²²

To better understand the variety of beliefs of individual teachers, several studies clustered teachers with similar beliefs into profiles.²⁷⁻³⁰ By clustering, one can group together similar and homogeneous subsamples of people and analyse the characteristics of those participants that are clustered into the same group.³¹

The literature provides two practical reasons why studies on teaching beliefs are important. A first reason is that it is important to investigate whether the teaching beliefs of medical academics are in alignment with the student-centred educational approach of their medical schools, because clearly, any curricular innovation that is inconsistent with the beliefs of those responsible for its execution is ‘doomed to fail.’³² A second reason to explore teaching beliefs is that these should be an important point of engagement in faculty development. The teaching beliefs that academics hold influence how they approach professional development, and how they benefit from it.³³

Insight into the beliefs of academics about teacher qualities can thus enhance the insight into the teaching beliefs of academics. However, in contrast to studies on beliefs about teaching, few studies on beliefs about teacher qualities are available within the context of higher education,^{11,12,34} let alone within the medical context.¹¹ While these studies drew attention to the person of the teacher when exploring academics’ teaching beliefs, they did not deliver a useful framework for our study. Because of our interest in obtaining a full image of all aspects relevant to beliefs about teacher qualities and their interrelatedness, we decided to opt for a different, more extensive model for the analysis of our data.

Within the field of teacher education Korthagen³⁵ developed a theoretical model to enable reflection on teacher qualities (Figure 3.1), which integrates and relates different perspectives on teacher qualities in a holistic way. The model has been empirically evaluated in various international studies, in both medical and teacher education contexts.³⁶⁻⁴¹

This concentric onion model hypothesises that all levels of teacher qualities influence each other. These levels are: (1) Environment, (2) Behaviours, (3) Competencies, (4) Convictions, (5) Identity, and (6) Mission. The *environment*, the most peripheral level, can be defined as the context: persons, groups, and non-personal external factors that influence teacher qualities. The *behavioural* level refers to all concrete, observable behaviours or actions of the teacher. The level of *competencies* can be described as the integrated body of knowledge, skills and attitudes of the teacher. It represents a potential for behaviour and is not directly observable. The level of *convictions* refers to conceptions or perspectives teachers hold about learning, teaching, or teachers. Korthagen refers to this level as the ‘beliefs’ level. Because of the way we defined the content and demarcation rules of this level, and to prevent confusion with our concept of beliefs about teacher qualities in the present study, we decided to

name this level as the level of *convictions*. *Identity*, the next level, can be defined as the perspective teachers have on themselves, how they define themselves, how they perceive their professional role. Even though the focus is on the ‘self,’ the perspective is relational, and largely determined by how relationships with significant others are viewed. Finally, the core level of the model, the level of *mission*, implies the intentions and goals a teacher pursues through teaching. What characterises the mission level is that it is focused on others, and on giving meaning to one’s own existence through contributions in a larger context. It has also been characterised as the ‘transpersonal’ level. Answering the question of *why* one teaches can lead to a reflection on the educational mission of the academic, whereas the question of *who* teaches can lead to further insight into the identity of the academic.

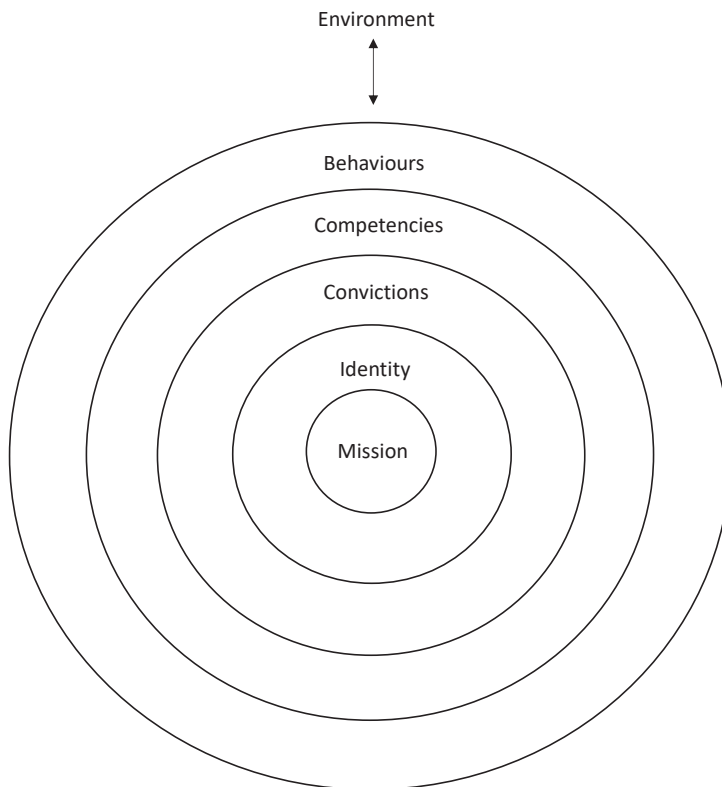


Figure 3.1. Concentric onion model of essential elements of teacher qualities (Korthagen³⁵, adapted).

According to Korthagen, the process of a teacher's professional development will be hindered when problems at a specific level are not tackled by progressing to a more central level, which underlines the importance of increasing our insight into these central levels of teacher qualities. For example, when academics reflect on their mission as a teacher they may discover that their professional inspiration mainly lies in their clinical work and much less in the relationship with students. A dialogue about what motivates these academics in their teaching might help them to become aware of their educational mission, which in turn may cause a shift in their perception of their professional identity and serve as an important motivator to challenge their educational convictions.

After analysing the beliefs about teacher qualities, we aim to explore whether profiles, clusters of academics with comparable beliefs, can be delineated. This will enable us to obtain a better understanding of why academics vary in their beliefs about teacher qualities, and to analyse which contextual and personal factors are associated with the academics that are clustered into the same profile.

By uncovering the variety in beliefs about teacher qualities through clustering into teacher profiles, and exploring the characteristics of these profiles, we aim to deepen our understanding of the teacher, and in particular our understanding of aspects relevant to academics' identity and mission, as these are at the core of the educational beliefs of academics and ultimately to their behaviour in class.³⁵ From a more practical perspective, the identified teacher profiles can provide input into how to shape faculty development programmes in medical schools with a student-centred curriculum.

Thus, our research questions are:

- (1) What is the variety of beliefs held by medical academics about teacher qualities?
- (2) How can the variety of beliefs about teacher qualities be clustered into profiles?
- (3) What is the relationship between the profiles and contextual (culture and organisation of the medical school, discipline) and personal factors (gender, teaching experience, teaching roles, educational tasks)?

METHODS

Design and procedure

This exploratory, qualitative study consisted of four steps: the first step was largely deductive using Korthagen's model as a template.⁴² In the second step subthemes were developed inductively. The third step consisted of qualitatively clustering academics into profiles. The final step consisted of a quantitative analysis of the relationship with contextual and personal factors as well as subthemes.

The research is based on semi-structured interviews with medical academics, and is part of a larger research project exploring the longitudinal development of beliefs of medical academics about teaching, learning, knowledge, and teacher qualities, as, to date, the literature is not conclusive about if and how easily beliefs can change.^{8,43,44} In this study we report on the outcomes of the baseline study executed in 2008-2010 regarding beliefs about teacher qualities. The medical academics invited to participate were all staff involved in a preclinical curriculum. The preclinical curriculum comprised both basic sciences and clinical topics. To investigate whether discipline is an influencing contextual factor, an equal number of academics teaching basic science and clinical topics were recruited as participants. To gain insight into the influence of the organisation we also interviewed academics at the highest administrative level. The study was conducted at two different medical schools, one in the Netherlands and one in the United States to obtain a deeper understanding of the influence of (national) culture and educational organisation as contextual factors. To exclude interpersonal variations during the interviews all the interviews were conducted by the first author. We started with the primary interview question of what makes a good teacher, and subsequently used unstructured follow-up questions to encourage participants to elaborate further, with the aim of developing an in-depth holistic image of the beliefs of the interviewees. Participants were asked to respond within the context of their preclinical teaching, to exclude differences in course level as an influencing contextual factor. We encouraged them to reflect on their teaching practice and to illustrate their responses with examples. The interviews lasted on average one hour and were audio-taped and transcribed verbatim by a research assistant. Prior to the interview the participant completed a brief survey to collect demographic data, including contextual factors (the name of the medical school, discipline) and personal factors (years of teaching experience, gender, educational roles, and type of educational tasks). The interview protocol as well as the survey questions were tested in a pilot study

with three participants who did not participate in the main study. To address potential language issues we purposefully added a bilingual participant in the pilot study. Their comments were used to adjust and improve the instruments, including aspects related to language.

Participants and setting

We estimated beforehand that 26 participants would suffice, as literature concerning sample size in qualitative research argues that if the participant sample is not too heterogeneous, sufficient (i.e. 88%) saturation will usually be reached with 12 participants.⁴⁵ Because we expected heterogeneity between the participants from the two medical schools and more homogeneity among the participants within each medical school, we decided to take $2 \times 13 = 26$ participants to be sure to include a sufficient number of participants. The participants in the respective medical schools were selected by a senior educator or sub-dean on the basis of their perceived expertise in teaching, based on student evaluations and obtained teaching awards. The rationale for this selection is that we were specifically interested in what the 'best,' most respected -and therefore influential- teaching academics believe about teacher qualities. Of the 13 academics selected at each of the two medical schools involved, five taught basic science topics and five clinical topics and most of them were responsible for curriculum content; three were involved in educational administration. Of the 26 originally selected faculty, only one was not able to participate and was replaced by another faculty member who met the criteria.

The two medical schools were Stanford University School of Medicine (SUSM), California, USA, and Leiden University Medical Centre (LUMC), Leiden, The Netherlands. The interviews at SUSM took place in 2008, the interviews at LUMC in 2009/2010. Both medical schools are comparable in their emphasis on scientific education and had had their curricula redesigned in the decade prior to this study. At Stanford University School of Medicine a new preclinical curriculum was introduced in 2003. The hallmark of the new curriculum was the requirement for students to complete a Scholarly Concentration, a programme of study intended to integrate biomedical science, clinical medicine, and applied research in an area of a student's personal interest. This component of the curriculum combined faculty-mentored research with structured coursework. The programme aimed to develop students' skills essential for leadership in medicine and a lifelong commitment to cross-disciplinary investigation. The new curriculum also incorporated re-defined curriculum and increased time spent in direct patient-oriented learning. Classroom lectures were reduced

from 30 hours to 12-22 hours per week.⁴⁶ At the time of the interviews, the medical curriculum of the Leiden University Medical Centre (LUMC) had been reformed in the decade before from a traditional teacher-centred curriculum towards a student-centred curriculum. Central educational characteristics of the curriculum were: a student-centred approach, active learning and emphasis on learning, thinking, and performing strategies rather than on only obtaining factual knowledge. The numbers of large group lectures were reduced, small group teaching sessions were introduced, and part of the study time was designated for self-study.⁴⁷

Analysis

The analysis of the data followed the steps of the study design. The software programme Atlas-ti was used as the main supportive tool.

After immersion in the data, the first step was largely deductive: within the first twelve transcripts three team members (MO, LvS, RvdR) selected those text fragments that related to our first research question using the six levels of the onion model (Figure 3.1) as initial themes, even though we kept the possibility for new themes open. These twelve transcripts were analysed independently to ensure data dependability. For each of the six themes the descriptions as formulated by Korthagen were the starting point; demarcation rules for each theme were fine-tuned during the analysis process to enable a consistent coding. We chose to code a text fragment within the *convictions* theme only if it could not be placed in one of the other five themes.

As a second step, since we uncovered a broad diversity of content within each of the themes, we developed, revised and refined subthemes inductively within each theme, using the procedure of constant comparison.⁴⁸ Descriptions and demarcation rules with respect to the subthemes were discussed within the research team, together with example text fragments. Within each theme, we reached ‘code saturation,’⁴⁹ meaning that no new subthemes emerged after we were about halfway through the analysis of all text fragments.

To calculate inter-rater agreement of the coding of themes and subthemes, the first author selected the text fragments of four not yet coded interviews – a total of 55 text fragments – as meaning units, which were coded independently by two team members (MO, LvS). This resulted in an inter-rater reliability of 0.87 (Cohen’s Kappa). Consensus was reached on the text fragments that were coded differently. The remaining transcripts were analysed by the first author,

and discussed within the research team. After the coding procedure we re-read all transcripts again to ensure data confirmability, and to confirm ‘meaning saturation,’⁴⁹ that is we checked if we had harvested all new insights from the data.

During the third step, in order to answer our second research question we clustered the individual participants who shared similarities in themes qualitatively into teacher profiles. The theme that each participant emphasised as most relevant was leading for the clustering. To enhance the credibility and trustworthiness of this step in the analysis, the research team frequently gathered to discuss potential clustering, which had to be confirmed by the interview data before being accepted.

In the final step we analysed the participants in each profile quantitatively comparing them to all other participants with regard to the coded subthemes, which led to a richer picture of each of the profiles. In order to address the third research question the profiles were related to the contextual and personal factors. For this, we used a Fisher’s exact test to study differences regarding categorical data and a Student’s t-test for continuous data. IBM SPSS Statistics 20 was used.

Ethical approval and consent to participate

This study was granted an ethics waiver by the Medical School Ethics Committee of the LUMC. The same committee advised that formal written informed consent was not required. All participants were invited by e-mail or telephone by the first author, who emphasised that participation was voluntary and anonymous, and gave oral consent.

RESULTS

We decided to exclude one SUSM interview for further analysis, because the teacher-educator was responsible for the teach-the-teachers programme which we felt created a potential conflict of interest. Because of his educational expertise (he had obtained a PhD in education), he appeared to answer less from his own teaching experience and more from the theoretical framework that he used in his professional development programme.

In the first section of the results we will start with a description of the six themes. All six themes were adequately represented in the data (see number of text fragments per theme, Table 3.1), and data analysis did not generate new

themes. Within each of the themes, subthemes were developed relating to teacher qualities, twenty subthemes in total, between two and four subthemes per theme (see Table 3.1). We will not here describe in detail the subthemes, but description of those subthemes that are relevant to the profiles will follow in the second section, in which the four profiles will be presented. After description of each of the profiles, including the relationships with contextual and personal factors as well as subthemes, in the last section we will describe our analysis of the relationship between the profiles.

Themes

The *environment* theme related to contextual factors which were considered as either constructive or obstructive to teacher functioning. The main distinction between the themes of *behaviours* and *competencies* lay in the fact that teacher behaviours would be directly observable in real time, and that academics usually phrased their beliefs about teacher behaviours in the present tense, while competencies would not be directly observable and were phrased as a potential for behaviour, like: ‘the ability to...’ or ‘knowing how to....’ The *convictions* theme incorporated cognitive statements, describing convictions academics hold with regard to the teacher or regarding the process of learning and teaching. Coded text fragments were placed within this theme only *per exclusionem* (see methods). The *identity* theme incorporated beliefs about the identity of academics; participants used phrases such as ‘Someone who is...,’ ‘Being...,’ and ‘Willingness to....’ The main distinction between the *identity* and *mission* theme was whether the academic focused on him/herself or on the student. The *mission* theme, the core theme, dealt with the academic’s deeper motivation for teaching which revolves around others and in which the student is central. This was in line with Korthagen’s definition of the mission level as a ‘transpersonal’ level.³⁵ Participants used terms like caring, sharing, helping, being dedicated, being passionate.

Even though the *environment*, *behaviours*, *competencies*, and *convictions* themes incorporated affective aspects, the content was mainly cognitive. Examples of these cognitive aspects are: ‘preparing a teaching session’ or ‘the ability to restructure.’ Within the *identity* and *mission* themes this was just the opposite: the *identity* theme incorporated mainly affective aspects, while the *mission* theme contained exclusively affective aspects of teacher qualities, for example ‘sharing one’s passion for learning with the students.’

Table 3.1. Themes of teacher qualities with corresponding subthemes, frequencies of text fragments, and examples.

Theme (number of text fragments)	Subtheme
Environment (85)	• related to non-personal factors • related to students • related to administration • related to peers
Behaviours (56)	• related to students • related to task • related to self
Competencies (55)	• related to students • related to task as educator • related to task as MD • related to self
Convictions (22)	• regarding the teaching process: teacher-centred • regarding the teaching process: student-centred • regarding the teacher: not innate • regarding the teacher: innate
Identity (55)	• related to educational role • related to personal role • related to patient-care role
Mission (13)	• related to educational field • related to medical field

Profiles

The clustering process generated four profiles. Each profile represents participants with shared beliefs about teacher qualities. Through discussions within the research team we concluded that the most central theme (corresponding to the level of the Korthagen model, see Figure 3.1) that a participant had reflected on, was the most relevant to his/her beliefs. Therefore we clustered the profiles accordingly. The first profile included all the participants who had expressed beliefs related to the *mission* theme as their most central theme. The second consisted of all of the remaining participants who had reflected on the *identity* theme as their most central theme. The third contained all the remaining participants who had beliefs about *competencies* and *behaviours* themes as their most central theme.

Frequency of text fragments (%)	Example (subtheme; case number)
41	<i>'Too often I have the feeling that if I want to spend time and attention to teaching it has to be done in my own spare time, outside working hours.'</i> (related to administration; L01)
38	
18	
3	
41	<i>'they [some teachers] come in completely unprepared, and they haven't thought about how they are going to convey the material to the students.'</i> (related to task; S01)
41	
18	
36	<i>'Be someone who has the knowledge base. I think being on the same knowledge level as the student is not enough: you need to have the depth behind.'</i> (related to task as MD; L10)
29	
24	
11	
32	<i>'A great teacher is of course also someone who stimulates the student asking relevant questions.'</i> (regarding the teaching process: student-centred; L04)
32	
23	
13	
69	<i>'[...] be someone who is approachable and inviting for other opinions.'</i> (related to personal role; S04)
20	
11	
69	<i>'they [good teachers] can transmit their passion, [...] are dedicated to their profession, they like sharing their enthusiasm.'</i> (related to medical field; S07)
31	

The fourth profile included the three remaining participants, all of whom had expressed beliefs related to the most outer theme of *environment*. The reason that we did not take the theme of convictions as a basis for a profile was because the four subthemes within this theme represent two mutually exclusive convictions, regarding the teacher and the teaching process, respectively. Thus, the academics who had expressed beliefs incorporated within the convictions theme did not all share similar beliefs.

Table 3.2 shows how the participants are divided among the profiles, and the themes within which each participant has reflected.

Table 3.2. Participants, demographical data, and themes, categorised per profile.

Profile (n)	Case number	Faculty	Gender (m/f)	Teaching experience (yrs)	Topic/ task
I. Inspirer (7)	S02	SUSM	m	15	Clinical
	S04	SUSM	f	10	Clinical
	S07	SUSM	m	15	Basic science
	S08	SUSM	f	15	Clinical
	S10	SUSM	f	19	Administrative
	S11	SUSM	m	38	Administrative
	S13	SUSM	m	25	Clinical
Mean				20	
II. Role model (10)	L01	LUMC	f	#	Administrative
	L04	LUMC	m	10	Clinical
	L05	LUMC	m	13	Basic science
	L06	LUMC	f	5	Clinical
	L08	LUMC	m	25	Clinical
	L10	LUMC	f	16	Basic science
	L11	LUMC	m	#	Administrative
	L12	LUMC	m	25	Basic science
	L13	LUMC	m	25	Administrative
	S01	SUSM	m	40	Basic science
Mean				20	
III. Practitioner (5)	L03	LUMC	m	20	Clinical
	L07	LUMC	m	16	Basic science
	L09	LUMC	m	25	Basic science
	S06	SUSM	m	19	Basic science
	S09	SUSM	f	35	Basic science
Mean				23	
IV. Critic (3)	L02	LUMC	m	10	Clinical
	S03	SUSM	m	24	Basic science
	S12	SUSM	m	32	Clinical
Mean				22	

LUMC = Leiden University Medical Centre, The Netherlands; SUSM = Stanford University School of Medicine, USA; # = missing value; 0 = no codes in this theme; + = one or more codes in this theme.

Mission	Identity	Convictions	Competencies	Behaviours	Environment
+	+	0	+	0	+
+	+	0	+	+	+
+	+	0	0	+	+
+	+	0	+	+	+
+	+	0	+	+	+
+	+	0	+	0	+
+	+	0	+	+	+
0	+	0	+	+	+
0	+	+	+	+	+
0	+	0	+	+	+
0	+	0	+	+	+
0	+	+	0	+	+
0	+	0	+	+	+
0	+	+	+	+	+
0	+	+	+	+	+
0	+	+	0	+	+
0	0	+	+	+	+
0	0	+	+	+	+
0	0	0	+	+	+
0	0	+	+	+	+
0	0	+	+	+	+
0	0	+	0	0	+
0	0	+	0	0	+
0	0	0	+	0	+

We related the four profiles to all 20 subthemes as well as to the contextual and personal factors to explore in which aspects the participants within a profile differed significantly from all other participants. This resulted in an in-depth description of each of the four profiles. We were unable to explore the roles of two of the four personal factors because they were the same for all participants, namely the factor 'educational role' as well as 'type of educational task.' All our participants had not only a teaching role, but also roles in educational management/ development and/or research; and all participants were involved in both lecturing and small group teaching. Below we describe each profile. Where relevant, we include quotations from participants belonging to the profile concerned to clarify the core characteristics of the profile (main theme and subtheme labels are italicised).

Profile I: the 'Inspirer'

The seven academics within this profile had in common that they all reflected on their *mission*. As the beliefs within the *mission* theme can be summarised as 'inspiring students,' we gave this profile the name of 'Inspirer.' Because these academics reflected on their mission as educator or as physician, we developed two subthemes: *mission related to educational field* and *mission related to medical field*. For example, they emphasised the importance of sharing one's passion for learning (*mission/related to educational field*) or one's passion for the medical profession (*mission/related to medical field*) with students. Some academics reflected on both:

*Enjoying your topic, enjoying your field, **caring about your students, that they learn. The number one thing is caring about the students*** (*mission/related to educational field*). *Having a lot of energy: people get more engaged by **people who are excited about what they are doing and part some of that energy*** (*mission/related to medical field*). *I think you can't substitute anything for **caring that your students learn. The more you care, the better you are.*** (*mission/related to educational field*; S10)

Significantly, the academics within the 'Inspirer' profile more often reflected on the subtheme *identity/related to personal role* ($p = .007$) compared to the other profiles. Academics who were aware of their mission to support students' learning and inspire students for the medical profession also emphasised the importance of an academic's personal character qualities, such as being flexible, being receptive to feedback, being wise, acknowledging the limitations of one's own knowledge:

*What makes somebody a good teacher? I think **mostly caring about the students, caring that they learn something, that's the first thing** (mission/related to educational field). Then **being someone who is approachable, who is wise and experienced but not intimidating or arrogant**. (identity/related to personal role; S08)*

Remarkably, the 'Inspirer' profile is the only profile in which academics did not express any belief within the convictions theme.

The Inspirer profile contained only academics from Stanford University School of Medicine (SUSM) ($p = .002$), while for other contextual or personal factors no significant difference was found as compared to the academics of the other profiles.

Profile II: the 'Role model'

This profile contained ten academics who referred to *identity* as their most central theme. The three subthemes that emerged within the *identity* theme relate to the teacher role (*identity/related to educational role*), patient-care role (*identity/related to patient-care role*) and personal role (*identity/related to personal role*). We chose to characterise the academics of this profile as 'Role models.'

In contrast to the academics of the 'Inspirer' profile who reflected on their personal role (*identity/related to personal role*), this profile includes significantly more academics who refer to the subtheme *identity/related to educational role* ($p = .018$). Academics described the importance of being enthusiastic, being flexible in teaching methodology, being encouraging and supportive of the students and being interested in the development of the student.

*Well, I think **a genuine interest in and engagement with the students. You should enjoy that and consider that important. You should also be concerned to see whether the student is developing in the direction that he should be developing in. That should give the teacher a thrill**. (identity/related to educational role; L01)*

Other respondents stressed commitment as the main factor to being a good teacher: the willingness to teach and to improve one's own teaching, to make learning fun or to work with students.

*I think it's just really **willingness to make the learning fun**. You know the students. They like teachers who allow them to learn something new.* (identity/related to educational role; S01)

With regard to contextual and personal factors, the 'Role model' profile included significantly more academics from Leiden University Medical School (LUMC) ($p = .004$).

Profile III: the 'Practitioner'

The five academics in this profile all commented within the themes of *competencies* and *behaviours*. They did not refer to the more central themes of *mission* or *identity*. We called them the 'Practitioners,' skilled professionals, who focus on the practice of education.

Looking at the subthemes, three academics expressed the *conviction* that being a good teacher is an *innate talent* ($p = .004$); no academic in the other profiles articulated such a conviction. Yet, all these three practitioners emphasised the importance of the appropriate competencies to being a good teacher.

All academics of the 'Practitioner' profile verbalised behaviours that are *related to students*; within this subtheme four distinctive aspects can be distinguished. Firstly, generating the students' enthusiasm is considered a crucial element of teacher qualities.

*You need to have **a motivating way of doing your presentation or coaching**. I think that's very important.* (competency/related to student/evoking enthusiasm; L03)

Secondly, relating to the student at an interpersonal level is considered important, for instance by creating a safe atmosphere, or by being available after class or by e-mail.

Thirdly, respondents mentioned behaviours that should stimulate self-directed learning, such as encouraging students to ask questions or to actively participate during the session.

Trying to let the students do most of the work, for that is the idea behind small group teaching. A teacher who just tells a story to the students [...], in the end that is not the purpose [of small group teaching]. (behaviours/related to student/stimulate self-directed learning; L09)

Fourthly, two respondents emphasised the importance of reflecting on group dynamics: picking up signals of what is going on in a group as well as accepting that within a group one should not try to please everybody.

*You need to be able to put yourself in the position of the student as much as possible. It's difficult, but you need **to have a feeling of balancing the needs of the different students.*** (competency related to student/dealing with the group; S06)

With regard to contextual and personal factors, the academics of the 'Practitioner' profile did not differ significantly from all other academics.

Profile IV: the 'Critic'

This profile contained three academics who focused on the theme of *environment*. They did not make any references to *mission* or *identity*, nor did their comments refer to the *behaviours* theme. Two of the three respondents reflected on the *environment* and *beliefs* themes, while the third reflected on the themes of *environment* and *competencies*.

Compared to the other profiles the focus of the academics in this profile was on external factors that prevented them from being a good teacher: this was significant for factors attributed to their peers (*environment/peers*: $p = .029$), such as lack of recognition by colleagues that teaching is important.

They [other faculty] don't like to change things. Once they get it down they just want to keep doing it. Improvement is out of the realm of 90% of the faculty who are teaching. They're busy people, it's the last thing on their list, it has the lowest priority. (environment/related to peers; S03)

All three participants emphasised lack of time as an important constraining factor to good teaching. Two of the three participants mentioned factors caused by the administration of the faculty, for example, being responsible for sufficient finances, for explicit teaching rewards or for faculty development (a non-significant difference of $p = .052$). Because of this focus on external factors that need improvement, we named this profile the 'Critic' profile.

*The most important is always **time and money** (environment/related to non-personal factors), but let's put those aside for a moment, because we're not going to fix those. If someone felt that being a good teacher **brought rewards,***

some of them emotional, some of them promotional (environment/related to administration), **some of them standing among their peers** (environment/related to peers) – **not everyone has to stand up and applaud every time you walk down the hall, but a sense that teaching is important, clinical care is important, research is important, administration is important, if you have any one of them not working, bad things happen.** (S12)

Within the *conviction* theme, two of the three respondents of the ‘Critic’ profile expressed a teacher-centred teaching orientation (*conviction/regarding the teaching process: teacher-centred*) (a non-significant difference of $p = .057$). However, it was not possible to determine the teaching orientation of the third respondent.

The academics of this profile did not differ significantly from all other academics regarding contextual and personal factors.

Relationships between the profiles

The data suggested that the four teacher profiles were hierarchically ordered, the ‘Inspirer’ profile being the highest in hierarchy because of its inclusiveness. This is supported by the finding that academics of profiles higher in hierarchy reflected on an increasing number of themes, including those reflected on by academics of profiles lower in hierarchy. Thus, the main focus of the academics in the ‘Critic’ profile was on the *environment*. Within the ‘Practitioner’ profile, reflection was on *environment* as well as on teacher *behaviours* and *competencies*. Although the academics in the ‘Role model’ profile extended their elaborateness as far as teacher *identity* issues, academics in the ‘Inspirer’ profile reflected on all the themes, even on the core theme of teachers’ *mission* (see Table 3.2).

To illustrate the inclusive, elaborated beliefs of the ‘Inspirer’ profile we conclude with an example of an academic who verbalised his awareness of an effective teacher’s mission, identity, related competencies, and relevant environmental factors in a congruent way (coded text fragments in bold).

S11	(Sub)themes
<i>What makes someone an effective teacher is when they are able to elevate the interest of the students so that they</i>	(competency/related to students)
<i>desire to sustain in interaction and to learn more; to really help inspire them. [...] If you are really a great teacher</i>	(mission/educational field)
<i>you come to a topic with a great background of information and you are able to distil that in ways that present new challenges and opportunities. So I think that</i>	(competency/related to task as MD)
<i>great teachers bring out the best both in themselves and</i>	(identity/related to personal role)
<i>in those that they are interacting with.</i>	(mission/educational field)
<i>Great learners are receptive to that and I think that a student could make -or not- a great teacher be effective.</i>	(environment/related to students)

DISCUSSION

The educational beliefs of medical academics influence how they act as teacher and thus influence student learning. One component of these educational beliefs are the beliefs that academics hold about the qualities of teachers themselves. This study aimed to deepen our understanding of medical academics' beliefs about these qualities. These teacher qualities range from behaviours and competencies to more personal attributes such as the identity and mission of the academic teacher.

The theoretical model of Korthagen (Figure 3.1) proved to be a useful model to explore beliefs about teacher qualities. All six elements of the model could be uncovered, though some academics articulated their beliefs about teacher qualities more extensively than others. To better understand the variety of beliefs of individual academics we clustered them into four profiles; in each profile the academics focus on a specific subset of beliefs. We found the profiles to be hierarchically ordered based on the extent of inclusiveness of academics' beliefs.

We will pay specific attention to the two most inclusive profiles, the 'Role model' and 'Inspirer' profiles, which focus on the two core levels of the onion model of teacher qualities (Figure 3.1), a teacher's identity and mission. The reason for this

is that, as Korthagen³⁵ presupposes, in the development of a teacher's teaching beliefs the exploration of these two levels is crucial. Reflection on these two levels can help academics to become aware of their professional inspiration and their deeper motivation for teaching (their mission), as well as their professional identity as teacher. This can in turn motivate them to challenge their teaching beliefs and self-direct their own development. Development of the teaching beliefs of academics is relevant when implementing a curriculum innovation, since any change in curriculum design should go hand in hand with the development and change of the teaching beliefs of the academics who implement the innovation.³²

The medical academics in both the 'Role model' and the 'Inspirer' profiles acknowledge the importance of the academic's identity. This identity is expressed in three distinct roles: the educational role, patient-care role and personal role. Two recent systematic reviews on doctor role modelling also conclude that the medical academic's role encompasses not only the patient-care and educational domains but also the personal domain, and contains mostly affective attributes.^{50,51} In another study that compared academics' beliefs about teacher qualities in preclinical *versus* clinical contexts, role modelling to enhance a medical student's personal and professional development was only emphasised within the clinical context.¹¹ However, our findings show that also within the preclinical context, academics believe this teacher quality of role modelling to be important for student learning. Of the three above mentioned identity roles, the academics in the 'Role model' profile emphasise the educational role more than other academics. In contrast, the academics in the 'Inspirer' profile underline the personal role and characteristics, such as being wise, welcoming the opinions of others, being approachable. This emphasis is in alignment with their focus on the academic's mission, which has been characterised by Korthagen³⁵ as a 'transpersonal' level and should revolve around others, i.e. the students. Academics who are aware of their mission to contribute to the learning of the students realise that the best tool they have to achieve this is their own personality. A recent review concludes that an important aspect underlying the development of an academic's identity is a 'sense of commitment.' This 'sense of commitment' can be seen as a teacher's mission, being described as 'feeling a deep personal interest in teaching the next generation' and having a 'strong value in terms of caring for students.'⁵² In this review, which focused on the academic teacher's identity, the relevance of explicating a teacher's *mission* remained implicit. Yet, in our opinion, this finding relates the academic teacher's identity to their mission and underscores the relevance of having an explicit educational mission. While several other studies within medical education have focused on the academic teacher's identity, the

academic's mission has received little attention in the literature. Our study shows that medical academics within the most inclusive profile not only emphasise the academic's identity but also the importance of developing a clear mission as a teaching academic. Spending time reflecting on why one teaches, on the deeper aims which one wants to achieve, can not only promote the development of an academic teacher's identity but also can contribute to a deep personal involvement of the academic in student learning and ultimately in delivering the next generation of physicians. Thus, in the discourse on the academics' teaching beliefs we recommend paying attention to awareness of identity, and in particular to educational mission.

In our findings the affective aspects of beliefs about teacher qualities, which are so prominently expressed within the 'Role model' and 'Inspirer' profiles, are articulated generically, transcending the context of pre-clinical teaching. Participants, for instance, emphasise their mission as the desire to bring out the best in the student, the willingness to make learning exciting, or the drive to improve one's teaching. These teacher qualities will most likely not be limited to one particular context.

The findings of another study, executed in a non-medical context within higher education underscore the relevance of affective aspects, concluding that an important aspect of the academic's beliefs about teacher qualities are teacher satisfaction and enjoyment.¹² This indicates that our conclusion that affective aspects are important also applies in contexts beyond those in which our study was executed.

Unlike other studies we found no significant relationship between the profiles and the academic's discipline, gender, teaching experience, educational role or type of educational task. For the latter two factors this is related to the way the participants were selected, namely by perceived expertise: all our participants had multiple educational roles; and all participants were involved in both lecturing and small group teaching. For the other three factors discipline, gender, and teaching experience this is possibly because of the limited number of participants in this qualitative study. However, as with the findings of Jacobs,²² we did find a relationship with the medical school in which the academics were working: the 'Inspirer' profile consisted of exclusively SUSM teachers. This may be due to a difference in the medical school's mission, or in the admissions policy for new staff. Another explanation could be a culture difference: in Dutch culture it may be less common to talk about one's mission than in the American culture. Finally, it could also be related to professional

development programmes and the teacher-educator responsible for this programme. Other research has emphasised the importance of the teacher-educator's role in the educational development of academics.⁵³ At SUSM a faculty member provided teach-the-teacher seminars which emphasised the ability of an academic to inspire students to high achievement. A majority of the SUSM academics referred to his programme during their interview. No reference to any teacher-educator was made by LUMC academics. We presume that the relationship between academics and their students shows a parallel with the relationship between the teacher-educator and the academics in his teach-the-teacher seminars. In line with the findings of our study that academics within the 'Inspirer' profile have a drive to contribute to the learning of the students, the teacher-educator's mission would be to contribute to the learning of the academics in his programme by helping them reflect on their teaching. The inspiration which he conveys may influence the articulated educational mission of the SUSM teachers.

Two other findings merit some comment. The first is that within the 'Inspirer' profile the convictions theme is absent. We presume that academics with more elaborate beliefs about teacher qualities are less likely to articulate these beliefs in general statements, but express their beliefs more explicitly. As the convictions theme is a theme *per exclusionem*, their articulated beliefs could be categorised in one of the other five themes. The second is that even though we did not explicitly explore the relationship between academics' beliefs about teacher qualities and their teaching beliefs orientation, in one of the profiles, the 'Critic' profile, the majority of academics expressed a teacher-centred teaching beliefs orientation. These academics mainly see themselves as responsible for the transfer of subject matter knowledge to their students, even though this is incongruent with the student-centred orientation of their medical school. Another study²⁷ also concluded that not all academics teaching in a student-centred curriculum embrace a student-centred teaching belief. Our findings raise the question whether there is a relationship between an individual academic's teacher profile and the academic's beliefs about teaching. Such a relationship is not unlikely, as in our findings the least inclusive profile, the 'Critic' profile, corresponds to a teacher-centred beliefs orientation, which is widely regarded as less developed than a student-centred orientation.^{8,12}

Limitations and implications for future research

This study was executed within the context of two medical schools. This may limit the immediate transferability of our findings to other medical schools. Secondly, almost ten years have passed between the data collection and the

report of this study. However, we have no reasons to doubt that the four profiles derived from the beliefs of medical academics about teacher qualities are still current and valid. This is because we know that beliefs are relatively stable and hard to change.¹³ Even though their distribution may change, we surmise that teacher teams will always include these four profiles. Thirdly, we purposefully selected the participants for perceived excellence and chose for a preclinical setting. Consequently, we have to be cautious in drawing conclusions from our findings for other contexts. Further study is needed to validate the profiles described in this study to investigate their characteristics in contexts beyond those of our study.

To gain more insight into the relationship between teaching behaviours of academics and their beliefs about teacher qualities, a study combining interview and observation could uncover (in)consistencies between individual medical academic's beliefs and behaviours. Indeed, a recent mixed methods study showed a discrepancy between teacher beliefs and teacher behaviour.⁵⁴

Furthermore, we recommend future research to explore whether there is a relationship between the four teacher profiles on the one hand and a teacher-versus student-centred teaching beliefs orientation on the other hand.

Finally, our conclusion of the profiles' hierarchical ordering does not imply that an individual academic will develop from a less to a more inclusive profile during his/her professional career. In the context of faculty development it would be relevant to study if academics show a shift of profile over time, and to explore the factors influencing such a shift.

Practical implications

We anticipate three implications for faculty development in medical schools. The first is that the six levels of the onion model (Figure 3.1) should all be taken into consideration when developing educational programmes for medical academics. At many medical schools, the focus of faculty development programmes is mainly on the levels of competencies and behaviours and not on the levels of convictions, identity and mission.¹³ A second implication is that the twenty subthemes that we uncovered with regard to teacher qualities could be used as an innovative tool to encourage medical academics' self-reflection. This could be incorporated into faculty development programmes, for instance by asking academics to reflect on the main question used for the interviews in this study: what makes someone a good teacher? Their answers could be compared to the subthemes, and this

could help them to gain more insight into the variety of aspects important to being a good teacher. Third, the model of the four profiles of medical academics that we propose might serve to understand academics' individual contributions within medical education: the 'Inspirers' can play an important role in inspiring both students and peers. In the larger context of the medical school this type of academic might play a significant role in the development of an educational mission with a focus on the student. The 'Role model' academics can contribute by being examples in role modelling: this is relevant for both students as well as for their academic peers. At the institutional level these academics might contribute by emphasising the importance of being a living example as teacher and as patient-care giver. The importance of the 'Practitioners' is their practical emphasis; they can translate abstract concepts like inspiring ideas and role modelling into concrete behaviours. Within the medical school we suggest that the role of the 'Critics' might be to emphasise the importance of external factors such as sufficient time, priority, financial, and other resources being allocated to medical education.

Medical schools that are innovating towards student-centred curricula can benefit by considering these recommendations and incorporate them into their faculty development programmes. These programmes should not only pay attention to the teaching beliefs of the academics involved which need to be congruent with this student-centred orientation^{27,32}; they should also focus on all other aspects of teacher qualities, in particular on the academic's identity and mission.

CONCLUSIONS

Academics hold a variety of beliefs about teacher qualities. This study fills a gap by exploring this variety within a medical context. The concentric onion model of Korthagen (categorising teacher qualities from mission to environment) proved to be a useful model in the exploration of these beliefs. The variety of beliefs can be elucidated by the extent to which academics reflect on the levels of this model. Four hierarchically ordered profiles are identified, the 'Inspirer' profile being the highest in hierarchy, because it is the most elaborate profile and includes all levels of the model. The two least elaborate profiles predominantly focus on cognitive aspects of teacher qualities: external constraining factors, and practical competencies, respectively. The academics in the second most inclusive profile, the 'Role model' profile, extend their scope by emphasising the importance of being an example as a teaching academic to the students. Both the 'Identity'

profile and the 'Inspirer' profile, the most inclusive profile, underline the relevance of the affective personal qualities of the teaching academic. The academics of the 'Inspirer' profile are unique in reflecting on their deeper motives when teaching. They demonstrate the importance of developing a clear mission as a teaching academic, centred around students' learning and professional development. They emphasise their personal attributes as a main tool for accomplishing this mission. In our view, academics who inspire student learning and professional development continue to be inspired themselves.

The profiles are relevant for faculty development programmes, particularly in medical schools innovating towards student-centred curricula. An important conclusion from this study for the discourse on teaching beliefs is that in the development of teaching beliefs greater attention should be paid to the educational mission of medical academics.

Acknowledgements

The authors wish to thank the medical academics who took part in the study.

REFERENCES

1. Dall'Alba G. Foreshadowing conceptions of teaching. In: Ross B, ed. *Research and Development in Higher education*. HERDSA; 1991:293-297.
2. Martin E, Balla M. Conceptions of teaching and implications for learning. *High Educ Res Dev*. 1991;13:298-304.
3. Pratt DD. Conceptions of teaching. *Adult Educ Q*. 1992;42(4):203-220.
4. Samuelowicz K, Bain JD. Revisiting Academics' Beliefs about Teaching and Learning. *High Educ*. 2001;41(3):299-325.
5. Samuelowicz K, Bain JD. Conceptions of teaching held by academic teachers. *High Educ*. 1992;24(1):93-111.
6. Martin E, Ramsden P. An expanding awareness: how lecturers change their understanding of teaching. In: Parer MS, ed. *Research and Development in Higher education*. HERDSA; 1992;15:148-155.
7. Gow L, Kember D. Conceptions of teaching and their relationship to student learning. *Br J Educ Psychol*. 1993;63(1):20-23.
8. Kember D. A reconceptualisation of the research into university academics' conceptions of teaching. *Learn Instr*. 1997;7(3):255-275.
9. Prosser M, Trigwell K. Relations between perceptions of the teaching environment and approaches to teaching. *Br J Educ Psychol*. 1997;67(1):25-35.
10. Trigwell K, Prosser M, Waterhouse F. Relations between teachers' approaches to teaching and students' approaches to learning. *High Educ*. 1999;37(1):57-70.
11. Stenfors-Hayes T, Hult H, Dahlgren LO. What does it mean to be a good teacher and clinical supervisor in medical education? *Adv Health Sci Educ Theory Pract*. 2011;16(2):197-210. doi: 10.1007/s10459-010-9255-2
12. Åkerlind GS. A new dimension to understanding university teaching. *Teach High Educ*. 2004;9(3):363-375.
13. Jacobs JC. *Conceptions of learning and teaching in teachers: in student-centred curricula in Medicine*. Vrije Universiteit Amsterdam; 2015.
14. Samuelowicz K. *Academics' educational beliefs and teaching practices*. Griffith University Queensland; 1999.
15. Becher T. The significance of disciplinary differences. *Stud High Educ*. 1994;19(2):151-161.
16. Fox D. Personal theories of teaching. *Stud High Educ*. 1983;8(2):151-163.
17. Lindblom-Ylänne S, Trigwell K, Nevgi A, Ashwin P. How approaches to teaching are affected by discipline and teaching context. *Stud High Educ*. 2006;31(03):285-298.
18. Lueddeke GR. Professionalising teaching practice in higher education: A study of disciplinary variation and 'teaching-scholarship'. *Stud High Educ*. 2003;28(2):213-228.
19. Neumann R, Parry S, Becher T. Teaching and learning in their disciplinary contexts: A conceptual analysis. *Stud High Educ*. 2002;27(4):405-417.
20. Singer ER. Espoused teaching paradigms of college faculty. *Res High Educ*. 1996;37(6):659-679.
21. Ramsden P, Prosser M, Trigwell K, Martin E. University teachers' experiences of academic leadership and their approaches to teaching. *Learn Instruct*. 2007;17(2):140-155.

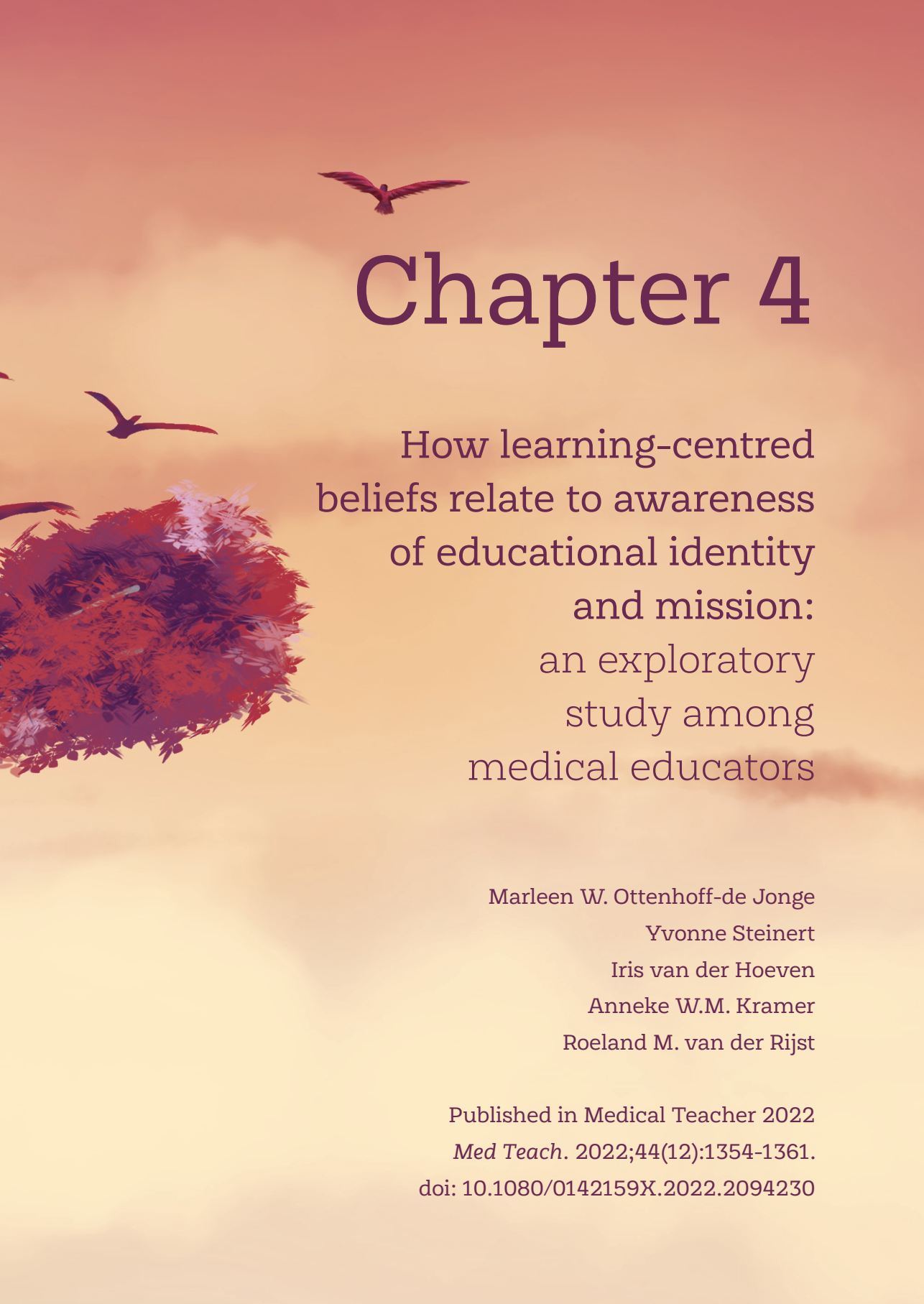
22. Jacobs JC, Muijtjens AM, Van Luijk SJ, Van der Vleuten CP, Croiset G, Scheele F. Impact of institute and person variables on teachers' conceptions of learning and teaching. *Med Teach*. 2015;37(8):738-746.
23. Norton L, Richardson T, Hartley J, Newstead S, Mayes J. Teachers' beliefs and intentions concerning teaching in higher education. *High Educ*. 2005;50(4):537-571.
24. Bullough RV, Knowles JG, Crow NA. *Emerging as a Teacher*. Routledge; 1991.
25. Sadler I. The challenges for new academics in adopting student-centred approaches to teaching. *Stud High Educ*. 2012;37(6):731-745.
26. Stes A, Gijbels D, Van Petegem P. Student-focused approaches to teaching in relation to context and teacher characteristics. *High Educ*. 2008;55(3):255-267.
27. Jacobs JC, van Luijk SJ, Galindo-Garre F, et al. Five teacher profiles in student-centred curricula based on their conceptions of learning and teaching. *BMC Med Educ*. 2014;14:220. doi: 10.1186/1472-6920-14-220
28. Pratt DD, Arseneau R, Collins JB. Reconsidering "good teaching" across the continuum of medical education. *J Contin Educ Health Prof*. 2001;21(2):70-81.
29. Postareff L, Katajavuori N, Lindblom-Ylänne S, Trigwell K. Consonance and dissonance in descriptions of teaching of university teachers. *Stud High Educ*. 2008;33(1):49-61.
30. Stes A, Van Petegem P. Profiling approaches to teaching in higher education: a cluster-analytic study. *Stud High Educ*. 2014;39(4):644-658.
31. Cohen L, Manion L, Morrison K. *Research methods in education*. Routledge; 2013.
32. Verloop N, Van Driel J, Meijer P. Teacher knowledge and the knowledge base of teaching. *Int J Educ Res*. 2001;35(5):441-461.
33. Richardson V. The role of attitudes and beliefs in learning to teach. In: Sikula J, ed. *Handbook of research on teacher education*. MacMillan; 1996:102-119.
34. Åkerlind GS. Growing and developing as a university teacher--variation in meaning. *Stud High Educ*. 2003;28(4):375-390.
35. Korthagen FAJ. In search of the essence of a good teacher: towards a more holistic approach in teacher education. *Teach Teach Educ*. 2004;20(1):77-97.
36. Williams J, Power K. Examining teacher educator practice and identity through core reflection. *Stud Teach Educ*. 2010;6(2):115-130.
37. Tigelaar DE, Dolmans DH, De Grave WS, Wolfhagen IH, Van derVleuten CP. Portfolio as a tool to stimulate teachers' reflections. *Med Teach*. 2006;28(3):277-282.
38. Sööt A, Viskus E. Reflection on teaching: A way to learn from practice. *Procedia Soc Behav Sci*. 2015;191:1941-1946.
39. Zwart RC, Korthagen FA, Attema-Noordewier S. A strength-based approach to teacher professional development. *Prof Dev Educ*. 2015;41(3):579-596.
40. Schepens A, Aelterman A, Vlerick P. Student teachers' professional identity formation: between being born as a teacher and becoming one. *Educ Stud*. 2009;35(4):361-378.
41. Geursen J, de Heer A, Korthagen FA, Lunenberg M, Zwart R. The importance of being aware: Developing professional identities in educators and researchers. *Stud Teach Educ*. 2010;6(3):291-302.
42. Brooks J, McCluskey S, Turley E, King N. The utility of template analysis in qualitative psychology research. *Qual Res Psychol*. 2015;12(2):202-222.
43. Kember D, Kwan K-P. Lecturers' approaches to teaching and their relationship to conceptions of good teaching. *Instr Sci*. 2000;28(5):469-490.

44. Richardson V, Placier P. Teacher change. In: Richardson V, ed. *Handbook of research on teaching*. American Educational Research Association; 2001:905-47.
45. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field methods*. 2006;18(1):59-82.
46. Stanford school of medicine MD admissions. Accessed 7 April, 2008. <http://med.stanford.edu/md-admissions/flexible-curriculum.html>
47. "Zelfstudie ten behoeve van de visitatie 2003 van de opleiding Geneeskunde" ["Self-assessment of the Medical School Curriculum for the 2003 visitation"] LUMC; 2003.
48. Glaser BG, Strauss AL. *The discovery of grounded theory: Strategies for qualitative research*. Transaction Publishers; 2009.
49. Hennink MM, Kaiser BN, Marconi VC. Code saturation versus meaning saturation: how many interviews are enough? *Qual Health Res*. 2017;27(4):591-608.
50. Jochemsen-van der Leeuw HR, van Dijk N, van Etten-Jamaludin FS, Wieringa-de Waard M. The attributes of the clinical trainer as a role model: a systematic review. *Acad Med*. 2013;88(1):26-34.
51. Passi V, Johnson S, Peile E, Wright S, Hafferty F, Johnson N. Doctor role modelling in medical education: BEME Guide No. 27. *Med Teach*. 2013;35(9):e1422-e1436.
52. van Lankveld T, Schoonenboom J, Volman M, Croiset G, Beishuizen J. Developing a teacher identity in the university context: A systematic review of the literature. *High Educ Res Dev*. 2017;36(2):325-342.
53. O'sullivan PS, Irby DM. Reframing research on faculty development. *Acad Med*. 2011;86(4):421-428.
54. Assen J, Meijers F, Otting H, Poell R. Explaining discrepancies between teacher beliefs and teacher interventions in a problem-based learning environment: A mixed methods study. *Teach Teach Educ*. 2016;60:12-23.

‘Consciously we teach
what we know;
unconsciously we teach
who we are’

- *Don Hamachek* -





Chapter 4

How learning-centred
beliefs relate to awareness
of educational identity
and mission:
an exploratory
study among
medical educators

Marleen W. Ottenhoff-de Jonge

Yvonne Steinert

Iris van der Hoeven

Anneke W.M. Kramer

Roeland M. van der Rijst

Published in Medical Teacher 2022

Med Teach. 2022;44(12):1354-1361.

doi: 10.1080/0142159X.2022.2094230

ABSTRACT

Introduction

Although learning-centred education would be most effective if all medical educators held learning-centred beliefs, many educators still hold teaching-centred beliefs. A previously developed theoretical model describes a relationship between beliefs, educational identity and 'mission,' meaning that which inspires and drives educators. To increase our understanding of why educators hold certain beliefs, we explored the empirical relationship between educators' beliefs and their awareness of their educational identity and mission.

Methods

A qualitative study was conducted using in-depth interviews with medical educators. We performed a deductive thematic analysis employing two existing models to examine educators' beliefs about teaching and learning and their awareness of their educational identity and mission.

Results

Educators demonstrated both teaching-centred and learning-centred beliefs, which aligned with an awareness of their educational identity and mission. While educators who were *unaware* of both their identity and mission displayed teaching-centred beliefs, educators aware of their identity and mission displayed learning-centred beliefs. Those who were aware of their identity, but not their mission, displayed either teaching- or learning-centredness.

Conclusions

Medical educators' awareness of identity and mission are related to their beliefs about education. Further research is needed into whether beliefs can change over time by increasing identity and mission awareness.

PRACTICE POINTS

- Faculty development interventions should focus on helping educators develop teaching beliefs that align with the educational principles of learning-centred education.
- Understanding the educational identity and mission of an educator may help to influence teaching beliefs.
- Faculty development interventions should enable medical educators to reflect not only on *who* they wish to be as educators, but also on *why* they teach, that is, on what drives and inspires them.
- Having an educational mission may help strengthen and maintain learning-centred beliefs, even when the educational culture does not support learning-centredness.

INTRODUCTION

Learning-centred education has gained ground in recent decades and is commonly implemented in medical schools around the world.¹ The medical educators involved play a crucial role in the success of this education. Instead of a sole focus on the transfer of factual knowledge, educators in learning-centred curricula also aim to facilitate the students' learning processes.²⁻⁴ To be able to support and facilitate student learning in a learning-centred educational context, medical educators' beliefs about teaching and learning need to be consistent with the educational principles behind learning-centred education. Indeed, the literature shows that beliefs are one of the driving forces behind educators' teaching behaviours and the choices they make in the design and delivery of their teaching.⁵⁻⁸ 'Beliefs' refer to conceptions about teaching and learning which are formed throughout life, are deeply rooted, and can consist of both cognitive and affective aspects.^{9,10}

Although many medical schools have implemented learning-centred curricula, a substantial number of educators in these schools appear to have teaching-centred, rather than learning-centred, beliefs.^{4,11} To effectively encourage learning-centred teaching behaviours, we need to understand which factors influence educators' beliefs about teaching and learning.

Korthagen^{12,13} developed and validated a theoretical model in the teacher education context which relates beliefs not only to behaviours and competencies, but also to a teacher's educational identity and mission. Korthagen described 'identity' as how teachers define themselves and how they see their professional role. While the focus is on the 'self,' the concept is largely determined by how relationships with significant others are viewed. 'Mission' is defined as the source of inspiration, reflecting a teacher's deepest purposes and ideals. A mission gives meaning to one's professional existence by contributing to others (e.g. students or colleagues) within a larger context and therefore has a transpersonal characteristic. The question of *who* I am as a teacher is related to a teacher's identity, whereas the question of *why* I teach is related to a teacher's mission.

While the literature provides substantial evidence for the relationship between educators' beliefs and behaviours,^{3,14,15} little is known about the relationship between beliefs and identity. Only a few studies show a potential link between educators' beliefs and their educational identities.^{16,17} However, these studies did not explore aspects of teaching-centred or learning-centred beliefs, which are specifically relevant in learning-centred education.

The notion of 'educational mission' has also not received much attention in the medical education literature, and even less is known about the relationship between a medical educator's educational mission and their beliefs about teaching and learning. Although recent studies have paid attention to educators' motivation to teach, in particular within the 'professional identity' literature,¹⁸⁻²⁰ the concept of motivation is not identical to Korthagen's concept of mission. Whereas motivation can refer to temporary, short-term goals, 'educational mission' refers to what 'deeply drives and gives meaning' to an educator's professional existence. Even though Korthagen defines this concept as a core teacher quality, underlying a teacher's identity, it has been infrequently studied. Indeed, we know of only two studies in the health professions exploring educators' missions. Steinert & Macdonald²¹ focused on what teaching means for educators working in a clinical context. They described physicians' educational mission as 'being morally and socially motivated to teach, wanting to contribute to the next generation of physicians, which gave them a sense of personal fulfilment.' Ottenhoff-de Jonge et al.²² examined medical educators' perspectives about being a good teacher in a preclinical context, using Korthagen's model as a theoretical framework. They concluded that educators with the most elaborate perspective on being a good teacher were not only aware of their educational identity, but of their educational mission as well.

To summarise, educators' beliefs about teaching and learning seem to be influenced not only by the educational context in which they work, their behaviours and their competencies, but also by their awareness of their identity and mission. A better understanding of these influencing factors will help to effectively support educators in implementing learning-centred education which is beneficial for student learning.

Although Korthagen's model, developed in a teacher education context, theoretically describes the interrelationships between beliefs, identity, and mission, we need to address the empirical gap: if and how medical educators' beliefs about teaching and learning relate to the awareness of their educational identity and mission. Therefore, this study aims to answer the following question: How are medical educators' beliefs about teaching and learning related to the awareness of their educational identity and mission?

METHODS

To answer our research question, we conducted a qualitative study using in-depth semi-structured interviews with medical educators from two medical schools. We performed a deductive thematic analysis,²³ in which we used existing theories as our point of departure. These theories relate to beliefs about teaching and learning⁴ as well as to aspects of being an educator,¹² including the identity and mission of educators. We first identified participants' awareness of their educational identity and mission as well as their beliefs about teaching and learning. Then, we explored the relationship between these two areas of inquiry.

Participants and setting

To obtain a wide variety of participants, we recruited faculty members from two medical schools in the Netherlands and the USA, inviting physicians with a variety of educational roles. We purposefully selected physicians for several reasons. One reason is that the majority of educators at both medical schools have a medical background, even those who teach basic science topics. The other reason is that beliefs about teaching and learning can be influenced by an educator's medical or non-medical background, in particular beliefs related to students' professional development.⁴ We wanted to exclude potential differences due to medical or non-medical backgrounds as an influencing factor. We recruited participants from Stanford University School of Medicine, USA, and Leiden University Medical Centre, the Netherlands, both research intensive medical

schools with a long-standing learning-centred curriculum. Selection took place on the recommendation of a sub-dean or senior educator from the respective medical schools. Four educators were involved in educational administration, and were, for example, responsible for curriculum innovations or professional development programmes. The other 17 participants were selected on the basis of their active and long-standing educational involvement and exemplary teaching, as witnessed by student evaluations and teaching awards. Each of the participants had at least twenty years of teaching experience, and most of them were responsible, or had been responsible, for curriculum content. Eight of the participants taught basic science topics; the other nine taught clinical topics. We chose these selection criteria because we expected that these faculty members would be 'information-rich' and that their experiences would be enlightening (*critical case sampling*). The first author invited the participants by e-mail or telephone and emphasised that participation was voluntary and anonymous. All invited faculty members agreed to participate. This study was approved by the Netherlands Association for Medical Education (NVMO) Ethical Review Board (NERB number 834).

Procedures

We used the interview guide of Ottenhoff-de Jonge et al.,⁴ designed to explore educators' beliefs about teaching and learning, as well as their perspectives on being an educator (see Addendum 4.1: interview guide). A sample question related to beliefs about teaching and learning was: 'Does your teaching influence student learning? If so, how?.' The primary question related to educational identity and mission was: 'What makes somebody a good teacher?,' followed by the question on what might prevent them from being a good teacher. Due to our selection criterion of exemplary teaching, the participants identified with the notion of 'good teachers' and related these questions to themselves. By asking for examples from their own teaching practices, we further ensured that the participants elaborated on their own teaching experience. We asked them to consider the preclinical educational context during the interview, as in this setting, learning-centred education is most clearly designed and implemented. Because beliefs about teaching and learning may vary according to the level of teaching,^{24,25} we also wanted to avoid participants answering the questions with the clinical context in mind. Interviews took place between May and September 2018 and all were conducted by the first author. The interviews lasted on average 60 minutes and were audiotaped and transcribed.

Analysis

We performed a three-step analysis. Firstly, we identified participants' awareness of their educational identity and mission (Step 1); secondly, we identified their beliefs about teaching and learning (Step 2); thirdly, we determined the relationship between these two areas of inquiry (Step 3).

Awareness of educational identity and mission

In Step 1, to identify participants' awareness of their educational identity and mission, we used the codebook developed in a previous medical education study²² which is based on Korthagen's model.¹² This study describes four teacher profiles, hierarchically ordered to describe an educator's increasing awareness of distinct aspects of being an educator (see Table 4.1).

Table 4.1. Summary of teacher profiles (based on Ottenhoff-de Jonge et al.²²).

Teacher profile:	Teacher's main focus is on:	Teacher is aware of their:	
		Educational identity	Educational mission
Critic	Contextual aspects that constrain being a successful educator	-	-
Practitioner	The practice of education: educational behaviours and competencies	-	-
Role Model	Educational identity	+	-
Inspirer	Personal educational mission	+	+

- = not present; + = present

In the least elaborate profile, labelled as the 'Critic,' educators focus on environmental and contextual factors while in the second profile, the 'Practitioner,' educators focus on behaviours and competencies as an educator. In the 'Role model' profile, educators extend their awareness to include their educational identity, whereas in the most elaborate 'Inspirer' profile, educators reflect not only on aspects emphasised by the other profiles, but also on their educational mission. Educators in the 'Role model' and 'Inspirer' profiles are characterised by their emphasis on affective aspects of being an educator, in contrast to the other two profiles that emphasise cognitive aspects.

Based on the coded text fragments, each educator was categorised into one of four profiles to discern educators' awareness identity and mission. Educators in the 'Critic' and 'Practitioner' profiles did not have any codes related to identity and mission, educators in the 'Role model' profile had assigned codes that

related to identity but not to mission, and educators in the ‘Inspirer’ profile had assigned codes that related to both identity and mission. The categorisation of a participant to a profile was determined holistically, based on the whole transcript, including the labelled fragments. We followed the analytic process as described by Ottenhoff-de Jonge et al.²²

Beliefs about teaching and learning

In Step 2, we selected those text fragments that related to the participant’s beliefs about teaching and learning. To categorise these beliefs, we used a beliefs framework previously developed within the medical education context⁴ which is based on an earlier framework of Samuelowicz and Bain.⁸ The framework consists of a matrix and describes teaching beliefs in terms of belief orientations and belief dimensions (for convenience, we have provided the framework in Addendum 4.2). A belief orientation represents a global, composite set of beliefs about teaching and learning. In the framework, there are six different belief orientations, indicated in the columns in the matrix, ranging from teaching-centred to learning-centred. These six belief orientations are defined by nine dimensions, indicated in the rows in the matrix. Each dimension represents a different aspect of the belief orientations regarding teaching and learning. Within each dimension three or four beliefs can be distinguished. For example, the three beliefs listed within the dimension ‘Students’ existing conceptions’ are: ‘not taken into account,’ ‘used as basis for developing expertise,’ and ‘used to negotiate meaning.’ These beliefs are ordered on a continuum from teaching-centred to learning-centred. We labelled the text fragments according to the beliefs as identified in the framework, and subsequently determined a belief orientation holistically, meaning that we used the whole transcript, including all of the labelled fragments.

For Steps 1 and 2, the first and third author (MO and IvdH) independently analysed the interview transcripts to ensure *credibility*, using Atlas-ti qualitative data analysis software. Both authors had experience in the analysis procedure related to both models used. We discussed our labelling jointly and reached consensus on the categorisation of each participant’s teacher profile (‘Critic,’ ‘Practitioner,’ ‘Role model,’ or ‘Inspirer,’ respectively) and belief orientation (ranging from I to VI). In a separate interview, the first author performed a *member check* by asking all participants if they agreed with our conclusions on the assigned teacher profile and belief orientation, by providing them with a relevant selection of the labelled fragments from their previous interview.

Relationship between beliefs about teaching and learning, and awareness of an educational identity and mission

For the third step in the analysis, we looked for combinations of the belief orientations and the teacher profiles (see Table 4.2) to answer our research question about the relationship between beliefs about teaching and learning, and awareness of identity and mission. To obtain a better understanding of the meaning of this relationship and its implications for practice, we discussed the findings within the research team.

Table 4.2. The relationship between medical educators' belief orientation and teacher profile.

Teacher profile	Belief orientation					
	Teaching- centred orientations			Learning- centred orientations		
	I. Imparting information	II. Transmitting structured knowledge	III. Providing and facilitating understanding	IV. Helping student develop expertise	V. Sharing the responsibility for developing expertise	VI. Negotiating meaning
Critic	-	-	-	-	-	-
Practitioner	-	+	+	-	-	-
Role model	-	+	+	+	+	-
Inspirer	-	-	-	+	+	+

RESULTS

We will describe the results in the order of the three steps of the analysis.

Awareness of educational identity and mission

When classifying the educators' teacher profiles, none of our participants fell into the 'Critic' profile. Of the twenty-one participants, three fell into the 'Practitioner' profile, eight into the 'Role model' profile, and ten into the 'Inspirer' profile.

The educators with a 'Practitioner' profile were unaware of their educational identity and mission. They instead emphasised their competencies as educators, such as knowing how to help students understand basic concepts, and concrete behaviours that could help to achieve this goal, for example repetition of the content:

It's really a challenge to balance the topics, so that it's sophisticated enough that they will be able to use this for the rest of their life..., these concepts. (...) most people, the first time they hear a lot of these things, they will not get it... And that's why I think repetition is essential. I think anything that is worth learning should be repeated. (S06)

Awareness of an educational identity was present in the educators with a 'Role model' profile. However, they did not discuss an educational mission. They emphasised the importance of being enthusiastic, engaged with the student, and committed to teaching.

I think you have to have a certain enthusiasm, a certain love for the profession..., you have to enjoy working with younger people. And I like that. (...) I think the biggest influence [on the student's learning process] is whether the teachers in front of the student have a heart for education; heart for the teaching of their profession and therefore also for education. (L05)

We labelled this fragment as 'identity,' as throughout the interview it became clear that the focus of this participant was on their own role as educator.

Awareness of an educational mission was present in the educators who demonstrated the 'Inspirer' profile. They expressed their caring about student learning or sharing their passion for the medical profession with the student.

If I succeed in inspiring people to want to learn something more, then I would consider that as a success. (...) I think the most important thing [as a teacher] is modelling the care of patients (...) and the patient's values and beliefs and context are incredibly important. So, I think, as an individual, that is what I impart most and hope to inspire. (S08)

All participants who were aware of their educational mission also articulated an awareness of their educational identity.

Beliefs about teaching and learning

When classifying the educators' belief orientations, the most teaching-centred belief orientation, characterised as 'Imparting information,' was found to be absent from our dataset. Of the teaching-centred orientations, one participant described teaching as a 'Transmission of structured knowledge' (Orientation II), and eight participants viewed teaching as 'Providing and facilitating understanding' (Orientation III). Examples of teaching-centred beliefs are the beliefs that the purpose of learning is to understand concepts, and that the purpose of interacting with students is to hold their attention.

I think the main thing [learning goal] is we want them to learn these concepts and so what we try to do for teaching is to make it clear what the concepts are that we think are important for each of these topics. (S06)

I think [the purpose of interaction is] to keep their attention. Yes, I think that is a very important goal. (L03)

Of the learning-centred orientations, two participants believed that teaching is 'Helping students to develop expertise' (Orientation IV), two viewed teaching and learning as 'Sharing the responsibility for developing expertise' (Orientation V), and eight believed that teaching and learning was about 'Negotiating meaning' (Orientation VI). Examples of learning-centred beliefs include beliefs that the purpose of learning is to encourage a change in a student's thinking, and that the interaction between student and teacher has a reciprocal purpose to negotiate meaning.

If the students share in the excitement of learning new ways of thinking, and new things, that definitely influences them. (S01)

...in the expectation that you learn... both [teacher and student]. So it's not a unidirectional process, it's not a transfer; it is a two-directional transfer I would say. (L04)

In Addendum 4.3 we provide sample quotes of both a teaching-centred and a learning-centred belief for each dimension.

Relationship between beliefs about teaching and learning, and awareness of educational identity and mission.

Exploring the relationship between the belief orientations and the teacher profiles revealed several combinations (see Table 4.2). Every educator unaware of their educational identity or mission (in the 'Practitioner' profile) showed a teaching-centred belief orientation. In contrast, every educator aware of both their educational identity and mission (in the 'Inspirer profile') showed a learning-centred belief orientation. Of the educators with an awareness of their educational identity, but no awareness of their mission (in the 'Role model' profile), some educators showed teaching-centred belief orientations while others held learning-centred orientations.

The most learning-centred belief orientation (VI) , labelled 'Negotiating meaning,' was only present in the educators with an awareness of their educational identity and mission (in the 'Inspirer' profile). The two beliefs in which this belief orientation (VI) differs from the second most learning-centred orientation (V), labelled 'Sharing the responsibility for developing expertise,' are related to the importance of fostering students' existing conceptions and intrinsic motivations.

Interviewer: *What do students bring to the learning process?*

Participant: *They bring different points of view, ... I think that is very engaging for other people including their professors; how they think about problems helps other people learn; they bring new ideas in that you haven't even thought about. (...) I use them or I learn from them. (S10)*

I really work hard to get to know these students at a personal level. (...) to know a little better about their own interests and experiences and draw on these as part of the teaching and learning that we do, to make it seem so relevant to them. (S13)

DISCUSSION AND CONCLUSION

Based on the results of our study on the relationship between educators' beliefs about teaching and learning, and their awareness of their educational identity and mission, we conclude that these two areas of inquiry are aligned. Educators who are not aware of their educational identity or mission have teaching-centred

beliefs, while educators with an awareness of their identity and mission have learning-centred beliefs. Since learning-centred beliefs will enable educators to successfully implement learning-centred education, the present study sheds light on the importance of educational identity and mission for educators working in learning-centred curricula.

The relationship between a lack of identity and mission awareness (in the Practitioner profile) and teaching-centredness can be explained, as the primary focus of educators with teaching-centred beliefs is on transmitting the content of the subject matter, in other words on *what* should be taught, rather than on *how* content can best be learned by the students. This focus is consistent with the Practitioner profile's emphasis on an educator's competencies and behaviours to deliver this content. The finding that educators who are not aware of their educational identity do not hold learning-centred beliefs confirms the importance of identity awareness for learning-centred education. We can conclude that educators whose beliefs about teaching and learning align with the learning-centred educational context in which they work, are aware of their educational identity, or, in other words, are aware of *who* they are as teachers. The study of Dory et al.,¹⁶ even though not focusing on beliefs relevant for learning-centred education, confirmed that teaching beliefs aligned with the educational context are related to awareness of an educational identity. It is conceivable that educators who are aware of their educational identity are more motivated to reflect on whether their teaching role aligns with their teaching beliefs and with the learning-centred educational context, than educators for whom their educational identity is less evident.

The finding that some educators with an awareness of their educational identity (in the Role model profile) show teaching-centred belief orientations may be explained by the fact that, although the formal educational context embraces learning-centred education, the implicit educational culture of the organisation may still favour teaching-centred beliefs. Several studies have indeed shown that the educational culture in organisations can sometimes have a constraining influence on the beliefs about teaching and learning of educators.²⁶⁻²⁸

Our finding that the educators who are aware of their educational mission (in the Inspirer profile) all show learning-centred belief orientations underlines the relevance of an educator's educational mission awareness in learning-centred education. Awareness of an educational mission is apparently an effective 'antidote' to the constraining influences of the implicit educational culture, and

may help educators strengthen and maintain their learning-centred beliefs. Our findings demonstrate an alignment between educators' personal mission and motivation to contribute to the student's development, and their belief that learning activities should be aimed at facilitating the student's learning process. This relates to another finding that only educators with an awareness of their educational mission show the most developed learning-centred belief orientation. This belief orientation is characterised by an awareness of the importance of fostering what a student brings to the learning session: their existing conceptions and their intrinsic motivations. We conclude that educators who believe that they should foster the student's input are not only aware of their educational role but also of their educational mission. Thus the educators' beliefs about the relevance of student input and the relevance of utilising this input align with the educators' mission to focus on student learning. An explanation for these findings may be that educators who articulate an educational mission, in other words, *why* they teach, demonstrate that they have reflected on their deeper motivations as educators, and that this reflectiveness may help them consider whether their teaching beliefs align with this 'mission' and with their teaching role. Akin to the belief in our beliefs framework that student-learning is most enhanced if the intrinsic motivation of the individual student is fostered (see Addendum 4.2), we believe that the educator's learning about teaching is most enhanced if they are encouraged to reflect on their personal motivation to teach. Two studies describe results consistent with our findings. Steinert and MacDonald²¹ reported that teachers who articulate their educational mission, also say that teaching enables them to learn from their students which is a learning-centred belief (see Addendum 4.2 and 4.3); Åkerlind²⁹ concluded that teachers with learning-centred beliefs describe a focus on the student. Both findings are consistent with our conclusion that educators with learning-centred beliefs focus their educational mission on the student.

Two other findings, related to the two areas of inquiry, deserve attention. The first concerns the hierarchical structure of the teacher profile model, which is confirmed by our findings: educators who were aware of their mission were also aware of their identity. In the discourse on the identity formation of an educator, the relevance of explicating one's educational mission often remains implicit. Our finding reinforces the recommendation to pay explicit attention not only to *who* one wants to be as an educator but also to *why* one wants to be an educator, to what deeply drives and motivates.²² The second is the fact that a substantial proportion of the interviewed educators held teaching-centred beliefs. We expected teaching-centredness to be the exception due to the selection of the two

medical schools, both with learning-centred curricula implemented more than 15 years earlier, and the selection of highly engaged, exemplary educators with longstanding experience. However, our unexpected finding is in line with previous studies reporting that in medical schools with learning-centred curricula some of the educators maintain teaching-centred beliefs.^{4,11} This finding underscores the sharp boundary between teaching-centredness and learning-centredness, which cannot be easily crossed. The transition to a learning-centred belief orientation means a profound shift in which multiple, often deeply-rooted beliefs would be required to change.⁴ This observation further emphasises the need for future studies to explore how we can encourage the development of learning-centredness through faculty development initiatives for medical educators.

Implications for practice

Thus our study has implications for faculty development in promoting learning-centred education. In addition to the growing attention on educational identity formation in faculty development,^{19,30,31} we recommend that faculty development interventions also pay attention to the underlying educational mission. That is, our findings support the recommendation of Steinert and Mc Donald²¹ that faculty development should not only focus on the *what* and *how* of teaching, but also on what it means to educators to teach, in order to enhance the effectiveness of medical educators. In addition, we suggest that, to promote learning-centred education, it is important not only to help medical educators reflect on *who* they wish to be as educators, but also on *why* they teach, that is, what drives and inspires them. If educators have a clear mission to foster student learning, this may strengthen their awareness of their educational identity and their role as facilitator of student learning, consistent with their learning-centred beliefs, even if the informal educational culture does not support learning-centredness.

We consider that recommendations for developing and supporting an educational identity also apply to helping educators develop an educational mission. We highlight those recommendations that we believe are specifically relevant in relation to our findings, which concern reflection, meaningful relationships with others, and context. In faculty development studies, reflection on the 'self' as well as on the teaching and learning process has been shown to strengthen the development of an educational identity,^{19,31,32} and has also been suggested for the development of learning-centred beliefs.^{11,26,33} We believe that reflection can also be valuable to help educators develop an individual educational mission. Since affective aspects predominate in the articulation of an educational identity and mission, we believe that meaningful relationships with others can serve as an

important trigger for self-reflection regarding professional development as an educator. In addition to personal contact with students, contacts with peers and mentors with an articulated awareness of their educational identity and drive for teaching may contribute to an educator's development of their educational identity and mission. One way to embed these relationships is through personal networks or communities of practice in the workplace,³⁴ or through more formal longitudinal programmes,³¹ which can create a sense of belonging and connectedness with like-minded colleagues. Since the context in which educators work can be both supportive and challenging to the professional development of educators,^{27,31} it is important to take the context into account and to address the informal educational culture. A supportive leadership at all levels of the organisation, rewarding teaching in career paths, encouraging teacher networks and communities, and minimising conflicts created by competing tasks, are examples of how the context of the workplace can be beneficial to the development of an educator's mission.

Limitations and future research suggestions

We purposefully selected participants known for their exemplary teaching. This may have resulted in less variation in the two areas of inquiry, and may explain why the most teaching-centred belief orientation and the least elaborate teacher profile were not present in our dataset. As well, since we purposefully focused on preclinical curricula, we need to be cautious when extending conclusions from our findings to other contexts. Nevertheless, we expect that the alignment between educators' personal motivation to contribute to student learning and their learning-centred beliefs, both deeply rooted, will not be limited to one particular educational context. A future study carried out in other contexts can provide further insights. It would also be interesting to study the perspectives of younger educators regarding their educational mission, identity and teaching orientation, since they are often educated in learning-centred curricula with more emphasis on self-reflection. According to Korthagen,¹² teachers' beliefs, identity and mission can be developed and can influence each other in both directions. Further research is needed into whether beliefs about teaching and learning can change from teaching-centredness to learning-centredness, and to confirm if increasing awareness of identity and mission will influence beliefs, and vice versa. This could be explored by means of a longitudinal study with repeated interviews over time.

In conclusion, our findings display an alignment between educators' learning-centred beliefs and their awareness of their educational identity and mission in learning-centred education, thus confirming Korthagen's model.^{12,13} Until now, the educational identity and mission of educators, that is, their deepest inspiration

and motivation, have received limited attention in the literature. Therefore, we propose that, in addition to a focus on educational identity, both research and faculty development place greater emphasis on the educational mission of educators.

Acknowledgements

The authors wish to thank the medical educators who took part in this study, and Prof.dr. Neil Gesundheit for enabling data collection at Stanford University School of Medicine.

REFERENCES

1. McLean M, Gibbs T. Twelve tips to designing and implementing a learner-centred curriculum: Prevention is better than cure. *Med Teach*. 2010;32(3):225-230.
2. Åkerlind GS. A new dimension to understanding university teaching. *Teach High Educ*. 2004;9(3):363-375.
3. Taylor DC, Hamdy H. Adult learning theories: implications for learning and teaching in medical education: AMEE Guide No. 83. *Med Teach*. 2013;35(11):e1561-e1572.
4. Ottenhoff-de Jonge MW, van der Hoeven I, Gesundheit N, van der Rijst RM, Kramer AW. Medical educators' beliefs about teaching, learning, and knowledge: development of a new framework. *BMC Med Educ*. 2021;21(1):176. doi: 10.1186/s12909-021-02587-x
5. Richardson V. The role of attitudes and beliefs in learning to teach. In: Sikula J, ed. *Handbook of research on teacher education*. MacMillan; 1996:102-119.
6. Pratt DD. *Five perspectives on teaching in adult and higher education*. Krieger; 1998.
7. Hativa N, Barak R, Simhi E. Exemplary university teachers: Knowledge and beliefs regarding effective teaching dimensions and strategies. *J High Educ*. 2001;72(6):699-729.
8. Samuelowicz K, Bain JD. Revisiting Academics' Beliefs about Teaching and Learning. *High Educ*. 2001;41(3):299-325.
9. Jacobs JC. *Conceptions of learning and teaching in teachers: in student-centred curricula in Medicine*. Vrije Universiteit Amsterdam; 2015.
10. Samuelowicz K. *Academics' educational beliefs and teaching practices*. Griffith University Queensland; 1999.
11. Jacobs JC, van Luijk SJ, Galindo-Garre F, et al. Five teacher profiles in student-centred curricula based on their conceptions of learning and teaching. *BMC Med Educ*. 2014;14:220. doi: 10.1186/1472-6920-14-220
12. Korthagen FAJ. In search of the essence of a good teacher: Towards a more holistic approach in teacher education. *Teach Teach Educ*. 2004;20(1):77-97.
13. Korthagen F. Inconvenient truths about teacher learning: Towards professional development 3.0. *Teach Teach*. 2017;23(4):387-405.
14. Kember D, Kwan K-P. Lecturers' approaches to teaching and their relationship to conceptions of good teaching. *Instr Sci*. 2000;28(5):469-490.
15. Kane R, Sandretto S, Heath C. Telling half the story: A critical review of research on the teaching beliefs and practices of university academics. *Rev Educ Res*. 2002;72(2):177-228.
16. Dory V, Audétat M-C, Rees C. Beliefs, identities and educational practice: a Q methodology study of general practice supervisors. *Educ Prim Care*. 2015;26(2):66-78.
17. Taylor EW, Tisdell EJ, Gusic ME. Teaching beliefs of medical educators: perspectives on clinical teaching in pediatrics. *Med Teach*. 2007;29(4):371-376.
18. Browne J, Webb K, Bullock A. Making the leap to medical education: a qualitative study of medical educators' experiences. *Med Educ*. 2018;52(2):216-226.
19. Steinert Y, O'Sullivan PS, Irby DM. Strengthening Teachers' Professional Identities Through Faculty Development. *Acad Med*. 2019;94(7):963-968.
20. Cantillon P, Dornan T, De Grave W. Becoming a clinical teacher: identity formation in context. *Acad Med*. 2019;94(10):1610-1618.

21. Steinert Y, Macdonald ME. Why physicians teach: giving back by paying it forward. *Med Educ*. 2015;49(8):773-782.
22. Ottenhoff-de Jonge MW, van der Rijst RM, Gesundheit N, et al. From critic to inspirer: four profiles reveal the belief system and commitment to educational mission of medical academics. *BMC Med Educ*. 2019;19(1):268. doi: 10.1186/s12909-019-1665-0
23. Boyatzis RE. *Transforming qualitative information: Thematic analysis and code development*. Sage; 1998.
24. Samuelowicz K, Bain JD. Conceptions of teaching held by academic teachers. *High Educ*. 1992;24(1):93-111.
25. Stenfors-Hayes T, Hult H, Dahlgren LO. What does it mean to be a good teacher and clinical supervisor in medical education? *Adv Health Sci Educ Theory Pract*. 2011;16(2):197-210. doi: 10.1007/s10459-010-9255-2
26. Calkins S, Johnson N, Light G. Changing conceptions of teaching in medical faculty. *Med Teach*. 2012;34(11):902-906.
27. Jacobs JC, van Luijk SJ, van der Vleuten CP, Kusurkar RA, Croiset G, Scheele F. Teachers' conceptions of learning and teaching in student-centred medical curricula: the impact of context and personal characteristics. *BMC Med Educ*. 2016;16(1):1-11.
28. Sansom DW. Investigating processes of change in beliefs and practice following professional development: multiple change models among in-service teachers in China. *Prof Dev Educ*. 2020;46(3):467-481.
29. Åkerlind GS. Growing and developing as a university teacher--variation in meaning. *Stud High Educ*. 2003;28(4):375-390.
30. Trautwein C. Academics' identity development as teachers. *Teach High Educ*. 2018;23(8):995-1010.
31. van Lankveld, Thampy H, Cantillon P, Horsburgh J, Kluijtmans M. Supporting a teacher identity in health professions education: AMEE Guide No. 132. *Med Teach*. 2021;43(2):124-136.
32. Lieff S, Baker L, Mori B, Egan-Lee E, Chin K, Reeves S. Who am I? Key influences on the formation of academic identity within a faculty development program. *Med Teach*. 2012;34(3):e208-e215.
33. Postareff L. *Teaching in higher education: From content-focused to learning-focused approaches to teaching*. University of Helsinki; 2007.
34. O'sullivan PS, Irby DM. Reframing research on faculty development. *Acad Med*. 2011;86(4):421-428.

ADDENDA

Addendum 4.1. Interview guide: see Chapter 2, Addendum 2.2.

Addendum 4.2. Beliefs framework: see Chapter 2, Table 2.1.

Addendum 4.3. Sample quotes of both a teaching-centred and a learning-centred belief for each dimension.

The respective teaching-centred orientations (orientations II and III) and learning-centred orientations (orientations IV, V and VI) have been merged, as we here aim to illustrate global differences between teaching-centred and learning-centred beliefs as identified in this study.

Belief orientations		
Belief dimension	Teaching-centred (Orientation II or III)	Learning-centred (Orientation IV, V or VI)
Desired learning outcome	Students' understanding of concepts <i>'Well, that small group is about a certain subject and the intention is that they understand what is...[discussed] in that small group. And that they can answer questions about that later.'</i> (L09)	Change in students' thinking <i>'if the students share in the excitement of learning new ways of thinking, and new things, that definitely influences them.'</i> (S01)
Expected use of knowledge	Within subject for future use <i>'Learning? Learning is making synaptic changes in your own mind so that certain knowledge or connections stick in your head, things you really understand, that you can recap at any time.'</i> (L12)	To enable interpretation of the professional reality of patient care or health care <i>'...so I hope that my teaching is helping people think, (...) and how to apply tools and skills and knowledge in the domain we're used to doing.'</i> (S10)
Responsibility for transforming knowledge	Teacher <i>'Students' main responsibilities? Preparing. Participating. That's really what it is. (...) They should bring the knowledge base that we explicitly ask them to judge.'</i> (S03)	Students & teacher <i>'The student (...) is responsible for his/her development, and I am the coach. So you [the teacher] have to make sure that you help them as best you can to achieve those goals. Whether they are achieved is of course the student's responsibility.'</i> (L13)

Addendum 4.3. Continued.

Belief orientations		
Belief dimension	Teaching-centred (Orientation II or III)	Learning-centred (Orientation IV, V or VI)
Nature of knowledge	Externally constructed. Focus on 'factual' knowledge <i>'Knowledge is, of course, partly factual knowledge. I think it is important that the students in the first years in particular acquire sufficient knowledge of anatomy and physiology. That they know how processes in the body work.'</i> (L08)	Personalised and dynamic. Focus on learning from reality <i>'Professional knowledge obviously comes from books, lectures, other learning opportunities, and it's coupled with experiential knowledge, ideally with reflection about the experience....'</i> (S12)
Students' existing conceptions	Not taken into account	Used as basis for developing expertise or to negotiate meaning <i>'They [students] bring their backgrounds, their ingenuity, their dreams, their hopes, their interests. The whole concept of self-directed learning begins with saying everybody has this drive inside of them to learn and master things.'</i> (S05)
Teacher-student interaction	Reciprocal to maintain students' attention/ to clarify meaning <i>'I think [the purpose of interaction is] to keep their attention. Yes, I think that is a very important goal.'</i> (L03)	Reciprocal to negotiate meaning <i>'..in the expectation that you learn... both. So it's not a unidirectional process, it's not a transfer; it is a two-directional transfer I would say.'</i> (L04)
Creation of conducive learning environment	Not stressed/ stressed to make students feel at ease <i>'So you ... want them to feel that it is okay to be somewhat overwhelmed with the material. You know, the beginning is hard and I tell them. You acknowledge that and it helps; it gives them some encouragement.'</i> (S06)	Stressed to help individual student/ to allow student to learn <i>'...I'd like to avoid embarrassment. Why? It's demoralising, they're not in a position to learn if they're demoralised; I want the atmosphere to be one of having fun and discussing important ideas together (...). Learning is more effective if it's fun.'</i> (S01)

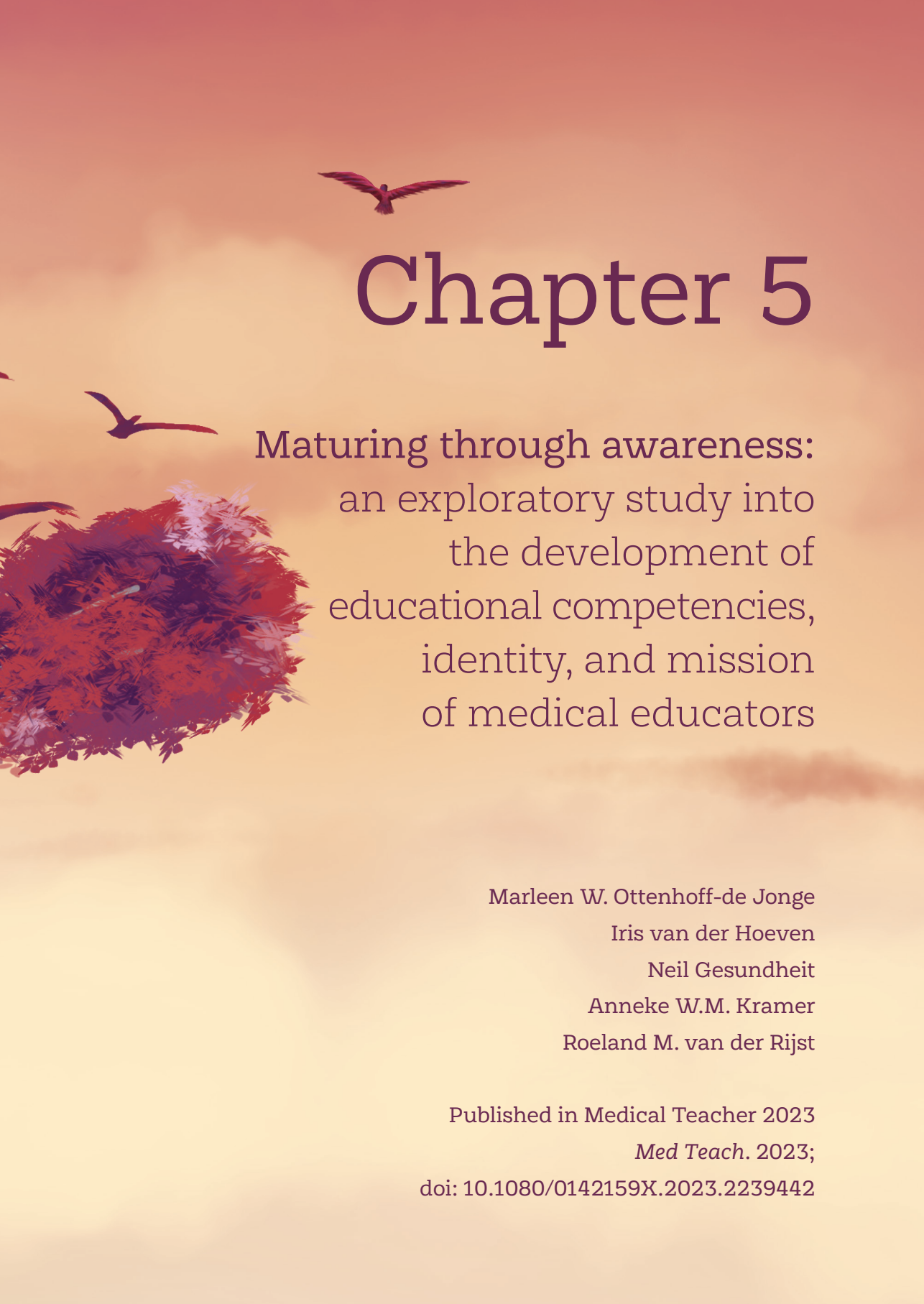
Addendum 4.3. Continued.

Belief orientations		
Belief dimension	Teaching-centred (Orientation II or III)	Learning-centred (Orientation IV, V or VI)
Students' professional development	Not stressed/ a limited number of competencies (communication/ collaboration) stressed <i>'The aim of the small group is often the transfer of knowledge, and a bit of course also the collaboration that they should have with each other in such a small group. Although I don't really do much about that.'</i> (L05)	Stressed; teacher helps/ fosters student in their professional development <i>'I want to make sure that I prepare the students for the outcomes which include taking care of patients, as well as assessments and life-applications; whether it's in the clinic or it's in academics or if it's in team-based work with other professionals.'</i> (S04)
Students' motivation	Teacher tries to transmit own motivation to students/ is aware of students' intrinsic motivation <i>'...the enthusing role of the teacher. (...) With nice small group teaching, which appeals to them, I think you give them tools to be even more interested.'</i> (L03)	Teacher is aware of individual student's motivation/ fosters individual student's motivation to enhance the learning <i>'I really work hard to get to know these students at a personal level. (...) to know a little better about their own interests and experiences and draw on these as part of the teaching and learning that we do, to make it seem so relevant to them.'</i> (S13)

‘Everyone has his own specific
vocation or mission in life;
everyone must carry out a
concrete assignment that
demands fulfilment’

- Viktor E. Frankl -





Chapter 5

Maturing through awareness:
an exploratory study into
the development of
educational competencies,
identity, and mission
of medical educators

Marleen W. Ottenhoff-de Jonge

Iris van der Hoeven

Neil Gesundheit

Anneke W.M. Kramer

Roeland M. van der Rijst

Published in Medical Teacher 2023

Med Teach. 2023;

doi: 10.1080/0142159X.2023.2239442

ABSTRACT

Purpose

Faculty development in learning-centred medical education aims to help faculty mature into facilitators of student learning, but it is often ineffective. It is unclear how to support educators' maturation sustainably. We explored how and why medical educators working in learning-centred education, more commonly referred to as student-centred education, mature over time.

Methods

We performed a qualitative follow-up study and interviewed 21 senior physician-educators at two times, ten years apart. A hierarchical model, distinguishing four educator phenotypes, was employed to deductively examine educators' awareness of the workplace context, their educational competencies, identity, and 'mission,' i.e. their source of personal inspiration. Those educators who grew in awareness, as measured by advancing in educator phenotype, were re-interviewed to inductively explore factors they perceived to have guided their maturation.

Results

A minority of the medical educators grew in awareness of their educational qualities over the 10-year study period. Regression in awareness did not occur. Maturation as an educator was perceived to be linked to maturation as a physician and to engaging in primarily informal learning opportunities.

Conclusions

Maturation of medical educators can take place, but is not guaranteed, and appears to proceed through a growth in awareness of, successively, educational competencies, identity, and mission. At all stages, maturation is motivated by the task, identity, and mission as a physician.

PRACTICE POINTS

- Faculty development, aiming to help medical educators mature into facilitators of student learning, is often ineffective
- If maturation of medical educators occurs, it appears to follow the developmental stages of awareness of their educational competencies, identity, and mission
- The maturation of medical educators may be temporarily distorted due to dissatisfaction with adverse professional or private circumstances
- Medical educators link their maturation as an educator to their maturation as a physician, so involving practising physicians as faculty developers may be beneficial
- To support medical educators' maturation, faculty development initiatives need to be varied, extending over a long period of time and embedded in the workplace

INTRODUCTION

Faculty development aims to help faculty mature into educators and improve their effectiveness as teachers. We use the term 'mature' to emphasise our perspective that faculty development is a holistic and ongoing process that takes place in the everyday work setting.¹ The most mature educators focus on facilitating students' learning processes rather than solely imparting factual knowledge,² particularly in learning-centred education, which has been commonly implemented in most medical schools around the world. We refer to learning-centred education rather than student-centred or learner-centred education since several studies emphasise that the focus in this type of education is primarily on the learning of the learner rather than on the learner themselves.^{e.g. 3}

Faculty development (FD) as conducted at most medical schools, however, is often ineffective at promoting maturation.⁴ This may be due to the educational context, e.g. the hidden curriculum which is not supportive of the educators' teaching role.⁴ In addition, the content of FD interventions may need to be refocused. The emphasis of FD has primarily been to improve medical educators' pedagogical knowledge and skills.^{1,5} FD may be more effective if

it also promotes the development of other essential qualities, including an educator's educational identity^{5,6} and 'mission.' The concept of mission refers to the source of personal inspiration that underlies an educator's identity.⁷

However, we still know little about how the development of these qualities can be effectively supported, since there is a paucity of data on the maturation processes of medical faculty.⁵ Gaining more insight into the maturation processes of medical educators over time may help to advance the field of FD for the benefit of the education of future physicians, consistent with learning-centred educational principles.

One recent study related awareness of educational identity and mission to teaching beliefs that align with the educational principles of learning-centred education,⁸ which can lead to a change in teaching behaviours.⁹ Development of medical educators' awareness of their educational identity has been explored by a limited number of studies, primarily in the context of longitudinal FD interventions.^{10,11} A few studies have explored the development of medical educators' awareness of their educational identity outside of formal faculty development interventions, focusing on informal learning opportunities in authentic settings which are suggested to be at least as important in FD.¹ Browne et al.¹² and Cantillon et al.¹³ ascertained development of an educational identity awareness in retrospect, as self-identified or self-perceived by their studies' participants. Van Lankveld et al.¹⁴ explored this development in beginning pre-clinical educators through a follow-up study, thus reducing the risk of recall bias. However, in Van Lankveld's study, the vast majority of educators were not involved in patient care. While not all university educators in pre-clinical medical education are involved in patient care, the vast majority are. Moreover, a recent review⁴ concluded that educators who are involved in patient care 'reconcile' their educational identities with their identities as patient-care providers, thus implying a reciprocal influence of both identities.

With regard to the development of a personal educational mission awareness, the literature is even more limited: we know of no such research within the medical education context. Therefore, this study aims to fill the gap in understanding how educators who have a patient-care role develop an awareness of their educational identity as well as a sense of educational mission over time.

To inform the conceptualisation of this study we have utilised a model which presents four educator 'phenotypes,' categories based on the extent to which medical educators are aware of their educational qualities and the workplace

context⁷ (see List 5.1). In this model the structural relationships among the categories are perceived as hierarchically inclusive, meaning that category B includes category A, category C includes category B, and category D includes category C, but not vice versa.¹⁵ In using the term ‘phenotype’ for the categories, we aim to emphasise that maturing as an educator depends on both individual qualities and environment.

List 5.1. Summary of the four educator phenotypes.

Educator phenotype	Category	Awareness of	Focus on
Critic	A		Contextual aspects that constrain being an effective educator, e.g. lack of time
Practitioner	B	Educational context	The practice of education, i.e. behaviours & competencies
Role Model	C	Educational context; Behaviours & competencies	Educational identity
Inspirer	D	Educational context; Behaviours & competencies; Educational identity	Personal educational mission

In the least inclusive phenotype, labelled the ‘Critic,’ educators focus on adverse contextual aspects. In the next phenotype, the ‘Practitioner,’ educators are aware of the importance of contextual aspects but in addition demonstrate behaviours and competencies of an educator. In the ‘Role model’ phenotype, educators extend their awareness to include their educational identity, whereas in the most inclusive ‘Inspirer’ phenotype, educators demonstrate characteristics present in the other phenotypes and also manifest and share their educational mission. A key difference between the Role model and the Inspirer phenotypes is their focus on the teacher and student, respectively. If educators advance towards a more inclusive phenotype over the 10-year study period, we consider this to be maturation.

Our research questions were:

1. To what extent do medical educators mature through a growing awareness of their educational qualities over time?
2. Which factors, as perceived by the medical educators who mature over time, contribute to their maturation?

METHODS

Design and procedures

To explore the maturation of educators, we performed a qualitative follow-up study with a baseline period of 2008-2010 (first interview, Phase 1), and a follow-up period in 2018 (second and third interviews, Phases 2 and 3).

In Phase 1, we conducted in-depth, semi-structured interviews with senior educators ($n=23$) from two medical schools. We used the interview guide as reported by Ottenhoff-de Jonge et al.¹⁶ (see Addendum 5.1). We started with the primary questions regarding what qualities make a good teacher, and what obstacles there might be to being a good teacher. Due to our selection of exemplary teachers, the participants identified with the notion of ‘good teachers’ and related these questions to themselves. By asking for examples from their teaching practice, we further ensured that the participants elaborated on their own teaching experiences. We explored the preclinical educational contexts during the interviews because experiences of being an educator may vary according to the level of teaching¹⁷ and we wanted to avoid participants answering the questions in a clinical context. In the preclinical setting, learning-centred education is more carefully designed and implemented.

To answer our first research question, in Phase 2 we repeated the interviews in 2018 with the same participants who were still available ($n=21$), to examine whether educators matured through a growing awareness of their educational qualities over a 10-year period. The educator phenotype model provided the framework for data analysis in Phases 1 and 2.

In Phase 3, we conducted a third interview with those educators who showed maturation towards a more inclusive educator phenotype ($n=6$) to answer our second research question. We prepared a document that included relevant excerpts from these participants’ first and second interviews which illustrated their growth in awareness of their educational qualities between the first and second interviews. We added specific questions related to underlying factors that might have contributed to their maturation. The document served as a prompt and was sent prior to the third interview to give the participants ample time and encourage them to reflect on these excerpts. The aim of the third interview was twofold. First, we checked whether the educators agreed with the categorisation of the initial and new phenotypes (member check). Second, we explored which factors they perceived to be instrumental to their maturation as educators.

Prior to the second interview, we discussed with the interviewees any changes in the demographic data that had been collected in 2008-2010, including their weekly workload for educational, patient-care, research, or administrative tasks. All interviews were conducted by the first author, and audiotaped and transcribed. We tested the interview procedures on a bilingual educator not included in the study.

Participants and setting

In Phase 1, we recruited exemplary physician-educators with a variety of educational roles from Stanford University School of Medicine (SUSM), USA, and Leiden University Medical Centre (LUMC), the Netherlands, both with learning-centred curricula. Of the 23 selected participants, five educators were involved in educational administration and were responsible for curriculum innovations. The other 18 participants were selected on the basis of their active educational involvement and excellent teaching, as reflected in student evaluations and receipt of teaching awards. The participants on average had 21 years of teaching experience, and most of them were responsible for preclinical curriculum content. Eight of the participants taught basic science topics; the other ten taught clinical topics in the preclinical curriculum. We chose these selection criteria because we expected that these faculty members would be 'information-rich' and that their experiences would be enlightening (critical case sampling). For each of the interviews, the first author invited the participants, emphasising that participation was voluntary and anonymous. In 2018, 21 of the 23 participants were still available, all of whom were willing to participate in the follow-up interviews for Phase 2. Two participants had left academia; one because of an administrative position elsewhere, and the other because of dissatisfaction with their work.

This study was approved by the Netherlands Association for Medical Education (NVMO) Ethical Review Board (NERB number 834). It was deemed as a protocol not involving human subject research and approved as such by the Stanford Institutional Review Board (IRB).

In the period between the first and second interviews (2008-2018) curriculum reform took place at LUMC. The curriculum maintained its learning-centred approach but placed more explicit emphasis on students' active learning. In addition, an intensive faculty development programme was implemented in which almost all LUMC participants participated. At SUSM, which already had an extensive faculty development programme, no major changes had been made to the preclinical curriculum or to faculty development programmes during this interval.

Data analysis

In Phases 1 and 2, the (first and second) interviews were deductively analysed to explore awareness of the educational environment, behaviours/competencies, identity, and mission, using the codebook as developed by Ottenhoff-de Jonge et al.⁷ (See Addendum 5.2). Two researchers independently coded the interviews. In addition to the researcher who had conducted both interviews (MO), two different research assistants coded the first and second interviews independently. The assistant who coded the second interviews (IvdH) was blinded to the interviewees' initial categorisation. The codings were discussed jointly to reach consensus. We determined an educator phenotype for each participant holistically, i.e., based on the whole transcript, including all the coded text fragments. A third team member (RvdR) independently analysed half of the first interviews and a selection of the second interviews to further ensure data credibility.¹⁸ The first author performed a member check by asking all participants if they agreed with our conclusions on the assigned educator phenotypes. The member check was incorporated into the third interview with those who had matured into a more inclusive phenotype. In Phase 3, we analysed the transcripts of the third interviews. MO and IvdH inductively analysed which factors were perceived by the educators to be instrumental in their maturation during the last decade. This analysis followed an iterative process to promote in-depth understanding of the interviews and the coding. Coding took place independently by MO and IvdH, and discrepancies were discussed until consensus was reached. After further analysis we consolidated the codes into a limited number of categories by discussing the coding of the fragments and categorisation with RvdR and AK. To strengthen the confirmability¹⁸ of our findings, the categorisation and interpretation were discussed with the full research team. The team members come from diverse backgrounds, including from different cultures (USA *versus* the Netherlands), disciplines (medical *versus* non-medical), and professional experiences (student *versus* long-term professional experience). This approach ensured interpersonal reflexivity to identify and address any personal beliefs or biases that may have influenced the research process, and intersubjectivity to reach agreement on the interpretation of the findings through dialogue and the sharing of meanings. Regarding contextual reflexivity, MO, AK and IvdH are familiar with the educational context of the LUMC, as medical educators and as a medical student respectively, while NG is familiar with the SUSM context as the Senior Associate Dean for Medical Education. In addition, the first author (MO) participated at SUSM as a medical teacher for a short period of time, in order to gain a better understanding of the practice and

culture of medical education at SUSM. Conversely, this research also positively impacted the participating educators: participants frequently elaborated on how the interview questions stimulated them to reflect on their perspectives on essential teacher qualities.

RESULTS

After describing relevant changes in the demographic data, we will first consider the results related to research question 1, i.e. the extent to which maturation occurred, as determined by advancing towards a more inclusive educator phenotype. Subsequently we describe the maturation of the participants for each phenotype, followed by the factors perceived as instrumental to maturation, to answer research question 2.

When asked about any changes in the weekly education workload, two educators who did not mature into a more inclusive phenotype disclosed that they had reduced their educational responsibilities. Despite their passion for education, they had taken on a major administrative role, partly motivated by lack of recognition and status within the educational domain.

Table 5.1 provides an outline of the participants categorised by educator phenotype in Phase 1; demographic data at the time of Phase 1; occurrence of maturation; educator phenotype in Phase 2.

Extent of maturation

Six of 13 educators with potential to advance in educator phenotype matured over the 10-year study period (Figure 5.1). Maturation followed the order of the phenotype categorisation from less to more inclusive; regression toward a less inclusive phenotype did not take place.

The three participants who were initially categorised as focusing on adverse contextual aspects (Critic phenotype) all showed growth to a more inclusive phenotype. Three of the six educators who had been unaware of their educational identity developed this awareness (Role model phenotype). Two educators, initially aware of their educational identity, grew in awareness of their educational mission (Inspire phenotype). In Box 5.1 we provide an example of the latter to illustrate how we identified maturation.

Table 5.1. Participants categorised by educator phenotype in Phase 1; demographic data at the time of Phase 1; occurrence of maturation; educator phenotype in Phase 2.

Educator phenotype in Phase 1	Case number	Faculty	Gender (m/f)	Teaching experience (yrs)	Topic/ task	Maturation	Educator phenotype in Phase 2
I. Inspirer	S02	SUSM	m	15	Clinical		=
	S04	SUSM	f	10	Clinical		=
	S05	SUSM	m	#	Administrative		=
	S07	SUSM	m	15	Basic science		=
	S08	SUSM	f	15	Clinical		=
	S10	SUSM	f	19	Administrative		=
	S11	SUSM	m	38	Administrative		=
	S13	SUSM	m	25	Clinical		=
Mean				20			
II. Role model	L01	LUMC	f	#	Administrative		<i>Left academia</i>
	L04	LUMC	m	10	Clinical	+	Inspirer
	L05	LUMC	m	13	Basic science		=
	L06	LUMC	f	5	Clinical		<i>Left academia</i>
	L08	LUMC	m	25	Clinical		=
	L10	LUMC	f	16	Basic science		=
	L12	LUMC	m	25	Basic science		=
	L13	LUMC	m	25	Administrative		=
	S01	SUSM	m	40	Basic science	+	Inspirer
Mean				20			
III. Practitioner	L03	LUMC	m	20	Clinical		=
	L09	LUMC	m	25	Basic science	+	Role model
	S06	SUSM	m	19	Basic science		=
Mean				21			
IV. Critic	L02	LUMC	m	10	Clinical	+	Role model
	S03	SUSM	m	24	Basic science	+	Practitioner
	S12	SUSM	m	32	Clinical	+	Role model
Mean				22			

LUMC = Leiden University Medical Centre, The Netherlands; SUSM = Stanford University School of Medicine, USA; + = maturation occurred between Phase 1 and Phase 2; '=' = participant kept the same educator phenotype as in Phase 1; # = missing value.

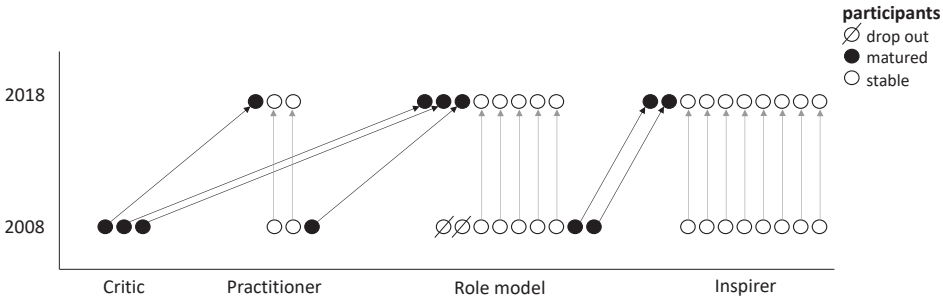


Figure 5.1. Maturation of medical educators through a growing awareness of their educational qualities over a period of 10 years.

Factors contributing to maturation

Factors perceived to be instrumental in maturation could be divided into intrapersonal aspects and meaningful experiences. Intrapersonal aspects refer to factors that the participant experiences as part of their ‘inner self,’ such as personal values, characteristics, or competencies. The relevance of the meaningful experiences was not so much the experience itself, but rather the way the participant attributed meaning to the experience. We chose to link the attributed meaning of an experience to the experience itself and to present it as separate from the intrapersonal aspects, consistent with the way the participants themselves presented these factors.

The three educators who shifted *from* the Critic phenotype shared common factors which they perceived as contributing to their transformation. The educators who matured *toward* a particular phenotype also shared common factors they perceived as contributing to their maturation. Below we describe the maturation of the participants for each phenotype, followed by the factors perceived as instrumental to their maturation (see Table 5.2).

Maturation through shifting from focusing on adverse contextual aspects

The three educators who initially fell into the Critic phenotype had focused on contextual aspects that constrained them in their teaching. They indicated that it had been important to learn to come to terms with these adverse circumstances in order to shift focus to other aspects of being an educator. We categorised this under *intrapersonal aspects*. For example, they described how they had dealt with the lack of rewards for teaching tasks.

Participant: *But if you want to look at things that have changed, nothing has. And I doubt it will. So the way teaching is rewarded here is minimally.*

Interviewer: *And is that the reason why you were more cynical?*

Participant: *I've given up on that. That's not worth my effort to even raise my breath about it. But what that leaves you is your own motivation for teaching, and that I can get rewarded for that in any significant way. And that's when the effects of your teaching on the students become really apparent. (S03)*

Box 5.1. Sample.

2008 (Phase 1):

Interviewer: *What makes somebody a good teacher?*

Participant: *Wanting to learn how to be a good teacher (...). You can't believe how much time I've spent trying to analyse how to be a better teacher. (...) I think it's just really a willingness to make the learning fun.*

2018 (Phase 2):

Interviewer: *What makes somebody a good teacher?*

Participant: *Paying attention to the students. (...) to constantly be self-critical and constantly think of ways that you might do better. (...) If the students are enjoying the class, and they share in the excitement of learning new ways of thinking, that definitely influences them. If they feel that you care about their learning, that influences them. (...) I tried to learn their names. It's just a demonstration that I care enough to know at least their first name.*

In both 2008 and 2018 this educator (S01) emphasised certain characteristics of a good teacher, e.g. a willingness to learn how to be a good teacher or to make learning fun. These are examples of his awareness of his educational identity. In 2018, his primary focus is more on the students: his first answer to the question of what makes a good teacher is: paying attention to the students. He emphasises caring for the students and their learning, and sharing with them in the excitement of learning. These are examples of his awareness of his educational mission. Therefore, we categorised him in the Role model phenotype in 2008, and in the Inspirer phenotype in 2018.

Table 5.2. Summary of factors perceived as contributing to educator maturation by phenotype.

Phenotype shifting from (case number)	Factors perceived as contributing to maturation	
	Intrapersonal aspects	Meaningful experiences
Critic (S03, S12, L02)	Learning to accept adverse professional or private circumstances	Positive change in professional or private domains
Phenotype maturing to (case number)		
Practitioner (S03)	Becoming more effective in teaching	Tasks and activities leading to growth in competencies
Role model (S12, L02, L09)	A willingness to keep growing, both personally and as teacher	Tasks, activities and initiatives leading to (self-) reflection and increased self-awareness
	Being reflective: reflective on the 'self' and on the teacher role	
	Maturing relevant character traits	
Inspirer (S01, L04)	Changing focus from self to other	Meaningful encounters with others
	Growing in awareness of the importance of societal (medical) issues for functioning as physician	Adverse developments in society and the medical profession

In relation to *meaningful experiences*, all three educators acknowledged that a positive change in their professional circumstances had been influential. One educator stated that he no longer had to work under an authoritarian supervisor. Another educator described how, when his educational role had become more clearly defined, he had become more content and less cynical. The third educator referred to the difficult period his department was going through at the time of the first interview; when the department got a new head, he had become more satisfied with his role as educator.

In addition to these changes within the professional domain, educators described positive changes within the private domain. For example, after a 'nasty divorce' at the time of the first interviews, one educator's improved personal life had subsequently influenced his job satisfaction.

Maturation through growing awareness of educational competencies

The educator who became more aware of his educational competencies (Practitioner phenotype) described himself mainly in terms of being more effective.

I'm getting old (...). Maybe more effective. Because I know what works and what doesn't. (S03)

He explained that his task as an educator was motivated by the responsibility he felt as a physician to the students' future patients rather than to the students themselves. This educator gave credit to predominantly *meaningful experiences* which had helped him to develop his competencies as a teacher. Examples of these were activities such as taking on new teaching responsibilities, modelling by observing mentors, and participating in informal exchanges with colleagues.

And, probably involvement with my colleagues. (...) We would sometimes have barbed discussions, but it's good! It's comforting to know you're not alone. (S03)

Maturation through growing awareness of educational identity

The three educators who became more aware of their educational identities (Role model phenotype) demonstrated more self-awareness. Some of them emphasised that the role of patient-care giver was their primary professional identity. Even though their focus on the relationship with their students increased, their main emphasis was not on students but on their own development. They mainly highlighted that *intrapersonal aspects* were instrumental to their maturation, such as a willingness to evolve, both personally and as teacher.

Obviously, like everything else, you have to want to change. And frankly, sometimes, you have to be in enough pain that you then want to change.(...) Sometimes it's the gun to the head that makes the change. (S12)

Another intrapersonal aspect that these educators emphasised was being reflective: reflective on the 'self' or on the teacher role. For example, one educator pointed out the value of actively soliciting feedback, including from junior colleagues, which helped him to reflect on his teaching.

What has had the most influence on my development as a teacher? The reaction of others to what I do. Yes, to reflect on what the other has to say. (L02)

Finally, the evolution of relevant character traits was highlighted, such as becoming milder and maturing in general, or becoming more patient with students.

So I've become more careful over the years... the impact of what you do on a person... more patient with slow processes. (L09)

The *meaningful experiences* that these educators highlighted included activities that encouraged reflection on the 'self' or on the teacher role, and led to increased self-awareness. Examples of these are: coaching students, receiving feedback from colleagues, and reading self-help literature.

I have done a fair amount of reading in the business and self-help literature, seeking to enhance my effectiveness in promoting desired change in myself. (S12)

Maturation through growing awareness of educational mission

The two educators who became aware of their educational mission (Inspirer phenotype) changed their focus from themselves to the students and patients. They indicated that they had become more deeply motivated to raise students' awareness of philosophical, spiritual, ethical, or societal medical issues. They linked this maturation to their maturation as a patient-care provider. Topics such as access to healthcare, the professional calling of a patient-care provider, giving the patient a voice, and exploring questions of meaning were emphasised. They attributed both *intrapersonal aspects* and *meaningful experiences* as playing a role in their maturation. One intrapersonal aspect they emphasised was the importance of giving a voice to 'the other,' for example by learning to be silent in order to listen more closely to what a patient or student had to say.

...learning how to be silent. I'm very articulate in certain ways and I can talk a mile. (...) But I am disciplining myself to just listen and be silent. (S01)

Another intrapersonal aspect they expressed was a growing awareness of the importance of societal issues for their functioning as a patient-care provider.

...over the years it's become clear to me that in medicine, access to healthcare turns out to be very important for some people. And if you're taking care of patients, you realise they don't have access, then it brings up all the social and ethical issues. ...I think I was always aware of them, but what I'm more aware of is the paramount importance of them. (S01)

They connected these intrapersonal aspects to two meaningful experiences. First, they emphasised that ‘meaningful encounters with others,’ such as indigent patients, had helped them to change their focus from themselves to their patients and their students.

...then it comes through the patients, because the patients that come in are poor. There [in patient care] it's more obvious, because it impacts their health. And it impacts their access to care. (S01)

Second, they emphasised that adverse developments in society and the medical profession were influential in their maturation. For example, one of the educators emphasised that changes in his medical discipline had made him more motivated to make students aware that being a doctor is a calling.

...the development of family medicine over the past ten years, more management and fewer home visits. So it has become more of a... no longer a calling but more a trade. (...) and then I wonder how can you still do that... [inspiring the students to consider this calling]. (L04)

DISCUSSION

Based on the findings of this follow-up study we conclude that maturation as a medical educator can occur but is not guaranteed: less than half of the medical educators with the potential to grow in awareness of educational competencies, identity, or mission, showed maturation in our study within the period of a decade. Our finding that none of the interviewed educators reverted to a less inclusive phenotype may imply that medical educators’ awareness of their educational qualities, once acquired, will not regress and is deeply integrated into the being of an educator.

A noteworthy finding from our study is that the educators who initially focused on adverse contextual aspects (the Critic phenotype) all matured toward a more inclusive phenotype. Our findings suggest that the Critic phenotype may not be a permanent end-stage phenotype nor a ‘starting’ phenotype. Educators’ awareness of their educational qualities may become temporarily distorted due to dissatisfaction related to adverse professional or private circumstances. Our findings suggest that once educators experience a lack of support from their departments or institutions, they have three options for coping with

their dissatisfaction. A first option is to learn to come to terms with an adverse educational context, allowing them to shift focus to their qualities as educator. A second option is to change their academic role from education to more clinical, administrative, or research work. Two of the participating educators who did not grow to a more inclusive phenotype referred to this coping strategy in their second interviews. A third option is to discontinue working in academia,¹⁹ which happened to one of the participants included in the first interviews. Our conclusion regarding the influence of context fits into a ‘*social-relational*’ perspective of how educators mature, which conceptualises maturation as constructed through social interaction in cultural contexts.⁴ In future research it may be useful to further explore whether the Critic phenotype differs from the other three phenotypes and presents a more temporary stage.

From an ‘*individualist*’ perspective, which situates maturation within the person,⁴ we conclude that maturation as a medical educator appears to occur *via* developmental stages. In the first stage, exemplary educators showed an awareness of important educational competencies, which was then followed by a growing understanding of one’s educational identity and subsequently by a deeper understanding of one’s educational mission. Interestingly, at all three stages, maturation is generally motivated by the task, identity, or mission as a *physician*. A parallel between the development as an educator and as a physician has been reviewed in two retrospective inquiries into the maturation of exemplary medical educators²⁰ and mentors.²¹

Although factors considered influential to maturation varied by developmental stage, our findings across all stages underscore the importance of individual proactivity and motivation.²² They also underscore the importance of the workplace setting, rather than formal faculty development settings, as the main context where maturation occurs, consistent with previous research.¹ In addition, we conclude that maturation is a multifactorial process in which intrapersonal aspects and meaningful experiences interact. The extent to which these factors play a role differs per developmental stage. These conclusions imply that, to support the maturation of educators, supervisors in career development should encourage educators to balance their teaching tasks with other academic work. In addition, faculty development initiatives need to be varied, preferably extending over a long period of time and embedded in the workplace such as through communities of practice.²³ As Steinert²⁴ advised, faculty development should target all of the roles that medical educators play, consistent with our findings that medical educators explicitly link their maturation as an educator to that

as a physician. Therefore, we would emphasise the value of involving faculty developers and mentors who are practising physicians in faculty development. The educator phenotype model could be used as a tool to support FD interventions, in line with the implications suggested in our initial study.⁷

The growth in competencies of educators can be supported by offering varied tasks and activities, such as a variety of educational responsibilities, practice and instruction by experienced and well respected faculty developers, and (in)formal discussions with peers about the ‘What and how’ of an effective educator.

Initiatives that encourage reflection on the ‘self’ and on the teaching and learning process may help the growth in awareness of one’s educational identity. Although the tasks and activities may be similar to those that support growth in competencies, their goal here is to encourage reflection on ‘Who’ one wants to be as an educator. Reflection has also been promoted as a useful instrument for faculty development with regard to educational identity formation.^{5,6,10}

Finally, encouraging educators to reflect on ‘Why’ they want to be a medical educator may nurture a deeper awareness of one’s educational mission. Discussing one’s personal patient-care mission with fellow physician-educators and relating it to one’s educational mission may be helpful in maintaining teacher motivation, even when the organisational culture is not supportive of the maturation of educators. Faculty developers who put their own educational mission into practice are helpful as role models. For the growth of an educational mission, meaningful encounters with students, for example mentoring individual students, may help to shift the focus from one’s own teaching role to the development of the student.

Strengths, limitations, and future research suggestions

The design of this follow-up study with a 10-year interval between initial and follow-up interviews with dedicated, experienced and exemplary medical educators provides valuable data to gain insight into the long-term maturation of medical educators. Because of our intentional selection of exemplary medical educators, our findings should be interpreted in this light. Medical faculty are primarily trained as physicians; faculty dedicated to providing patient care or research but not to teaching would presumably show different results. Future studies are needed to explore whether faculty that are less dedicated to teaching revert to less inclusive phenotypes over time. Our selection criteria also resulted in a limited number of educators demonstrating maturation, as some of them already had the most inclusive educator phenotype at the first interview. Thus

the factors we identified as contributing to maturation are exploratory in nature. It would be useful to repeat this research with less experienced educators; such a study would be expected to yield more educators with growth potential and could confirm the factors found in our study. Conducting this research with educators involved in educating medical students, but who are not practising physicians, could provide further insight into the applicability of the educator phenotype for educators from different backgrounds. In addition, it would be interesting to explore what these educators, if they show maturation, indicate as motivating their maturation. We focused interviews on educators involved in the preclinical curriculum. This limits drawing general conclusions for clinical or postgraduate contexts. Nevertheless, because the awareness of certain distinct qualities, once acquired, is deeply integrated into the person of educator, we expect that our results are not limited to a particular educational context. A future study carried out in other educational contexts could provide further insights.

CONCLUSION

This study provides evidence for the maturation of medical educators. Maturation is influenced by the educational context and appears to proceed through certain developmental stages, from focusing on educational competencies to a growing awareness of educational identity and a deeper understanding of educators' personal educational mission. Maturation is a multifactorial and complex process, which implies that faculty development initiatives need to be varied and differentiated and preferably extend over a long period of time. The interventions can be summarised as supporting the reflection on the 'what and how,' 'who' and 'why' of being an effective educator. Since medical educators indicate that their teacher role is inspired by their patient-care role, we recommend including educators' patient-care role in faculty development initiatives and involving practising physicians as faculty developers to support the maturation of medical educators.

Acknowledgements

The authors wish to thank the medical educators who took part in this study.

REFERENCES

1. Steinert Y, Mann K, Anderson B, et al. A systematic review of faculty development initiatives designed to enhance teaching effectiveness: A 10-year update: BEME Guide No. 40. *Med Teach*. 2016;38(8):769-786.
2. Taylor DC, Hamdy H. Adult learning theories: implications for learning and teaching in medical education: AMEE Guide No. 83. *Med Teach*. 2013;35(11):e1561-e1572.
3. Calkins S, Johnson N, Light G. Changing conceptions of teaching in medical faculty. *Med Teach*. 2012;34(11):902-906.
4. Cantillon P, Dornan T, De Grave W. Becoming a clinical teacher: identity formation in context. *Acad Med*. 2019;94(10):1610-1618.
5. Steinert Y, O'Sullivan PS, Irby DM. Strengthening Teachers' Professional Identities Through Faculty Development. *Acad Med*. 2019;94(7):963-968.
6. van Lankveld T, Thampy H, Cantillon P, Horsburgh J, Kluijtmans M. Supporting a teacher identity in health professions education: AMEE Guide No. 132. *Med Teach*. 2021;43(2):124-136.
7. Ottenhoff-de Jonge MW, van der Hoeven I, Gesundheit N, van der Rijst RM, Kramer AW. Medical educators' beliefs about teaching, learning, and knowledge: development of a new framework. *BMC Med Educ*. 2021;21(1):176. doi: 10.1186/s12909-021-02587-x
8. Ottenhoff-de Jonge MW, Steinert Y, van der Hoeven I, Kramer AW, van der Rijst RM. How learning-centred beliefs relate to awareness of educational identity and mission: An exploratory study among medical educators. *Med Teach*. 2022;44(12):1354-1361. doi: 10.1080/0142159X.2022.2094230
9. Ericsson KA, Krampe RT, Tesch-Römer C. The role of deliberate practice in the acquisition of expert performance. *Psychol Rev*. 1993;100(3):363.
10. Lief S, Baker L, Mori B, Egan-Lee E, Chin K, Reeves S. Who am I? Key influences on the formation of academic identity within a faculty development program. *Med Teach*. 2012;34(3):e208-e215.
11. Onyura B, Ng SL, Baker LR, Lief S, Millar B-A, Mori B. A mandala of faculty development: using theory-based evaluation to explore contexts, mechanisms and outcomes. *Adv Health Sci Educ Theory Pract*. 2017;22(1):165-186.
12. Browne J, Webb K, Bullock A. Making the leap to medical education: a qualitative study of medical educators' experiences. *Med Educ*. 2018;52(2):216-226.
13. Cantillon P, D'Eath M, De Grave W, Dornan T. How do clinicians become teachers? A communities of practice perspective. *Adv Health Sci Educ Theory Pract*. 2016;21(5):991-1008.
14. van Lankveld T, Schoonenboom J, Kusurkar R, Volman M, Beishuizen J, Croiset G. Integrating the teaching role into one's identity: a qualitative study of beginning undergraduate medical teachers. *Adv Health Sci Educ Theory Pract*. 2017;22(3):601-622.
15. Ottenhoff-de Jonge MW, van der Rijst RM, Gesundheit N, et al. From critic to inspirer: four profiles reveal the belief system and commitment to educational mission of medical academics. *BMC Med Educ*. 2019;19(1):268. doi: 10.1186/s12909-019-1665-0
16. Åkerlind GS. A phenomenographic approach to developing academics' understanding of the nature of teaching and learning. *Teach High Educ*. 2008;13(6):633-644.

17. Stenfors-Hayes T, Hult H, Dahlgren LO. What does it mean to be a good teacher and clinical supervisor in medical education? *Adv Health Sci Educ Theory Pract*. 2011;16(2):197-210. doi: 10.1007/s10459-010-9255-2
18. Frambach JM, van der Vleuten CP, Durning SJ. AM last page: Quality criteria in qualitative and quantitative research. *Acad Med*. 2013;88(4):552.
19. Jauregui J, O'Sullivan P, Kalishman S, Nishimura H, Robins L. Remooring: A qualitative focus group exploration of how educators maintain identity in a sea of competing demands. *Acad Med*. 2019;94(1):122-128.
20. MacDougall J, Drummond MJ. The development of medical teachers: an enquiry into the learning histories of 10 experienced medical teachers. *Med Educ*. 2005;39(12):1213-1220.
21. Kvernenes M, Valestrand EA, Schei E, Boudreau JD, Ofstad EH, Hokstad LM. Threshold concepts in group-based mentoring and implications for faculty development: A qualitative analysis. *Med Teach*. 2021;43(8):879-883. doi: 10.1080/0142159X.2021.1931077
22. King SM, Richards J, Murray A-M, et al. Informal faculty development in health professions education: Identifying opportunities in everyday practice. *Med Teach*. 2021;43(8):874-878.
23. de Carvalho-Filho MA, Tio RA, Steinert Y. Twelve tips for implementing a community of practice for faculty development. *Med Teach*. 2020;42(2):143-149.
24. Steinert Y. Faculty development: from rubies to oak. *Med Teach*. 2020;42(4):429-435.

ADDENDA

Addendum 5.1. Interview guide: see Chapter 2, Addendum 2.2. Q 6, main and supplementary questions are relevant to the present study.

Addendum 5.2. Codebook related to study on phenotypes.

(see Ottenhoff-de Jonge MW, van der Rijst RM, Gesundheit N, et al. From critic to inspirer: four profiles reveal the belief system and commitment to educational mission of medical academics. *BMC Med Educ.* 2019;19:268.)

ENVIRONMENT: everything outside the academic him-/herself that can influence his/her teaching.

Environment/non-personal/enough time, given the teachers' other responsibilities

Environment/non-personal/a non-distracting learning environment

Environment/non-personal/constraints of academics

Environment/non-personal/enough time

Environment/non-personal/enough time and money

Environment/non-personal/enough time in curriculum

Environment/non-personal/more faculty

Environment/non-personal/setting of small vs large group

Environment/non-personal/size of classes not being too big

Environment/administration/being rewarded for teaching

Environment/administration/compensation in time or money by administration

Environment/administration/emotional and promotional reward

Environment/administration/enough time allocated to education by administration

Environment/administration/giving priority to teaching by administration

Environment/administration/professionalising teachers by administration

Environment/administration/recognition of the importance of teaching by the administration

Environment/students/different knowledge levels of the students

Environment/students/enough time, given the students' other responsibilities

Environment/students/interacting with receptive students

Environment/peers/enough faculty involved in teaching

Environment/peers/recognition by peers that teaching is important

BEHAVIOURS: fragments articulated in a direct, usually present tense, which in real time would be directly observable.

Behaviour/related to student/dealing with the group/ not trying to please everybody

Behaviour/related to student/dealing with the group/identifying and reflecting on what is going on in the group

- Behaviour/related to student/evoking enthusiasm
- Behaviour/related to student/evoking enthusiasm/active, enthusiastic presentation
- Behaviour/related to student/evoking enthusiasm/conveying enthusiasm for your discipline
- Behaviour/related to student/evoking enthusiasm/evoking interest in student
- Behaviour/related to student/evoking enthusiasm/trying to transmit enthusiasm
- Behaviour/related to student/relating to student on an interpersonal level/behaving respectfully
- Behaviour/related to student/relating to student on an interpersonal level/being available to student, e.g. by e-mail
- Behaviour/related to student/relating to student on an interpersonal level/creating a non-judgmental, safe atmosphere
- Behaviour/related to student/relating to student on an interpersonal level/relating to get him engaged
- Behaviour/related to student/stimulating self-directed learning/giving feedback about deficiencies to student
- Behaviour/related to student/stimulating self-directed learning/listening attentively to students' questions
- Behaviour/related to student/stimulating self-directed learning/stimulating asking questions
- Behaviour/related to student/stimulating self-directed learning/stimulating self-directed learning
- Behaviour/related to student/stimulating self-directed learning/stimulating self-reflection
-
- Behaviour/related to task/innovating (of material, session, presentation)
- Behaviour/related to task/preparation (of material, session, presentation)
- Behaviour/related to task/presenting in an attractive way
- Behaviour/related to task/providing answers to students' questions
- Behaviour/related to task/repeating
- Behaviour/related to task/simplifying, reducing redundant knowledge, focus on main issues
- Behaviour/related to task/structuring knowledge of discipline
-
- Behaviour/related to self/ setting the example
- Behaviour/related to self/giving it enough time and priority
- Behaviour/related to self/setting the example by showing the behaviour you expect from student
- Behaviour/related to self/spending time analysing how to be a better teacher
- Behaviour/related to self/telling the student when you don't know something
-
- COMPETENCIES: fragments expressed as a potential for behaviour, which would not be directly observable. Competencies represent an integrated body of knowledge, skills and attitudes. E.g.: 'Ability to...'
-
- Competency/related to student/dealing with the group/ability to lead the interaction among students
- Competency/related to student/dealing with the group/balancing between goal- and relation orientation

Competency/related to student/dealing with the group/having a feeling of balancing needs of different students

Competency/related to student/evoking enthusiasm/engaging and motivating the student

Competency/related to student/evoking enthusiasm/ability to elevate interest of student

Competency/related to student/evoking enthusiasm/ability to engage students

Competency/related to student/relating on an interpersonal level/ability to identify with the student

Competency/related to student/relating on an interpersonal level/ability to make student feel comfortable

Competency/related to student/relating on an interpersonal level/courage to give feedback

Competency/related to student/relating on an interpersonal level/ability to relate to student in a non-authoritarian way

Competency/related to student/stimulating self-directed learning/ability to communicate that the sessions are for the students' benefit

Competency/related to student/stimulating self-directed learning/ability to get the student to ask questions

Competency/related to student/stimulating self-directed learning/ability to present new challenges to student

Competency/related to task as educator/ability to choose appropriate educational behaviour/ability to present content in attractive way

Competency/related to task as educator/ability to help student see and understand difficult concepts

Competency/related to task as educator/ability to organise session, focus on important issues

Competency/related to task as educator/ability to restructure information

Competency/related to task as educator/ability to simplify, reduce redundant knowledge, focus on main issues

Competency/related to task as educator/attitude to improve, innovate

Competency/related to task as educator/knowledge of content in order to gain respect of student

Competency/related to task as educator/knowledge of the setting, context of the teaching

Competency/related to task as educator/knowing where your students are, what they know

Competency/related to task as educator/knowledge of education

Competency/related to task as MD/ability to structure knowledge of discipline

Competency/related to task as MD/knowledge of content

Competency/related to self/(attitude) to know oneself and ability to adapt

Competency/related to self/ability to self-reflect

Competency/related to self/ability to deal with feedback

Competency/related to self/attitude to keep learning

BELIEFS: fragments phrased as convictions with regard to teaching and learning. Usually put as statements, impersonal. Residual category: if a fragment can also be placed in another level we choose that level.

Belief/regarding the learning process/teaching-centred/reaching your teaching objectives
 Belief/regarding the learning process/teaching-centred/conveying knowledge
 Belief/regarding the learning process/teaching-centred/to gain interest of the student
 Belief/regarding the learning process/teaching-centred/to make student learn something

Belief/regarding the learning process/learning-centred/creating the right atmosphere to allow student to learn
 Belief/regarding the learning process/learning-centred/giving the student ownership
 Belief/regarding the learning process/learning-centred/allow students to learn something
 Belief/regarding the learning process/learning-centred/cherishing curiosity
 Belief/regarding the learning process/learning-centred/learning is something a student does himself with help of given structures
 Belief/regarding the learning process/learning-centred/stimulating asking the right questions

Belief/regarding the teacher/innate trait, charisma
 Belief/regarding the teacher/innate/being a good performer
 Belief/regarding the teacher/not innate
 Belief/regarding the teacher/not innate/someone who has gained the respect of the student

IDENTITY: fragments expressed as beliefs about oneself, how one defines oneself. E.g.: 'Being...', 'Willingness to...', 'Someone who is...' Difference between identity and mission level is that in mission fragments the focus should be on the student and not on the academic him-/herself.

Identity/related to educational role/someone who opens new vistas to students
 Identity/related to educational role/being a synthesizer of information
 Identity/related to educational role/being committed, motivated to teaching; prioritising teaching
 Identity/related to educational role/being education minded
 Identity/related to educational role/being engaged in student
 Identity/related to educational role/being engaged in what's going on in a group
 Identity/related to educational role/being enthusiastic about the topic
 Identity/related to educational role/being enthusiastic, motivating the student
 Identity/related to educational role/being interested in development of student
 Identity/related to educational role/being interested, engaged with student
 Identity/related to educational role/being mindful about group dynamics
 Identity/related to educational role/being respectful, approachable, non-intimidating, not arrogant to student
 Identity/related to educational role/being stimulating
 Identity/related to educational role/being supportive
 Identity/related to educational role/enjoying sharing your enthusiasm
 Identity/related to educational role/enjoying teaching
 Identity/related to educational role/enthusiastic willingness to work with students and convey knowledge

Identity/related to educational role/flexibility in ways of teaching
Identity/related to educational role/making learning exciting
Identity/related to educational role/making learning inspiring
Identity/related to educational role/to convey enthusiasm for teaching the student
Identity/related to educational role/willingness to improve your own teaching
Identity/related to educational role/willingness to make the learning fun
Identity/related to educational role/willingness to teach, commitment

Identity/related to personal role/acknowledgement of the limitations of one's knowledge
Identity/related to personal role/being a role model with whom student can identify
Identity/related to personal role/being approachable
Identity/related to personal role/being approachable and inviting for other opinions
Identity/related to personal role/being flexible
Identity/related to personal role/being non-intimidating or -arrogant
Identity/related to personal role/being receptive to feedback
Identity/related to personal role/being wise and experienced
Identity/related to personal role/someone who brings out the best in himself
Identity/related to personal role/someone who is a great learner himself

Identity/related to patient-care role/being a good clinical teacher on the ward
Identity/related to patient-care role/being a role model
Identity/related to patient-care role/being comfortable in your profession
Identity/related to patient-care role/enjoying your topic, your field
Identity/related to patient-care role/having a passion for the topic

Note: fragments like 'being respectful/ approachable,' even though it has both identity and mission aspects, will be placed under identity level, because the main focus is on the academic and not on the student.

MISSION: fragments phrased as goals/aims pursued in teaching. The focus should be on the student, not on the academic.

Mission/related to educational field/being a role model for learning
Mission/related to educational field/caring that students learn something
Mission/related to educational field/sharing your passion for learning with student
Mission/related to educational field/someone who brings out the best in the student
Mission/related to educational field/to help student to be inspired to learn

Mission/related to medical field/being excited about your field and sharing that energy
Mission/related to medical field/dedicated to their profession
Mission/related to medical field/sharing your enthusiasm for the profession
Mission/related to medical field/to convey one's passion for the profession

Note: if there is uncertainty between two levels, we choose the most inner level

‘You cannot teach
people anything.
You can only help them
discover it within themselves’

– *Galileo* –





Chapter 6

General discussion



GENERAL DISCUSSION

The studies presented in this dissertation were performed to increase our understanding of how medical educators working in learning-centred education contexts mature over time, and how this maturation is related to their beliefs about teaching and learning. This central goal led to the following main research questions:

1. What are the content and structure of medical educators' beliefs about teaching and learning?
2. What is the variety of medical educators' perspectives on being a teacher? How can this variety be clustered into educator phenotypes?
3. How are medical educators' beliefs about teaching and learning related to the awareness of their educational identity and mission?
4. To what extent do medical educators mature in their perspectives on being a teacher over time, and which factors contribute to this maturation?

In this chapter we will discuss our main findings, conjoin them and relate them to the current literature. We have explored educators' maturation from a holistic perspective. This means that we not only examined how they perceive their behaviours and competencies, but also how they perceive the educational context, their identity and mission as teachers, and what they believe about learning and teaching. This led to the two main lines of our research, which are: the beliefs of medical educators about the process of teaching and learning, and their perspectives on being a teacher. After discussing these two lines of research, we will discuss two themes that emerged from our research findings as particularly relevant: the role of the environment, and the role of mission. This culminates into a discussion on the maturation of educators. Finally we conclude this chapter describing the strengths and limitations of our research project; suggestions for future research; and specific recommendations for practice.

Beliefs about teaching and learning

Our exploration of medical educators' beliefs about teaching and learning led to a better understanding of the content and structure of the diverse beliefs, and resulted in a new framework, contextualised in the medical education context (see Chapter 2, Table 2.1). In Chapter 2 we discussed the changes required to adapt the original framework of Samuelowicz and Bain¹ to the medical education context. Here we will discuss the main results, and elaborate in more detail on the significance of our findings for learning-centred education.

We identified a new belief dimension which we labelled: ‘Creation of a conducive learning environment.’ While educators with a learning-centred belief orientation stressed its importance, and viewed it as a prerequisite for student learning, most educators with a teaching-centred belief orientation were unaware of this dimension. Educators with a teaching-centred belief orientation with learning-centred aspects (Orientation III, see Table 2.1) did emphasise its relevance, but for a different reason, namely to put students at ease. In this Orientation (III), the interaction between teacher and student is more reciprocal than in the other teaching-centred orientations. In contrast to the learning-centred orientations, the focus is primarily on the students as a group rather than as individuals, and on relating to the students in a positive way rather than on specifically facilitating the *learning* of the student.

We also were compelled to refine existing belief dimensions. One of these is the dimension ‘Nature of knowledge,’ which needed to be expanded from two to three beliefs. In addition to knowledge, this dimension also includes skills and attitudes relevant to the discipline. The original framework distinguished one teaching-centred belief and one learning-centred belief. In the new framework, the teaching-centred belief of knowledge as factual and as obtained from outside, split into two beliefs. We uncovered that educators in the teaching-centred belief orientation with learning-centred aspects (Orientation III), although viewing knowledge as coming from external sources, believe that they should explain how this ‘factual knowledge’ can be used in the realities of medical practice. Figure 6.1 visualises and summarises the relationship between teacher, student, content, and environment, as it emerges from the new framework, for two maximally contrasting belief orientations: teaching-centred Orientation I (Fig 6.1.A) and learning-centred Orientation VI (Fig 6.1.C), as well as for the teaching-centred with learning-centred aspects orientation: Orientation III (Fig 6.1.B).

By contextualising the framework in the medical education context, we gained a deeper and more detailed understanding of medical educators’ beliefs relevant to learning-centred education. This applies to most of the ‘cognitive’ dimensions (see Chapter 2, Table 2.1, Dimensions 1-6), but in particular to the ‘affective’ belief dimensions (Dimensions 7- 9). The cognitive belief dimensions of medical educators with learning-centred beliefs are *qualitatively* distinct from those with teaching-centred beliefs and can be summarised as focusing on conceptual change in students, with the aim of developing medical expertise, i.e., mastering a physician’s knowledge, skills, and attitude.

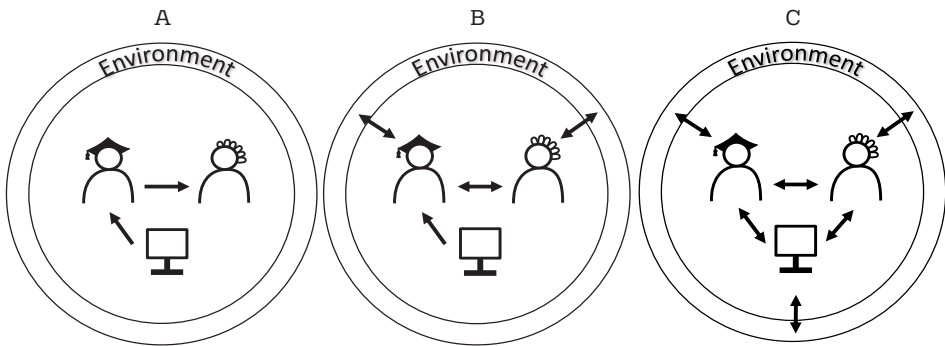


Figure 6.1. The relationship between teacher, student, content, and the learning environment for three different belief orientations: teaching-centred (A), teaching-centred with learning-centred aspects (B), and learning-centred (C).

The two affective dimensions which Samuelowicz and Bain¹ included in their framework each distinguish whether educators are aware or unaware of these dimensions, but do not elucidate the content of this awareness. The new framework not only adds one new, affective, dimension, but also gives a differentiated content to the three affective belief dimensions. One of these dimensions (Dimension 8) relates to the professional development of the student, and includes competencies relevant to future physicians such as communication and collaboration, as well as issues related to professional identity formation. This belief dimension recognises that there is more to being a physician than just mastering a physician's knowledge, skills, and attitude. A second dimension (Dimension 9) relates to the student's personal motivation for learning, thus acknowledging that motivation has a significant impact on the process of learning and development. A third (Dimension 7) relates to the influence of the learning environment, emphasising that learning does not take place in isolation but is importantly influenced by context, including the (physical) setting and interactions with peers and teachers.

Since educators with learning-centred beliefs emphasise these affective dimensions, while educators with teaching-centred beliefs are unaware of them, we can conclude that educators with learning-centred beliefs not only have *qualitatively different* beliefs, but also more *comprehensive* beliefs about the process of teaching and learning.

This outcome is significant as it broadens our understanding of beliefs about teaching and learning out into a more holistic view that incorporates not only cognitive dimensions, but also affective dimensions relevant to student learning and development. It also confirms that specific attention to affective dimensions can positively and powerfully influence the outcomes of learning-centred education,² and thus has implications for faculty development, as will be described in more detail under the Practical implications section.

Our finding that even in medical schools with long standing learning-centred curricula, a significant proportion of the most experienced and engaged educators still held teaching-centred beliefs about teaching and learning suggests that individual development towards learning-centred beliefs is neither easy nor self-evident. We suppose that at least two factors play a role here. First, as the framework clearly illustrates, beliefs about teaching and learning do not just concern a single belief but a whole system of interrelated beliefs, which, in line with Samuelowicz and Bain,¹ we refer to as a ‘belief orientation.’ Indeed, we have shown that in the development from a teaching-centred to a learning-centred belief orientation, many beliefs (eight out of the nine) would be required to change. A second factor that may play a role is that, even when the formal educational context of a medical school may embrace learning-centred education, the implicit educational culture of the organisation may still favour teaching-centred beliefs. This may have a constraining influence on medical educators’ beliefs about teaching and learning, as some studies confirmed.^{3,4} These findings are relevant for two reasons: the persistence of teaching-centred beliefs underscores the importance of our research into why educators hold certain beliefs. Second, they suggest that the environment, i.e. the educational context including the informal teaching culture, may be an important factor influencing the beliefs of educators, which will be further discussed below. From a practical point of view, this implies that faculty development (FD) should pay explicit attention to beliefs about teaching and learning, as confirmed by others.^{1,5-10} So far, FD programmes still generally focus on the development of competencies, in particular the acquisition of pedagogical knowledge and skills,¹¹⁻¹³ for example by giving workshops which train educators how to teach small groups, or how to develop a teaching module. In addition, FD need to pay attention to the educational context. This will be further discussed under the Practical implications section.

Perspectives on being a teacher

In our search for factors influencing educators’ beliefs about teaching and learning we explored their perspectives on being a teacher (Chapter 3), for which the model of Korthagen (see Chapter 1, Figure 1.2) proved to be a useful model.

We used the levels of the Korthagen model to cluster the participants qualitatively into educator phenotypes. The levels that individual participants emphasised as most relevant were leading for the clustering.

The clustering process generated four educator phenotypes, which are hierarchically ordered by inclusiveness. This means that phenotype B includes the levels of phenotype A; phenotype C includes the levels of phenotype B; phenotype D includes the levels of phenotype C, but not vice versa. The Critic phenotype (A) represents the educators who emphasise the environment, focusing in particular on adverse environmental circumstances. The Practitioner phenotype (B) represents the educators who are aware of the environment and focus on their educational behaviours and competencies. The Role model phenotype (C) represents the educators who extend their awareness to include their educational identity. In the Inspirer phenotype (D) the educators are aware of the levels of the other phenotypes and focus on their educational mission.

The educator phenotype model thus takes into account the educational environment or context. While all four phenotypes are aware of the importance of the educational context, the Critic phenotype specifically focuses on adverse contextual aspects. This can be interpreted as an affirmation that education sometimes receives less priority within academia than the other academic core tasks of patient care and research.^{12,14,15} We assume that this phenotype may not be a permanent end-stage phenotype nor a 'starting' phenotype. Our findings suggest that the perspectives on being a teacher may be temporarily distorted due to dissatisfaction with professional or personal circumstances.

Figure 6.2 illustrates how the four phenotypes are hierarchically ordered, including their focus and awareness of the different levels related to perspectives on being a teacher.

We also discovered that the perspectives of the Role model and Inspirer phenotypes consist of predominantly affective aspects. For example, as their mission, they articulate the desire to bring out the best in the student, or as their identity, to be someone who enjoys teaching. This confirms the conclusions of two review studies which emphasise the importance of affective personal attributes for clinical teachers.^{16,17} For faculty initiatives this finding implies that, in order to become aware of one's educational identity and mission, it is helpful to accommodate these affective aspects (see under Practical implications).

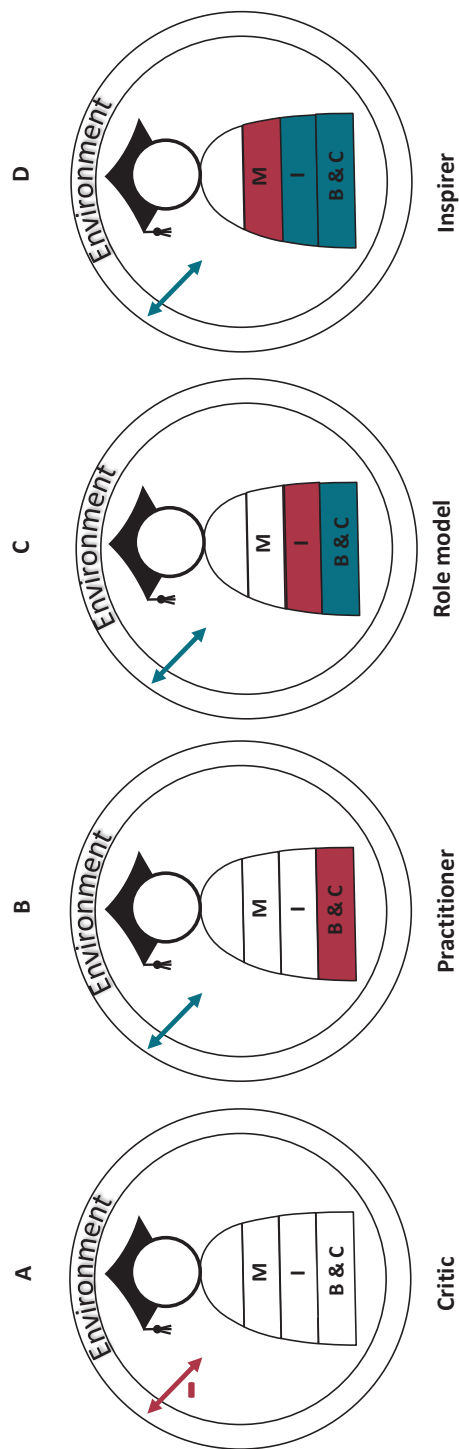


Figure 6.2. The four educator phenotypes.

B&C = educational Behaviours & Competencies; I = educational Identity; M = educational Mission; Blue = area of awareness; Red = phenotype's main focus.

We will describe under separate headings the role of the environment and mission, which emerged so prominently from our findings.

The environment

The environment plays a role in both our lines of research. Our study on educators' beliefs about teaching and learning shows that educators with learning-centred beliefs indicate that they feel responsible for creating a safe, stimulating, conducive learning environment for student learning. This means that the student's environment is included as part of the educators' belief system about student learning and development.

The environment also appears to play a major role in educators' perspectives on being a teacher: all educators were aware of the importance of the environment for their functioning as teachers. We discovered that it is not only the objective, observable environment, but particularly the educators' *perceived* environment which influences their functioning, and in which affective aspects are included. While, in line with other studies,^{12,18} in the Critic phenotype the environment is mainly experienced as restrictive, educators in the other phenotypes have a more varied experience of the environment. They also acknowledge negative elements in the environment, but additionally emphasise positive elements, for example how recognition of the importance of teaching by the administration can contribute to their functioning as teachers. Thus, similar to the first line of research, the environment is also incorporated into educators' perspectives on being a teacher. This has theoretical significance because it sheds a different light on the educational environment: not only as an objective reality situated outside of the person, but also as a personally constructed or perceived reality. It also has practical significance for faculty development, which we will discuss further under the Practical implications section.

Mission

One of our most prominent findings with regard to perspectives on being a teacher is the importance of being aware of one's personal mission as a teacher. A mission can be defined as the source of one's deepest motivations that drive and guide an educator in their teaching. One important characteristic of a mission is that it is not focused on the self, but on the other, and on desiring to contribute to a larger community and its contexts. The notion of educational mission has not received much attention in the medical education literature. While medical educators' motivation to teach has been the subject of multiple studies, particularly within the 'professional identity' literature,^{12,14,19-21} the concept of motivation is not

identical to the concept of mission. Two important differences with mission, are, first, that motivation can refer to short-term, temporary goals, and second, that motivation does not necessarily have to be focused on others.

In our studies (Chapters 3, 4, and 5), we discovered that in the concept of mission, affective aspects predominate, and that *meaningful contact with students* is an important theme. Educators with a personal educational mission, who desire to contribute to the student's learning and development, describe their mission as a teacher for example as '*caring about the students, that they learn something, that's the first thing.*' Other studies confirm the relevance of meaningful contact with students, and relate this to educators' motivation to become and remain involved in education.²²⁻²⁶

Moreover, we discovered that the educational mission of medical educators, all involved in patient care, is fuelled by their mission as a physician: they aspire to contribute to the well-being of their patients and/or healthcare in a broader sense (see Chapters 3 and 5). In line with their mission as a physician, they have become aware of their mission as a teacher: they envision that, through their involvement with the next generation of physicians, the patients of these future physicians will benefit. It is this awareness that gives great enjoyment and satisfaction to being a teacher. For example, one educator in the Inspirer phenotype commented: '*I enjoy teaching because I get very energised, I love students and I think they are interesting, and I love what I do (as a physician), so I kind of like to get them to love what it is (being a physician).*' That educators perceive being able to contribute to the next generation of physicians as deeply rewarding and satisfying has been confirmed elsewhere.^{20,22,26-28} The enjoyment and satisfaction connected with teaching can thus be seen as the fruit of experiencing that one's efforts are devoted to what one is deeply motivated for, even in adverse circumstances. Enjoyment and satisfaction, in turn, will maintain and strengthen the educator's motivation and commitment.²⁰ Thus, in addition to the view that satisfaction is a foundational motivator for medical educators,²⁰ we consider mission awareness as a foundational source of motivation. Hence, the pronouncement of the famous Professor of Surgery John Benjamin Murphy (1857–1916), which adorned the largest lecture hall in the LUMC for decades, remains valid: 'The patient is the centre of the medical universe around which all our works revolve and towards which all our efforts tend.' Our findings add a new dimension to this statement: not only is it directly applicable to patient care but, as our results show, also to medical education.

From our studies, three other important findings in relation to mission awareness emerged. First, educators who are aware of their educational mission (in the Inspirer phenotype) have the most comprehensive perspective on being a teacher, as demonstrated by the hierarchical ordering of the educator phenotypes (see Figure 6.2). This means that all educators who are aware of their deepest motivations as teachers are also aware of the importance of the relevant competencies (i.e. knowledge, skills and attitude) as a teacher, and of their identity as a teacher. This finding contributes to the discourse on the development of identity as a teacher, in which the relevance of explicating one's personal educational mission often remains implicit. Significantly, awareness of one's mission as a teacher can reinforce and nurture one's identity as a teacher. Thus we suggest that, next to paying attention to *who* one wants to be as a teacher, focusing on the teacher themselves, the question of *why* one wants to be an educator, what one aims to contribute, is at least as important in faculty development.

Second, a mission awareness is related to an educator's beliefs about teaching and learning. Here the relationship between the two lines of research becomes clear. In our study, educators who are aware of their mission all have a learning-centred belief orientation. This means that they have the most comprehensive beliefs about the process of teaching and learning in which both cognitive and affective dimensions are incorporated. We assume that awareness of their mission as teachers gave them a high level of motivation to become educators who encourage student learning, to actively seek opportunities as to how this can be achieved, and to take action. Thus, supporting educators to become aware of their mission as teachers appears to be a key to promoting learning-centred beliefs.

Third, a mission awareness appears to be helpful to maintain and reinforce a learning-centred belief orientation: educators who are aware of their mission as a teacher seem to be more resilient to a non-supportive culture in which education is given little priority. This is significant since recent medical education studies emphasise the major impact which the environment can have when medical educators experience a lack of support in the workplace.^{12,15,18,27,29-31} When mission awareness is not well developed, the choices which an educator makes seem to be primarily based on what the environment expects or on rewards, which is in line with the conclusions of a study on life mission and adult learning.³² Another recent meta-analysis³³ confirms our findings and concludes that when people experience their work as deeply meaningful, in particular when it is focused on

others, this not only contributes to psychological well-being, but can also protect people from the hardships of their work, even in extreme contexts.

We conclude that mission awareness is highly relevant to functioning as a teacher, as a mission guides adult lifelong learning and development. Almost a century ago, one of the founders of adult education in the USA indicated that adults learn in order to give meaning to life.³⁴ More recently, a study confirmed that mission awareness has a strong impact on adult learning and suggested that a mission awareness directs both the level of motivation to learn and the learning choices that the individual makes.³² So, being aware of one's mission as a teacher gives meaning to an educator's professional life and can fuel motivation for further development and maturation as a teacher.

Maturation of medical educators

In our 10-year follow-up study (Chapter 5), we explored how educators mature in their perspectives on being a teacher. We concluded that perspectives on being a teacher can develop over time, but that maturation is not self-evident and happened in only a minority of the educators. In other words, educators' perspectives on being a teacher appear as relatively stable and do not change easily. We discovered that maturation proceeds through 'developmental stages' and follows the order of the phenotypes from less to more inclusive. Our finding of developmental stages corresponds with an 'individualist' view-point on how educators mature, which situates maturation within the individual^{14,35} and pays attention to affective outcomes such as psychological well-being.³⁶ In addition, the least inclusive, 'Critic' phenotype, which highlights the influence of the educational context on the maturation of educators, fits a 'social-relational' view-point on maturation. In this view-point, maturation is perceived as fluid and constructed, negotiated through social interaction in cultural contexts.^{14,35} Indeed, our findings suggest that the Critic phenotype may be a more transient phenotype. An educator may temporarily lose sight of their competencies, or identity or mission as a teacher, when these become suppressed by the experience of unfavourable external circumstances. These circumstances may be work-related, such as a lack of appreciation for education within the organisational culture, particularly by peers, department heads or the higher education administration. Furthermore, we discovered that, in retrospect, difficult private circumstances may also play a role. Reasons that we have only been able to determine these private circumstances as influencing factors in hindsight may be that an educator is not aware of the influence of the private circumstances on their professional functioning, or does not yet want to disclose them while they are happening.

Thus, our finding that maturation occurs according to the order of Practitioner *via* Role model to Inspirer phenotype, suggests that educators focus on their competencies first before becoming aware of their identity as teachers. In other words, feeling competent as a teacher appears to be a prerequisite for shifting focus to one's identity as a teacher, as a review article in the context of higher education confirms.²⁴ Interestingly, the same order in developmental stages has been described in the development of medical students as physicians-in-training.³⁵ As the student progresses, the development expands from an initial focus on the 'knowing and doing,' i.e. the core *competencies* of a physician-in-training, to 'being,' i.e. the *identity* as a physician. Similarly, our findings show that educators focus on their identity first before becoming aware of their mission as teachers. We assume that only when an educator has gained sufficient confidence in their own identity as a teacher, and is no longer concerned with positioning themselves as a teacher, can they shift their focus from themselves to the students' learning and development, and mature towards a clear understanding of *why* they want to be a teacher. A similar shift in focus from self towards others, the learners, was reported in a study on the development of mentors in medical education.³⁷ Interestingly, the 'why' question also appeared in a recent publication on leadership development in medical education.³⁸ Although the term 'mission' was not used, the study emphasised the relevance of 'finding your purpose and passion' as an educator in the context of developing as a leader.

Because the phenotypes are hierarchically ordered from less to more inclusive this means that the perspective on being a teacher is extended from an educator's awareness of their competencies (the Practitioner phenotype) to, successively, an awareness of their identity (the Role model phenotype) and mission (the Inspirer phenotype) as a teacher. In other words, maturation can be perceived as an expansion in perspective, in the sense of a growing awareness towards a more inclusive, more holistic perspective on being a teacher. This view on development is consistent with the theory of transformative learning, a theory of how adults learn by making meaning of their experiences, developed by Mezirow.³⁹ According to this theory, learning is a transformation of perspective, where the new perspective is more inclusive, in the sense of being open to alternative viewpoints, and guides future action.^{39,40}

At each step of the educational development process, maturation appears to occur primarily in the setting of the everyday workplace. This finding is in agreement with Jippes et al.⁴¹ who concluded that informal learning in the workplace has more impact on the development of clinical educators than formal faculty development interventions.

Moreover, and strikingly, educators spontaneously referred to their role as physicians at each step when asked what had influenced their development as a teacher. Their primary motivation to be a competent teacher (Practitioner phenotype), to identify with the educational role (Role model phenotype), or to contribute to student learning (Inspirer phenotype) lay in their motivation as practising physicians to contribute to patient care. This is consistent with the results described in Chapter 3 in which we explored educators' perspectives on being a teacher. While we asked about what makes a good teacher, educators not only indicated aspects related to educational competencies, identity, and mission, but also aspects related to competencies, identity, and mission as a physician.

Thus, while it has often been reported that development as an educator is *constrained* by the role as a physician,^{14,15,27,29-31,42} we conclude that the role as a physician is also *a source of motivation* to develop as a teacher. A recent study on the maturation of physician-mentors also concluded that the role of mentor and clinician can mutually validate and reinforce each other.³⁷

Finally, factors perceived to be instrumental in maturation could be categorised under *intrapersonal aspects* and *meaningful experiences*. Intrapersonal aspects refer to factors educators experienced as part of their 'inner self.' The relevance of the meaningful experiences is not so much the experience itself, but rather the meaning that educators assigned to the experience. The extent to which the two categories play a role, as well as which factors are seen as contributing to maturation, vary by phenotype. Thus, the educator who matured to the Practitioner phenotype attributed his maturation primarily to *meaningful experiences*, such as tasks and activities which had helped him to develop more effective competencies as a teacher. The educators who matured to the Role model phenotype attributed their maturation primarily to *intrapersonal aspects*, such as being reflective on the 'self' and on the teacher role, which had helped them to become more self-aware of their educational identity. The educators who matured to the Inspirer phenotype attributed and related both categories of factors to their maturation. For example, they indicated that they had become aware of the importance of learning to remain silent in order to listen more closely to what a patient or student had to say. They linked this *intrapersonal aspect* to *meaningful experiences*, such as encounters with indigent patients. The combination of these factors had helped shift their focus from themselves to their patients and their students, and had been influential in the development of their mission to contribute to student learning. They articulated, for example, the mission to help students become aware of the importance of philosophical, spiritual, ethical or societal medical issues. This finding is consistent

with the theory of transformative learning, which states that adult learning is triggered by ‘disorienting dilemmas’ (comparable to *meaningful experiences*), coupled with ‘critical reflection’ (comparable to *intrapersonal aspects*).³⁹

Interestingly, the Critic phenotype educators who initially focused on the adverse educational environment, also attributed their maturation when shifting from the Critic phenotype to both categories of factors. They recognised that, next to a perceived positive change in the circumstances (categorised as *meaningful experience*), their personal attitude to these circumstances (categorised as *intrapersonal aspect*) had changed. For example, they reflected on an improved organisational structure or the arrival of a new department head, as well as acknowledged that they had learned to come to terms with the perceived restrictions of the educational context. This means that a change in the educational environment alone will not be enough to help educators shift from the Critic phenotype. Congruent with our conclusions under the ‘Environment’ section, it is the *perception* of and reflection on the environment, next to the reflection on inner processes, which will influence maturation.

These conclusions have important implications for faculty development, which we will describe below.

Strengths, limitations, and suggestions for future research

Next to study-specific methodological considerations, which have been described in the previous chapters (Chapters 2 to 5), we will address general strengths and limitations of our research here, and also include suggestions for future research.

One strength of the research is the methodological rigour used. In each study, multiple researchers independently analysed the transcripts and discussed their interpretation among themselves, and then within the research team. The team members come from diverse backgrounds, both medical and non-medical. This approach ensured reflexivity to identify and address any personal beliefs or biases that may have influenced the research process, and intersubjectivity to reach agreement on the interpretation of the findings through dialogue and the sharing of meanings. Additionally, the data collection for both the baseline studies and the follow-up study were conducted by the same interviewer, which eliminated interpersonal variations and enabled a deeper insight into the person of the interviewees. Executing the interviews by a single rather than more than one interviewer creates a safe environment for the interviewee. To counteract the limitations of having a single interviewer, the research team carefully

prepared and discussed the interview protocols with experts in medical education research outside the team. In addition, we received and used feedback from pilot interviewees who did not participate in the main study. Furthermore, the provision of thick descriptions of quotes in each study enhanced the rigour of the research.

Another strength is the design of the research covering a time span of 10-year follow-up period. Because maturation takes time and studies with such a long interval in their design are rare, the follow-up study yielded valuable data to gain insight into the long-term maturation of medical educators' beliefs and perspectives, which might not have emerged in a shorter research period. Because the number of interviews per participant is limited to two (plus a third interview with those who showed maturity), we cannot exclude that a longitudinal design of a more than 2-point study could have provided additional insights into the maturation trajectories of individual physician-educators.

The way we selected the participants has implications for the interpretation of our findings. Since participants were recruited from two medical schools from two different continents, a strength is that our results are not limited to one national educational culture and organisation. We selected medical schools that were carrying out innovations towards learning-centred education during a similar time period, i.e. about a decade prior to the initial interviews. It is conceivable that the selection of schools with a longer or shorter tradition of learning-centred education would have resulted in a different distribution of belief orientations. We selected medical educators with a variety of educational roles: both educators involved in educational administration and educators half of whom taught clinical topics while the others taught basic science topics, which adds to the generalisability of our conclusions. We also deliberately chose to select participants who are known for their exemplary teaching. It is important to note that we did not aim to generalise across all educators, but that we were particularly interested in the beliefs of the most committed, exemplary, and therefore most influential educators. We assume that the selection of involved and committed teachers contributed significantly to the fact that almost all participants were still available for the follow-up study after ten years. However, this selection may have limited the variation in both belief orientations (Chapter 2) and educator phenotypes (Chapter 3). Nonetheless, as discussed in Chapter 2, all six belief orientations from the original framework of Samuelowicz & Bain¹ were represented. Likewise, all the levels from Korthagen's model, which were decisive for the development of the phenotypes, were represented in the initial study (see Chapter 3). The sampling may also have resulted in a limited number of

educators demonstrating maturation (Chapter 5), as some of them already had the most inclusive educator phenotype at their first interview. Therefore, it would be useful to repeat this research with younger and with less experienced educators; such a study would be expected to yield more participants with growth potential regarding their educator phenotypes. It is difficult to predict how the distribution of the various belief orientations of such a cohort would turn out. Lack of teaching experience may result in more teaching-centred beliefs, since in some studies teaching experience is related to learning-centred beliefs.^{43,44} At the same time, being educated in more current, up-to-date, learning-centred, curricula, with more emphasis on self-reflection, may also result in more learning-centred beliefs. Finally, we cannot rule out that the finding that educators did not reverse to less inclusive phenotypes in our follow-up study (Chapter 5) is related to our selection of exemplary educators. A study with less motivated or less involved educators might generate different results. The selection of educators who taught in a preclinical setting limits drawing conclusions from our findings for other contexts, in particular with regard to the beliefs about teaching and learning (Chapter 2). Indeed, a postgraduate setting might uncover more learning-centred belief orientations, consistent with the findings of Samuelowicz and Bain.^{1,45} On the other hand, we assume that the educator phenotype model will be valid in other educational contexts; firstly because the perspectives on being a teacher, once acquired, are deeply integrated into the person of educator; secondly because in developing the phenotype model we used a model from a different context: Korthagen's model stems from the context of teacher education. Similarly, we expect that the alignment between awareness of educational mission and learning-centred beliefs (see Chapter 4), both deeply rooted, will not be limited to one particular educational context. A future study carried out in other educational contexts could provide further insights.

Other suggestions for future research would be, first, to explore the relationship between educators' beliefs about teaching and learning and their actual behaviours when teaching, through combining interview and observation of individual medical educators. The relevance of our research on beliefs about teaching and learning lies in the supposed relationship between beliefs and behaviours. While a number of studies show a strong relationship between beliefs and behaviours,⁴⁶⁻⁴⁸ this is challenged by others.⁴⁹⁻⁵¹ Moreover, all of these studies have been conducted outside the context of medical education. Second, it would be enlightening to explore the development of educators' beliefs about teaching and learning, similar to our follow-up study of educators' maturation in perspectives on being a teacher (Chapter 5). Such research could provide further insights into whether educators' beliefs become more learning-centred over time,

whether they are reversible or unidirectional, and which factors they perceive to be of influence to their development. The new framework as presented in Chapter 2 (Table 2.1) could serve as a useful instrument for such a follow-up study. Moreover, such a study could confirm whether the development towards more learning-centred beliefs influences the maturation towards more inclusive educator phenotypes, and vice versa.

Practical implications

To support and facilitate student learning in a learning-centred educational context, we propose a holistic approach to the development of medical educators based on our research. This means that faculty development (FD) initiatives need to be diverse, and not just focus on the development of competencies: attention should also be paid to beliefs about teaching and learning,^{1,5-10} to awareness of an educational identity,^{19,21,52} and in particular to awareness of a personal educational mission, of which the latter has so far received little attention in the literature. In addition, they should include the medical educational context.¹³⁻¹⁵

Before going into detail about how FD can address this development, we will first discuss some general recommendations for FD based on the results of our research.

General recommendations

First, FD can best be embedded in the workplace, thus extending over time, for example through communities of practice,^{53,54} as educators indicate that their maturation is most influenced by informal learning opportunities (Chapter 5). Second, since medical educators explicitly link their maturation as an educator to their role as a physician (Chapter 5), the role of physician should be included in FD interventions. This is in line with Steinert's⁵⁵ advice not to focus exclusively on the educational role in FD, but to target all roles that medical educators play. Third, involving practising physicians as faculty developers and mentors may be valuable in FD (Chapter 5). This recommendation is also supported by our finding in the initial study (Chapter 3) that the Inspirer phenotype consisted exclusively of Stanford University School of Medicine (SUSM) educators. As discussed in Chapter 3, one explanation for this may be the influence of the esteemed and influential faculty developer responsible for the professional development programmes at SUSM, who turned out to be a practising physician.

Finally, we recommend two activities to support educator maturation at all stages of development. The first is the intrapersonal activity of *reflection*, the second is the external activity of *meaningful relationships with others*. Affective aspects play a major role in the learning-centred belief orientations, and also predominate in the articulation of an educational identity and mission. These affective aspects can be eminently addressed in meaningful relationships with colleagues and students. In addition, meaningful relationships can serve as an important trigger for reflection on the ‘self’ and on the process of teaching and learning. One way to embed the relationships with colleagues is through personal networks or communities of practice in the workplace, or through more formal longitudinal programmes with a group of educators who know each other,¹⁵ which can create a sense of belonging. Coaching or mentoring students can provide useful feedback on one’s effectiveness as a teacher, increase understanding in the process of student learning, and provide motivation to remain involved in teaching.

Recommendations per developmental stage

The development of *competencies* of educators can be supported by offering varied educational tasks and responsibilities, tailored to further the development of the individual educator. Activities such as mentoring, instruction and practice by experienced and respected faculty developers may also prove helpful, as are encounters and (in)formal discussions with like-minded peers about the ‘What and how’ of an effective educator. In addition, feedback from students can help to grow in educational competencies.

To support the development from teaching-centred to learning-centred *beliefs*, reflection on the teaching and learning process has been suggested.^{3,5,56} The new beliefs framework (Chapter 2, Table 2.1) can assist in this reflection, helping educators become aware of their beliefs about teaching, learning, and knowledge by making them more explicit. The newly uncovered extensions to the framework are particularly relevant to the context of learning-centred medical education. Based on our findings, we recommend helping educators reflect on which knowledge is relevant to be acquired, and on the importance of creating a positive learning environment, supporting students’ professional development, and fostering students’ intrinsic motivation. One way to support this reflection process is through interaction with individual students.

To promote the growth in awareness of one’s educational *identity*, initiatives that encourage reflection on the ‘self’ and on the teacher role can be helpful. The usefulness of reflection has been described in other studies on educational

identity formation.^{12,15,19,57} Although the tasks and activities may be similar to those that support growth in competencies, their goal here is to encourage reflection on ‘Who’ one wants to be as an educator. In addition, personal contact with students, contacts with peers and faculty developers with an articulated awareness of their educational identity may contribute to an educator’s growth in awareness of their educational identity.

Encouraging educators to reflect on ‘Why’ they want to be a medical educator and contribute to medical education may nurture a deeper awareness of one’s educational *mission*. Because a hallmark of an educational mission is a focus on the other, a growth in mission awareness requires a shift in focus from one’s own teaching role to the student learning role and their development. This can be facilitated through meaningful encounters with students, for example by mentoring individual students over a longer period of time. In addition, discussing one’s personal patient-care mission with fellow physician-educators and relating it to one’s deeper motives for teaching can support the awakening and maintenance of an educational mission, even when the organisational culture is not supportive of the maturation of educators. Faculty developers who are fully in contact with their own educational mission and put this into practice are helpful and influential as role models.

Finally, FD should pay explicit attention to the educational *environment* and educators’ perception of this environment to support educators’ maturation. Examples of how the workplace can be beneficial include a supportive leadership at all levels of the organisation, rewarding teaching in career paths, and addressing conflicts created by competing tasks. Offering opportunities that foster the development of educators’ competencies, identity, and mission as teachers can be helpful to come to terms with a perceived adverse educational environment. Lastly, we need to recognise that adverse private circumstances can also play a restrictive role in educators’ maturation, but are beyond the influence of faculty developers or administrators.

In conclusion

We conclude that, in the context of learning-centred education, maturation of medical educators’ perspectives on being a teacher can take place but is not self-evident. Maturation can be influenced and seems to proceed through developmental stages, from educational competencies *via* educational identity to educational mission awareness. At every developmental stage, the role as physician appears to be a source of motivation to develop as a medical teacher. The process of maturation is influenced by educators’ perception of

and reflection on both external factors and internal processes; these two factors are interrelated. Perspectives on being a teacher are related to beliefs about teaching and learning: educators with the most mature perspectives on being a teacher have learning-centred beliefs about teaching and learning. In their perspectives, affective aspects play an explicit role. Educators incorporate their perception of the environment into their perspectives on being a teacher and their beliefs about teaching and learning; thus, next to the observable educational environment, the way educators experience the educational environment is at least as important. Being aware of one's personal mission as a teacher can reinforce, nurture and support an educator's identity. Moreover, it gives meaning to an educator's professional life and can fuel motivation for further development, life-long learning, and maturation as a teacher. This is an important explanation as to why educators who are aware of their educational mission have the most elaborate, learning-centred, beliefs about teaching and learning. Thus, supporting educators to become aware of and develop their mission as teachers may not only help them make choices independently of what the environment expects, but is also essential to foster learning-centred beliefs. This dissertation offers a deeper understanding of medical educators' maturation, the factors influencing maturation, and its relationship with beliefs about teaching and learning, thereby contributing to the quality of learning of next generation healthcare professionals.

REFERENCES

1. Samuelowicz K, Bain JD. Revisiting Academics' Beliefs about Teaching and Learning. *High Educ.* 2001;41(3):299-325.
2. Kusurkar RA, Croiset G, Mann KV, Custers E, Ten Cate O. Have motivation theories guided the development and reform of medical education curricula? A review of the literature. *Acad Med.* 2012;87(6):735-743.
3. Calkins S, Johnson N, Light G. Changing conceptions of teaching in medical faculty. *Med Teach.* 2012;34(11):902-906.
4. Jacobs JC, van Luijk SJ, van der Vleuten CP, Kusurkar RA, Croiset G, Scheele F. Teachers' conceptions of learning and teaching in student-centred medical curricula: the impact of context and personal characteristics. *BMC Med Educ.* 2016;16(1):1-11.
5. Jacobs JC, van Luijk SJ, Galindo-Garre F, et al. Five teacher profiles in student-centred curricula based on their conceptions of learning and teaching. *BMC Med Educ.* 2014;14(1):1-10.
6. Richardson V. The role of attitudes and beliefs in learning to teach. In: Sikula J, ed. *Handbook of research on teacher education.* MacMillan; 1996:102-119.
7. Pratt DD. *Five perspectives on teaching in adult and higher education.* Krieger; 1998.
8. Hativa N, Barak R, Simhi E. Exemplary university teachers: Knowledge and beliefs regarding effective teaching dimensions and strategies. *J High Educ.* 2001;72(6):699-729.
9. Taylor EW, Tisdell EJ, Gusic ME. Teaching beliefs of medical educators: perspectives on clinical teaching in pediatrics. *Med Teach.* 2007;29(4):371-376.
10. Taylor EW. Attending graduate school in adult education and the impact on teaching beliefs: A longitudinal study. *J Transform Educ.* 2003;1(4):349-367.
11. Masunaga H, Hitchcock MA. Aligning teaching practices with an understanding of quality teaching: A faculty development agenda. *Med Teach.* 2011;33(2):124-130.
12. Steinert Y, O'Sullivan PS, Irby DM. Strengthening Teachers' Professional Identities Through Faculty Development. *Acad Med.* 2019;94(7):963-968.
13. Steinert Y, Mann K, Anderson B, et al. A systematic review of faculty development initiatives designed to enhance teaching effectiveness: A 10-year update: BEME Guide No. 40. *Med Teach.* 2016;38(8):769-786.
14. Cantillon P, Dornan T, De Grave W. Becoming a clinical teacher: identity formation in context. *Acad Med.* 2019;94(10):1610-1618.
15. van Lankveld T, Thamphy H, Cantillon P, Horsburgh J, Kluijtmans M. Supporting a teacher identity in health professions education: AMEE Guide No. 132. *Med Teach.* 2021;43(2):124-136.
16. Jochemsen-van der Leeuw HR, van Dijk N, van Etten-Jamaludin FS, Wieringa-de Waard M. The attributes of the clinical trainer as a role model: a systematic review. *Acad Med.* 2013;88(1):26-34.
17. Passi V, Johnson S, Peile E, Wright S, Hafferty F, Johnson N. Doctor role modelling in medical education: BEME Guide No. 27. *Med Teach.* 2013;35(9):e1422-e1436.
18. Jauregui J, O'Sullivan P, Kalishman S, Nishimura H, Robins L. Remooring: A qualitative focus group exploration of how educators maintain identity in a sea of competing demands. *Acad Med.* 2019;94(1):122-128.

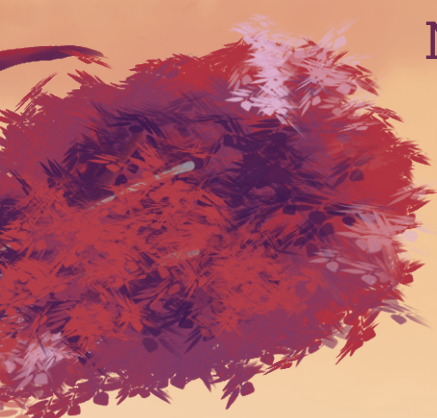
19. Lieff S, Baker L, Mori B, Egan-Lee E, Chin K, Reeves S. Who am I? Key influences on the formation of academic identity within a faculty development program. *Med Teach*. 2012;34(3):e208-e215.
20. O'Sullivan PS, Irby DM. What motivates occasional faculty developers to lead faculty development workshops? A qualitative study. *Acad Med*. 2015;90(11):1536-1540.
21. Browne J, Webb K, Bullock A. Making the leap to medical education: a qualitative study of medical educators' experiences. *Med Educ*. 2018;52(2):216-226.
22. Steinert Y, Macdonald ME. Why physicians teach: giving back by paying it forward. *Med Educ*. 2015;49(8):773-782.
23. Sheu L, Charondo LB, O'Sullivan PS. Faculty motivations for leading clinical clerkship electives: A qualitative study. *Med Teach*. 2022;44(10):1109-1115.
24. van Lankveld T, Schoonenboom J, Volman M, Croiset G, Beishuizen J. Developing a teacher identity in the university context: A systematic review of the literature. *High Educ Res Dev*. 2017;36(2):325-342.
25. Soemantri D, Findyartini A, Greviana N, et al. Deconstructing the professional identity formation of basic science teachers in medical education. *Adv Health Sci Educ Theory Pract*. 2023;28(1):169-180. doi: 10.1007/s10459-022-10150-6
26. Lochner L, Wieser H, Mischo-Kelling M. A qualitative study of the intrinsic motivation of physicians and other health professionals to teach. *Int J Med Educ*. 2012;3:209-215.
27. Hu WC, Thistlethwaite JE, Weller J, Gallego G, Monteith J, McColl GJ. 'It was serendipity': a qualitative study of academic careers in medical education. *Med Educ*. 2015;49(11):1124-1136.
28. Hanson ER, Gantwerker EA, Chang DA, Nagpal AS. To teach or not to teach? Assessing medical school faculty motivation to teach in the era of curriculum reform. *BMC Med Educ*. 2022;22(1):1-10.
29. Sabel E, Archer J, Educators ECWGatAoM. "Medical education is the ugly duckling of the medical world" and other challenges to medical educators' identity construction: a qualitative study. *Acad Med*. 2014;89(11):1474-1480.
30. van Lankveld T, Schoonenboom J, Kusurkar R, Volman M, Beishuizen J, Croiset G. Integrating the teaching role into one's identity: a qualitative study of beginning undergraduate medical teachers. *Adv Health Sci Educ Theory Pract*. 2017;22(3):601-622.
31. Kumar K, Roberts C, Thistlethwaite J. Entering and navigating academic medicine: academic clinician-educators' experiences. *Med Educ*. 2011;45(5):497-503.
32. Kroth M, Boverie P. Life mission and adult learning. *Adult Educ Q*. 2000;50(2):134-149.
33. Dobrow SR, Weisman H, Heller D, Tosti-Kharas J. Calling and the good life: a meta-analysis and theoretical extension. *Adm Sci Q*. 2023;0(0). doi: 10.1177/00018392231159641
34. Lindeman E. *The meaning of adult education*. New Republic, Incorporated; 1926.
35. Jarvis-Selinger S, Pratt DD, Regehr G. Competency is not enough: integrating identity formation into the medical education discourse. *Acad Med*. 2012;87(9):1185-1190.
36. Hogg MA, Terry DJ, White KM. A tale of two theories: A critical comparison of identity theory with social identity theory. *Soc Psychol Q*. 1995:255-269.
37. Kvernenes M, Valestrand EA, Schei E, Boudreau JD, Ofstad EH, Hokstad LM. Threshold concepts in group-based mentoring and implications for faculty development: A qualitative analysis. *Med Teach*. 2021;43(8):879-883. doi: 10.1080/0142159X.2021.1931077

38. McKimm J, Ramani S, Forrest K, et al. Adaptive leadership during challenging times: Effective strategies for health professions educators: AMEE Guide No. 148. *Med Teach*. 2023;45(2):128-138. doi: 10.1080/0142159X.2022.2057288
39. Mezirow J. *Transformative dimensions of adult learning*. ERIC; 1991.
40. Van Schalkwyk SC, Hafler J, Brewer TF, et al. Transformative learning as pedagogy for the health professions: a scoping review. *Med Educ*. 2019;53(6):547-558.
41. Jippes E, Steinert Y, Pols J, Achterkamp MC, van Engelen JM, Brand PL. How do social networks and faculty development courses affect clinical supervisors' adoption of a medical education innovation? An exploratory study. *Acad Med*. 2013;88(3):398-404.
42. MacDougall J, Drummond MJ. The development of medical teachers: an enquiry into the learning histories of 10 experienced medical teachers. *Med Educ*. 2005;39(12):1213-1220.
43. Bullough RV, Knowles JG, Crow NA. *Emerging as a Teacher*. Routledge; 1991.
44. Sadler I. The challenges for new academics in adopting student-centred approaches to teaching. *Stud High Educ*. 2012;37(6):731-745.
45. Samuelowicz K, Bain JD. Conceptions of teaching held by academic teachers. *High Educ*. 1992:93-111.
46. Kember D. A reconceptualisation of the research into university academics' conceptions of teaching. *Learn Instr*. 1997;7(3):255-275.
47. Martin E, Ramsden P. An expanding awareness: how lecturers change their understanding of teaching. In: Parer MS, ed. *Research and Development in Higher education*. HERDSA; 1992;15:148-155.
48. Martin E, Prosser M, Trigwell K, Ramsden P, Benjamin J. What university teachers teach and how they teach it. *Instr Sci*. 2000; 28: 387-412.
49. Kane R, Sandretto S, Heath C. Telling half the story: A critical review of research on the teaching beliefs and practices of university academics. *Rev Educ Res*. 2002;72(2):177-228.
50. Assen J, Meijers F, Otting H, Poell R. Explaining discrepancies between teacher beliefs and teacher interventions in a problem-based learning environment: A mixed methods study. *Teach Teach Educ*. 2016;60:12-23.
51. Fischer E, Hânze M. How do university teachers' values and beliefs affect their teaching? *Educ Psychol*. 2020;40(3):296-317.
52. Monrouxe LV. Identity, identification and medical education: why should we care? *Med Educ*. 2010;44(1):40-49.
53. O'Sullivan PS, Irby DM. Reframing research on faculty development. *Acad Med*. 2011;86(4):421-428.
54. de Carvalho-Filho MA, Tio RA, Steinert Y. Twelve tips for implementing a community of practice for faculty development. *Med Teach*. 2020;42(2):143-149.
55. Steinert Y. Faculty development: from rubies to oak. *Med Teach*. 2020;42(4):429-435.
56. Postareff L, Lindblom-Ylänne S, Nevgi A. The effect of pedagogical training on teaching in higher education. *Teach Teach Educ*. 2007;23(5):557-571.
57. Trautwein C. Academics' identity development as teachers. *Teach High Educ*. 2018;23(8):995-1010.

‘A small body of determined
spirits fired by an unquenchable
faith in their mission can alter
the course of history’

- *Mahatma Gandhi* -





Chapter 7

Summary

Nederlandse samenvatting

Dankwoord

Acknowledgements

List of publications

About the author

Over de auteur

SUMMARY

This research explores the beliefs medical educators hold on the *process of teaching and learning* as well as on *being a teacher*, within the context of learning-centred education. Gaining a deeper understanding of these beliefs is important to support the development of medical educators, and thus promote the quality of student learning.

In the general introduction (**Chapter 1**), we explain the concept of learning-centred education, more often referred to as student-centred education, which is the teaching approach adopted by most medical schools around the world. Characteristic of learning-centred education is the focus on the student and their learning, with the educator acting as a facilitator of the student's learning processes, rather than merely as a transmitter of factual knowledge. To properly fulfil this role, educators' perspectives or beliefs need to be taken into account, as beliefs are important drivers of behaviour. In the introductory chapter we provide an overview of current insights into beliefs about teaching and learning, explain why learning-centred beliefs are preferred in contemporary education, and why we need to develop a classification of medical educators' beliefs about teaching, learning, and knowledge in medical education context (research line 1). Previous studies have demonstrated that in medical schools with learning-centred curricula, a substantial number of medical educators still hold teaching-centred beliefs. This is problematic because it hinders the effective implementation of learning-centred education. Therefore, we need to better understand which factors influence educators' beliefs about teaching and learning. Since beliefs about teaching and learning have been associated with beliefs about being a teacher in non-medical educational contexts, this research subsequently focuses on medical educators' perspectives on being a teacher (research line 2). In order to properly distinguish these two lines of research, we refer to 'perspectives' instead of beliefs in the line of research which focuses on being a teacher. We introduce the Korthagen model, a theoretical holistic model developed in the field of teacher education, which we used to explore educators' perspectives on being a teacher. The model distinguishes and relates various perspectives on being a teacher, presented as concentric levels, namely, from periphery to core: the environment, behaviours, competencies, beliefs, identity, and mission. Mission refers to that which inspires and drives educators. Finally, we discuss the need to increase our understanding of how medical educators develop in their perspectives on being a teacher, to help promote the maturation of educators towards a more explicit focus on the student and their learning.

The overarching aim of this dissertation is thus to deepen our understanding of how medical educators mature over time, and how this maturation relates to their beliefs about teaching and learning.

To achieve this aim, we performed qualitative studies, using an exploratory approach. We interviewed medical educators, all of whom were deeply involved in teaching, from two medical schools from two different continents, and which therefore differed in educational and national culture and organisation. Leiden University Medical Centre, the Netherlands, and Stanford University School of Medicine, CA, USA, are comparable in their emphasis on scientific education and had implemented reforms towards learning-centred education in the decade prior to the initial interviews. To gain insight into educators' maturation, we performed follow-up interviews a decade after the initial ones with the same participants who were still available.

Chapter 2 presents a study on medical educators' beliefs about the process of teaching and learning. It proposes a framework specifically adapted to the context of medical education that describes the content and structure of beliefs about teaching, learning, and knowledge.

The framework consists of a matrix and describes beliefs in terms of belief orientations (indicated in the columns in the matrix) and belief dimensions (indicated in the rows in the matrix). The belief orientations, which represent a global, composite set of beliefs about teaching, learning, and knowledge, range from teaching-centred to learning-centred. The belief orientations are defined by the dimensions which each represent a different aspect of the belief orientations regarding teaching, learning, and knowledge. Within each dimension three or four beliefs can be distinguished, ordered on a continuum from teaching-centred to learning-centred.

To adapt the framework, we conducted the initial semi-structured interviews with 26 medical educators in the period of 2008-2010. We used a framework, developed in higher-education non-medical contexts, as a starting point for context-specific adaptation. The qualitative analysis consisted of relating relevant interview fragments to this framework, while remaining open to potentially new beliefs identified during the interviews.

The most important adaptation from the original framework is the addition of a new belief dimension, which we labelled: 'Creation of a conducive learning environment.' The belief orientations that have counterparts in the original

framework are described more precisely in the new framework, adding to its descriptive power. The new framework sharpens the boundary between teaching-centred and learning-centred belief orientations. This is significant because it makes clear that the transition from a teaching-centred to a learning-centred belief orientation involves a profound shift in which eight out of the nine beliefs would be required to change (see Chapter 2, Table 2.1).

We additionally comment on the surprising finding that a substantial number of the educators displayed a teaching-centred belief orientation. This confirms that in medical schools with a learning-centred curriculum, even educators who are deeply involved in teaching do not automatically adopt learning-centred beliefs. This finding supports the importance of targeted faculty development interventions to help educators make this transition. The new framework can be used as an instrument for reflection and discussion, with the newly uncovered extensions in the framework being particularly relevant to the context of learning-centred medical education. Based on our findings, we recommend helping educators reflect on which knowledge is relevant to be acquired, and on the importance of creating a positive learning environment, supporting students' professional development, and fostering students' intrinsic motivation.

In addition to practical applications, the new framework can be used in medical education research as an instrument for determining beliefs about teaching and learning.

During the initial interviews, we also explored medical educators' perspectives on being a teacher; the outcome of this study is described in **Chapter 3**. We developed a model of educator 'phenotypes' by identifying and characterising profiles of educators with similar perspectives on being a teacher.

The six levels of the Korthagen model, which can be viewed as themes, were used to analyse and categorise the data deductively. Subsequently, subthemes were developed inductively. To gain insight into the variety of perspectives we then qualitatively clustered the participants into educator phenotypes, according to the themes. The theme that each participant emphasised as most relevant was leading for the clustering. To better understand each of the phenotypes we carried out a quantitative study of the differences between educator phenotypes regarding subthemes, contextual and personal factors, and analysed statistical significance using Fisher's exact- and Student's t-tests for categorical and continuous data, respectively.

The analysis resulted in four educator phenotypes: the Critic, Practitioner, Role model, and Inspirer. These are hierarchically ordered by inclusiveness, which means that phenotype B includes the themes of phenotype A; phenotype C includes the themes of B; phenotype D includes the themes of phenotype C, but not vice versa. The ‘Critic’ phenotype (phenotype A) represents the educators who focus on the environment, in particular on adverse environmental circumstances. The ‘Practitioner’ phenotype (phenotype B) represents the educators who are aware of the environment and focus on their educational behaviours and competencies. The ‘Role model’ phenotype (phenotype C) represents the educators who extend their awareness to include their educational identity. In the ‘Inspirer’ phenotype (phenotype D) the educators are aware of the themes of the other phenotypes and focus on their educational mission (see Chapter 6, Figure 6.2). We found that affective aspects, for example the drive to improve one’s teaching, prevailed in the perspectives of the Role model and Inspirer phenotypes. Educational institute was the only significant factor related to the phenotypes: the Inspire phenotype consisted exclusively of educators from Stanford University School of Medicine.

The proposed educator phenotype model provides insight into the variety of medical educators’ perspectives on being a teacher. The most inclusive, Inspirer phenotype highlights the importance of developing a clear personal mission as a teacher, centred around student learning and professional development. The educators within this phenotype significantly more often reflect on personal characteristics such as being receptive to feedback. They apparently are aware that the best instrument they have to achieve their mission is their own personality. In our view, by inspiring their students, they continue to be inspired themselves. Our findings suggest that faculty development interventions should pay explicit attention to affective aspects, and in particular support educators to become aware of their educational mission.

To increase our understanding of why educators hold certain beliefs, we aimed to uncover factors that might influence educators’ beliefs about teaching and learning. Since the results presented in Chapter 3 suggest that beliefs are particularly influenced by identity and mission, in **Chapter 4** we present a study into the relationship between educators’ beliefs about teaching and learning and their awareness of their educational identity and mission. We used the interviews conducted for the follow-up study presented in Chapter 5 (see below) with the 21 educators who were still available from those who had participated in the initial study. A deductive thematic analysis was performed, employing the two models which resulted from the studies described in Chapters 2 and 3. To examine

educators' beliefs about teaching, learning, and knowledge, we used the new beliefs framework; and to examine their awareness of their educational identity and mission, we used the educator phenotype model. The Critic and Practitioner phenotypes represent educators who are unaware of their educational identity and mission, the Role model phenotype those who are aware of their identity but not their mission, and the Inspirer phenotype those who are aware of both identity and mission.

Our results show that educators demonstrated both teaching-centred and learning-centred beliefs, which aligned with an awareness of their educational identity and mission. Educators who were unaware of both their identity and mission displayed teaching-centred beliefs, which confirms the importance of awareness of an educational identity and mission for learning-centred education. Educators with learning-centred beliefs all showed an awareness of their educational identity. These educators may be more motivated to reflect on whether their teaching role aligns with their beliefs and with the learning-centred educational context, than educators for whom their educational identity is less evident. Educators who were aware of their identity but not their mission (Role model phenotype) displayed either teaching-centred or learning-centred beliefs. The finding that some educators showed teaching-centred beliefs may be explained by the influence of the organisation's implicit educational culture that may still favour teaching-centred beliefs, even though the formal educational context embraces learning-centred education. Educators aware of their identity and mission (Inspirer phenotype) displayed exclusively learning-centred beliefs. This underlines the relevance of educators' personal educational mission awareness in learning-centred education. Awareness of an educational mission is apparently an effective 'antidote' which may help strengthen and maintain learning-centred beliefs even when the educational culture does not support learning-centred beliefs and behaviours. The study presented in this chapter sheds light on the importance of educational identity and mission awareness for educators working in learning-centred curricula. This implies that faculty development should not only pay attention to the *what* and *how* of teaching, but also to *who* one wishes to be as educator, to promote identity awareness as a teacher. Moreover, our findings highlight the importance of reflecting on *why* one teaches, to foster awareness of one's personal mission as a teacher. To develop this awareness we recommend reflection on the 'self' as well as on the teaching and learning process. Since affective aspects predominate in the articulation of an educational identity and mission, one way to encourage this reflection is through meaningful relationships with others. Examples of these are

personal contacts with students and with peers and mentors with an articulated awareness of their educational identity and mission. In addition, it is important to consider the educators' workplace context, which can be both supportive and challenging, and to pay attention to the informal teaching culture. A supportive leadership at all levels of the organisation, rewarding teaching across career paths, fostering teacher networks and communities, and minimising conflicts arising from competing tasks are examples of how the workplace context can be beneficial to the development of an educator's identity and mission.

To increase our understanding of whether and how medical educators develop their perspectives on being a teacher we performed the study presented in **Chapter 5**. We use the term 'maturation' to emphasise that development of faculty is a holistic and ongoing process that takes place in the everyday work setting. For this qualitative ten-year follow-up study, as mentioned above, we re-interviewed 21 educators from the initial study. We used the same interview protocol as during the initial interviews. The dataset collected in 2008-2010 formed the baseline study. We deductively analysed both datasets, using the educator phenotype model as described in Chapter 3. For each participant we explored whether they had matured towards a more inclusive educator phenotype. The educators who showed maturation were interviewed again to explore factors they perceived to have guided their maturation. Our findings showed that a minority of the medical educators matured over the 10-year study period. Maturation followed the order of the phenotype categorisation from less to more inclusive. Regression towards a less inclusive phenotype did not take place. Factors considered influential for maturation varied for each phenotype and could be divided into *intrapersonal aspects* and *meaningful experiences*. Intrapersonal aspects refer to factors that are experienced as part of the 'inner self,' such as personal values, characteristics, or competencies. The relevance of the meaningful experiences was not so much the experience itself, but rather the attributed meaning to the experience.

The three educators who were initially categorised in the Critic phenotype, all showed maturation. They indicated that it had been important to learn to come to terms with adverse circumstances such as lack of rewards for teaching tasks. In addition, they acknowledged that positive changes in their professional and private circumstances had been influential. The educator who matured towards the Practitioner phenotype credited the development of his competencies predominantly to meaningful experiences, such as taking on new teaching responsibilities. The educators who matured towards the Role model

phenotype attributed the development of their educational identity primarily to intrapersonal aspects: a willingness to evolve, being reflective, and developing relevant character traits. The educators who matured towards the Inspirer phenotype attributed the development of their educational mission to both intrapersonal aspects and meaningful experiences. Consistent with the core characteristic of a mission, which is that it is focused on others, these educators reported having become more aware of the importance of giving the patient or student a voice. On a larger scale, they had become more aware of adverse developments in the medical profession and society, and aimed to contribute to solving these in their role as teachers. All educators who showed maturation indicated that this development was motivated by their task, identity, and mission as a physician, and attributed it to engaging in primarily informal learning opportunities.

We conclude that maturation of medical educators can occur, but is not guaranteed. Our findings suggest that the Critic phenotype may not be a permanent phenotype, nor a 'starter' phenotype, but that dissatisfaction with adverse professional or private circumstances may temporarily distort these educators' perspectives on being a teacher. Maturation is thus influenced by the context, and appears to progress *via* developmental stages, with increasing awareness of successively educational competencies, identity, and mission. Thus, to promote the maturation of educators, medical educators should be supported in their teaching tasks by their departments and institutions. In addition, faculty development initiatives need to be varied and differentiated, preferably extending over a long period of time and embedded in the everyday work setting. Finally, an important recommendation of this study is to include educators' patient-care roles in faculty development initiatives and involve practising physicians as faculty developers.

In the general discussion (**Chapter 6**) we discuss the main findings of the research, conjoin them and relate them to current literature. Exploration of educators' maturation led to the two main lines of our research: the beliefs of medical educators about the process of teaching and learning, and their perspectives on being a teacher. After discussing these two lines of research, we elaborate on two themes that emerged from our research findings as particularly relevant: the role of the environment, and the role of mission. This culminates in a discussion on the maturation of educators. Finally, we conclude this chapter by describing the strengths and limitations of our research project, suggestions for future research, and specific recommendations for practice.

In conclusion, maturation of medical educators' perspectives on being a teacher can take place but is not self-evident. Maturation can be influenced and seems to proceed through developmental stages. Perspectives on being a teacher are related to beliefs about teaching and learning. Awareness of a personal educational mission can reinforce and nurture an educator's identity. Moreover, it gives meaning to an educator's professional life and can fuel motivation for further development and life-long learning. This is an important explanation as to why educators who are aware of their educational mission have the most elaborate, learning-centred, beliefs about teaching and learning. Thus, supporting educators in becoming aware of and developing their educational mission may not only help them to make choices independently of what the environment expects, but is also essential to foster learning-centred beliefs. This dissertation offers a deeper understanding of medical educators' maturation, the factors influencing maturation, and its relationship with beliefs about teaching and learning, thereby contributing to the quality of learning of the next generation healthcare professionals.

NEDERLANDSE SAMENVATTING

Dit onderzoek verkent de opvattingen die medisch docenten hebben over het proces van doceren en leren, alsook over het docent zijn, in de context van studentgericht onderwijs. Een dieper begrip van deze opvattingen is belangrijk om de ontwikkeling van medisch docenten te kunnen ondersteunen, ten behoeve van de kwaliteit van het leren van studenten.

In de algemene introductie (**Hoofdstuk 1**) wordt het concept van studentgericht onderwijs uitgelegd, een onderwijsbenadering die wereldwijd door de meeste medische scholen wordt gehanteerd. Kenmerkend voor studentgericht onderwijs is de focus op de student en diens leren, waarbij de docent fungeert als facilitator van het leerproces van de student, in plaats van uitsluitend als overbrenger van feitenkennis. Om deze rol effectief te vervullen moeten de perspectieven of opvattingen van docenten worden meegenomen, aangezien deze opvattingen belangrijke drijfveren zijn voor gedrag. Het introductiehoofdstuk biedt een overzicht van de huidige inzichten in opvattingen over doceren en leren, licht toe waarom leergerichte opvattingen de voorkeur hebben in hedendaags onderwijs, en waarom een classificatie van opvattingen van medisch docenten over doceren, leren en kennis dient te worden ontwikkeld in de context van medisch onderwijs (onderzoekslijn 1). Eerdere studies hebben aangetoond dat in medische scholen met een studentgericht curriculum, een aanzienlijk aantal medisch docenten nog steeds doceergerichte opvattingen huldigt. Dit is problematisch omdat dit het effectief implementeren van studentgericht onderwijs in de weg staat. Daarom is het noodzakelijk beter te begrijpen welke factoren van invloed zijn op de opvattingen van docenten over doceren en leren. Aangezien opvattingen over doceren en leren in niet-medische onderwijscontexten zijn geassocieerd met opvattingen over het docent zijn, richt het onderzoek zich vervolgens op de opvattingen van medisch docenten op het docentschap (onderzoekslijn 2). Om de twee onderzoekslijnen te onderscheiden spreken we bij de tweede onderzoekslijn die zich richt op het docentschap over 'perspectieven' in plaats van over opvattingen. Het Korthagen model wordt vervolgens geïntroduceerd, een theoretisch holistisch model ontwikkeld binnen de context van de lerarenopleidingen, dat we gebruikten om de perspectieven van docenten op het docentschap te verkennen. Het model onderscheidt en relateert verschillende perspectieven op het docentschap, die worden gepresenteerd als concentrische lagen, namelijk, van periferie naar kern: de omgeving, gedrag, competenties, opvattingen, identiteit en missie, waarbij missie verwijst naar datgene wat docenten inspireert en drijft. Ten slotte bespreken we de noodzaak om meer inzicht te krijgen in de ontwikkeling van

perspectieven op het docentschap in de loop van de tijd. Dit inzicht kan helpen de ontwikkeling van docenten te bevorderen naar een meer expliciete focus op de student en diens leren.

Het overkoepelende doel van dit proefschrift is dus ons begrip te vergroten van hoe medisch docenten zich in de loop van de tijd als docent ontwikkelen, bezien vanuit hun perspectieven op het docentschap, en hoe deze ontwikkeling verband houdt met hun opvattingen over doceren en leren.

Hiertoe voerden we kwalitatieve studies uit, gebruik makend van een exploratieve benadering. We interviewden medisch docenten die allen intensief betrokken waren bij het geneeskunde onderwijs. Zij werden gerekruteerd van twee medische scholen van twee verschillende continenten, die daarmee verschilden in onderwijs- en nationale cultuur en organisatie. Leiden Universitair Medisch Centrum, Nederland, en Stanford University School of Medicine, CA, VS, zijn vergelijkbaar in hun nadruk op wetenschappelijke vorming en hadden in het decennium voorafgaand aan de initiële interviews herzieningen doorgevoerd naar studentgericht onderwijs. Om inzicht te krijgen in de ontwikkeling van docenten, hielden we tien jaar na de eerste interviews follow-up interviews met dezelfde docenten voor zover nog beschikbaar.

Hoofdstuk 2 beschrijft een onderzoek naar de opvattingen van medisch docenten over het proces van doceren en leren. Het presenteert een raamwerk dat specifiek is aangepast aan de context van medisch onderwijs en de inhoud en structuur beschrijft van opvattingen over doceren, leren en kennis.

Het raamwerk bestaat uit een matrix van opvattingen, ingedeeld naar opvattings-oriëntaties (aangegeven in de kolommen in de matrix) en opvattings-dimensies (aangegeven in de rijen). De oriëntaties, die een globale, samengestelde set van opvattingen over doceren, leren en kennis vertegenwoordigen, zijn gerangschikt van doceergericht naar leergericht. De oriëntaties worden gedefinieerd door de dimensies die elk een verschillend aspect van de opvattings-oriëntaties met betrekking tot doceren, leren en kennis vertegenwoordigen. Binnen elke dimensie kunnen drie of vier opvattingen worden onderscheiden, gerangschikt op een continuüm van doceergericht naar leergericht.

Om het raamwerk aan te passen, hielden we semigestructureerde interviews met 26 medisch docenten in de periode van 2008-2010. We gebruikten een raamwerk dat was ontwikkeld in niet-medisch hoger onderwijs contexten als

uitgangspunt voor een context specifieke aanpassing. De kwalitatieve analyse bestond uit het relateren van relevante interviewfragmenten aan dit raamwerk, maar we bleven ook open voor potentieel nieuwe opvattingen die naar voren kwamen uit de interviews.

De belangrijkste aanpassing van het oorspronkelijke raamwerk is de toevoeging van een nieuwe opvattings-dimensie, die we labelden als ‘het creëren van een positieve leeromgeving’. De opvattingen, die hun equivalent hebben in het oorspronkelijke raamwerk, worden in het nieuwe raamwerk nauwkeuriger beschreven, waardoor het raamwerk meer onderscheidend wordt. Het nieuwe raamwerk verscherpt de grens tussen doceergerichte en leergerichte opvattings-oriëntaties. Dit is relevant omdat dit duidelijk maakt dat de overgang van doceergerichte naar leergerichte opvattingen een diepgaande verschuiving betekent waarbij acht van de negen opvattingen moeten veranderen (zie Hoofdstuk 2, Tabel 2.1).

We bespreken ook de verrassende bevinding dat een aanzienlijk aantal docenten een doceergerichte opvatting-oriëntatie vertoonde, wat bevestigt dat in medische scholen met een studentgericht curriculum zelfs docenten die diep betrokken zijn bij het onderwijs niet automatisch leergerichte opvattingen hebben. Deze bevinding ondersteunt het belang van gerichte docentprofessionaliseringsinterventies om docenten te helpen de overgang naar leergerichte opvattingen te maken. Het nieuwe raamwerk kan worden gebruikt als instrument voor reflectie en discussie, waarbij vooral de nieuw ontdekte uitbreidingen in het raamwerk relevant zijn in de context van studentgericht medisch onderwijs. Op basis van onze bevindingen adviseren we docenten te helpen reflecteren op welke kennis relevant is om te verwerven, en op het belang van het creëren van een positieve leeromgeving, het ondersteunen van de professionele ontwikkeling en het bevorderen van de intrinsieke motivatie van studenten.

Naast deze praktische toepassingen kan het nieuwe raamwerk in medisch onderwijskundig onderzoek worden gebruikt als instrument voor het categoriseren van de opvattingen over doceren en leren.

Tijdens de eerste interviews hebben we ook de perspectieven van medisch docenten op het docent zijn onderzocht. De uitkomst van deze studie wordt beschreven in **Hoofdstuk 3**. We hebben daarin een model van docent fenotypen ontwikkeld door profielen van docenten met vergelijkbare perspectieven op het docentschap te identificeren en karakteriseren.

De zes lagen van het Korthagen model, die kunnen worden beschouwd als thema's, werden gebruikt om de data deductief te analyseren en te categoriseren. Vervolgens werden inductief sub-thema's ontwikkeld. Om inzicht te krijgen in de variatie aan perspectieven, werden de deelnemers vervolgens op basis van de thema's kwalitatief gegroepeerd in docent fenotypen. Het thema dat elke deelnemer als meest relevant benadrukte was leidend voor de clustering. Om een dieper inzicht te krijgen in de afzonderlijke fenotypen onderzochten we kwantitatief de verschillen tussen de docent fenotypen met betrekking tot de sub-thema's en contextuele en persoonlijke factoren, en analyseerden we de statistische significantie met behulp van Fisher's exact- en Student's t-tests voor respectievelijk categorische en continue data.

De analyse resulteerde in vier docent fenotypen: de Criticus, de Practicus, het Rolmodel en de Inspirator. Deze zijn hiërarchisch geordend op basis van inclusiviteit. Dat betekent dat Fenotype B de thema's van Fenotype A includeert; Fenotype C includeert de thema's van Fenotype B; en Fenotype D includeert de thema's van Fenotype C, maar niet vice versa. Het 'Criticus' fenotype (Fenotype A) vertegenwoordigt docenten die zich richten op de omgeving, in het bijzonder op ongunstige omgevingsomstandigheden. Het 'Practicus' fenotype (Fenotype B) vertegenwoordigt docenten die zich bewust zijn van de omgeving en zich richten op hun onderwijskundige gedrag en competenties. Het 'Rolmodel' fenotype (Fenotype C) vertegenwoordigt docenten die zich bewust zijn van de thema's van het Practicus fenotype en zich richten op hun onderwijskundige identiteit. In het 'Inspirator' fenotype (Fenotype D) zijn de docenten zich bewust van de thema's van de andere fenotypen en richten zij zich op hun onderwijsmissie (zie Hoofdstuk 6, Figuur 6.2). We ontdekten dat in de perspectieven van het Rolmodel en de Inspirator affectieve elementen, bijvoorbeeld de drive om hun onderwijs te verbeteren, overheersten. Het onderwijsinstituut was de enige significante factor die correleerde met de fenotypen: het Inspirator fenotype bestond uitsluitend uit docenten van Stanford University School of Medicine.

Het voorgestelde docent fenotype-model biedt inzicht in de verscheidenheid aan perspectieven van medisch docenten op het docentschap. Het meest inclusieve fenotype, de Inspirator, benadrukt het belang van een persoonlijke missie als docent, gericht op het leren en de professionele ontwikkeling van de student. De docenten passend bij dit fenotype reflecteren significant vaker op persoonlijke eigenschappen zoals ontvankelijk zijn voor feedback. Ze zijn zich blijkbaar bewust dat het beste instrument dat ze hebben om hun missie te bereiken, hun eigen persoonlijkheid is. Naar onze mening blijven ze door het

inspireren van hun studenten zelf geïnspireerd. Onze bevindingen suggereren dat docentprofessionaliseringsinterventies expliciet aandacht moeten besteden aan affectieve aspecten, en docenten moeten ondersteunen bij het zich bewust worden van hun onderwijsmissie.

Om beter te begrijpen waarom docenten bepaalde opvattingen hebben, richtten we ons op het bestuderen van welke factoren de opvattingen van docenten over doceren en leren beïnvloeden. Aangezien de resultaten beschreven in Hoofdstuk 3 doen vermoeden dat opvattingen met name worden beïnvloed door identiteit en missie, presenteren we in **Hoofdstuk 4** een studie naar de relatie tussen de opvattingen van docenten over doceren en leren en hun bewustzijn van hun onderwijsidentiteit en -missie. We gebruikten de interviews die werden afgenomen voor de vervolgstudie gepresenteerd in Hoofdstuk 5 (zie hieronder) met de 21 docenten die nog beschikbaar waren in 2018. Er werd een deductieve thematische analyse uitgevoerd, waarbij de twee modellen werden gebruikt die het resultaat waren van de studies beschreven in Hoofdstuk 2 en 3. Om de opvattingen van docenten over doceren, leren en kennis te onderzoeken, gebruikten we het nieuwe raamwerk; en om hun bewustzijn van hun onderwijsidentiteit en -missie te onderzoeken, gebruikten we het docent fenotype-model. De Criticus en Practicus fenotypen vertegenwoordigen docenten die zich niet bewust zijn van hun onderwijsidentiteit en -missie, het Rolmodel fenotype vertegenwoordigt degenen die zich bewust zijn van hun identiteit maar niet van hun missie, en het Inspirator fenotype degenen die zich bewust zijn van zowel hun identiteit als missie.

Onze resultaten laten zien dat docenten zowel doceergerichte als leergerichte opvattingen hadden, die gerelateerd waren aan het zich al dan niet bewust zijn van hun onderwijsidentiteit en -missie. Docenten die zich niet bewust waren van hun identiteit noch hun missie hadden doceergerichte opvattingen. Dit onderstreept het belang van het bewustzijn van een onderwijsidentiteit en -missie voor studentgericht onderwijs. Docenten met leergerichte opvattingen waren zich allemaal bewust van hun onderwijsidentiteit. Deze docenten zijn mogelijk meer gemotiveerd om te reflecteren op de vraag of hun onderwijsrol in overeenstemming is met hun opvattingen en met de studentgerichte onderwijscontext dan docenten voor wie hun onderwijsidentiteit minder duidelijk is. Docenten die zich bewust waren van hun identiteit maar niet van hun missie (Rolmodel fenotype) hadden ofwel doceergerichte ofwel leergerichte opvattingen. De bevinding dat sommige Rolmodel docenten doceergerichte opvattingen hadden, kan mogelijk worden verklaard door de invloed van de impliciete onderwijscultuur van de organisatie die nog steeds de voorkeur

geeft aan doceergerichte opvattingen, ook al omarmt de formele onderwijscontext studentgericht onderwijs. Docenten die zich bewust waren van hun identiteit en missie (Inspirator fenotype) hadden uitsluitend leergerichte opvattingen. Dit benadrukt de relevantie van het zich bewust zijn van de persoonlijke onderwijsmissie van docenten in studentgericht onderwijs. Het bewustzijn van een onderwijsmissie is blijkbaar een effectief 'tegengif' dat kan helpen bij het versterken en handhaven van leergerichte opvattingen, zelfs wanneer de onderwijscultuur leergerichte opvattingen en -gedrag niet ondersteunt. De studie die in dit hoofdstuk wordt gepresenteerd, werpt licht op het belang van het zich bewust zijn van een onderwijsidentiteit en -missie voor docenten die werken in studentgerichte curricula. Dit impliceert dat docentprofessionalisering zich niet alleen moet richten op *wat* en *hoe* er wordt gedoceerd, maar ook op *wie* men als docent is of wil zijn, om het zich bewust zijn van een identiteit als docent te bevorderen. Bovendien benadrukken onze bevindingen het belang van reflectie op *waarom* men docent is, om het bewustzijn van de persoonlijke missie als docent te bevorderen. Om dit bewustzijn te ontwikkelen, raden we reflectie aan op de eigen persoon en op het proces van doceren en leren. Aangezien affectieve aspecten een grote rol spelen bij een onderwijsidentiteit en -missie, is één van de manieren om deze reflectie aan te moedigen via 'betekenisvolle relaties' met anderen. Voorbeelden hiervan zijn persoonlijke contacten met studenten, en met collega's en mentoren die zich bewust zijn van hun onderwijsidentiteit en -missie. Bovendien is het belangrijk om rekening te houden met de werkomgeving van de docenten, die zowel ondersteunend als belemmerend kan zijn, en aandacht te besteden aan de informele onderwijscultuur. Een ondersteunend leiderschap op alle niveaus van de organisatie, het belonen van doceren in carrièrepaden, het bevorderen van docentennetwerken en -gemeenschappen en het minimaliseren van conflicten die voortvloeien uit concurrerende taken zijn voorbeelden van hoe de werkomgeving kan bijdragen aan de ontwikkeling van de identiteit en missie van een docent.

Om beter te begrijpen of en hoe medisch docenten hun perspectieven op het docentschap *ontwikkelen*, voerden we de studie uit die in **Hoofdstuk 5** wordt gepresenteerd. Voor dit kwalitatieve tienjarig follow-uponderzoek hebben we de eerder genoemde 21 docenten die nog beschikbaar waren vanuit het oorspronkelijke onderzoek opnieuw geïnterviewd. We gebruikten hetzelfde interviewprotocol als tijdens de oorspronkelijke interviews. De dataset die tussen 2008-2010 was verzameld vormde de basislijn van het onderzoek. Beide datasets werden deductief geanalyseerd, waarvoor we het docent fenotype-model zoals beschreven in Hoofdstuk 3 gebruikten. We onderzochten per deelnemer of deze zich had ontwikkeld tot een meer inclusief docent fenotype. De docenten die deze ontwikkeling lieten zien werden opnieuw geïnterviewd om te verkennen

welke factoren zij beschouwden als sturend voor hun ontwikkeling. We vonden dat een minderheid van de medisch docenten in de tienjarige onderzoeksperiode ontwikkeling liet zien. De ontwikkeling verliep volgens de volgorde van de fenotypes van minder naar meer inclusief. Regressie naar een minder inclusief fenotype trad niet op. De factoren die voor ontwikkeling als invloedrijk werden beschouwd varieerden voor elk fenotype en konden worden onderverdeeld in *intra-persoonlijke aspecten* en *betekenisvolle ervaringen*. Intra-persoonlijke aspecten verwijzen naar factoren die als onderdeel van het ‘innerlijke zelf’ worden ervaren, zoals persoonlijke waarden, kenmerken of competenties. De relevantie van de betekenisvolle ervaringen lag niet zozeer in de ervaring zelf, maar eerder in de aan de ervaring toegekende betekenis.

De drie docenten die oorspronkelijk waren gecategoriseerd in het Criticus fenotype, lieten allen ontwikkeling zien. Ze gaven aan dat het belangrijk was te leren omgaan met ongunstige omstandigheden, bijvoorbeeld het ontbreken van beloningen voor onderwijstaken. Daarnaast erkenden ze dat positieve veranderingen in hun professionele en privé leven van invloed waren geweest. De docent die zich ontwikkelde tot het Practicus fenotype schreef de ontwikkeling van zijn competenties voornamelijk toe aan betekenisvolle ervaringen, zoals het op zich nemen van nieuwe onderwijstaken. De docenten die zich ontwikkelden tot het Rolmodel fenotype schreven de ontwikkeling van hun onderwijsidentiteit voornamelijk toe aan intra-persoonlijke aspecten: de bereidheid om te evolueren, vermogen tot reflectie, en het ontwikkelen van relevante karaktereigenschappen. De docenten die zich ontwikkelden tot het Inspirator fenotype schreven de ontwikkeling van hun onderwijsmissie toe aan zowel intra-persoonlijke aspecten als betekenisvolle ervaringen. In lijn met het kernkarakter van een missie, namelijk dat deze gericht is op anderen, meldden deze docenten dat ze zich bewuster waren geworden van het belang van het geven van een stem aan de patiënt of student. Op grotere schaal waren ze zich meer bewust geworden van zorgwekkende ontwikkelingen in de medische professie en de samenleving, en wilden vanuit hun rol als docent bijdragen aan het oplossen hiervan. Alle docenten die ontwikkeling lieten zien, gaven aan dat deze werd gemotiveerd door hun taak, identiteit en missie als arts, en schreven deze vooral toe aan informele leermogelijkheden.

We concluderen dat ontwikkeling van medisch docenten kan plaatsvinden, maar niet vanzelfsprekend is. Onze bevindingen suggereren dat het Criticus fenotype mogelijk geen permanent fenotype is, noch een ‘starter’ fenotype, maar dat ontevredenheid over ongunstige professionele of privé omstandigheden tijdelijk de perspectieven van deze docenten op het docentschap kan vertroebelen. Ontwikkeling wordt

dus beïnvloed door de context en lijkt via ontwikkelingsstadia te verlopen, met een groeiend bewustzijn van, achtereenvolgens, onderwijskundige competenties, identiteit en missie. Om de ontwikkeling van docenten te bevorderen, dienen medisch docenten te worden ondersteund in hun onderwijstaken door hun afdelingen en instellingen. Daarnaast zijn initiatieven voor docentprofessionalisering bij voorkeur gevarieerd en gedifferentieerd, zich uitstrekkend over een langere periode en ingebed in het dagelijks werk. Tot slot is een belangrijke aanbeveling van dit onderzoek om de patiëntenzorg rol van docenten te includeren in docentprofessionaliseringsinitiatieven, en praktiserende artsen bij docentprofessionalisering te betrekken.

In de algemene discussie (**Hoofdstuk 6**) bespreken we de belangrijkste bevindingen van het onderzoek, verbinden deze met elkaar en relateren ze aan de huidige literatuur. Verkenning van de ontwikkeling van docenten leidde tot de twee hoofdlijnen van ons onderzoek: de opvattingen van medisch docenten over het proces van doceren en leren, en hun perspectieven op het docentschap. Na bespreking van deze twee onderzoekslijnen gaan we in op twee thema's die uit onze onderzoeksbevindingen naar voren kwamen als bijzonder relevant: de rol van de omgeving en de rol van missie. Dit leidt tot een discussie over de ontwikkeling van docenten. Tot slot besluiten we dit hoofdstuk met het beschrijven van de sterke en zwakke punten van ons onderzoeksproject, suggesties voor toekomstig onderzoek en specifieke aanbevelingen voor de praktijk.

Samenvattend: ontwikkeling van medisch docenten, gezien vanuit hun perspectieven op het docentschap, kan optreden maar is niet vanzelfsprekend. Deze ontwikkeling is beïnvloedbaar en lijkt te verlopen via ontwikkelingsfasen. Perspectieven op het docentschap zijn gerelateerd aan opvattingen over doceren en leren. Bewustzijn van een persoonlijke onderwijsmissie kan de identiteit van een docent versterken en voeden. Bovendien geeft dit bewustzijn betekenis aan het professionele leven van een docent en kan het motiveren tot verdere ontwikkeling en levenslang leren. Dit is een belangrijke verklaring waarom docenten die zich bewust zijn van hun onderwijsmissie de meest uitgebreide, leergerichte opvattingen over doceren en leren hebben. Het ondersteunen van docenten om zich bewust te worden van hun onderwijsmissie en deze te ontwikkelen kan hen niet alleen helpen keuzes te maken die onafhankelijk zijn van wat de omgeving verwacht, maar is ook essentieel om leergerichte opvattingen te bevorderen. Door een dieper begrip te bieden van de ontwikkeling van medisch docenten, de factoren die deze beïnvloeden en de relatie met opvattingen over doceren en leren, draagt het onderzoek gepresenteerd in dit proefschrift bij aan de kwaliteit van het leren van de volgende generatie zorgprofessionals.

DANKWOORD / ACKNOWLEDGEMENTS

Het onderzoekstraject dat tot dit proefschrift heeft geleid draagt niet alleen –naar ik hoop– bij aan het proces van ‘maturation’ van medisch docenten, maar heeft zeker ook bijgedragen aan mijn eigen ‘maturation’ als docent én als onderzoeker. Veel mensen hebben hier een rol in gespeeld. Albert Scherpbier enthousiasmeerde me voor onderzoek van onderwijs en was een inspirerend voorbeeld als docent. Mijn afdelingshoofden maakten het mogelijk dat ik met dit traject kon starten: Pim Assendelft deed de suggestie om tijdens een verlofperiode op Stanford me met onderzoek bezig te houden, wat door mijn toenmalige leidinggevende Tjeerd de Jongh van harte werd gefaciliteerd; Mattijs Numans schiep de voorwaarden waardoor ik in 2016 aan een promotietraject kon beginnen. Ik had het geluk dat Roeland van der Rijst al ruim vóór 2016 bereid was om met mij op te trekken bij mijn eerste stappen op het onderzoekspad. Roeland: je bent een voorbeeld in het ‘studentgericht’ begeleiden. Dank voor het verder aanwakkeren van mijn motivatie voor dit onderzoek, je inzichten en goede vragen, in je rol als copromotor en later als tweede promotor. De komst van Anneke Kramer bracht voor het eerst expertise op het gebied van onderzoek van medisch onderwijs op onze afdeling, waardoor er een promotor beschikbaar kwam. Anneke: door jou heb ik me verder kunnen ontwikkelen in onder andere het wetenschappelijk schrijven, met een heldere ‘problem/gap/hook’. Je hart voor het medisch onderwijs, gevoed door je hart voor patiënten is inspirerend. Dank voor dit alles.

Iris van der Hoeven kwam in 2016 mij als student-assistent ondersteunen. Door jou lukte het in 2018 om in 7 weken tijd op Stanford de 2^e serie data te verzamelen, transcriberen en analyseren. Ik heb genoten van onze discussies in de analyse fase. Je enthousiasme werkt aanstekelijk en je kritische vragen verdiepen. Dat je nu ook mijn paranimf wil zijn ervaar ik als een bijzonder voorrecht. Marieke de Jong is mijn langst zittende collega huisarts-docent en de tweede paranimf. Je support in mijn rol als leidinggevende en als startende onderzoeker waardeer ik zeer. Iris en Marieke vertegenwoordigen de studenten en collega-docenten die zo’n belangrijke rol spelen in mijn ontwikkeling als medisch docent. Ik wil mijn mede docenten van het studentenonderwijs daarnaast specifiek bedanken voor hun positieve betrokkenheid bij mijn onderzoek.

De LUMC collega’s die zo van harte hebben meegewerkt door hun bereidheid drie keer door mij geïnterviewd te worden dank ik voor hun openheid en het delen van hun expertise, waardoor ik meer inzicht kreeg in de opvattingen van ervaren docenten.

From the very beginning of this research, my Stanford colleagues have made a major impact on my maturation, both as a starting researcher in the field of medical education and as a medical educator. Neil Gesundheit contributed to this dissertation in many ways. Neil, this dissertation would not have materialised without your suggestions of whom to recruit as interviewees, your enthusiasm for the topic, and your constructive feedback on my many drafts. The interviews with my Stanford colleagues were always insightful, instructive and inspiring. Thank you all for your contributions.

Een woord van dank aan Jenny de Sonnevile. De manier waarop je feedback op mijn Engels gaf, maar ook je creatieve suggesties voor het verbeteren van titels waren leerzame en waardevolle ervaringen.

Vera Nierkens: dank voor je belangeloze inzet en zorgvuldige feedback op mijn Introductie en Discussie.

In het privédomen van vrienden en familie hebben veel mensen mij support gegeven, en dat geldt ook voor de collega's van de huisartspraktijk. Dank voor jullie betrokkenheid bij mij en bij dit traject.

Er zijn betere gelegenheden om geliefden te laten weten wat ze voor je betekenen dan een dankwoord in een proefschrift. Maar dit is wel een gelegenheid om mijn dankbaarheid uit te spreken voor de immer positieve support van mijn ouders in mijn onderzoekstraject. Ook het enthousiaste applaus en de praktische ondersteuning van onze kinderen bij het voltooien van dit proefschrift betekenen veel voor me. Tenslotte, Tom: de belangrijkste bijdragen kwamen van jou. Jij hielp me in mijn keuze dit project te starten; bemoedigde me toen mijn eerste artikel werd afgewezen met een citaat van een collega: 'Life as a researcher is all about being rejected'; was altijd bereid om mijn enthousiasme en frustraties, en jouw onderzoeksexpertise te delen. Dank je wel.

Deo Gratias

LIST OF PUBLICATIONS

1. Brandsma JW, **Ottenhoff-de Jonge, MW**. Flexor digitorum superficialis tendon transfer for intrinsic replacement: long-term results and the effect on donor fingers. *J Hand Surg Br.* 1992;17(6):625-628. doi: 10.1016/0266-7681(92)90187-7
3. Barnhoorn PC, Bolk JH, **Ottenhoff-de Jonge MW**, van Mook WN, de Beaufort AJ. Causes and characteristics of medical student referrals to a professional behaviour board. *Int J Med Educ.* 2017;8:19-24. doi: 10.5116/ijme.584b.d591
2. Barnhoorn PC, Houtlosser M, **Ottenhoff-de Jonge MW**, Essers GT, Numans ME, Kramer AW. A practical framework for remediating unprofessional behavior and for developing professionalism competencies and a professional identity. *Med Teach.* 2019;41(3):303-308. doi: 10.1080/0142159X.2018.1464133
4. **Ottenhoff-de Jonge MW**, van der Rijst RM, Gesundheit N, et al. From critic to inspirer: four profiles reveal the belief system and commitment to educational mission of medical academics. *BMC Med Educ.* 2019;19(1):268. doi: 10.1186/s12909-019-1665-0
5. **Ottenhoff-de Jonge MW**, van der Hoeven I, Gesundheit N, van der Rijst RM, Kramer AW. Medical educators' beliefs about teaching, learning, and knowledge: development of a new framework. *BMC Med Educ.* 2021;21(1):176. doi: 10.1186/s12909-021-02587-x
6. **Ottenhoff-de Jonge MW**, Steinert Y, van der Hoeven I, Kramer AW, van der Rijst RM. How learning-centred beliefs relate to awareness of educational identity and mission: An exploratory study among medical educators. *Med Teach.* 2022;44(12):1354-1361. doi: 10.1080/0142159X.2022.2094230
7. **Ottenhoff-de Jonge MW**, van der Hoeven I, Gesundheit N, Kramer AW, van der Rijst RM. Maturing through awareness: an exploratory study into the development of educational competencies, identity, and mission of medical educators. *Med Teach.* 2023; doi: 10.1080/0142159X.2023.2239442

ABOUT THE AUTHOR

Marleen Ottenhoff-de Jonge was born on March 27, 1960, in Nuenen, as the eldest daughter of Max and Anneke de Jonge. From her mother, who was trained as a nurse, she inherited an interest in healthcare. Her father, who ran his own architectural firm and taught one day a week at a University of Applied Sciences, served as a role model for her in combining one's original profession with a teaching job. Marleen graduated with honours from Eindhoven Protestant Lyceum in 1978 and subsequently studied medicine in Leiden. After completing her studies in 1985, she studied Amharic for six months in preparation for working in Addis Ababa, Ethiopia, where she and her husband Tom lived for 2.5 years while she worked as a surgical resident at the ALERT leprosy hospital. Upon returning to the Netherlands, Marleen completed a two-year residency programme in general practice in 1990. While living in Bethesda, MD, USA, from 1991 to 1993, she gained her first experience teaching medical students at Georgetown University. From early 1994, she worked in the general practice of Haitse Wiersma, where she works as the 'Friday doctor' to this day. Five years later, she began her career as a medical teacher at Leiden University Medical Centre. She served as coordinator of clinical rotations, year coordinator for the first and fourth years of study, a member of the Education Committee, and a member of the Curriculum Revision Committee. She was twice nominated as 'Teacher of the year.' Since 2009, she has been the Head of Student Education in the Department of Public Health and Primary Care. In 2008, while staying in Palo Alto, CA, USA with her family, Marleen began her research into the beliefs of medical educators at Stanford University School of Medicine. This research formally continued in a PhD programme starting in October 2016, resulting in this thesis.

Marleen and Tom are the parents of Matthije, Janna, and Max; foster parents of Redi and David; parents-in-law of Wouter, Michiel, and Célestine; and grandparents of Evi.

OVER DE AUTEUR

Marleen Ottenhoff-de Jonge werd op 27 maart 1960 geboren in Nuenen, als oudste dochter van Max en Anneke de Jonge. Van haar moeder, die is opgeleid als verpleegkundige, erfde ze de interesse in de gezondheidszorg. Haar vader, die naast een eigen architectenbureau één dag per week les gaf aan een Hogeschool, was voor haar een rolmodel in het combineren van je oorspronkelijke professie met een baan als docent. Marleen haalde in 1978 haar gymnasium diploma op het Eindhovens Protestants Lyceum (cum laude), waarna ze in Leiden geneeskunde ging studeren. Na het afronden van de studie (1985) studeerde ze een half jaar Amhaars ter voorbereiding op het werken in Addis Abeba, Ethiopië. Ze verbleef er samen met haar man Tom 2,5 jaar en werkte als arts-assistent chirurgie in het ALERT lepra ziekenhuis. Na terugkomst in Nederland deed ze de tweejarige huisartsopleiding, die ze eind 1990 afrondde. Tijdens het verblijf in Bethesda, MD, VS, (1991-1993) deed ze aan de Georgetown University haar eerste ervaring op met lesgeven aan medisch studenten. Vanaf begin 1994 ging ze in de huisartspraktijk van Haitse Wiersma werken, waar ze nog steeds de 'vrijdagdokter' is. Vijf jaar later startte ze haar carrière als huisarts-docent aan het Leids Universitair Medisch Centrum. Ze was onder andere coördinator coschappen, jaar coördinator voor het eerste en vierde studiejaar, lid van de Opleidingscommissie en lid van de Curriculum herzieningscommissie. Ze werd twee keer genomineerd als 'docent van het jaar'. Sinds 2009 is ze Hoofd van het studentenonderwijs van de afdeling Public Health en Eerstelijns Geneeskunde. Toen zij in 2008 enkele maanden met het gezin in Palo Alto, CA, VS verbleef, maakte ze aan de Stanford University School of Medicine een eerste begin met haar onderzoek naar de opvattingen van medisch docenten. Dit kreeg vanaf oktober 2016 een formeel vervolg in een promotietraject, wat resulteerde in dit proefschrift.

Marleen en Tom zijn ouders van Matthije, Janna en Max; pleegouders van Redi en David; schoonouders van Wouter, Michiel en Célestine; en grootouders van Evi.