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HOW, WHAT AND WHY MEDICAL STUDENTS LEARN IN CLINICAL PROBLEM-BASED MEDICAL EDUCATION

AN ETHNOGRAPHIC STUDY OF THE RELATION BETWEEN MEDICAL STUDENTS' SOCIAL IDENTITY DEVELOPMENT AND LEARNING APPROACH IN CLINICAL PRACTICE

BY
NICOLAJ JOHANSSON

DISSERTATION SUBMITTED 2022

AALBORG UNIVERSITY
DENMARK

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Project manager, consultant &
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ENGLISH SUMMARY

Medical educations around the world are responsible for educating medical students to meet the demands from a complex and fast-changing healthcare system. A trend that requires competent, reflective, robust, and engaged students who can collaborate interdisciplinary. A trend that also requires high-quality medical education that enables students to meet the personal and professional expectations of their future duties as a physician. In the wake of the increasing demands for both medical education and medical students, there has been an increased focus on both problem-based medical education and the importance of medical students' identity development, as part of preparing medical students to become a future physician.

Despite the growing awareness and interest in problem-based medical education and identity development in medical students, the relationship between the two is sparsely described in the literature. Based on the lack of research in the field and my interest, I seek through my dissertation to uncover how clinical practice sets the scene for medical students' social identity development and further how their social identities affect how, what and why they learn, during their final three years of their problem-based medical education.

These aims are reached through my scoping review and ethnographic study of medical students in the clinical practice in the hospital. My dissertation is based on data from 3 studies and shows the following:

There is a growing interest in problem-based medical education and identity development in medical students, respectively. In my scoping review, I show that the relationship between problem-based medical education and identity development is very sparsely described in the literature. The majority of the literature concerning identity development in medical students is based on a certain identity understanding grounded in ‘communities of practice’ by Lave and Wenger (1998) as a theoretical framework and thus sees identity as being something dynamic that is always under construction and strongly influenced by social interaction. Furthermore, the literature concerning problem-based medical education focuses primarily on the effect on

learning, implementation and the principles behind the pedagogy and not as a frame for social identity development.

The clinical practice gives the students a high degree of autonomy and responsibility for their own learning and forms the framework for several different social identities. Social identities that depend on the students' own participation, engagement, and personality as well as the clinical practice in which they are enrolled. Among several social identities, three prominent social identities were identified. Which is social identity as *medical student*, as *colleague* and as *nearly physician*. Though, it is important to emphasize that these social identities are expressed in different ways depending on the medical student's personality and clinical practice.

With a social identity as a medical student, there is a focus on feedback, supervision, reflection, learning, peer-learning, role modelling; as a colleague, there is a focus on language, norms, values, cooperation, social interaction and; as an nearly physician, there is a focus on patient care, responsibility, independence, autonomy, performance and self-directed learning.

In summary, my dissertation shows how medical students social identities affects their learning approaches and furthermore how, what and why they learn in clinical practice. The intention of this research is to create an educational discussion and initiate new perspectives on how medical education and clinical practice can support the transition from being a medical student to becoming a physician.

DANISH SUMMARY (DANSK RESUME)

Medicinske uddannelser verden over står for at skulle uddanne medicinstuderende til et komplekst og hurtigt omskifteligt sundheds- og behandlingssystem. En udvikling, der kræver kompetente, reflekterende, robuste og handlekraftige studerende, der kan samarbejde tværfagligt omkring generering af ny viden samt behandlingen af patienter. En udvikling, der tillige kræver medicinuddannelser af høj kvalitet, der sætter de studerende i stand til at indfri de personlige og faglige forventninger der er knyttet til deres kommende hverv som læge. I kølvandet på de stigende krav til såvel medicinuddannelser som medicinstuderende, er der kommet et øget fokus både på den problembaseret medicinuddannelse samt betydningen af medicinstuderendes identitetsudvikling, som et led i at forberede de medicinstuderende på rollen som læge.

Til trods for den stigende opmærksomhed og interesse for problembaseret medicinuddannelse og identitetsudvikling hos medicinstuderende er relationen mellem de to sparsomt beskrevet i litteraturen. Med afsæt i den manglende forskning inden for området og min interesse, søger jeg gennem min afhandling at afdække relationen mellem klinisk problembaseret medicinuddannelse og medicinstuderendes personlige og faglige udvikling. Her med et indgående fokus på, hvordan den kliniske praksis sætter rammen for medicinstuderendes sociale identitetsudvikling og deres læring.

Baseret på erfaringer, teoretisk viden og mine etnografiske studier af klinisk praksis, undersøger jeg: Hvad der karakteriserer medicinstuderendes sociale identitetsdannelse i de sidste tre år af deres kliniske problembaseret medicinuddannelse, og hvilken indflydelse deres sociale identiteter har på, hvordan, hvorfor og hvad de lærer.

Formålet med afhandlingen er at generere ny aktuel viden om, hvordan klinisk praksis danner rammen for social identitetsudvikling og læring hos medicinstuderende, hvilket i litteraturen er et underbelyst forskningsfelt. Endvidere har afhandlingen til formål at skabe et fremadrettet fokus på udvikling og design af medicinuddannelser

verden over, der både understøtter og forbereder de medicinstuderende på overgangen fra at være studerende til at blive læge.

Ovenstående formål er gjort muligt gennem mit scoping review og flerårige etnografiske studie af medicinstuderende i den kliniske praksis på Aalborg sygehus. Min afhandling baserer sig på 3 studier og viser følgende:

Der er stor forskningsmæssig interesse for henholdsvis problembaseret medicinsk uddannelse og identitetsudvikling hos medicinstuderende. I mit scoping review viser jeg, at forskning i relationen mellem problembaseret medicinsk uddannelse og identitetsudvikling er meget sparsomt og snævert beskrevet. Størstedelen af litteraturen inden for identitetsdannelse hos medicinstuderende tager afsæt i Lave og Wengers teori om praksisfællesskabers betydning for identitetsudvikling. Et perspektiv på identitetsudvikling, der er dynamisk og under konstant forandring og i særlig grad påvirket af sociale interaktioner. En stor del af litteraturen inden for problembaseret medicinuddannelse fokuser på effekt på læring, implementering og principperne bag pædagogikken.

Den kliniske problembaserede medicinuddannelse giver de studerende en høj grad af autonomi og ansvar for egen læring og danner rammen for flere forskellige sociale identiteter. Sociale identiteter, der i høj grad afhænger af de studerendes egen engagement og personlighed såvel som omgivelsernes tilgængelighed. Blandt de mange sociale identiteter de studerende enten påtager sig eller bliver tildelt af læger, patienter, pårørende eller medstuderende i den kliniske praksis, har jeg identificeret tre prominente sociale identiteter, der i særlig grad træder frem. Det er social identitet som medicinstuderende, som næsten læge og som kollega.

Endvidere har jeg identificeret, hvordan de tre prominente sociale identiteter influerer på hvordan, hvorfor og hvad de studerende lærer når de indgår i den kliniske praksis. Som medicinstuderende er der fokus på feedback, supervision, refleksion, hvad og hvorfor der skal læres, peer-learning, rollemodeller; som næsten læge er der fokus på patientpleje, ansvar, uafhængighed, autonomi, præstation, diagnosticering og selvstyret læring; og som kollega er der fokus på sproget, normer, værdier, samarbejde, social interaktion. De forskellige læringsperspektiver, der relaterer sig til

de sociale identiteter, har indflydelse på hvad, hvorfor og hvordan de lærer og er derfor en vigtig viden at bringe med ind i udviklingen af medicinske uddannelser fremadrettet.

Opsummeret lægger afhandlingen op til en diskussion og en øget opmærksomhed på, hvordan problembaseret medicinuddannelser designes for at give de studerende de bedst mulige vilkår og forudsætninger for at lære og håndtere overgangen fra at være studerende til at blive læge.

Acknowledgements

Writing this PhD dissertation was like dealing with stocks, filled with ups and downs and always struggling against time and Covid-19 restrictions. This work would never have been accomplished without the great support I have received from everyone around me. Therefore, I will use this valuable space to express my sincere gratitude to those who made this work possible.

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Nicolaj Johansson

August 2022, Aalborg

Overview of papers

My PhD dissertation is based on the following research papers listed below:

Paper 1: (Published)

A scoping review of the relation between problem-based learning and professional identity development in medical education.

Nicolaj Johansson, Susanne Nøhr & Diana Stentoft

Journal of Problem Based Learning in Higher Education. 2020;8(2):25-41.

Paper 2: (Submitted)

How clinical problem-based medical education sets the scene for social identity development in medical students.

Nicolaj Johansson, Susanne Nøhr, Tine Klitgaard, Henrik Vardinghus-Nielsen & Diana Stentoft

Interdisciplinary Journal of Problem-based learning

Paper 3: (In review, minor revision)

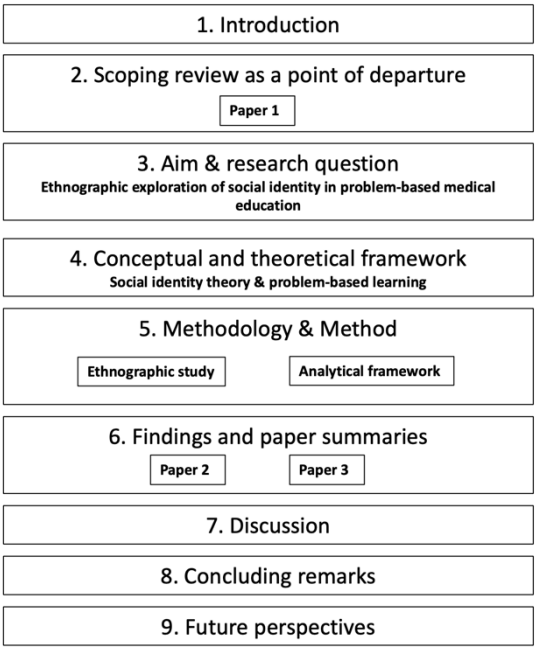
Clinical problem-based medical education: A social identity perspective on learning.

Nicolaj Johansson, Henrik Vardinghus-Nielsen, Susanne Nøhr, Tine Klitgaard & Diana Stentoft.

Dansk Universitetspædagogisk Tidsskrift

Overview of the dissertation

The following figure shows the progression and how the dissertation is organised. The dissertation consists of 8 chapters. In chapter 1, I introduce the essence of problem-based learning as a pedagogical approach in medical education to give the reader an insight to the premises of problem-based learning. Furthermore, I briefly introduce the term professional identity and how that relates to medical education. In chapter 2, I present my scoping review as a point of departure for my further research and give an overview of the existing research within problem-based learning and identity development in medical education. In chapter 3, I present the aim of the dissertation and my research questions. In chapter 4, I describe the conceptual and theoretical framework and how that is related to the aim of the dissertation and in chapter 5 I present the study design and the considerations behind my ethnographic work in the clinical practice. In chapter 6, I present my findings and concise summaries of my second and third paper consisting of *aim, theory, method, results* and *conclusion.* Chapter 7 is a discussion of my findings in relation to my research question and in chapter 8 I conclude and present my final remarks and my contributions to further research. And finally in chapter 9 I present ideas for future educational perspectives.



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1. INTRODUCTION

In medicine, as in all professions, identity is closely tied to education and learning. It is in the years of medical training that extend from gaining academic and professional knowledge and clinical practice that the medical students learn the craft of medicine. It is also at that point that they achieve a sense of themselves as members of the distinct professional community. Besides medical expert knowledge, medical students must learn to behave, think and act according to their professional positions, dealing with workplace cultures, fulfil the expectations of patients, relatives, and other professionals, be effective in working together with different stakeholders, and discerning in making judgements about ethical issues (Dall'Alba & Barnacle, 2007; Cruess, et al., 2014; Sharpless et al., 2015). The purpose of this dissertation is to gain new knowledge about how clinical practice as problem-based educational framework sets the scene for medical students' social identity development. Furthermore, I will examine how social identities affect how, what and why medical students approach to learning in relation to how, what and why they learn. According to Smyth, et al. (2015) and Smyth et al. (2017) social identity is moderating components influencing professional behaviour, thinking, performance and attitudes and therefore is important components influencing learning. I choose to focus on the clinical part of problem-based medical education because the everyday life at the hospital, is likely to be a very important and influential learning environment where medical students learn to think, act and behave as future physicians (Dornan et al., 2007).

Today all medical educations must meet the requirements of fast-changing societies and healthcare systems. Furthermore, medical knowledge and the way of handling complex diseases are rapidly expanding (Boyd & Fortin, 2010; Stenberg, Haaland-Øverby, Fredriksen, Westermann, & Kvisvik, 2016). To keep pace with such requirements and changes, high-quality education and practice that prepare medical students for the work as a physician is essential (Boyd & Fortin, 2010). This transition from medical student to physician has long been considered a significant rite of passage (Blackwell, 1986). Learning to become a physician is a multidimensional

transition involving the development of medical expert knowledge, skills, behaviour, thinking and attitudes (Wilson, Cowin, Johnson, & Young, 2013). Barnett (2012) describes it as a non-linear journey with an unknown destination, and this uncertainty is not tempered by skills or knowledge alone. Moreover, graduation from medical education is not only completion of academic study but leads to membership in a group licensed for special privileges and responsibilities and to new prestigious identities. Becoming a member of such group and preparing for it can be very challenging and stressful and fraught with uncertainty (Dyrbye & Shanafelt, 2016; McNiell, Kerr & Mavor, 2014; Teunissen & Westerman, 2011; Pitkala & Mantyranta, 2003; Weurlander et al., 2019). Inadequate preparation during medical school, and lack of support and education for newly graduated physicians as they first enter the clinical practice, have been identified as vital factors contributing to this stressful experience of transition (Klitgaard et al., 2021; Klitgaard et al., 2022; Luthy, Perrier, Cedraschi, & Allaz, 2004). To meet these challenges medical schools and educators around the world have been trying to find ways to ease that transition, e.g., by increasing the length of undergraduate medical education; introducing a mandatory two-year foundation programme before postgraduate training, and some paying attention to curricular reforms, all this attest to the interest and importance of developing and improve medical education around the world (Van den Broek et al., 2020).

Furthermore, in response to this challenging transition, problem-based medical education has been given much attention over the last decade since many medical educators believe that problem-based learning can embrace these challenges (Barnett, 2009; Savery, 2006; Walker, Leary, Hmelo-Silver, & Ertmer, 2015). In particular, occupational practice and authentic experiences in practice settings are being used as a vehicle for identity development and experiences provided in practice settings, usually workplaces or work settings, are essential for developing the knowledge required to effectively practice occupations (Billett, 2009). Therefore, problem-based learning has become an essential theme in the research of medical education around the world and is often acknowledged as a way of preparing medical students for future

work as physicians (Barrows & Tamblyn, 1980; Boud & Feletti, 1997; Tan, Van Der Molen & Schmidt, 2016).

One of the first university courses formally designed as problem-based learning was launched by McMaster University, Canada, in the late 1960s (Barrows & Tamblyn, 1980; Neufeld & Barrows, 1974). The McMaster university educators noted some consistent differences between the environment of the classroom where medical students learned and the environment of the physician's examining room. They observed, for example, that whereas physicians spent most of their time with patients, medical students spent most of their time reading scientific literature. Furthermore, practising physicians spent more time dealing with ambiguous problems presented by patients, but medical students spent most of their time learning 'known' facts by rote. The McMaster educators saw that asking good questions to patients was essential to the success of a skilled practising physician but giving 'right' answers was essential to the success of being a good medical student. With a question-asking approach, physicians were often ready to change their decisions, develop new knowledge and form new conceptions of what was wrong with the patient, whereas medical students had only 'right' answers and were not able to flexible thinking. Skilled physicians accessed new knowledge on an 'as needed' basis in order to enhance their treatment of patients, but new graduates seemed to think they were finished with their learning and did not manage to operationalise what they had learned (Barrows, 2000; Barrows & Tamblyn, 1980; Spaulding, 1969) According to Barrows, Tamblyn and Spaulding the interaction between the physician and the patient seemed to be the pivot of the differences between the conventional classroom and the examination room as setting for learning and development.

The McMaster educators found a particular feature of that social interaction that united all the other differences – patient care consistently required good problem-solving abilities from physicians (Barrows & Tamblyn, 1980). The conception of 'physician as problem-solver' helped define the goals for a new form of problem-based medical curriculum, where medical students needed: to be taught subject knowledge in a way that they would remember it and operationalise it appropriately;

to learn to phrase and appreciate a good question as much as a good fact; finally, to practice asking questions as a means of learning subject matter (Barrows & Tamblyn, 1980). Recognising that the learning context had relevance for medical students learning the skills of professional reasoning and problem-solving through the process of diagnosing and treating patients.

Problem-based medical education in all forms is intended to support medical students to acquire professional acumen and facilitate the transition to professional and clinical work environments post-graduation (Billet, 2009; Bowen, 2011; Kramer & Usher, 2011). Problem-based medical education is based on complex authentic real-world problems as an approach of integrating disciplinary knowledge and skills with educational and clinical applications. Barnett (2012) suggests that this work-integrated approach to learning is only a part of the equation and does not necessarily focus on how medical students understand their relationship to the 'clinical' world in a time of transition and uncertainty. Smith (2012) agrees, that learning from the clinical practice is not a fixed strategy for transforming medical students into work-life professionals, but rather a set of activities that fluctuate – and relying on context and discipline garner various learning outcomes. Therefore, learning about professionalism and identity development, which is often referred to as the appropriate ways in which individuals behave, think and act in a workplace is essential, albeit often a part of a hidden curriculum (Trede, 2012).

Parallel to the increasing interest of problem-based learning in medical education, research in identity development in medical students has been given much attention resent years and seems to have high priority on the medical educational agenda (Hefler & Ramnanan, 2017; Passi, Peile, Thistlethwaite, & Johnson, 2010; Sharpless et al., 2015). Furthermore, a strong identity enhances robustness and is acknowledged as an important component of preparing graduate medical students for the future as physician (Cruess, et al., 2014; Passi, et al., 2010). These findings show the importance of identity development which also has been emphasised by international guidelines in medical education by organisations such as Royal College of physicians and surgeons of Canada, Accreditation Council for Graduate Medical Education and

Tomorrows Doctor (Franco, Franco, Severo & Ferreira, 2015; Maudsley & Strivens, 2000). However, it is important to emphasise that when identity is described in the literature, it is often used as a static position that can be achieved and includes a certain set of characteristics and competencies, which differs from the social identity approach used in my dissertation. The social identity approach, propose a model of the self as content dependent, dynamic, and comprised partly of social identities (Tajfel & Turner, 2004). Social identities is the basis for all forms of productive social interaction between individuals, and develops through a sense of self as a member of a profession e.g. as a medical student, peer, learner, novice, professional, consultant, colleague, physician and also as a member of a specific team or ward. Social identity, is so to speak, much about medical students' own perception of readiness, salience, and fitting in and develops through all the everyday practices in which medical students engage within, and the level to which they are involved and included (Monrouxe, 2009; Turner, 1987). Each of these social identities also refer to social norms for behaviour (an idea of what group members do and should do). Turner (1991) argue that it is these social norms that allow social identification to have impact on behaviour, acting and thinking. The more strongly a group member is socially identified with the group, the more likely they are to think, act and behave in accordance with what they perceive the group norms to be. Applying this concept of social identity to learning in clinical practice, the way in which medical students approach learning in a particular authentic real-life context will be partially dependent on the context and their perception of their social group memberships and the associated norms for learning (Smyth et al., 2017).

When referring to learning in clinical practice, my focus is on professional learning which is closely associated with workplace learning, work-based learning and organisational learning, which consists of a nexus of behaviour, interaction, thoughts, communication, activities, actions, and social norms. (Hager, Lee & Reich, 2012). Inspired by Fenwick and Nerland (2014), I think of professionals as members of any occupational group that defines itself as collectively sharing particular professional knowledge and practices, there off professional learning. Professional learning has for decades been treated as an individual and person-centred process, based on personal

experience and problem-solving competencies in knowing what to do, how and why (Fenwick & Nerland, 2014; Fuller & Unwin, 2014). Countering this individual learning perspective, sociocultural and situated views learning as a participational and contextual matter (Fenwick & Nerland, 2014), a view on learning that fluctuates with the one presented above by (Smyth et al., 2017). These views emphasises the importance of clinical practice, participation, social norms and social relations, and states that knowing is always situated in activity and participation and therefore is particular to educational settings and professional communities. According to Kemmis et al. learning is to be seen as a transition into other practices and occurs without any ´teacher´ being present (2014). Based on that learning perspective medical students simply learn by engaging and participating in and by reflecting on the clinical practice they are learning and situated in. And practice is defined as those doings and sayings that are basic activities and take place without the learner's participation (Kemmis et al., 2014; Schatzki, 2012), so to speak an authentic real life learning context. In such cases, the difference between learning and practicing may be blurred, though, learning in this dissertation seems rather like an early stage in a transition towards abilities in practising this or that particular practice. Learning is, so to speak, a process of initiation into other practices (Kemmis et al., 2014). A learning perspective that is supported by Hager, Lee and Reich (2012) who argue that the learner is an embodied subject produced through engaging and participation in practices that develop competences, knowledge, skills, understanding and disposition to action. And therefore, learning becomes an evolving relational web, a process of ongoing development which changes both the medical student and the learning context in which he or she is enrolled (Billet, 2009; Hager, Lee & Reich, 2012).

The combination of social identity theory and professional learning compasses the duality between the contributions to learning developed by participating in everyday educational practices in clinical workplace settings and how medical students elect to engage in and learn from these activities. A theoretical approach that considers not only learning aspects strictly related to the clinical practice, but also takes into consideration the medical students personal characteristics and their dynamic relationships with their particular social context. That is, how medical students

perceive themselves in the clinical practice, how and the degree to which they identify with different groups is intrinsically related to how they approach learning in a specific educational setting. Focusing on how medical students' social identities affects how, what and why they learn in clinical practice, there is evidence that social identities and social influence processes can affect the social norms for learning behaviour (Smyth et al., 2015) and actual learning approaches (Smyth, Chandra, & Mavor, 2018; Smyth, Mavor, & Platow, 2017).

This theoretical positioning of a 'practice epistemology' (Green, 2009) presented above, gives me the opportunity through my ethnographic research, to explore and contribute to research on how clinical practice sets the scene for social identity development in medical students and further how medical students social identities affect how, what and why they learn in clinical practice. Knowledge that is of great importance for the improvement and development of medical education to meet the educational challenges associated with the transition from medical student to future physician.

Research in problem-based medical education, social identity development in medical students and learning provides knowledge and insight into the potentials for a smoother transition from medical student to physician. Although, there remains a gap in understanding how, what and why medical students learn in clinical practice and internalise information about professionalism, and their perceptions of how social identity development affect who they are and who they are becoming (Bowen, 2018; Yew, Chng & Schmidt, 2011). As a point of departure to gain new knowledge about how problem-based learning is related to social identity development and further how social identity is related to learning, I started out conducting a scoping review. The results from my review will inspire me and inform and guide my research in the intersection of problem-based medical education, social identity development and learning approach in medical education.

2. SCOPING REVIEW AS A POINT OF DEPARTURE

As described above, problem-based medical education intends to give the medical students a smoother transition into the life as physician by a certain problem-based curriculum design. I further outlined the importance of identity development and how that enhances mental robustness and self-confidence in medical students. To be clearer on these two perspectives in the research field of medical education and to delineate my research question, I started out conducting a literature review to identify how the relation between problem-based medical education and identity development was represented in the literature. Early in the review process I found that this specific relation represented a knowledge gap in medical education research. Therefore, I decided to conduct a scoping review and publish it as my first research paper, with the purpose to explore and provide an overview of the topic and as a richly informed starting point for my further investigation. Below I will summarise my first research paper that will lead to the research aim of this dissertation presented in chapter 3. The research question for the Scooping review was: How is the relation between problem-based learning and professional identity formation represented in the field of medical education research?

2.1 SCOPING REVIEW AS METHOD

Using a scoping review as method allows a more general question and exploration of the related literature, rather than focusing on providing answers to a more limited question (Moher, Stewart & Shekelle, 2015) and has a broader conceptual range (Arksey & O'Malley, 2005). Moreover, a scoping review provides more flexibility than traditional systematic review. It is able to account for a diversity of relevant literature and studies using different methodologies, which is not feasible in a traditional review (Arksey & O'Malley, 2005; Levac, Colquhoun & O'Brien, 2010).

Theoretical and narrative reviews, gray literature, as well as both qualitative and quantitative research are all included within the scoping review (Arksey & O'Malley, 2005), which I saw as a strength, since the topic was sparsely described. Therefore, I found scoping review as an appropriate alternative to a systematic review to gain insight and knowledge about the topic.

There is no general accepted definition of a scoping review, neither is there an exacting set of procedures. Thus, the methodology for a scoping review compromises similar systematic activity completed in any review, including focus on a specific topic, a well-defined research question, rationale regarding inclusion and excluding criteria, and clearly defined procedures and responsibilities for all researchers involved (Levac, Colquhoun & O'Brien, 2010). To guide my review and to ensure reliability, I used the five-step methodological approach delineated by Arksey & O'Malley (2005) and Levac, Colquhoum & O'Brien (2010).

2.2 SEARCH STRATEGY

Based on my research question, the following keywords were identified to direct the literature search: ((“medical education” OR “medical student” OR “Medical students”) AND identity AND (“problem based learning” OR “problem-based learning”)) (Johansson, Nøhr & Stentoft, 2020). And to pin down the exact topic of my scoping review I employed a number of inclusion as well as exclusion criteria's derived from the research question. Studies were included: if problem-based learning was mentioned in either the title, abstract or keywords; if identity was mentioned in either the title, abstract or keywords; and if the study was conducted in the context of undergraduate medical education (Johansson, Nøhr & Stentoft, 2020). In addition to the scoping review, I conducted a preliminary search to identify the universal interest in research in problem-based medical education and identity development (Johansson, Nøhr & Stentoft, 2020). As shown in the figure below research in identity as well as problem-based learning in relation to medical education has been given much attention. 10.466 papers were identified relating to research in problem-based learning and medical education and 208.230 papers were identified relating to research in

identity and medical education. 2.618 papers were identified in relation to problem-based learning and identity and only 8 papers were identified to meet our inclusion criteria derived from our research question (Johansson, Nøhr & Stentoft, 2020).

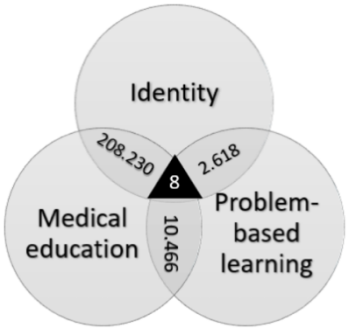

Figure 2. Volume of identified papers in six databases used in the scoping review concerned with problem-based learning, medical education, and professional identity (Johansson, Nøhr & Stentoft, 2020).

The literature search based on the search presented above yielded 398 papers without duplicates. As shown in figure 2.1 below, only 8 papers meet the inclusion criteria and were retrieved for review. A result which testifies the lack of research concerning the relation between problem-based learning and identity development.

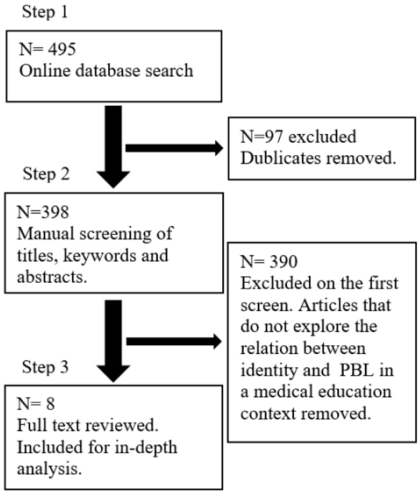

Figure 2.1 Search and identification flowchart (Johansson, Nøhr & Stentoft, 2020).

2.3 RESULTS

During the analysis, three themes were identified as important to the research question: *Nature of research*, *Conceptualisation of identity* and *Relation between problem-based learning and identity development in medical education* (Johansson, Nøhr & Stentoft, 2020). These three themes gave us the opportunity to examine the methodology used in the included papers and identify how they conceptualised the term professional identity and finally, we were able to see how problem-based medical education and identity development were related in the medical education literature.

We found that 7 of the 8 articles contained empirical content based on qualitative data and the last paper contained conceptual principles about current knowledge on enhancing active learning in problem-based medical education. In the included articles the conception identity refers to what a physician is including characteristics as values and norms of the profession learned through social interaction, reflection, acting, behaving and feeling like a physician (Johansson, Nøhr & Stentoft, 2020). Furthermore, identity is described as an ongoing dynamic process that occurs both on the individual level within the medical students as well as a result of social interaction. According to the final theme we found that professional community, real patient learning, cultural environment, social interaction, agency and communication are essential problem-based characteristics that affect professional identity formation in medical students (Johansson, Nøhr & Stentoft, 2020). Moreover, 6 of the included articles recommended problem-based learning as a pedagogical approach to enhance identity development. Thus 2 articles problematised problem-based learning concerning the need for active participation, communication skills and claim that the pedagogical approach is best suited for capable students (Johansson, Nøhr & Stentoft, 2020).

2.4 INSPIRATION FOR FURTHER RESEARCH

As shown above none of the included articles used ethnographic data from the clinical practice to examine and explore the relation between problem-based learning and identity development. Even though, all the included articles recognise and stress that identity development is affected by active participation in practice by engaging,

observing and embody the values and behaviours of the profession. How problem-based learning sets the scene for identity development in medical students remains unclear and to gain more knowledge about how and what medical students learn in problem-based medical education more research is needed.

2.5 CONCLUDING REMARKS

The most important outcome of this scoping study was that it gave us the inspiration and the opportunity to challenge the one-sided methodical and theoretical approaches used in the reviewed articles. Furthermore, we have been able to show that even though the topic of identity development in medical education has been studied quite extensively, there is still a lack of knowledge about how different pedagogical approaches such as a problem-based learning affects medical students' identity development. Finally, this new knowledge about how engagement and active participation affects identity development paved the road for my following ethnographic research in clinical problem-based medical education.

3. ETHNOGRAPHIC EXPLORATION OF SOCIAL IDENTITY IN PROBLEM-BASED MEDICAL EDUCATION

Medical educators have long been advocating students being actively engaged in their own learning as they engage in meaningful and authentic activities as vital part of their learning process (Bell, et al., 2009; Yew, Chng & Schmidt, 2011). But what really happens when the medical students enter the clinical practice is still unclear, even as the clinical practice is most likely to be the most influential learning environment in becoming a physician (Dornan, Boshuizen, King, & Scherpbier, 2007). How self-directed learning, problem-solving, reflection, critical thinking, authentic learning environment, real-world experiences, and collaboration with professionals, together with the possibility to act, behave and think like a physician are related to medical ´students´ social identity development, remains unclear according to our scoping review (Johansson, Nøhr & Stentoft, 2020) and is the focal point of this dissertation.

As shown in the scoping review none of the included articles draw on data from a clinical practice, but focuss solely on learning issues in pre-clinical practice. Furthermore, we identified that there has been very little research undertaken specifically drawing on social identity theory within identity development in problem-based medical education. With great interest, I decided to explore the knowledge gab as a point of departure to understand how clinical problem-based medical education sets the educational frame for social identity development in medical students. Moreover, I was further intrigued by how social identity development in medical students is related to what, how and why they approach learning as they do. An initiate hypothesis is that clinical practice promotes several social identities, depending on the learning context as well as the individual, because medical students are not retained as ‘medical students in a classroom’. Rather they are encouraged to engage in clinical

practice, providing patient care with a pedagogical focus on learning through clinical experience. Whereas this hypothesis was examined in our scoping review, it turned out there is a lack of knowledge concerning that topic and more research is needed. The scoping review also showed that none of the included articles used ethnography as method to examine the relation between problem-based learning and identity development.

Inspired by existing medical education literature on problem-based learning, social identity development and learning approaches, I chose to conduct an ethnographic study of medical students in clinical placements during semester 7 to 10 of a clinical problem-based medical education. In these semesters they spent most of their time on different wards at the hospital providing supervised patient care, examinations and solving authentic clinical cases in small peer-groups, all of which are intended to prepare them as future physicians. I choose this clinical educational setting for my research because this is likely to be a very important and influential learning environment in becoming a physician, an argument that is supported by Dornan et al. (2007). But what happens in the medical students every-day life in the clinical practice (e.g., how they approach learning and what they learn, how they behave, think and act) still remains unknown. This lack of knowledge I seek to explore and illuminate through my ethnographic research, which gives me the opportunity to explore how the clinical practice sets the scene for social identity development in medical students and further how medical students social identities affect their learning approach. So, my interest and the scooping review led me to the following research questions:

> *How clinical practice as medical educational framework sets the scene for medical students social identity development. And further, how social identities affects medical students learning approach concerning how, what and why they learn.*

These questions are addressed in my second and third research paper, which both rely on my ethnographic studies. The second paper explored how clinical practice sets the scene for social identity development in medical students. The third paper builds on the findings from the second paper and explored how the identified social identities

affect medical students approach to learning. In the following chapters I explain the theoretical and methodical approach and clarify the concepts that are used in my research, and finally I discus relevant perspectives on my results and approaches.

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4. CONCEPTUAL AND THEORETICAL FRAMEWORK

In this chapter, I discuss the theoretical perspectives of social identity development and further how social identity theory relates to the concept of learning, and finally I will describe the pedagogical framework of problem-based learning. I propose a social identity perspective that enables me to investigate how clinical practice sets the scene for social identity development in medical students and further how their social identities affect their learning approach. I will clarify how I understand social identity theory as a frame for further understanding of the relation between social identity theory and problem-based learning and how this relation relates to learning in medical students.

4.1 SOCIAL IDENTITY THEORY

In this dissertation I argue that social identity work are moderating components influencing medical students' professional behaviour, thinking, acting and attitudes and therefore are essential components influencing learning in medical students. The concepts of clarification I use in this dissertation regarding identity work are social identity theory and self-categorisation theory, which are complementary theories explaining social identity – what it is (the elements) and how it develops (the process). We develop a social identity which is the element through a process of self-categorisation.

4.1.1. SOCIAL IDENTITY

Generally, social psychologists see social identity theory as the processes through which we categorise ourselves into groups and consider how we think about ourselves, and others strongly depend on the focal group level and heavily influences our behaviour and performance (Pratt, 2003). Once we have identified with a certain group, we then make social comparisons between our group (in-group) and other groups (out-groups) – who we think we are and, how we act – is under influence of the norms and values within the group to which we affiliate and by the internalised

feeling of social identity that we achieve from our group memberships (Burford, 2012; Haslam, 2017; Hogg, 2006). This behaviour provides us with the motivation to develop, and maintain, our sense of positive group uniqueness (Tajfel, 1978). This means that when people consider themselves in terms of *us* and *we* instead of *me* or *I* they want to think of *us* (in-group) as better and different than others (out-group) to feel good about who they are and what they do (Burford, 2012; Haslam, 2017; Tajfel & Turner, 2004). This process defines not only who we are but also who we are not, which can be seen as one of the primary sources of social identity work and self-categorisation. This approach also conceptualises the social group as being at the psychological level 'an intrapersonal cognitive entity' (a self-conception, with evaluative, stereotyping, and emotional components, in terms of a group or category label), and at the 'formal level' (a collection of people who perceive themselves to be members of the same social category) (Turner, 1982).

Social identity plays a central role in understanding how we situate ourselves and gives oneself opportunities to learn in the social context. At the level of organisational identity (e.g., identification with an organisation which can include social categorisation in terms of education, medical student, university, profession, workplace, etc.). Ashforth, Harrison & Corley talk about the relation between cognition, identity, and behaviours:

> Identity situates the person in a given context, delimiting a set of cognitions, affect and behaviours (...). In the study of human cognition and behaviour, identity is one of the key foundational concepts helping to explain why people think about their environment the way they do and why people do what they do in these environments. The concept of identity helps capture the essence of who people are and, thus, what they do as they do (...). Identification matters because it is the process by which people come to define themselves, communicate that definition to others, and use that definition to navigate their lives, work-wise or other.
> (Ashforth, Harrison, & Corley, 2008, p. 334)

Mostly we seek to identify with social groups that afford us the highest source of self-concept clarity (Harkins & Petty, 1982). So, the relevant group for a particular social identity depends on the salience of that group in any situation. For example, a first-year medical student could be more likely to self-categorise as a medical student rather

than physician. However, a final-year medical student could more likely self-categorise as junior physician. This is particularly so if the medical student is afforded that category within the professional community in which the medical student is learning through (Burford & Rosenthal-Stott, 2017; Zaborenko & Zaborenko, 1978). However, it is important to acknowledge that this categorisation process is very context dependent and challenging because the social identities are continuously being renegotiated (Oaks, 1987; Burford, 2012). These efforts are theoretically located in Tajfel's (1978) definition of social identity as "that part of an individual's self-concept which derives from his knowledge of his membership of social group (or groups) together with the value and emotional significance attached to that membership." (p.63). According to Tajfel's definition, our behaviour, attitudes, even speech, depend on our affiliation and social interaction with people who are like ourselves – we gravitate towards similar others, toward our in-groups, to make social comparisons and learn what to think, how to behave, and even know who we are. This point underscores the fact that groups define and validate who we are and thus configure our behaviour, attitudes, perceptions, and expectations of others (Hogg & Gaffney, 2018).

The literature on social identity has suggested that a task in new member socialisation is conformity to and adoption of the new culture that gives rise to new social identities, whether of a new education, a new profession, or a new workplace (Hogg, 2006; Hogg & Gaffney, 2018). Though, the culture is the context (e.g. a hospital ward, an examining room, a classroom, professionals) that sets the scene for the social identity work and influences the availability of social identities. This means that medical students´ social identity is influenced by norms, values, ethics, expectations, and rules of their specific learning environment. Incomplete, inadequate, or poor socialisation can result in various challenges in medical students such as low learning outcome, stress, and low commitment (Ashforth, Harrison & Corley, 2008; Wagoner & Hogg, 2016). With reference to the role of the culture in medical students´ social identity work and learning outcome, one of the most important ways to secure this socialisation and to ensure a good learning environment in medical education is through a high-quality curriculum development.

Medical students across the world are pursuing their professional goals of becoming a physician. Even as they are acquiring the skills, competences and knowledge expected of a medical student, they are at the same time undergoing a process of developing a sense of self that is increasingly consistent with own and society's expectations of what it means to be a physician (Burford, 2012; Monroux, Rees & Hu, 2011). Social identification in medicine is a dynamic process occurring at two parallel levels: the individual level of psychological development, which occurs primarily within the individual; and the social level, whereby the individual learns through collaboration and interaction in the context of behaviour, ways of thinking and how to participate in the professional community (Jarvis-Selinger, Pratt & Regehr, 2012; Postmes & Branscombe, 2010; Tajfel, 1978). Individuals have different roles within a social group, which prescribe different patterns of behaviour (Stryker & Burke, 2000) and successfully fulfilling a role may be an essential means to cementing one's status within the group (Harkins & Petty, 1982). This means that a group of medical students do not necessarily assume or assign identical identities in a context of clinical practice, because social identities within professional communities afford students different means to fulfil their goals. If a medical student believes that members of one group are more likely to allocate acknowledgement and inclusion, it can be expected that the student role generally will pay attention to that group. However, if another group will be more salient, the student will pay more attention to the members of that group to reduce feelings of uncertainty about their self and identity (Burford, 2012; Wagoner & Hogg, 2016; 2020).

4.1.2 SELF-CATEGORISATION

The self-categorisation theory assumes that we vary in our opportunity to affiliate with group's depending on our readiness and fit, as well as the group's accessibility (Turner & Onorato, 1999). Groups are available to some and unavailable to others. In the process of self-categorisation, we evaluate ourselves the accessibility of the group and, in turn, are assessed by the group for readiness and fit. Our knowledge, experiences, competencies, personality, and opportunity constrain the choice of groups available (Turner & Onorato, 1999). Through the process of self-

categorisation, we construct the meaning and purpose of this social identity along with adopting the appropriate behaviour, norms and values guiding performance in this group (Hogg, 2006; Hogg & Gaffney, 2018). This categorisation process reveals the complexity of medical student's social identity work in a clinical setting – the responsibility to conform and adapt to the norms, values, behaviour, way of thinking, demands and expectations (achieving learning goals) of the culture in which the medical students learn on the one hand and their ability to manage the multiple social identities available on the other hand. Through individual motives and aspirations as well as self-categorisation and membership of the group (e.g. professional communities or peers), the medical students develop their social identities, which serves as a social-cognitive schema based on norms, values, and beliefs for the group related behaviour. In adopting the social identity of the group, the medical student's personal identity recedes to the background, and the identity as a member of the group becomes prominent. This switch to a group-based identity involves a corresponding change in motives, expectations, affective connotations, 'professional' language, knowledge, competencies, values, beliefs, and norms (Turner & Onorato, 1999). Influenced by the context, the medical students may display behaviour that conflict with their knowledge, competences, values, beliefs, and norms and may even take more challenging positions that they might otherwise, which can enhance as well as reduce learning outcome (Ashforth & Mael, 1989; Ashforth, Harrison & Corley 2008).

In the context of clinical problem-based medical education, the clinical setting in which the medical students work and learn contributes to their social identity work in a number of ways: through developing a sense of self as a member of the profession e.g. as physician, medical student, peer, and as a member of the specific department to which they are affiliated e.g. as colleague. Furthermore, the activities in which they engage within the clinical setting, and the level to which they are included, also contribute to the concept of their identities and approach to learning: it is much about their perception of readiness, salience and fitting in (Turner, 1987; Crossley & Vivekananda 2009; Monrouxe, 2009).

Both Social identity and self-categorisation are much about learning, which strongly depends on the context and medical student's readiness to fit into the professional role. Learning in that sense can be seen as a change in the way that medical students conceptualise the world around them and is not to be seen as transmitted by direct instruction, rather as created by the medical student's learning activities (Ramsden, 2003). Therefore, the learning environment including the problem-based medical curriculum also play an important role as approaches to learning and can be seen as a function of medical students learning orientation and their perception of how and what to be learned, perceptions that are influenced in turn by the context of learning (Duff, Boyle, Dunleavy, & Ferguson, 2004)

These theories are important to my study because it helps me understand what characterises identity work in medical students and how the identity work influences their learning. One way to examine why medical students do things they do or why they behave, think and act as they do is to examine who they believe they are – their identity. In addition to the complexity of this question, people are comprised of multiple identities (Jenkins, 2008).

4.2. LEARNING IDENTITY AND PROFESSIONAL LEARNING

Wortham's work on learning identities was adopted as a frame for investigating how students' social identities affected their approach to learning in relation to professional and academic opportunities available to them or not (2006). At the crux of the learning identity framework, Worthman (2006) viewed social identity as intimately related to learning; therefore, he coined the concept *learning identity.* "Subject matter, argument, evidence and academic learning overlap with social identification, power relationships, and interpersonal struggles" (Wortham, 2006, p.1). This quote emphasizes the proposition that a full understanding of how medical students approach learning in clinical practice without considering their individual and social dimensions is hardly achievable. An approach that considers not only aspects strictly connected to the learning process and the clinical practice, but also takes into consideration the medical students and their dynamic relationships with their

particular social context. That is, the way medical students perceive themselves in the clinical practice, the way and the degree to which they identify with various social categories is intrinsically related to the way they approach learning in a specific educational setting. By applying the views of learning presented by Kemmis et al. to the concept *learning identity* defined by Worthman (2006) and my social identity theory approach, the analytical work of my ethnographic data becomes clearer. Kemmis et al. portray learning as a process of initiation into practices and define it as:

> […] a form of socially established cooperative human activity in which characteristic arrangements of actions and activities (doings) are comprehensible in terms of arrangements of relevant ideas in characteristic discourses (sayings), and when the people and objects involved are distributed in characteristic arrangements of relationships (relatings), and when this complex of sayings, goings and relatings 'hangs together' in a distinctive project. (Kemmis et al., 2014, p.56)

Doings includes 'participation', 'engagement'', 'reading', 'studying' and 'being assessed'; Sayings are things like ideas of 'knowing' and 'not knowing' and theoretical ideas like 'reinforcement' and 'scaffolding; Relatings are things like the roles of teacher, supervisor, peer and student, and educational 'set-ups' for learning (Kemmis et al., 2014, p.56). These doings, sayings and relatings are strongly related in the distinctive transition of coming to think, act and behave as a future physician and is always and only a process of being engaged and stirred in to practice, even when the medical student is learning alone or from participation with others in shared activities in clinical practice (Kemmis et al., 2014). Integrating ideas from social psychology (i.e. Social identity theory) and practice learning gives me the opportunity to explore how the clinical practice sets the scene for social identity development in medical students and how, what and why they learn.

4.3. PROBLEM-BASED LEARNING AS A PEDAGOGICAL APPROACH IN MEDICAL EDUCATION

In the introduction, I shortly presented some of the ideas behind problem-based learning and in this section, I will clarify the principles of problem-based learning and how it is effectively used in medical education.

As a start, to address a better understanding of problem-based learning as educational framework, I will present the intentions of problem-based learning in a formalised list below, defined by Barrows (1996, p.5-8):

- Fostering clinical-reasoning skills and problem-solving skills
- Enhancing acquisition, retention, and use of knowledge
- Improving medical students self-directed learning skills
- Developing medical students' intrinsic interest in subject matter and, subsequently, their motivation to learn
- Developing medical students' capacity to see problems from multi-disciplinary viewpoints, integrating information from many different sources
- Facilitating the development of effective collaborative learning practices
- Emphasising for medical students the importance of learning for understanding rather than learning for recall
- Improving flexible minds and the capacity to adapt to change.

According to these points, problem-based learning builds on the educational philosophy advocating discovering and learning through solving ill-structured problems in small collaborative groups. The problems became integral to the curriculum, not 'generic problems' but authentic real-world problems, similar to those medical students would meet when they became physicians (Barrows, 2000; Hmelo-Silver, 2004; Gallagher, 1997). This pedagogical transformation initiating learning from authentic real-world problems and using medical teachers as problem-solving guides rather than as all-knowing medical experts, which currently underpins the philosophy of the entire medical education curriculum (Barrows, 1990; O'Brien & Irby, 2013; Quirk, 2006). Problem-based learning has since been improved and successfully used internationally as a new way of pedagogical thinking for medical education (Camp, 1996), And increasingly favoured by medical educators to better prepare medical students for the collaboration, communication, and patient interaction required in the clinical practice (Cohen-Schotanus, Muijtjens, Schonrock-Adema,

Geertsma, & Van der Vleuten 2008; Prince, Van Eijs, Boshuizen, Van der Vleuten, & Scherpbier, 2005).

Despite the attention given to problem-based medical education (based on problem-based learning principles in a medical context), there is no consensus on defining what constitutes problem-based learning. A conceptual uncertainty lingers in the literature regarding its underlying philosophy, how it is executed and what true problem-based learning is (Neville, Norman & White, 2019).

Thus, problem-based learning advocating an experience-based and authentic learning environment that encourages collaboration to identify how, why and what to learn and how to solve problems by applying new knowledge to the problem and reflect on what is learned of the strategies used (Barrows, 1996; Hmelo-Silver, 2004; O'Brien & Irby, 2013; Schmidt & Rikers, 2007).

Most researchers in problem-based learning agree on the view that problem-based learning contains the following four core characteristics. The first characteristic is a focus on complex, real-world problems that have no right solution. Second, learning must occur in small collaborative groups. The third characteristic is that students gain new knowledge or refine existing knowledge by self-directed learning, and the problems encountered are used as a tool to achieve the required knowledge. Finally, teachers or tutors facilitate the learning process (Boud & Feletti, 2013; Hmelo-Silver, 2004; Walker et al., 2015). This correspondence of learning environment to real environment, involvement of self and learner control (autonomy) is to be defined as experiential learning and has functioned as a way of liberating learners and give them more responsibility through for example self-directed learning and self-reflection (freedom as learners); student-centred education (freedom to learn) and social interaction (freedom through learning) (Boud, 1989). A key component of experiential learning is the medical students' experiences, what the medical students experience (depend on the problem, learning context and the curriculum) and how they use their experience further. To discriminate between learning experiences that are worthwhile educationally and those that are not, I drew on Dewey's (1938) principles of continuity, meaning that a valuable experience must be connected to

experience and have consequences for future experience and interaction meaning that a valuable experience is connected to a transaction between an individual and the learning environment. Dewey's principles and Boud's definition of experiential learning frame the foundation of problem-based learning approach in which medical students are given the opportunity and encouragement to learn independently as well as collaboratively in authentic environments. This learning approach can support medical students' developing competences and skills which are needed in patient care, diagnosing, treatment and behaviour as a professional. It provides a framework of experiential and collaborative learning, in line with current understanding of learning as a constructive and co-constructive activity involving social interaction (Glaser & Bassok, 1989; Palincsar, 1998). This learning approach places itself within the social constructivism which focuses on the interdependence of social and individual processes in the co-construction of knowledge (Illeris, 2005).This pedagogical approach and philosophy are the key to assisting medical students in making a smooth transition to the clinical setting and thereby preparing the medical students as qualified future physicians (Barrows, 1990; Barrows & Tamblyn, 1980; Boud & Feletti, 2013; Murray & Savin-Baden, 2000; Tan, Van Der Molen & Schmidt, 2016).

Most educators and professionals such as teachers, physicians or tutors guide medical students' reflection on their problem-solving experiences asking them to articulate both the competencies and skills they are learning and supporting them in identifying the cognitive and practical skills needed for solving problems by providing them with feedback (Barrows, 1996; Willem et al., 1999). Thus, in the ideal clinical problem-based setting it is the medical students who decide how to examine the patient and the further treatment though supervised by a professional to secure the patient safety and to make sure that the learning goals in the medical curriculum are fulfilled. This learning approach allows the medical students to reflect upon problems from different perspectives, to use their existing knowledge and not at least to learn how to behave, think, and act like a physician. In this way, the skills needed for life-long and self-directed learning, collaborative learning are also acquired and their ability to clinical problem-solving would be enhanced and a better understanding of how symptoms can constellate to diagnoses (Azer, 2009; Hmelo-Silver, 1995; Norman & Schmidt, 1992;

Wood, 2003). An approach which is enforced when medical students become responsible for their own learning and use critical analysis as part of their learning approach and can be seen to amplify further in the clinical years (Jhala & Mathur, 2019). The assumption is that problem-based learning, on the one hand, actively engages medical students in their learning and, on the other hand, includes several scaffolds to promote student learning such as solving real-world problems and a group discussion facilitated by an educator or a tutor.

4.4. SUMMARY OF THEORETICHAL FRAMEWORK

As shown in this chapter, the key concept in the social identity theory approach and identity learning is that social identity has the adaptive and dynamic function of producing behaviour, thoughts and attitudes and represents the basis for a wide range of collective behaviours including collective action. How the medical students perceive themselves and fit into the context of clinical practice and how they identify with different social categories is intrinsically linked to the way they learn in the clinical practice. If the clinical practice sets the scene for medical students to assume and assign various social identities under supervision and the professionals allow them, they are more likely to behave, think and act like future professionals and thereby afford many different social identities. The conception of learning as a collective participatory process of active knowledge construction emphasises the role of clinical problem-based medical curriculum design. And, through the curriculum it is possible to stir medical students in to new practices through doings, sayings and relatings and promote certain identification in making certain identity content to appear normative or in constructing environments with particular identity affordance. As the figure below summarizes the clinical practice intend to set a real-life educational scene to prepare medical students properly for the future life as physician. By affording medical students to engage and participate in various clinical practices gives them the opportunity to behave, think and act as illustrated below in figure 4. (e.g., as peer, medical student, collaborator, communicator, self-directed learner, observer, novice, nearly physician, colleague, professional).

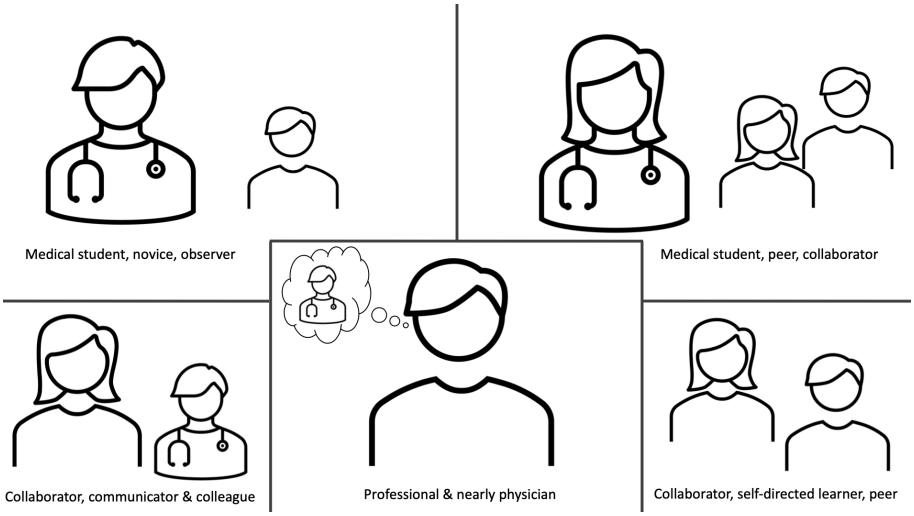

Figure 4. Illustration of some of the intended learning situations in clinical practice.

It is shown how learning and social identity theory of group behaviour and social influence assume a functional interaction between practice, psychological and social processes, in contrast to individualism, and at the same time generate distinctive empirical predictions (Turner & Oaks, 1986), which can be very fruitful according to improvement and development of medical educations.

5. METHODOLOGY & METHOD

This chapter aims to provide an insight into how the research was performed and the methodological arguments and reflections. I will outline the design of my ethnographic approach and discuss the methods used in this study: participant observation, informal conversations, and in-depth interviews. After elaborating my analytical strategy, I reflect upon my own role as researcher according to ethics and the quality of doing qualitative research.

5.1. ETHNOGRAPHY – A METHOD OF EVERYDAY LIFE

As a key method of anthropology, ethnography is concerned with culture, shared practices, behaviour, and beliefs, and how the social environment shapes, and is shaped by, individuals (Patton, 2015). According to Leung (2002) and Wallford (2008) ethnography is particularly well suited for studying educational environments, because it focuses on the details of individuals' everyday life and how these are related to the social and educational structures. Wallford (2008) also argues that ethnography has been used to switch from educator's perspective on the learners to the learners themselves. Ethnography has a history of more than 50 years in medical education and has elicited a valuable volume of research in this area by observing, inquiring, and understanding experiences, interpretations, interactions, and relationships surrounding a topic in everyday life (Goodson & Vasser, 2011).

Since my study primarily focus on how clinical problem-based learning pedagogy in the hospital sets the scene for medical student's social identity development and how their social identities relate to how and what they learn, I found this methodology appropriate, because it gives me the opportunity to examine and describe the process in which social and psychological aspects are explored at the same time with learning aspects. Specifically, by understanding the learning in medical students as a more holistic process, I refer to an approach that considers not only aspects strictly related to the learning process, but also takes the medical students and their dynamic relationships with their particular learning context into consideration.Namely, the way students perceive themselves in the context of learning, the way, and the degree to

which they identify with a social category is intrinsically linked to the way they learn in a specific setting. As described in the previous chapter, social identities are an individual as well as a collective effort, produced in interaction with others. Hence, it makes sense to study an existing group of medical students as they go about their daily lives in the clinical practice at Aalborg University Hospital.

The purpose of this dissertation is to understand and gain insight into medical students' social identity formation and how that relates to their learning process, which involves two distinct activities. First, one must become submerged into a social setting to get to know and establish trust to the participants involved, as well as participate in the daily routines of this setting, develop ongoing relations with the participants and observe their behaviour and acting related to their identity work. Second, one must document by regularly and in systematic ways writing down what is observed and learned while participating in the daily rounds of the lives of the participants. (Emmerson, Fretz & Shaw, 2013; O'Reilly, 2005; Spradley, 1990) These two activities compromise the body of ethnographic research: first-hand participation in initially unfamiliar social world and the production of written accounts of that world that draw upon such participation.

5.2. SCIENTIFIC POSITION

Ethnographic research can produce descriptions and accounts about the ways of life of those whom the study is about, including that of the author (Denzin, 1997). Ethnography is one way of exploring social identity work in a clinical setting, but it is also a method that includes the presence of me as a researcher whose whole sense of purpose is to convey what I have seen and experienced. This consideration is outlined by Geertz:

> Chartres is made of stone and glass. But it is not just stone and glass; it is a cathedral, and not only a cathedral, but a particular cathedral built at a particular time by certain members of a particular society. To understand what it means, to perceive it for what it is, you need to know rather more than the generic properties of stone and glass and rather more than what is common to all cathedrals. You need to understand also- and, in my opinion critically, the specific concepts of the relations between God, man and architecture that, having

> governed its creation, it consequently embodies. It is no difference with men: they, too, every last one of them are cultural artefacts.
> (Geertz, 1973: 50-1)

As Geertz put it Chartres is not just as a building but a 'meaningful reality', based on all the interactions that occurred between people and their society during a particular social context (Crotty, 1998, p. 42). At the centre of this reality was an idea, developed and created from a relationship that existed between man and God. By relating this philosophical perspective to the context within my particular ethnographic research, it was important for me to accept that the social identity development in medical students did not simply appear as an object waiting for me to identify it and seek meaning from it, but the medical students social identities existed and functioned prior to my research.

The epistemology of my study is interpretivism, which asserts that reality, as well as our knowledge thereof, are social products and hence unable of being understood independently of the social actors (including the researchers) that construct and make sense of that reality. The world as it is with social identities is not conceived of as a fixed constitution of objects, but rather as an emergent dynamic and continually constructed and reconstructed social process (Bryman, 2016; Crotty, 1998). I am using interpretative research to understand how medical students, through their performance and participation in social learning processes, enact their particular realities and attach them with meaning, and to show how these meanings, beliefs and intentions of the medical students help to constitute their behaviour, act and ways of thinking. According to Gibbons (1987, p.3), the interpretative perspective attempts "to understand the intersubjective meanings embedded in social life […] and hence to explain why people act the way they do." Thus, interpretivism holds that I can only understand the participants' social identity development and how that is related to their approach to learning by examining the interpretation of that learning context by its participants (Bryman, 2016; Foerster & Pörksen, 2003, p.126), meaning that I should examine the perspectives and experiences of the participants involved in the study and consider their location.

In this epistemological description, the cognitive elements such as norms, values, beliefs, thoughts, intentions, and behaviour are pivotal to me trying to get insight and understand the medical students' views of their social world and their role in it. Interpretivism is founded on a constructivist ontology and emphasises the importance of the social world and its categories, which are not external to us, but are constituted and reinforced in and through social interaction (Bryman, 2016, Hammersley 1992; Orlikowski & Baroudi, 1991). According to Gioia & Pitre (1990) and Crotty (1998), interpretivism aims at generating descriptions, insights, and explanations of events so that the system of interpretations and meaning, and the structuring and organising processes, are revealed. Thus, I cannot ignore my presence as researcher and my social identies, it is however an important part to consider if I am to interpret the participant's behaviour, acting and thoughts, as 'I' see and understand them within this social context. Therefore, it is important to acknowledge that my ethnographic work has been influenced and guided by my theoretical position and preconceptions: When asking curios and informal questions to the medical students, my presence when they are examining patients, constantly following them around in the ward, observing them writing medical charts and receiving supervision and feedback from physicians, me taking fieldnotes while observing them, me witness when difficult decisions are to be made by the participants. My presence, questions, thoughts and behaviour, which are based on social identity theory and knowledge of problem-based medical education have undoubtedly affected the way the participants reflect upon their own world, why they behave, think and act as they do.

5.3. WHAT IS ETHNOGRAPHY

Ethnography is the work of gaining insight and describing a culture. The method has been defined in various ways and there is no agreement about any definition. Thus, as a method ethnography in general refers to social research wherein behaviours is studied in a small everyday life setting, with observation and/or informal conservations being the main data gathering methods (Hammersley, 1990; Pink, 2015, Spradley, 1990). The task as ethnographer is to document the culture, the perspectives, and practices of the people in a given setting. The aim is to 'get insight into' the way

that individuals as well as groups see the world. As methodology ethnography can be defined as:

> Iterative-inductive research (that evolves in design through the study), drawing on a family of methods, involving direct and sustained contact with human agents, within the context of their daily lives (and cultures), watching what happens, listening to what is said, asking questions, and producing a richly written account that respects the irreducibility of human experience, that acknowledges the role of theory, as well as the researcher's own role, and that views humans as part object/part subject.
> (O'Reilly, 2005, p.3)

Her definition provides a general sense of what a researcher that uses ethnographic methods is supposed to do, without prescribing exactly how this must be done. As methodology, the term is often used interchangeably with qualitative social research or interpretative research (Hammersley, 1990). This section elaborates on my use of ethnography as a methodology. The methods used in my study are described in the subsequent sections.

As shown in our scoping review, not much research has been conducted in relation to identity formation in medical students in problem-based medical education. This knowledge gap forms the foundation of an iterative-inductive approach as outlined above by O'Reilly to answer the research questions in my dissertation. My approach is inductive because it is aimed at generating unexplored knowledge and perspectives about medical students´ social identity formation and learning processes in the final years of a clinical problem-based medical education. The research process is iterative because the process has been fluid and dynamic, and I have constantly been moving between different social identity theory perspectives and preconceptions and field work at the hospital and rethinking the research questions in my second and third research papers.

Despite my research field is almost unexplored, I am inspired and guided by my interest and knowledge of problem-based learning pedagogy and social identity theory to examine how clinical problem-based learning sets the scene for social identity formation in medical students and how social identities relate to how and what medical students learn in clinical problem-based medical education. The clinical

problem-based learning setting was important for my research because the clinical context referring to solving real life problems, working with authentic cases, practising real patient learning, developing collaborative practices and emphasises the importance of learning for understanding rather than learning for recall. Intentions which are a fundamental part of problem-based learning pedagogy. As a learner in clinical practice you must be a self-directed learner, show a high level of engagement, performe professionally, communicate with various professionals, be motivated to learn, and collaborate interdisciplinary. Drawing on the social identity theory guides my work and gives me the opportunity to examine how and why the participants behave, think, and act in relation to the clinical problem-based setting as they do. Using my knowledge of problem-based learning in medical education in combination with social identity theory as guidance through my empirical work, was important in terms of answering my research questions. This research strategy Blaikie refer to as abductive logic and describe it as follows:

> Abductive logic starts by discovering the lay concepts, meanings and motives that social actors use in the area of social life under investigation and, from the recording of these everyday accounts, technical or social scientific accounts are produced by an iterative process of typification and abstraction, each of which can involve other logics, such as iterations using induction and deduction. The movement is from lay descriptions and explanations to social scientific descriptions and explanations.
> (Blaikie & Priest, 2017, p.13)

Induction in qualitative research means no theoretical assumptions before gathering data, but it is commonly accepted that no study can be completely inductive (O'Reilly, 2005; Hammersley & Atkinson, 2007). Thus, induction does not refer to a blank mind, however, my dissertation started out with a scoping review exploring research in the relation between identity development in medical students and problem-based medical education. So, in my case induction refers to an open and curious mind inspired by the findings in the scoping review and my theoretical position that contributed to a dynamic and reflexive ethnographic approach. Even though, social identity theory and self-categorisation theory constituted my theoretical framework, I did not know in advance which social identities and social categories would emerge during my ethnographic study. I also had several meetings with the professor who

coordinates the clinical part of the medical education at Aalborg University Hospital to get an understanding of what I would face at the hospital. Furthermore, I continuously used social identity theory and knowledge about problem-based medical education and experiences to develop and inspire my participant observations and in-depth interviews. Iteration in this sense is to be understood as a spiral which loops and also moves forward (O'Reilly, 2005). In my case, the theoretical perspectives, data gathering, and my thematic analysis have not been strictly separated, because participant observations are selective interpretations, so analysis and interpretation are already an intrinsic part of conducting data. This process moving from lay descriptions and explanations towards social scientific descriptions and results is what Blaikie & Priest (2017) and Blaikie (2018) define as an abductive research strategy.

My abductive research strategy followed a process in which explanations emerged from iterative fluctuations between my ethnographic data and theoretical perspectives and preconceptions. However, in the initial stages of the thematic analysis, I strived to analyse my data open minded by establishing openness to the problem's complexity and various perspectives. My initial inspiration of problem-based learning in medical education and social identity theory guided me in this complex clinical setting and functioned as a theoretical inspiration and helped me to understand and identify social identity formation in medical students. As I became aware of the significance of the characteristics of the social interactions between the medical students and the professionals as well as the patients, I increasingly utilized the enactive approach in my search for how social identity and self-categorization could be used more analytically. Throughout the thematic analysis, I actively used the theoretical perspectives to investigate how clinical practice sets the scene for social identity development in medical students and how social identity is related to their learning approach.

5.4. THE PEDAGOGICAL SCENE: THE AALBORG MODEL OF PROBLEM-BASED LEARNING

The Aalborg model is based on problem-based learning and builds on the following five principles; 1) The problem as point of departure, 2) Project work and case work is organised in groups and based on collaboration, 3) The project work and case work is supported by courses, 4) The work is exemplary (exemplarity implies that learning outcomes achieved during project work and case work are transferable to the profession) and supported by a supervisor, and finally 5) The students are responsible for their own learning achievements (AAU, 2015). These five principles form the foundation for the curriculum framework at AAU and includes all the programmes and educational activities.

As illustrated below in figure 5 The Aalborg model intend to provide students with tools for independent acquisition of knowledge (viden), competences (kompetencer), and skills (færdigheder) as regards problem identification, problem analysis, problem solving, communication, corporation and the evaluation of work processes and the quality of their own work at a high academic level.

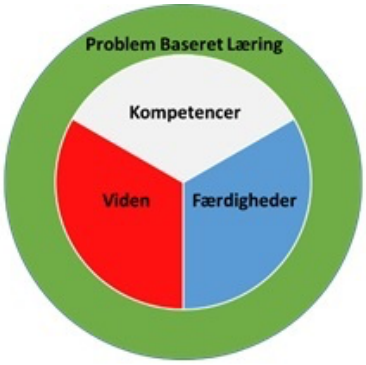

Figure 5. The intentions of problem-based learning (AAU, 2015).

Furthermore, the Aalborg model assumes that students learn best when applying theory, research-based knowledge, and practical experience in their work with solving

authentic real-life problems (AAU, 2015). This problem-based pedagogical approach encourages students to reflect critically on how and what is learned and why; in doing so, they should apply a perspective that extends beyond the individual discipline and the organisational framework of their work.

5.4.1. CURRICULUM: MASTER OF SCIENCE IN MEDICINE

The first three years of the six years problem-based medical education at AAU are primarily based on solving real life authentic problems (solving patient cases), project-based group work and a few clinical stays at the hospital (AAU, 2022a). The three final years (MSc in medicine) which also build on the problem-based learning principles of AAU, are primarily spent in the clinical practice in several different wards and clinical specialities at Aalborg University Hospital. Semester 7 and 8 builds on the themes 'general medicine and surgery' where the purpose is to develop clinical skills and theoretical knowledge; Semester 9 builds on the theme 'family' which includes medical specialities that have to do with family life; The 'head' is the theme in Semester 10, with a focus on the diseases relating to the mind, senses and nervous system; Semester 11 is focusing on 'clinical research'; and finally semester 12 is about 'integrating medical knowledge' with a purpose to think, act and behave as a future physician (AAU, 2022b). The Curriculum is based on supervised patient care, solving real life problems, working with authentic patient cases, developing interdisciplinary collaboration and professional reflection skills, clinical lectures, workshops, peer-learning, feed-back, supervision (AAU, 2022b). The intention of clinical practice at AAU is to enhance patient safety, promote problem-solving skills through self-directed learning and reduce uncertainty and prepare medical students for the future life as physician. Thus, clinical practice at Aalborg University Hospital allows the medical students to a lesser extent to adopt the everyday life of a physician (AAU, 2022b). As the principles of clinical practice (problem-based learning) centre the medical students, the physicians play an important role supervising, educating clinical cases, facilitate reflection and critical thinking, providing feedback and supporting the medical students in becoming a complete physician (AAU, 2022b).

5.5. PARTICIPANTS

The participants and location for this study were selected on the bases of the aim of the dissertation. This means that a number of choices regarding the participants and location had already been made: it concerns a topic orientated ethnography in a single community – Aalborg University Hospital. In a topic-oriented ethnography, the focus is on one or more aspects of life (Spradley, 1990).

As mentioned above some inclusion criteria regarding the participants had already been made regarding the purpose of the dissertation, such as, the participants had to be pre-graduates enrolled in medicine at Aalborg University as the observation period started, in order for me to follow them as long as possible during their three years in the clinical practice. Even though the study did not distinguish between findings from male or female participants, it was decided to include both sexes. The small group of participants included in the ethnographic study was recruited among a larger group of medical students. They were all affiliated with the ward where my observations started, and they agreed in participating in the study. The figure below shows the number of participants and their pseudonym, number of shifts and interviews conducted in the given period.

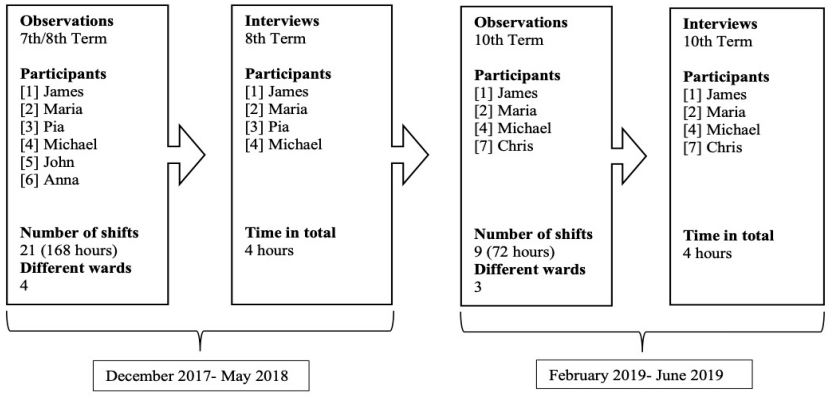

Figure 5.1. Overview of participant involvement and their pseudonym and the volume of conducted observations and interviews (Johansson et al., 2022).

5.5.1. PARTICIPANT CHARACTERISTICS

As described earlier in chapter 4 **conceptual and theoretical framework** social identities and learning are an individual as well as a collective effort, produced in interaction with others. To enhance transparency in relation to my analytical and empirical work, I find it relevant to give a brief presentation of the five participants who have been affiliated with my ethnographic work. All the presentations are supported by extracts from my empirical data. The participants are covering a five-year age span from 20 to 25 years at the beginning of my ethnographic study.

James: Extrovert, confident, independent, goal-oriented, intrinsic motivated, and engaged in his study. "I really enjoy studying medicine […] I find the clinical practice very motivating, interesting and educational. 'It is like being a passenger on a high-speed train' everything is going so fast and if you want to learn, you need to keep up the game […] I am constantly pushing my boundaries, which I really like" (Interview). Working with people motivates James and inspire him to do his best in his everyday life at the hospital "Working with people and knowing my work is helping to make a positive difference to patients' lives makes me always give my best and motivates me to become a competent and skilled physician" (observation, informal conversation). James has a certain educational goal "When becoming a physician, I want to work at an emergency department […] I really find the work pace and the unpredictable everyday life exciting and challenging (Observation, informal conversation).

Maria: Introvert, insecure, intrinsically motivated, very clear about her passion for working with people. "I often think about what I wear and how to blend in so that the people don't expect me to be a knowledgeable physician […] people look at you as an authority that knows everything which is very transgressive because you don't know anything as a medical student" (Interview). In the beginning she often blushed, and her voice became low, and she often tried to avoid challenging situations. After a while she started believing in herself and turned into a more confident and independent medical student. "Do you remember in the beginning how shy and quiet I was […] I often had a stomach-ache because I was nervous and had the feeling that I was not good enough and therefore stayed at home […] now I believe in myself and

is much more confident as medical student" (Interview). Her choice to study medicine stems from her own care trajectory experiences and is her primary motivation. "As a child I was often hospitalized, and I remember in particular some very nice physicians and what positive difference they made to my treatment and how they handled me and my family during the care trajectory […] I want to help sick people and make them feel secure […] I want to be a general practitioner because I think the everyday life at the hospital is very stressful and hectic and I am not that type at all" (Interview).

Pia: Extrovert, goal-oriented, intrinsic motivated, independent, confident, and engaged in her study. "It is so cool and challenging to be a medical student and I find the clinical practice exciting and educational both on a personal and professional level" (Interview). Pia is very engaged in her study and confident about her own role as medical student and sees herself as a part of the team right from the beginning "I can always ask an older and more experienced colleague if I am in doubt about something […] I think it is very important to have a good relationship with your colleagues (physicians) […] wearing the white coat gives you the feeling of being in the role" (Interview). Pia's engagement and motivation stems from her dream to become a psychiatrist "I am here to become a psychiatrist, because I like to work with people and find it very interesting how interaction and conversations can affect people with mental illness" (Interview).

Michael: Extrovert/ Introvert, goal-oriented, intrinsic motivated, independent, confident, and engaged in his study. "Studying medicine gives me a lot of respect and authority […] I am very engaged in my studies and want to achieve something special in my life and medicine is a part of that plan […] I am very aware of my own learning outcome and do what I feel is best for me […] sees myself as a competent medical student […] I study a lot and I have always been 100 percent engaged in everything I do" (interview). Michael is engaged, and both extrinsic and intrinsic motivated, and puts a lot of effort into his study. "I have always been in doubt about which study I should choose, though I knew that my study should involve biology […] I love animals and wanted to be a veterinarian or marine biologist but it was not possible for me to move to Copenhagen to study […] suddenly I became aware of medicine and

found it exciting because it involved both humanity and biology and the possibility to do clinical research (Interview). Michael don't know what he wants to do after graduation.

Chris: Extrovert, very confident and independent, highly goal-oriented, intrinsic motivated, and highly engaged in his study. "To become a skilled and competent physician is a mission in life […] I am very engaged in my study and life as physician […] my peers and I often meet to discuss patient-cases, which is of great interest to me […] I feel that I am a competent student and takes on tasks independently […] during my clinical placement a have taken a lot of responsibility and probably more than what was intended" (interview) Chris's father is a chief physician and he himself has always wanted to become a physician like his father, therefor he states that medicine is a mission in life. "I want to be a paramedic after graduation and hopefully I can become a part of the helicopter paramedic rescue team" (Interview). Chris is very clear about his educational goal which he also states and shows.

I will not in this section go deeper into how their personal characteristics influence their engagement and participation in clinical practice. Nor will I explore how their personal characteristics affect their social identity development and learning. Instead I will let these descriptions function as a base and point of departure for my analytical work later in chapter 6.

5.6. GAINING ENTRY

In this paragraph, I will describe the measures taken in accordance with entering the research field. Furthermore, I will apply some of my reflections made during the ethnography to give an insight into the ways in which the data is conducted.

So, what do you do once you set foot in the hospital? Where do you start? How do you stick to your plan? The scope of the complex scenery turned out to be much greater and less controllable than I ever imagined. Being at the hospital doing participant observation means that you are a part of the research field and therefore affect the clinical learning context as well as the situations that occur, which I cannot control. The field is framed in a certain way, and I am bound to accept it because my

job is to observe what happens, I am also obliged to observe the rules, norms, cultures, routines of the research field and to respect and acknowledge the given order of things. Such is the nature of my position in the beginning, as I am only a guest '*outsider*'. I am depending on what is given by the participants as well as the physicians, nurses, patients, willingness, or lack of it, to provide me with data, answer informal questions, allowing me to observe them, letting me in when something is up. So, I do not take control, I submissively play along and adjust to the clinical practice and the people around, and keep on doing it.

In the very beginning of this project, I was in an *outsider* position regarding medical education and clinical practice. I have not studied medicine, I have never worn a white coat before, I have never had the feeling of being a physician and experienced people glance at me like that. I experienced more than once to be included in learning situations as a physician: "Now the physicians are here to talk to you […]." A common introduction that patients were given by the nurses, when I arrived together with the participant. Furthermore, I sometimes had the feeling of being considered like a supervisor for the participants, because of my observing position in the room and the little black notebook and pen in my hand. Some will argue that my position could be a limitation, as I was not familiar with the everyday life that medical students face during their clinical and educational practice at the hospital. On the other hand, it could be seen as an advantage. Being unfamiliar with the social roles, norms, values and expectations in the actual learning environment, I was able to be curious and ask questions about issues that other local researchers might take for granted. Thus, access to the research field is still a key element in doing ethnographic research (Hammersley and Atkinson, 2007). Access, however, should not be thought of as a matter of course, but as a demanding process of developing trusting relations to the participants as well as the rest of the professionals involved. As participatory researcher you can have special access to how social and educational life and work are conducted in local fields by virtue of being *insider* (Kemmis, McTaggert & Nixon, 2014). As shown in the extract below from the last interview with James (participant) an insider position has advantages when it comes to doing participatory research in social and educational practices.

> James: […] I cannot remember a single time where you have been disruptive or that I have thought it would be better if you waited outside so that I could examine the patient on my own […]. And I am totally honest when I say that I have been able to do my work with full involvement and dedication despite your presence and I have not behaved differently. Sometimes you could put some thoughts in motion and make me reflect on the things that I take for granted or just do not see because it is a natural part of my everyday life. […] no not disturbing at all.
> (James, Interview, 28.05.2019)

According to Kemmis, McTaggert & Nixon (2014) an *insider* participatory researcher can; create the conditions for researchers to understand and develop the ways in which social and authentic educational practices are performed; create the conditions for researchers to speak a shared language, using interpretive categories, and joining the conversations and critical debates of those whose behaviour constitutes the social and educational practice being examined; create the conditions to participate in and develop the forms of behaviour and interaction in which the social and educational practices are conducted; Create the conditions for researchers to participate in the professional communities of social and educational practices through which the practice is conducted; and finally create the conditions for researchers, individually and collectively, to transform the findings into new perspectives and ways of doing things. By constantly paying attention to these key elements while doing participatory research at the University Hospital, it was possible to conduct research that helped me answering the research question.

5.7. PARTICIPATING AND OBSERVING

I, as an ethnographer, am committed to going out and getting close to the activities and everyday lives of the participants and scenes of their lives in order to observe and understand them (Hammersley & Atkinson, 2007; Rashid, Hodgson & Luig ,2019). With immersion, I can capture in my small book with field notes how the participants behave, act, and perform, how they carry out their daily routines, what they find meaningful to learn, and how they interact and collaborate with other professionals, peers and patients in the clinical practice. In this way, immersion gives me access to

the fluidity of their everyday lives and enhances my sensitivity to interaction and process (Emerson, Fretz & Shaw, 2013).

So how is the ethnographic method of participant observation to be carried out in a ward environment? As described in the section above it is necessary to take on a certain role in the field if the aim is to blend in and become a natural part (*insider*) of the ward environment. According to Van der Geest and Finkler (2004) there are three common ways of doing it, either by joining the staff, the patient, or the visitors. I did the first and played more or less explicitly the role of a medical student and put on a white coat to be regarded as 'one of them'. A choice that tends to represent the medical student's point of view. The extracts below illustrate some of the consequences of wearing a white coat during my ethnographic field work.

> Me: […] do you think that it would have affected your behavior and acted differently if I were dressed in normal clothes when following you around in the ward?
> Janus: No not at all, because you have managed to be 'the fly on the wall' and often I did not notice you at all.
> (James, Interview, 28.05.2019)

> Me: Have you been affected by me following you around observing and asking questions?
> Maria: No, I did not think so..
> Me: Were you sometimes stressed by presence.
> Maria: No, actually not, because I am used to be surrounded by different professionals such as nurses and physicians when doing examinations or consultations with patients.
> (Maria, Interview, 27.05.2019)

During my research, I ask the participants how they feel about being observed in the wards and during their clinical case-work with their peers. Assuming that Janus and Maria are secure in the interview situation and honest when claiming that they felt comfortable and confident with my presence observing and asking questions. In relation to their answers, it is also important to notice that I made it clear from the beginning that they could withdraw as participants at any time if they felt uncomfortable being observed, which none of them did.

Even though I strived to become an insider and act as a fly on the wall, I was still a researcher observing how they behave, think and act in different learning situations referring to my theoretical stance and knowledge of problem-based medical education. The combination of my participation in their everyday life in the clinical practice and my position as researcher can affect the participants behaviour and how they think and act. In my presence, they could carry out assignments and examinations they were not comfortable with and would have rejected if I was not there, because they want to show me how professional and competent they are. A close relation to the participants could also influence my ethnographic work, in that sense that they may have a desire to contribute positively to my research by trying to give me correct answers or at least tell me what they think I would like to hear. That I as a researcher had a good and friendly relationship with the participants is important knowledge to keep in mind when interpreting and analysing the ethnographic data and reading the whole dissertation.

5.8. IN-DEPTH INTERVIEWS

Asking informal questions is an integrated part of participant observation, but often, more formalised in-depth interviews are used to gain additional understanding or information (Hammersley & Atkinson, 2007; Spradley, 1979). According to Brinkmann and Kvale (2015) in-depth interviews aim to let the participant speak and describe their experiences and considerations freely but still allow the interviewer with the options to guide the interview in a certain direction concerning the research question. I used in-depth interviews because asking open-ended questions allowed freedom for both me and the participants to explore additional points and change topics, if necessary. That offered me the opportunity to identify rich, descriptive data about how and why they behave, think and act and learn like they do. It also contributes to new perspectives and initiates reflection upon the participants´ own practice, identity and learning, which also affect how they interpret and understand the everyday life that they are engaged in.

I used an interview guide based on three themes, (1) social identity, (2) problem-based learning and (3) future education (Appendix 12.4 & 12.5) to ensure that important

topics were covered. This means that the semi-structured interview guide was considered a guideline rather than a rigid recipe that had to be followed strictly. The themes were inspired and informed by my research questions, theoretical framework, my knowledge of problem-based medical education and my observations. The interview guides for both interview periods were designed in collaboration with my supervisor Diana Stentoft, to enhance reliability of the interview.

The interviews were audio-recorded and conducted in March to May 2018 right after the first period of observation. They all signed a statement of consent before the first interview period. The same procedure was followed in May to June 2019 after the second period of observation. The interviews took place at the University hospital or at the University in familiar surroundings. An average interview lasted one hour, and all the interviews were audiotaped and fully transcribed by me. The intention and plan were to conduct all interviews shortly after the final observations to enable discussions and considerations regarding themes or details from the observations in the clinical practice. Interviewing people you have a relationship to as a researcher is explored by McConnell-Henry, James, Chapman & Francis (2010). They claim that this duality is a great privilege, and one may enhance the interview experience for both parties. Furthermore, it is possible to reduce the asymmetry in the interview situation if there is an existing relationship to the participants. With the hope of being able to benefit from these findings, I conducted the interviews after completing the first period of participatory observations. Hoping that they by now would know me and be somewhat comfortable around me with the possibility to come close to everyday conversations, whilst having a purpose and involving a specific approach and technique (Brinkmann & Kvale, 2015).

5.9. ETHICAL CONSIDERATIONS

In conducting the ethnographic research and reporting the findings, I followed The European Code of Conduct for Research Integrity to ensure good research practices based on principles such as reliability, honesty, respect, and accountability (ALLEA, 2017).

Before I started doing my field study at Aalborg University Hospital, I was asked to sign a non-disclosure agreement, because my participant observations would include patient contact and insight into confidential patient data. To ensure full confidentiality in relation to the patients involved in my study, I assured not to take any field notes that could refer to them.

To ensure the participants were clearly informed of the purpose of the research and how data was handled, the aim of the research was introduced to the participants face-to-face before the first observation period started. I made it clear to them that they could withdraw as participants in the study if they felt uncomfortable being observed, which none of them took advantage of. Furthermore, I emphasised that I would not assess their medical competencies and skills, but only observe their behaviour in relation to the environment. All involved departments at Aalborg University Hospital and the participants were informed about the anonymized study and agreed on participation. All the participants provided written informed consent stating their participation and for their data being used. All information collected will be kept in accordance with the GDPR (2018) and policy for research data management at Aalborg University (AAU handbook, 2019).

Confidentiality and anonymity are often confused (O'Reilly, 2005). In ethnographic research, anonymity from the researcher is not possible, because anonymity is when the researcher or another person cannot identify the participant or subject from the information given. However, confidentiality means that the data cannot be tracked back to the participants. All the names of the participants and the involved wards in this dissertation are fictitious.

Whilst making field notes, I never wrote down anything compromising in my notebook and I told the participants that it was always free to read. Trust was important during the participant observation because the participants often were involved in difficult and challenging situations. During ethnographic fieldwork, I as a researcher most consider the consequences.

5.10. ANALYTICAL STRATEGY

The approach to analysis was initially guided by social identity theory, which was used from the outset to help me explore, identify, and zoom in on social identity work in medical students in the clinical practice. During the participant observations at the hospital, I had informal conversations to explore the participants acting, behaviour and way of thinking. I occasionally articulated my observations and invited the participants to add their observations or understandings. I also wrote a substantial amount of reflective commentary alongside the descriptive field notes; both during the observation and immediately after. My position as an interpretivist researcher I sought to understand the everyday life of the participants as well as attempting to see beyond the presented, and observed to use this to create an explanation of the findings (Emmerson, Fretz & Shaw, 2013). Influenced by my position as a constructivist I asked during the analysis 'why do the medical students behave, think, feel and act the way they do? Under what conditions do they behave, think, feel and act the way they do? And what are the consequences related to both social identity work and learning? Since social constructivism concerns itself with the construction of knowledge and therefore meaning through social interaction within a social context and accepts multiple constructions form those engaged in the social interaction, analysis relied upon member checking. Thus, the participants' reflections, conveyed in their own words, strengthened the face validity and credibility of the research (Patton, 2015).

The overall approach to analysis in the second and third paper can be described as a thematic analysis utilising an abductive framework described by Braun and Clarke (2006). The following analytical framework outlines the explorative approach used to analyse the ethnographic data from both the participant observations and the in-depth interviews. Braun and Clarke (2006) argue that thematic analysis offers a transparent, accessible and conceptually flexible framework to analysing qualitative data that demonstrates how overarching themes are, supported by excerpts from the raw data to ensure that data interpretation remains directly linked to the words of the participants. They go on to describe the six phases of thematic analysis: 1) Familiarising with data, 2) Generating initial codes, 3) Searching for themes, 4)

Reviewing themes, 5) Defining and naming themes, and finally 6) Producing the report. In this context, a 'theme' refers to a specific pattern found in the data which I find interesting. Using these six analytical steps, one need to note that the themes are analysed not just put forward as a collection of random extracts (Brown & Clarke, 2006). The six phases of the thematic analysis were applied to the ethnographic data as follows:

Familiarisation: The in-depth interviews and the field notes from the participant observations at the hospital were transcribed by me, then read and re-read to become familiar with the data.

Coding: Next , I manually assigned codes (a description, not an interpretation) to my ethnographic data, by highlighting significant phrases or sentences of the transcribed data with reference to social identity theory and gave it shorthand labels 'codes' to describe their content. For example, when medical students use words as 'us', 'them', 'we', 'medical student', 'colleague', 'peer', 'friend', 'physician', novice' or acting dependent / independent, assume and assign responsibility, engagement to the clinical practice, the need for direct or indirectly supervision. Afterwards my primary supervisor and I met and discussed which codes to bring further.

Themes: Whereas codes illustrate interesting perspectives identified in my data, themes are broader and involve interpretation of my codes and the data. During the next phase, I started by looking at my list of codes and their associated extracts and then collated the codes into broader themes that showed something interesting about my data. Searching for themes was an iterative process during which I moved codes back and forth trying to form different themes. In this process, I found that not all codes would fit together with other codes and some codes became themes themselves, while other codes seemed redundant. During the process of paper two, I found several interesting themes inspired by my social identity theory position, thus I ended up with the following three significant themes related to the aim of the dissertation (social identity as medical student, social identity as colleague and social identity as 'nearly' physician). During the process of paper three, I used the three identified themes from paper two to guide my manual coding, because I seeked to identify how these three

significant social identities relate to how, what and why medical students learn in clinical problem-based medical education.

Reviewing themes: The three themes and extracts were then presented and discussed with the rest of the research group and subsequently refined and validated by assessing the frequency of their use in the data. This was to ensure reliability and consistency on the selection of quotes that illustrated the findings, and to avoid contradictions within the themes, or else it would become too broad.

Defining and naming themes: As a result of the review the final list of themes were named and discussed in relation to how it would help me understand the data and answer my research questions. To put it in Braun and Clarke's own words, it is here we define the essence of what each theme is about (2006). As I describe the theme, I identify which story the theme tells and how this theme is connected to other themes as well as to my overall research questions.

Producing the report: Finally, the analytical framework was ready to help me analyse my data and help me answer my research question. This inductive and iterative process supported by social identity theory to zoom in on the analytical results, gave me the opportunity to gain new knowledge on social identity work in medical students. Knowledge that hopefully can initiate further research in this unexplored research area.

5.11. ETHNOGRAPHY AND RESEARCHER POSITION

I used the results from my scoping review as a point of departure for my ethnographic research to examine social identity formation in medical students enrolled in clinical problem-based medical education and how social identities affect how, what medical students learn. Social identity development is individual as well as contextual and a complex and multifarious phenomenon. Since, I cannot conduct an all-encompassing examination of the complex phenomenon, I chose two core issues in relation to social identity development in medical students in clinical problem-based medical education and how social identities relate to learning. The focus in my dissertation is as follows:

- *How clinical practice as medical educational framework sets the scene for medical students' social identity development.*
- *And further, how social identities affect medical students' learning approach concerning how, what and why they learn.*

My ethnographic study serves to uncover identified knowledge gaps and to gain more knowledge of what to focus on when designing and developing medical education. Brinkmann and Kvale (2015) argue that methods should be chosen based on how it matches the research matter of interest, which in my case takes the everyday life of medical students in clinical practice as point of departure. Since my dissertation primarily focuses on clinical problem-based educational phenomena, ethnography seemed like an obvious method to examine the everyday life of medical students in the clinical practice. For example, I wanted to gain knowledge of how clinical problem-based learning sets the scene for social identity formation in medical students and further, how social identity relates to how and what is learned. As a consequence of these aims, in order to be able to understand the participants meaning-making practices, why they think, act and behave as they do, I as a researcher need to 'be present' in the field and observe this practice (Hammersley & Atkinson, 2007). From the very beginning, ethnographic research requires that I as a researcher engage and interact with the medical students whose actions I seek to explore and understand. This implies certain kinds of sensibilities and abilities to puzzle in the field and to be open to surprises right from the start point of the research (Blaikie & Priest, 2017). Participating, observing, and asking informal questions in the field with the participants and 'hang around' so to speak, do have some methodological implications, and it would be naïve to ignore the challenges and limitations of conducting such research. Some ethnographers may reasonably claim to represent and construct reality as well as other scientific disciplines, but what distinguishes many ethnographies from other kinds of qualitative and quantitative research studies is a reflection on the 'self' of the ethnographer, with a particular background, identities and, existing knowledge on the one hand, and their everyday life experience and

position as researcher in the research field on the other (Pink, 2015). Social identity theory as the theoretical perspective, it is important to take my position into account when analysing and interpreting the data. As described in section 4 'Conceptual and theoretical framework' social identity is highly context and interaction dependent and also very complex since the social identities are continuously being renegotiated (Oaks, 1987; Burford, 2012). Tajfel (1978) emphasises in his definition of social identity that our behaviour, thoughts, attitudes, and speech all relate to our affiliation and social interaction with significant others and from these relations we learn how to behave, act and, what to think, and even know who we are and who we are not. These methodological and theoretical reflections about my position as researcher and my relation to the participants give rise to several questions according to how I may have affected their behaviour, acting, and thoughts and thereby influenced their social identity formation and approach to learning. To meet these challenges, I have had an intensive focus on my own actions in the research field and how I approached the participants, so that they did not feel monitored or assessed. As the quotes in section 5.5 and 5.6 show that the participants felt free to do their work, and often they did not even notice my presence. Though, even if they did not notice me, I still may have influenced their learning context, reflection on own practice and their doings in the clinical practice, and thereby affected their affordances and learning, if not directly then indirectly. In some situations, the physicians might have afforded the participants more or less responsibility because of my presence or the participants assumed examinations, assignments or consultations which they would not have done if they were not participants in my study. Though, these reflections are not of such character that it has affected the validity of my research and scientific outcome. Thus, it has to a greater extent helped me to sharpen my focus on my own role as an ethnographer and the importance of involving my supervisors and colleagues in the analytical and interpretative process.

To shortly summarize the relationship between my social identity theory perspective and my empirical analysis work in two ways: Social identity theory is used better to explore and understand the empirical work under study, and the theoretical concepts are used to create, understand and gain insights into to the participants´ social practice that has been analysed. Although my abductive approach and ethnographic method show how social identity theory are useful when making sense of particular the educational phenomena such as social identity development in medical students in clinical problem-based medical education and how that relates to their learning potentials.

6. FINDINGS AND PAPER SUMMARIES

The three papers of my dissertation each represent significant parts of the unified study. The key findings of my first paper are summarized in chapter 2 **Scoping review as a point of departure** and paper 2 and 3 are briefly presented in this chapter and further elaboration is offered in the papers (Appendix). Findings presented in my dissertation primarily builds on ethnographic research conducted in the clinical practice at Aalborg University Hospital. I therefore find it substantial for the transparency of the reading to give an insight into what happens in the clinical practice in relation to the medical students' personal characteristics presented in section 5.5.1. To do so I will present as a part of my findings an excerpt of sketches I have done during my observation periods concerning different clinical practices. Furthermore, I will present some extracts from my in-depth interviews to include the participants' perspectives on the clinical practice and their experiences.

6.1. INSIGHT INTO CLINICAL PRACTICE

The sketches below in figure 6. illustrate a sampling of my ethnographic observations from clinical practice. How the medical students position or are positioned relates to several aspects such as their personal characteristics, the physician / supervisor, the difficulty and complexity of the examination, the patient, peers, clinical experience, the interior of the room, and so forth. Aspects that also relate to their social identity development as well as how, what, and why they learn in these particular situations presented below.

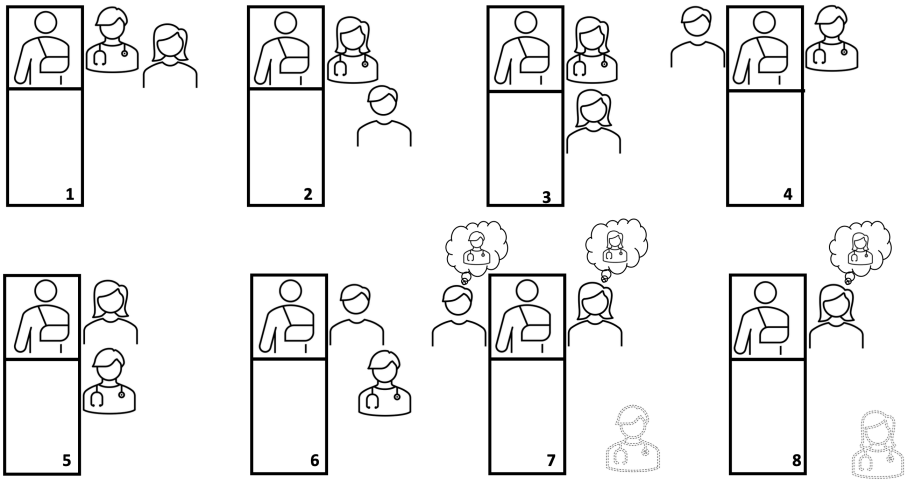

Figure 6. Observations: how medical students approach learning and their progression in clinical practice during 7.th to 10.th semester.

- Sketch (1-3) illustrates how the physician (illustrated with a stethoscope), is doing the examination on his or her own and the medical student only observes and stays in the background, though easily moving towards to the bedside with the intention to participate and be actively engaged in the examination. In practices like these direct participation and engagement is more or less absent, which means that the medical student primarily learn through reflecting on what is observed and no 'doings', 'sayings' or 'relatings' are activated, more or less like attending to a lecture. These practices are such that the medical student is supposed to identify as medical student and think, act, and behave like one.

- Sketch (4) shows how the medical students participate in the examination, where they observe as well as examine the patient under direct supervision from the physician. Here the medical student can imitate the physician, collaborate, communicate, use prior knowledge actively, and reflect together with the physician and begin to learn the craft of medicine, through 'doings', 'sayings' or 'relatings'. This practice are such that the medical student still

is supposed to identify as medical student and think, act, and behave like one, but the sense of becoming a future physician and a member of a privileged professional community is getting stronger.

- Sketch (5-6) illustrates a switch where the medical student examines the patient and receives direct or indirect supervision and feedback from the physician. Here the medical student can practice the craft of medicine on his or her own through engagement and participation that develops competences, knowledge, skills, understanding and disposition to action. And if the medical student thinks, acts and behaves as a future physician and shows independence, responsibility and demonstrates credibility, the physician is more likely to assign greater responsibility and autonomy to the medical student. If the medical student is allowed to do what a physician does, under supervision, they are more likely to identify as one and they will to a higher level embody the experiences and be stirred into the clinical practice they are situated in.

- Finally, sketch (7-8) shows how the medical student carries out the work as a physician by examining the patient together with a peer or alone, without any physician being present. The thought bubble indicates how they think, act, behave and identify as a physician in relation to what they have learned. This transition towards abilities in practicing this particular clinical practice is depending on the medical students own perception of readiness, salience and fitting in as well as the opportunities or affordances in the practice. In this case the medical student becomes an embodied individual produced through engaging and participation in the clinical practice that develops competences, knowledge, skills, understanding and disposition to independent action.

The transition from sketch 1 to 8 is initiated by the medical students themselves and their own perception of readiness, salience and fitting in as well as encouraged and

afforded by the physicians, patients, relatives, nurses, peers and further affected by the practice and workload in the wards. In addition to my findings, it is important to emphasise that the medical students' personal characteristics influence the way that they think, act and behave in a given situation. For example how Maria perceives herself and thinks, acts and behaves when identifying as a medical student or physician differ from the other medical students. Their personal characteristics also influence to what degree they engage and participate in the clinical practice and whether they primarily identify as medical student or as physician which relates to how, what and why they learn. This issue in relation to practice learning I will discuss later in my dissertation.

How to educate medical students varies from ward to ward, how much responsibility medical students are given varies from ward to ward, how involved and integrated the medical students are in the everyday life varies from ward to ward, the dress coat varies from ward to ward, so what I am trying to illustrate with my sketches and excerpts, is that no wards educate medical students in the same structured way, which makes it very challenging for most medical students. Another observation from two different medical wards, illustrates how medical students are afforded different opportunities to engage and participate (through doings, sayings and relatings) in everyday life in the clinical practice. Even if the medical students demonstrate readiness to fit into the team of physicians and identify with them, is it not solely up to themselves to decide how to engage and participate in the clinical practice and which social identities are salient. In figure 6.1 and 6.2 below, it is shown how the decor of a conference room and the attending physicians determine how the medical students identify, and their initiation into practice and how, what and why they learn.

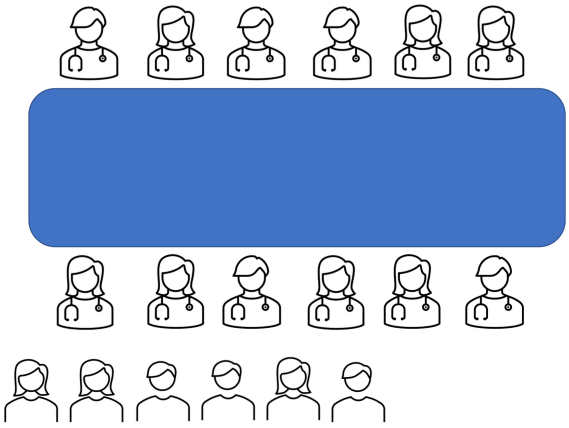

Figure 6.1. Morning conference at a ward (1).

Figure 6.1 illustrates how the medical students are seated along the wall during a conference and are not invited to join the discussions about the hospitalised patients. In this practice they are supposed to sit, listen and observe, which inhibits the medical students from actually practice the practising being learned and identifying with the team. This practice opposes the idea of learning that builds on learning through participation, engagement, cooperation, professional communication, and the ability to activate prior knowledge by using it (doings, sayings and relatings). Nonetheless, this practice affords the medical students to reflect upon what is discussed about diagnoses and treatments and memorised it, and get inspired by how the physicians behave and act in this given practice.

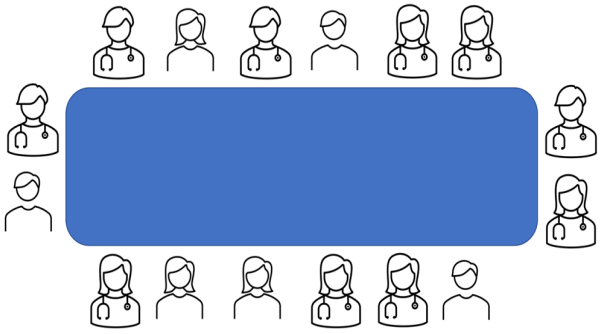

Figure 6.2. Morning conference at a ward (2).

Figure 6.2 illustrates another conference on another ward where the medical students were expected to engage and participate actively through practising doings, sayings and relatings. This practice allows the medical students to think, act and behave as physicians and identify with the team. Furthermore, they are inspired and motivated to activate prior knowledge and develop their professional language and communication skills by using it.

As illustrated in these two practices above the medical students' social identities and how, what and why they learn are not only a personal matter but also depending on the practice they are situated in. The excerpts below illustrate how the medical students experience the practice as an educational frame and shed light on some positive as well as challenging aspects of being a medical student in a clinical practice.

> "What they expect from us as medical students vary a lot from ward to ward, in some wards you have the feeling that you are encumbering by your presence and in other wards you feel like being a part of the team and they spend time teaching you."
> (Michael, Interview, 09.05.2018)

> "I clearly remember how difficult it was in the beginning to dress correctly, what shoes to wear, green shirt and green pants or blue shirt and white pants, white coat or not and, what to put into the pockets of my white coat, what do I need? because it varies from ward to ward"
> (Maria, Interview, 23.03.2018).

> "In the beginning you are supposed to follow a physician around, so you are never alone […] what you learn depends on the physician you follow, some involves and challenges you and some don't"
> (James, Interview, 05.02.2018)

> "I was nervous in the beginning because I was supposed to do the work of a physician, but I was not a physician, and no one knew me […] but I am getting used to it."
> (Pia, Interview, 16.03.2018)

> "Every time you start in a new ward, you have the feeling of not knowing anything at all and you have to start all over again and the feeling of starting all over again is very stressful. New procedures, new physicians and nurses, new specialities, new facilities and surroundings and even new sounds."
> (Michael, Interview, 09.05.2018)

> "Often, I am allowed to examine patients on my own and receive supervision afterwards. The independence enhances my theoretical understanding and helps me to remember what I have learned about diseases, medication, treatment, and symptoms. It is much easier for me to remember things if I can refer to a specific case, situation or patient.
> (Chris, Interview, 28.05.2019)

As the medical students express the clinical practice as an educational setting is both challenging, demanding, educational, exciting, and complex.

The above considerations concerning the clinical practice as educational setting show how unpredictable and complex social identity development and learning can be. As my observations also show the medical students' social identity development and how, what, and why they learn depends on the clinical practice as well as their own personal characteristics. With this brief insight into the clinical practice presented by my observations and in-depth interviews, I will now continue to present my papers.

6.2. PAPER 2

How clinical problem-based medical education sets the scene for social identity development in medical students.

AIM: Through the scoping review it was discovered that several studies recommended problem-based learning as a pedagogy to develop identities in medical students. Furthermore, a gab in empirical research qualifying this pedagogical assumption was identified (Johansson, Nøhr & Stentoft, 2020). Therefore, the results from paper 1 were used as a point of departure for paper 2.

In medical education, as in all professions, social identity is closely related to education (Billett, 2009), as curriculum design provides the pedagogical framework for how medical students are supposed to behave, think, act and learn (Johansson et al., 2022a). To gain a more detailed insight into the pedagogical assumption, I set out to explore how clinical practice, reflecting real life learning context, sets the scene for social identity formation in medical students. So, the aim of paper 2 '*How clinical problem-based medical education sets the scene for social identity development in*

medical students.' was to examine medical students' social identity development in clinical practice in detail. This purpose led to the following research question:

> What characterises medical students' social identity development during their clinical part of a problem-based medical education?

METHOD: I conducted an ethnographic study involving participant observation, informal conversations, fieldnotes, and individual in-depth interviews (Hammersley & Atkinson, 2007). I included empirical data from medical students:

- providing supervised patientcare
- patient consultation
- assisting ward rounds
- assisting surgery
- attending to conferences
- clinical education for medical students and physicians
- clinical case work (Solving authentic cases in small peer groups)
- lunch time in break room

My data consist of 240 hours participant observation and 8 hours in-depth interviews and all the data were transcribed and analysed. During the thematic analysis, I identified that the participants assumed and assigned several social identities during clinical practice.

THEORY: Social identity is not something that one can have or not, social identity is something that one does (Jenkins, 2008), whether assumed by oneself or assigned by others. Often individuals seek to identify with groups that afford them the highest selfconcept clarity, and the relevant group for a certain social identity depends on the salience of that group in any situation and the individuals ability to fit in (Tajfel & Turner, 2004). Turner (1987) argues that the context in which individuals fit into and engage within and afforded by others, mutually contributes to social identity development and approaches to learning. Therefore, social identity plays a central role in examining how medical students situate themselves and afford opportunities to learn in the social context. This suggests that a medical student who is acting,

behaving and thinking as a physician is more similar to the stereotype of physician than someone who does not. This theoretical approach asserts that social identities define the medical student's self and leads to a certain behaviour that differs from behaviour that is informed by their own personal identity (Burford, 2012).

In this study, social identity theory is used to explore and examine how medical students' sense who they are, how they behave, think and yet how they act, is determined by the internalised sense of social identity that they assume from their group membership as well as the social identities assigned by the group to which they affiliate. Therefore, through the social identity perspective, it is possible to examine how clinical problem-based medical education sets the scene for medical students´ social identity work and further what characterises medical students´ social identity development during their participation in clinical problem-based medical education.

RESULTS: All the participants show or express situations where they feel, think, behave and act in relation to certain situations, according to which they do what they do because they are their identity. Three social identities – as *medical student*, as *nearly physician,* and as *colleague* – appeared as particularly prominent in the data. Below some examples are seen on how medical students assume or assign social identities.

> "The physician explains to James that focus is important in this kind of physical examination and what to pay attention to. The physician has a very pedagogical approach and explains all that she does and why she does so". (James, observation)

In Michael´s case the physician chose to educate him by the bedside and thereby assigning the stage for a ***social identity as medical student*** to assume and behave as medical student who are supposed to watch and learn.

> "Her supervisor asked her if she is ready to carry out the consultation on her own, which she accepts. Shortly after, we leave the office and walk down the aisle toward the patient waiting for a cancer treatment consultation. She is nervous; she blushes and speaks in a faltering voice to the patient. […] on her own in the examining room, responsible for asking the right questions, acting as a physician".
> (Maria, observation)

The physician allowed and encouraged Maria to consult the patient on her own and thereby invites her into the in-group and offers her the accessibility to the group identity and assigns her the ***social identity as nearly physician***, which differ from the medical student identity. In this situation, Maria shows readiness to fit into the professional community by assuming the responsibility to consult the patient on her own and the nearly physician identity becomes more salient than the medical student identity.

> Author: "Do you feel like a colleague if you assume responsibility on your own?"
>
> Michael: "Certainly, I do, that is for sure. Furthermore, I feel that it is more exciting to work at the ward if the physicians can see that I contribute to the assignments in a positive way".
> (Michael, interview)

Michael shows that good workplace relations increase the feeling of belonging to a group of colleagues. Furthermore, he expresses that being included in the professional community and contributing to the assignments are important concerning his behaviour, thinking, feeling and acting as colleague. Assigned or assumed ***social identity as colleague***, he tends to take more responsibility, feel more motivated to learn and behave professionally.

CONCLUSION: We have shown that clinical practice allows medical students to orient towards several social identities. Among those, we identified three significant identities as *medical student*, as *nearly physician*, and as *colleague* which all are closely related to the clinical practice defined by the clinical problem-based medical curriculum. Furthermore, the findings emphasise the significance of the performative elements of social identity formation and the medical students´ ability and possibility to fit in and do what a medical student does, a physician does and a colleague does. Therefore, we presume that clinical problem-based medical education is as much about learning to behave, think, act and communicate like a physician, as it is about learning the academic content of the medical curriculum. Awareness of social identity issues in clinical practice can hopefully enhance learning in its own right and provide

a structure and a consciousness to support medical student reflection, through which they can consider whether they are behaving and thinking as *medical student* or *nearly physician* or *colleague* in relation to what they have to learn and how. These findings also illustrate how clinical practice promotes certain social identities in medical students and in case that other appropriate social identities are to be encouraged in medical students, it is first and foremost the curriculum design that needs to be changed, because the learning context sets the scene for the social identity formation.

6.3. PAPER 3

Clinical problem-based medical education: A social identity perspective on learning.

AIM: This research paper is based on the findings of the two previous papers. From the first paper, I concluded that not much research has been done according to the relation between problem-based medical education and identity formation in medical students (Johansson, Nøhr & Stentoft, 2020). In the second research paper, I found that three social identities were prominent among medical students in clinical problem-based medical education: social identities as *medical student,* as *nearly physician* and as *colleague* (Johansson et al., 2022a). Inspired by the social identity theory and informed by my previous findings, I anticipated that medical students' social identity would inform how medical students approach learning in the clinical practice. Therefore, I set out to examine how the three prominent social identities relate to medical students' approach to learning, with a specific focus on how, what and why they learn in clinical practice. My interest in the relation between social identity, clinical practice and learning led to the following research question:

> How social identities affect how, what, why medical students learn in clinical practice.

METHOD: The second and third research paper rely on the same ethnographic data. Due to the large amount of data and the strong relation between the two papers, it was decided that no further data was needed. The thematic analysis in the third paper differs from the one conducted in the second paper by using the three identified social identities as an analytical guide.

THEORY: As the aim of this research paper indicates, social identity theory was used as a theoretical lens to examine medical students´ approach to learning in clinical practice. Since social identity work is moderating components influencing professional behaviour, thinking and attitudes and therefore is important components affecting learning in medical students (Johansson et al., 2022b). As learning is understood as a collective participatory process of active knowledge construction, social identity theory helps understanding why medical students think about the clinical practice the way they do and why they behave and act the way they do (Collins & Kapur, 2014). Furthermore, social identities indicate what, how and why individuals learn and the process by which they categorise themselves, communicate that category to others, and use that category to navigate their approach to learning (Ashforth, Schinoff & Rogers, 2016).

RESULTS: Guided by social identity theory and the findings from research paper two, several patterns between medical students social identities and their approach to learning were identified. As with research paper two it is important to notice that multiple social identities were identified in the data, though the three social identities described above appeared as particularly prominent and therefore used as point of departure for this paper. All the participants show or explain situations where their assumed or assigned social identity is affecting their approach to learning. Below some examples from paper three (Johansson et al., 2022b) show how medical students' social identities affect their approach to learning.

> Michael: […] then they trust you more and more each time you have proven your worth which build a relationship based on trust and in that way, you can work your way up. […] But that's also the way they (the physicians) get involved and try to push you if they know that you can. You can also ask "hey can I try that" and then it is very rare that they say, "no you cannot ". If you do not say anything, you do nothing, and you just follow the others around, then pretty much nothing happens. […] The ones I look up to are usually also someone who have a youthful mind and I can relate to, because it's someone I can mirror myself in.
> (Michael, interview)

In the extract above, Michael emphasizes the importance of fellowship, belongingness, and respect, which are components that Problem-based learning

intends to facilitate through collaborative practices (Barrows, 1996). He states when ***social identity as colleague*** is salient, and he is able to fit in, it influences his professional behaviour and learning opportunities by expanding his boundaries and challenging him. Furthermore, the inclusion as a colleague gives him a higher degree of responsibility, motivation, trust, and the possibility of acquiring social norms and values of the in-group of physicians. A learning process that problem-based learning intends to support by developing medical students´ intrinsic interest in subject matters and, subsequently, their motivation to learn (Barrows, 1996). Michael also argues that medical students must put effort into the social interaction and communicate that category to assign and assume the social identity as a colleague.

> Author: "How do you feel about physicians attending to your consultations and examinations?"
> Maria: "I have gained more self-confidence and they are here to help me, so I feel confident about that. In the beginning I was very nervous and thought about what they were thinking and whether I was good enough, which I do not think of any more anymore. It also gives me the opportunity to get some good feedback afterwards, I learn a lot from that. […] Practice is so much better than theory, you can read so much, but you remember it better when you have seen it and experienced it."
> (Maria, observation)

In this excerpt, Maria explains how assuming the ***social identity as medical student*** moderates direct supervision from the physician, followed by feedback, enhances her learning outcome, and supports her self-confidence as a medical student. She describes how supervision and direct feedback sessions give her the opportunity to reflect upon her own practice and to activate her prior knowledge and develop a new. A learning process that improves flexible minds and learning for understanding rather than learning for recall (Barrows, 1996). She also emphasizes that providing supervised patient care makes her remember what is learned also referred to as deep-learning.

> Chris often seeks out the tasks he wants to carry out. He is acting very independent and is very busy and focused on contributing to the patient care in the ward. If I did not know any better, I would presume that he was one of the junior doctors working in the ward.

> Chris: "We just work and are not afraid to take responsibility." […] "We are quite independent, and we just want the physicians to leave so we can get to work. Then we confer with them afterwards."
> (Chris, observation)

Chris is a very independent and self-directed medical student with a high degree of autonomy. He is more or less behaving, thinking and acting like a physician and the learning context and the problem-based learning setting and the professionals often allow him to assume the ***social identity as nearly physician***. He expresses that he would rather examine the patients on his own and get supervision from the professionals afterwards. He behaves independently and takes responsibility as if he worked in the ward as a competent and professional junior physician. Categorizing as nearly physician enhances learning approaches such as professionalism and developing clinical procedures. Chris´ independent behaviour is supported and facilitated by the clinical problem-based learning setting that intends to foster self-directed learning, the capacity to adapt to changes, learning from authentic problems, problem-solving skills and clinical-reasoning skills (Barrows, 2000; Hmelo-Silver, 2004).

CONCLUSION:

The results of this study suggested that social identities as a *colleague*, a *medical student* and a *nearly physician* are closely related to how, what and why medical students´ learn. As shown in the excerpts above clinical practice offers medical students several different learning situations in their everyday life at the hospital. And, how, what and why they learn is seen to strongly depend on their assumed and assigned social identities, which rely on the curriculum design, clinical context, the group to which they affiliate and the salience of that group and how the medical students fit in. The results of the thematic analysis are summarised in the figure below, where the prominent social identities identified in paper two are put in relation to the learning approaches identified in paper three.

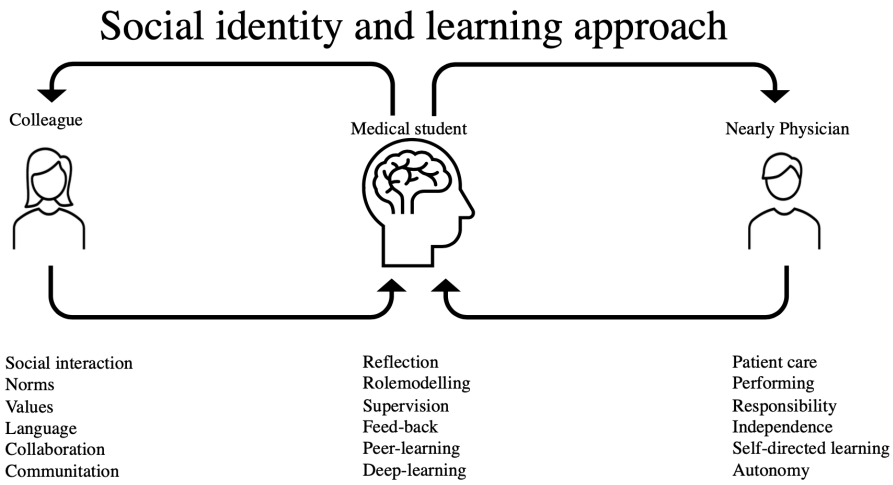

Figure 6.3 How social identities relates to learning approach in medical students in clinical problem-based learning (Johansson et al., 2022b).

Johansson et al. found that when medical students categorize as colleagues they focus on social interaction, collaboration, behaving according to the existing norms and values in accordance with the professional community (2022b). When categorized as medical students they give a high priority to direct supervision, feed-back, reflection and role modelling. Finally, when categorized as nearly physician, they think, act and behave independently, taking responsibility as self-directed learners, providing patient care on their own and showing a high degree of autonomy. So, there is a fine balance between offering medical students great responsibility and autonomy as 'nearly physician' and still keep them focusing on reflection, feedback and rolemoddeling as 'medical student'. If medical students primarily are assumed and assigned to the category as "nearly physician", it may affect patient safety and outshine the purpose of learning to learn as "medical student". On the other hand, it is important that they have the opportunity to actively engage in patient care and ward rounds to learn how to behave, think and act like a physician by categorizing as one.

These findings have essential implications at a practical level, as it suggests that by understanding how medical students' social identities are constructed and how they function, as well as how they relate to what medical students 'do' in the educational

and clinical context of learning, it can effectively help medical students in adopting qualitatively superior approaches to learning and improving the outcome of their individual learning.

7. DISCUSSION

As a point of departure for my dissertation I set out conducting a scoping review to explore existing literature on the relation between problem-based medical education and identity development. Early in the process, I found out that not much literature has been published in this specific research area. Though, I identified that several studies recommended problem-based learning as pedagogical approach in medical education and much research suggested further that identity development in medical students is as important as learning the medical expertise. These findings guided my research and initiated my interest to dive into the everyday life of medical students in a clinical problem-based medical education, to gain more knowledge about how clinical problem-based learning sets the scene for social identity development and approaches to learning. This research perspective stems from the assumption that social identity work has important components influencing medical students' professional acting, thinking and behaviour and therefore is essential components affecting how medical students approach learning.

In the following sections, I will discuss my findings and perspectives in relation to the existing literature on problem-based medical education and social identity development in medical students and try to clarify pros and cons of clinical problem-based medical education.

7.1 WORKPLACE EXPERIENCE AND LEARNING IN MEDICAL EDUCATION

As mentioned in the introduction, there is a growing interest in Problem-based learning in medical education directed towards augmenting medical students' approach to learning within vocational programmes of initial occupational preparation and social identity development. The positive contributions from clinical practice and experiences with real life assignments and authentic cases have been long acknowledged in medical education (Billett, 2009). Furthermore, the clinical practice is often seen as a dominant instructional setting where medical students acquire the 'tricks of the trade' needed for graduate practice (Spencer, 2003).

No doubt that, the workplace experience that clinical practice offers medical students is important to support and enhance their medical expertise and social identity development (Johansson, Nøhr & Stentoft, 2020). A higher degree of autonomy and responsibility, supervised real-patient learning, insight in everyday life of a physician and further how to behave, think and act as professional are all results of clinical practice learning as outlined earlier in chapter one and four. Given these positive characteristics described in the existing literature and further supported by my findings, though, why is it important to discuss: how clinical practice relates to medical students social identity development and how social identities affect how, what and why they learn? One reason to discuss this topic is to highlight the role that medical curriculum plays in relation to support medical students´ balancing between multiple social identities and how these support their ability and possibility to be a motivated learner. Further, it is important to discuss because no definitive way of educating different individuals is available and the learning output in clinical practice is complex and depends on multiple factors as; the learning context (the ward), the staff, the supervisor, is the medical student considered as a burden or a colleague, the degree of responsibility and autonomy. An educational complexity that Billett and Sweet (2015) emphasise in their study of how medical and midwifery students are engaged with what is afforded to them and they define participatory practice as:

> […] the duality between what is afforded by the social institutions in which individuals participate on the one hand, and how individuals elect to engage in and learn through those practices. Learners´ engagement is premised upon their interest, intentions and capacities, and how they value what is afforded to them. What constitutes an affordance is not subjective and fixed. Instead, affordances are subject to their projection (i.e. how they are suggested by the social world as norms, forms and practices) and the degree to which individuals engage with them. In other words, there is no guarantee that the 'same' invitation to participate is engaged with in the same way by different learners.
> (p. 117)

Real life workplace experience in a clinical practice is very complex and depends on the clinical setting, medical curriculum design as well as the professionals acting and the medical students' personal characteristics, how they perceive themselves, meet the norms, values and how they navigate in the social system. As earlier described the

approach to learning in the clinical practice is strongly related to medical students' social identities and is to be seen as variably structured and occurs through a spectrum of various learning activities from observation to supervised participation to autonomous practice (Johansson et al., 2022b). Each one of these activities contributes to a certain learning perspective, e.g when observing or getting direct supervision medical students tend to categorize as medical student and focus on, role modelling, feedback and spent time to analyse and reflect on the learning situation (Johansson et al.,2022b). Practicing patient care and examinations without direct supervision, medical students tend to categorize as nearly physician and primarily focus on workflow on the ward and clinical performance and require immediate action, and therefore does not give much time to reflect and analyse the learning situation (Johansson et al., 2022b). So clinical practice is not just about giving medical students as much responsibility and autonomy as possible, it is more about assigning medical students to a clinical practice that affords different social identities that enhance certain approaches to learning to secure a medical education of high quality. Though, affording the opportunities to do so can be challenging, because social identities and interactions with the physicians are content dependent and vary from setting to setting and are rarely made explicit. Expectations and the rules of engagement only become distinct to medical students through iterative practice of trail and error during which the medical students establish the extent of engagement that they will be afforded within each learning situation (Spencer, 2003). To be more specific, in this part of the discussion, I have chosen to dive further into the balance between the two prominent social identities as nearly physician and medical student, to examine the consequences of too much behaving, thinking and acting as either 'nearly physician' or 'medical student'.

7.2 BALANCING BETWEEN SOCIAL IDENTITIES AS 'NEARLY PHYSICIAN' AND 'MEDICAL STUDENT'

As a result of my ethnographic research, I found a strong relation between medical students´ social identities and their learning approach (Johansson et al., 2022b). When a high degree of autonomy and responsibility is given the medical student tends to stereotype as nearly physician, and mostly strives to perform on equal terms as junior

physician contributing with ward rounds, patient care, examinations and so forth (Johansson et al., 2022b). Categorizing as nearly physician fosters an eagerness in medical students to contribute to the workflow and solving assignments in the ward and seems to shift the focus away from being critical of own actions and reflection upon learning to a focus on clinical performance (Johansson et al., 2022b). On the one hand, this focus on professional growth gives the medical students the opportunity to acquire knowledge about patient-centeredness mainly from the patients, rather than from other physicians. In other words, education of patient-centeredness and acquirement of new clinical competencies are not reduced to exclusively role modelling on other physicians. If solely learning about and from patients happens through other physicians the learning will, paradoxically bypasses the patients, and medical students may feel un-easy or under-skilled in their early patient consultations and examinations. The literature on how medical students and patients encounter each other in the clinic and on the wards falls rather silent (Bleakley & Bligh, 2008; Bleakley, Bligh & Brown, 2011). This means that there is not enough knowledge about how medical students might learn from, with and about patients in a way that challenges their prevailing focus on gaining medical expertise. Since collaborating with professionals as well as patients towards better clinical outcome is an important component of clinical practice, this is surely something to be developed in medical students from the outset and it needs to be further explored.

On the other hand, too much focus on clinical performance, work, autonomy and gaining responsibility, often does not allow time and space for reflection and awareness of their own professional reflection and development and further to encourage new knowledge to come forward (Johansson et al., 2022b). Biggs (2011) suggests that students relate to the assignment or subject matter given to them in one of the following two ways: (1) focus on what the task is about, engaging and seeking to understand intent and broader implications of the content, focus on how new information may fit into a larger framework and relate to prior knowledge (known as deep learning approach) or (2) focusing on completion of task-requirements and memorising what is needed in the most efficient way possible. This learning approach is characterised by a focus on specific facts, rote memorisation strategies and selective

information processing (known as surface learning approach). This perspective on learning has inspired considerable research in relation to how curriculum and educators can form and affect these approaches to learning and the connections these approaches to learning may have to crucial academic outcomes (Platow, Mavor & Grace, 2013; Ramsden, 2003). Research has shown that different learning approaches lead to different academic outcomes and Bliuc et al. (2011) further identified in their study a robust relation between deep learning approach and better academic outcomes. Therefore, deep learning approaches are more desirable, for the faculty and educator perspective, as they are associated with more positive educational outcome, including development of identities, intention to continue with study, long-term knowledge retention and academic achievement level (Haslam, 2017; Platow, Mavor & Grace, 2013). Clinical practice is considered an active form of learning, since medical students need to reflect, analyse, contrast, compare, and explain information. The mechanisms through which practice is assumed to enhance deep learning, are learning by interdisciplinary collaboration, solving authentic problems, experiential and self-directed learning, integrating information from many different sources and activation of prior knowledge. According to Dolmans et al. (2016) problem-based learning is assumed to encourage and motivate students towards a deep learning approach in which students are essentially preoccupied trying to understand and reflect upon what is being studied. As Dolmans et al. (2016) argue in their review, time and space for reflection and self-directed learning are important components to enhance deep-learning, which suggests that medical students assumed or assigned to stereotype as 'nearly physician' can acquire a high degree of deep-learning if the circumstances allow time and space for reflection and supervision. Furthermore, Winja, Loyens, Derous & Schmidt (2015) found in their study that students in self-directed conditions, such as problem-based learning, showed a high degree of intrinsic motivation and autonomy, findings that also appear in the prominent social identities identified in my ethnographic research.

The figure belove summarizes Biggs (2011) and Dolmans et al. (2016) findings with reference to my findings. As shown, social identities as medical student and nearly physician relate both to surface and deep learning approach. When medical students´

identifying as medical student, deep learning are the primarily learning approach indicated by the thin arrow and surface learning secondary indicated by the dotted arrow and the other way around when identifying as nearly physician. When clinical practice sets the scene for medical students to assume and assign social identities as medical student as well as nearly physician in a balanced way the prerequisites for deep learning and professional development is best, which is indicated in the figure with the bold arrow pointing towards deep learning.

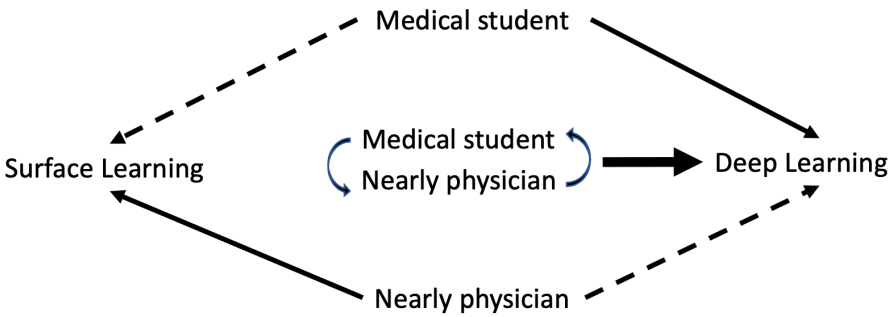

Figure 7. Summarizing the relation between social identities as medical student and nearly physician and how they influence on surface and deep learning approach in medical students.

Even though, clinical practice often is seen among researchers as a preferred pedagogical approach that encourages and motivates medical students, the pedagogy can also be both developing for some and inhibiting for others. Billet and Sweet (2015) emphasise:

> […] that it is important to have distinct considerations of the kinds of experiences that constitute the curriculum of the education program and also of the readiness (i.e. capacities, values and interests) of students. […] All this leads to practical considerations about the organisation of the learning experiences, and how these can be strengthened and augmented through pedagogic practices and also the importance of preparing students, supporting their engagement in, and the helpful reconciliation and what they experience in their practice settings.
> (p. 126)

How medical students fit into the professional community in the clinical practice and which particular social identities are salient is different among medical students, since it depends on engagement, self-directed learning, intentions, personal characteristics, intrinsic motivation, how they value what is afforded them and the learning practice. In other words, there is no guarantee that the medical students engage, participate and approach learning in the same way (Johansson et al., 2022b). It is therefore very important to take the above into account to ensure that the clinical practice sets the scene for social identity work that enhances self-directed learning including time and space for reflection to ensure deep learning in medical students.

7.3 TIME AND CLINICAL SETTING AFFECT MEDICAL STUDENTS APPROACH TO LEARNING

As shown above researchers emphasize the importance of reflection, activate prior knowledge, self-directed learning and engagement, to encourage a deep learning approach in medical students. As described earlier in this section the curriculum and clinical practice as well as the available time to solve a problem, afford different approaches to learning. According to Rasmussen et al. (2007) time available is decisive for what kind of knowledge is activated and developed in learning situations and they use the terms *practical knowledge* (praksisviden), *profession based reflection knowledge* (professionsviden) and *scientific based knowledge* (videnskabelig viden) to make the concepts operationalizable. *Practical knowledge* is defined as individual experience that can be activated and primarily used in situations requiring immediate action, and *profession based reflection knowledge* is defined as theoretical knowledge that can be used when reflecting and analysing problems, and *scientific based knowledge* is the capacity to take a critical stance in scientific research which also contributes to the ability to critical reflection. According to Rasmussen et al. (2007) all three forms of knowledge are important to develop and to apply in clinical practice and a learning process that depends on both the medical students´ ability to fit in as well as the salience of the group to which they are affiliated. *Profession based reflection knowledge* and *scientific based knowledge* are often activated when medical students assume or assign social identity as medical student and develop in learning situations where there is time for reflection and analysis. *Practical knowledge* is

activated when medical students assume or assign social identity as nearly physician when immediate action is required and there is no or sparse time to reflect or receive direct supervision or feedback, and the existing knowledge or knowhow are the only tool available to solve the problem. Therefore, in a unpredictable and busy working culture at the hospital where medical students assume and assign a high degree of autonomy, it can be difficult to manage what is learned and the quality of what is learned. The uncertainty of how, what and why medical students learn at the hospital, which is another kind of learning institution than the university, can challenge the intended learning goal in the medical curriculum. Thus, as Billet (2009) argues practice learning is important to prepare medical students to become a future physician and should not be omitted, but rather supported by learning activities that support medical students to assume and assign the social identity as medical student.

To ensure a learning outcome of good quality with reference to Rasmussen et al. (2007), it is important to pay attention to how clinical problem-based medical curriculum is designed and which social identities are salient in the learning environment. Too much independence, autonomy and responsibility often leave no time or space for reflection or awareness of medical students´ own professional development, but rather a focus on completion of assignments in the ward, doing ward rounds and patient care, as if they were at work (Smith et al., 2013). This approach to learning can contribute to an inappropriate practice and limit the learning of how to think, act and behave properly while doing what a physician should do. Though, the self-directedness that clinical practice offers, is to some extent fruitful for the medical students´ approach to learning and the learning outcome, thus structured reflection and supervision are needed to secure patient safety and an appropriate learning output formalized in the medical curriculum.

With that knowledge in mind one can argue that the medical faculty must prioritize direct supervision and feedback and must make room for reflection and academic reading to acquire new knowledge and to enhance research skills to develop *practical knowledge*, *profession based reflection knowledge* and *scientific based knowledge*. At the same time, it is important that the medical students assume and assign

responsibility and autonomy as nearly physician by providing independent patient care and attending in ward rounds, which supports successful transition from medical student to future physician. A transition that requires a supported period of identity reconciliation during which reflection, responsibility and autonomy are important to ensure deep learning as illustrated in figure 7.3. During this, there is a fine balance between too much and too little responsibility and autonomy. As it becomes clear, it is a complex assignment for the medical faculty to design a clinical problem-based medical curriculum that promotes a viable balance between multiple social identities in medical students to enhance and secure a deep learning approach.

These perspectives presented above in combination with my findings suggest that it is important to have distinct considerations of the kinds of learning approaches and experiences that constitute the medical curriculum of the clinical practice and also of the readiness of medical students. Put simply, what a medical student learns from a clinical practice is determined not only by the nature of the clinical setting but also by the nature of the medical students personal characteristics, including intentionality, interests and capabilities.

7.4 A PARADIGM IN PROBLEM-BASED MEDICAL EDUCATION COMBINING DISTINCT DICIPLINS AS MEDICAL STUDENT AND NEARLY PHYSICIAN.

As emphasized above social identity affects medical students´ approach to learning, and deep learning is more likely to have implications for developing social identities and vice versa, and further social identities are linked with academic success through deep learning (Smyth, Mavor & Gray, 2019). It has also become clear that social identity development in medical students does not exist in a vacuum but arises in the context of a complex bricolage of each medical student's network of other social and personal identities in combination with the learning context in which they are enrolled. Thus, there is a broad consensus that a good physician manifests a combination of scientific and humanistic attributes and capabilities (Hurwitz, Kelly, Powis, Smyth, & Lewin, 2013; Steiner-Hofbauer, Schrank & Holzinger, 2018).

With inspiration from The General Medical council and CanMEDSs definition of what good medical practice is, seven key roles of the ideal physician have been identified as collaborator, commutator, leader, health advocate, scholar, professional and the integrating role of medical expert, and formulated in '*De syv læge roller*' (sst, 2013). As illustrated in the figure below it is important to note that all the roles overlap equally to create the role as *medical expert*.

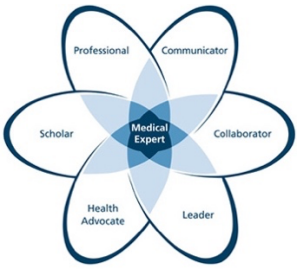

Figure 7.1. Better standards, better physicians, batter care (CanMEDS, 2015).

There is a consensus in the medical education literature that professionalism and identity development need to be incorporated as a fundamental element of medical education to promote and develop future medical experts (Kirch, Gusic & Ast, 2015; Monrouxe, 2010). In line with that, increased educational focus on developing professionalism and identity in medical students, my results show that medical students enrolled in clinical problem-based medical education are afforded the opportunity to think, behave and act like e.g. a medical student, as colleague and as nearly physician. What is interesting in relation to my findings and this educational perspective, is how to design the clinical problem-based medical curriculum so that it supports the medical students balancing between multiple social identities to enhance deep learning and skills as future medical expert. As Rosenblum, Kluijtmans & Cate (2016) and Kluijtmans, Haan, Akkerman & van Tartwijk (2017) identified in their study of professional identity, the formation in clinical-scientists navigating between patient care and science, that combining patient care and research activities can be complex. Further, they found that the education of clinician-scientists can be complex because they must balance and navigate between professional identities at the

intersection of patient care and doing research, which they experience as two separate positions, depending on learning context and assumed and assigned roles. Results that strongly relate to the complexity of everyday life of medical students in clinical practice. Finally, they concluded that reflection was a premise to stimulate the professional identity formation of clinical-scientists. These studies show how complex it is to navigate between multiple identities and how important time for reflection is, to stimulate and develop identities in healthcare education. So exclusively affording medical students to act, think and behave as nearly physician and allowing a high degree of autonomy without room for reflection or feedback, can inhibit deep learning in medical students. Furthermore, Buja (2019) emphasises that the transition from novice to medical expert cannot and should not be rushed. Time, experience, learning, and repetition are necessary for clinical and professional maturation. Therefore, clinical problem-based medical education should be designed so that the clinical learning environment supports various social identities in medical students to ensure a fruitful learning outcome.

7.5 THE IMPACT OF SOCIAL IDENTITY ON RESPONSIBILITY AND VICE VERSA

Above the complex relationship between problem-based medical education, responsibility (affordance), social identity and learning approach have been discussed. This suggests a successful transition from medical student to a future physician, influenced by e.g. how they behave, think, act and learn, assumed and assigned social identities, responsibility, and affordance are inherently intertwined and requires a supported period of social identity reconciliation during which responsibility and autonomy certainly may feel challenging from time to time. As shown in this dissertation, the relation between social identity as medical student, colleague and nearly physician is very complex and influenced by multiple factors inside as well as outside the individual. Dornan (2012) argues that it is difficult and maybe not possible at all to say which comes first, responsibility, autonomy, or identity, because each fosters the other through successful practices, and it all depends on their understanding and perception of fitting in, salience of the group, and readiness. A perspective supported by Turner (1987) and Crossley & Vivekananda (2009) who emphasize that

the learning context in which individuals fit into and engage within, as well as the level to which they are involved and afforded, mutually contribute to the concept of their social identities and approach to learning. Therefore, the level of responsibility and autonomy that clinical practice offers, the medical students play an important role in relation to how they approach learning and their perception of how and what to be learned are influenced by the context (Duff et al., 2004).

The requirement to think, act and behave autonomously is crucial to assuming the social identity as nearly physician and the sense of professional development. As with medical students newly graduated physicians are supervised but their qualifications allow and require them to develop autonomy and to accept responsibility for providing patient care, which is inextricably connected with some responsibility for the consequences. This level of responsibility is something which medical students anticipate but it represents a developmental process which they are unable to overcome without going through the learning process of graduation. According to my results, medical students recognising and receiving the direct supervision and feedback from physicians and time for reflection on own practice was important to overcoming barriers, such as taking responsibility and being concerned about the legality of their own authority to carry out assignments in the clinic. Results that correspond to Cruess, Cruess & Steinert (2016) findings, that not enough as well as too much responsibility and autonomy reduce the professional development in medical students, which illustrates the fine balance between challenge and support needed to enhance learning in medical students in clinical practice.

During my ethnographic fieldwork, I came about that newly graduated physicians expressed their experiences of transition from being a medical student to being a physician, and the process of accepting the authority (the white coat), the external demands of responsibility and the requirement to act, think and behave autonomously prior to their readiness to categorise themselves as physician. If medical students successfully accommodate these requirements, thinking, acting and behaving autonomously in the clinical practice, the impact of afforded responsibility on social identity development creates what cotê and Levine (2002) define as ‘identity capital’,

which both stimulates and accumulates a metamorphosis when accepting their growth in self-categorisation, self-confidence, and medical expertise. In the wake of this transformational process, social identity development as nearly physician comes to forth.

These educational perspectives on how responsibility and autonomy in clinical practice affect social identity development in medical students and vice versa, provide the knowledge and insight of how to scaffold medical students' social identity development and learning approach during clinical medical training. Furthermore, this knowledge informs curricula design and models of 'supported participation in practice' (Dornan et al., 2007) to underscore the need to integrate responsibility into medical clinical training as they prepare to behave, think and act as physician (Cruess, Cruess & Steinert, 2016).

8. CONCLUDING REMARKS

The initial aim of this dissertation was to conduct new and relevant knowledge within the research field of clinical problem-based medical education, social identity development and practice learning. As my scoping review showed, not much research has been conducted in relation to how problem-based medical education affect identity development in medical students.

This knowledge gap inspired me to explore, through an ethnographic study, how clinical practice as a medical educational framework sets the scene for medical students' social identity development. And further, how social identities affect medical students' learning approach concerning how, what and why they learn.

During my second study I identified that medical students in clinical practice assumed and assigned several different social identities, though the most prominent social identities were as medical student, as colleague and as nearly physician. At first glance the three identified social identities seem to be the most taken for granted ones. Though the analysis showed that these social identities were expressed among the medical students in various ways depending on their personal characteristics as well as the clinical practice in which they were situated. Some medical students preferred to assume the social identity as medical student even if the clinical practice afforded them the opportunity to engage and participate as nearly physician. On the contrary, there were other students who identified as nearly physician as soon as the opportunity was there. The clinical practice is therefore of great importance to support and secure the development of various social identities and thereby enhance a successful transition from medical student to physician.

The findings from my second study inspired me to explore how the social identities as medical student, as colleague and as nearly physician relates to how, what and why medical students learn in clinical practice.

During the analysis, I found that the medical students' social identities as well as the clinical practice were strongly associated with their learning outcome. When the medical students behave, think and act as medical student they primary learn through reflection, role-modelling, direct supervision, feedback and peer-learning. When they behave, think and act as colleague they focus on social interaction, norms, values, language, collaboration, and communication. And finally, when medical students behave, think and act as nearly physician, they primarily learn and embody the craft of medicine by active participation and engagement in clinical practice through patient care and examinations, responsibility, independence, and autonomy.

During my ethnographic fieldwork, it became clear that clinical practice is a very complex pedagogical frame to navigate in because it is difficult to predict what happens in different learning situations, and further it depends on multiple contextual and individual factors. Furthermore, there is a very fine balance to be found between the assumed and assigned social identities to ensure a high learning outcome. Only assuming and assigning social identity as medical student, the students will miss important situated knowledge and learning from the clinical practice, and on the other side if the medical students primarily assume and assign social identity as nearly physician, they will miss academic outcome and important time to reflect upon own professional practice.

In the discussion, I have advocated for the importance to design the clinical practice so that it enhances the medical students' possibilities to act, think and behave as medical student, as colleague and as nearly physician. Understanding and enhancing medical students' social identity development and their approach to learning, medical educators play an important role and need to be aware of the affordances in the learning environment, which requires insights derived from clinical practice in medical education and social identity development as advocated in my second and third study. Based on my findings that the clinical practice as well as the medical students' personal

characteristics is decisive for their social identity development and their learning, I acknowledge that educating medical students in a clinical practice setting at a hospital is a very complex and demanding assignment.

9. FUTURE PERSPECTIVES

Below I will give some recommendations that can be used to develop and design clinical problem-based medical curriculum, and further to give the medical educators knowledge about how to support medical students' social identity development and approach to learning.

- Combining experiential learning such as ward rounds, patientcare, examinations (doing as a nearly physician) and Clinical case-work where medical students are solving authentic real-life problems from the clinical practice in small groups (doing as medical student), the conditions for deep-learning are present. When the pedagogical framework offers medical students to behave, think and act as medical student as well as nearly physician, as shown in figure 7.1 the deep-learning is strongly supported.
- Scheduling daily reflection space during which medical students in small peer groups are encouraged to reflect upon their own practice and to exchange experiences from the clinical practice as nearly physician. It develops their ability to critically reflect on, communicate and convey new knowledge. This initiative allows medical students to approach learning as students, and to further support and develop their behaving, thinking, and acting as nearly physician. Furthermore, it will enhance the opportunities for gaining new perspectives on clinical practice.
- Receiving supervision from medical educators before, during or after, providing independent patient care and examinations is important because it sets the scene for either behaving, thinking, and acting as medical student or as nearly physician. Switching between direct and indirect supervision affects their autonomy, feeling of responsibility and enhances their *practical knowledge*, *professional expertise* and *expert knowledge*.

- Inviting the medical students to engage and actively participate in the shift change in the ward would raise the salience of the group of professionals, and give the medical students the opportunity to behave, think and act as medical student, nearly physician and colleague.

These recommendations are just a small cornerstone of options to support medical students' social identity development and enhance their learning outcome.

9.1. FUTURE RESEARCH

This dissertation builds on ethnographic data from seven medical students who I followed (observed and interviewed) for extended periods (December 2017 to June 2019) during their three final years of clinical problem-based medical education at AAUH. My research and results can serve as a point of departure to qualify new pedagogical initiatives and to develop future medical education of high quality supporting medical students´ transition from medical student to future physician. This would build on the results from my research to further explore how clinical problem-based medical education sets the scene for social identity development in medical students, and how that relates to their approach to learn. Another important issue to be explored is how to design a medical curriculum that supports social identities as medical student, as colleague and as 'nearly' physician in a balanced way to enhance deep learning in medical students.

10. REFERENCES

AAU. (2015). PBL – Problem-based learning: Aalborg model. Aalborg University https://prod-aaudxp-cms-001-app.azurewebsites.net/media/mmmjbthi/pbl-aalborg-model_uk.pdf

AAU. (2019). Hanbook: Policy for research data management. https://www.handbook.aau.dk/document?contentId=402570

AAU. (2022a). Curriculum for B.sc. in medicine faculty of medicine. Aalborg University. https://studieordninger.aau.dk/2022/32/3409

AAU. (2022b). Curriculum for M.sc. in medicine faculty of medicine. Aalborg University. https://studieordninger.aau.dk/2022/35/3423

ALLEA. (2017). The European Code of Conduct for Research Integrity. (Rev. Ed.) All European Academics. Berlin. https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology,* 8(19), e32.

Ashforth, B., Harrison, S., & Corley, K. (2008). Identification in organizations: An examination of four fundamental questions. *Journal of Management*, *34(3)*, 325–374.

Ashforth, B., & Mael, F. (1989). Social identity theory and the organization. *Academy of Management Review*, 14(1), 20–39.

Ashforth, Blake E ; Schinoff, Beth S ; Rogers, Kristie M. (2016). "I Identify with Her," "I Identify with Him": Unpacking the Dynamics of Personal Identification in Organizations. *The Academy of Management Review*, 41(1), 28–60.

Azer, S. (2009). Interactions Between Students and Tutor in Problem-Based Learning: The Significance of Deep Learning. *The Kaohsiung Journal of Medical Sciences*, 25(5), 240–249.

Barnett, R. (2009). Knowing and becoming in the higher education curriculum. *Studies in Higher Education*, 34(4), 429–440.

Barnett, R. (2012). Learning for an unknown future. *Higher Education Research and Development*, 31(1), 65–77.

Barrows, H. (1990). Inquiry: The pedagogical importance of a skill central to clinical practice. *Medical Education*, *24*(1), 3–5.

Barrows, H. (1996). Problem-based learning in medicine and beyond: A brief overview. *New Directions for Teaching and Learning*, 68(1), 3-12.

Barrows, H. (2000). *Problem-based learning applied to medical education*. Springfield, IL: Southern Illinoise University Press.

Barrows, H., & Tamblyn, R. (1980). *Problem-based learning: An approach to medical education*. Springer.

Bell, K., Boshuizen, H., Scherpbier, A., & Dornan, T. (2009). When only the real thing will do: Junior medical students' learning from real patients. *Medical Education*, 43(11), 1036–1043.

Biggs. (2011). *Teaching for quality learning at university.: what the student does.* Open University Press.

Billett, S. (2009). Realising the educational worth of integrating work experiences in higher education. *Studies in Higher Education*, 34(7), 827–843.

Billett, S., & Sweet, L. (2015). *Participatory practices at work: Understanding and appraising healthcare students' learning through workplace experiences*. In Researching Medical Education (pp. 117–128). John Wiley & Sons, Ltd.

Blackwell (1986). Prevention of impairment among residents in training. *JAMA* 255, 177-8.

Blaikie, N. (2018). Confounding issues related to determining sample size in qualitative research. *International Journal of Social Research Methodology*, 21(5), 635–641.

Blaikie, N., & Priest, J. (2017). *Social research: Paradigms in action.* Cambridge: Polity.

Bleakley, A., & Bligh, J. (2008). Students learning from patients: Let's get real in medical education. *Advances in Health Sciences Education*, *13*(1), 89–107.

Bleakley, A., Bligh, J., & Browne, J. (2011). Medical Education for the Future: Identity, Power and Location. Springer Science.

Bliuc, A.-M., Ellis, R. A., Goodyear, P., & Hendres, D. M. (2011). The role of social identification as university student in learning: Relationships between students' social identity, approaches to learning, and academic achievement. *Educational Psychology*: *An International Journal of Experimental Educational Psychology*, 31, 559–74.

Boud, D. (1989). Some competing traditions in experiential learning. In S. W. Weil & I. McGill (Eds.), *Making sense of experiential learning: Diversity in theory and practice* (pp. 39-49). Open University Press.

Boud, D., & Feletti, G. (1997). *The challenge of problem-based learning* (2nd ed.). Kogan Page.

Bowen (2011). Examining undergraduate student learning journals for indicators of developing autonomy and professional capacity in an intership course. *Higher education research and development* 30 (4): 463-75.

Bowen, B. (2018). Becoming professional: examining how WIL students learn to construct and perform their professional identities. *Studies in Higher Education*, 43(7), 1148-1159.

Boyd, C., & Fortin, M. (2010). Future of multimorbidity research: How should understanding of multimorbidity inform health system design? *Public Health Reviews*, 32(2), 1–18.

Brinkmann, S., & Kvale, S. (2015). *InterViews: learning the craft of qualitative research interviewing.* (3. ed.). Sage Publications.

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101

Bryman, A. (2016). *Social research methods* (5.ed.). Oxford University Press.

Buja, L. M. (2019). Medical education today: all that glitters is not gold. *BMC Medical Education*, 19(1), 110–110.

Burford, B. (2012). Group processes in medical education: learning from social identity theory. *Medical Education*, 46(2), 143–152.

Burford, R. (2017). First and second year medical students identify and self-stereotype more as doctors than as students: a questionnaire study. *BMC Medical Education*, 17(1), 209–209.

Burford, & Rosenthal-Stott, H. E. S. (2017). Stereotyping and the development of clinicians' professional identities. *In Self and Social Identity in Educational Contexts* (pp. 279–296).

Camp, G. (1996). Problem-Based Learning: A Paradigm Shift or a Passing Fad? *Medical Education Online*, 1(1), 42–82.

CanMeds (2015). https://www.royalcollege.ca/rcsite/canmeds/canmeds-framework-e

Cohen-Schotanus, Janke; Muijtjens, Arno M. M; Schonrock-Adema, Johanna; Geertsma, Jelle; van der Vleuten, Cees P. M (2008). Effects of conventional and problem-based learning on clinical and general competencies and career development. *Medical Education*, 42(3), 256–265.

Collins, A., & Kapur, M. (2014). Cognitive Apprenticeship. In R. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (pp. 109-127). Cambridge University Press.

Côté, J. E., & Levine, C. (2002). *Identity formation, agency, and culture a social psychological synthesis.* L. Erlbaum Associates.

Crossley, V., Vivekananda-Schmidt, P. (2009). The development and evaluation of a Professional Self Identity Questionnaire to measure evolving professional self-identity in health and social care students. *Medical Teacher*, 31(12), e603–e607.

Crotty, M. (1998). The foundations of social research: meaning and perspective in the research process. Sage Publications.

Cruess, R. L., Cruess, S. R., Boudreau, J. D., Snell, L., & Steinert, Y. (2014). Reframing Medical Education to Support Professional Identity Formation. *Academic Medicine*, 89(11), 1446–1451.

Cruess, R. L., Cruess, S. R., & Steinert, Y. (2016). Amending Miller's Pyramid to Include Professional Identity Formation. *Academic Medicine*, 91(2), 180–185.

Dall'Alba, & Barnacle, R. (2007). An ontological turn for higher education. *Studies in Higher Education,* 32(6), 679–691.

Denzin. (1997). *Interpretive ethnography ethnographic practices for the 21st century*. SAGE.

Dewey, J. (1938). *Experience and education*. Collier Books.

Dolmans, D., Loyens, S., Marcq, H., & Gijbels, D. (2016). Deep and surface learning in problem-based learning: a review of the literature. *Advances in Health Sciences Education : Theory and Practice*, 21(5), 1087–1112.

Dornan, T. (2012) Workplace learning. *Perspectives in medical education*, 1(1), 15-23.

Dornan, T., Boshuizen, H., King, N., & Scherpbier, A. (2007). Experience-based learning: a model linking the processes and outcomes of medical students' workplace learning. *Medical Education*, 41(1), 84–91.

Duff, A., Boyle, E., Dunleavy, K., & Ferguson, J. (2004). The relationship between personality approach to learning and academic performance. *Personality and Individual Differences,* 36, 1907-1920.

Dyrbye L, Shanafelt T. A. (2016). Narrative review on burnout experienced by medical students and residents. *Medical Education*. 50(1), 132–149.

Emerson, R., Fretz, R., & Shaw, L. (2013). *Writing Ethnographic Fieldnotes*. University of Chicago Press.

Fenwick, T. & Nerland, M. (2014). Introduction: Sociomaterial professional knowing, work arrangements and responsibility: new times, new concepts?. In: Fenwick, T. & Nerland, M. (Ed) *Reconceptualising Professional Learning: Sociomaterial knowledges, practices and responsibilities* (pp. 15–22). Routledge.

Foerster, H. & Pörksen, B. (2003). *Understanding systems: Conversations on epistemology and ethics*. Kluwer Academic/Plenum Publishers.

Franco, R. S., Franco, C. A., Severo, M., & Ferreira, M. A. (2015). General competences on medical professionalism: Is it possible? *Medical Teacher*, 37(10), 976–7.

Fuller, A. & Unwin, L. (2014). Nurturing occupational expertise in the contemporary workplace: An 'apprenhenticeship turn' in professional learning. In: Fenwick, T. & Nerland, M. (Ed) *Reconceptualising Professional Learning: Sociomaterial knowledges, practices and responsibilities* (pp. 85–97). Routledge.

Gallagher, S. (1997). Problem-Based Learning: Where Did it Come from, What Does it Do, and Where is it Going? *Journal for the Education of the Gifted*, 20(4), 332–362.

Geertz, C. (1973). *The interpretation of cultures: selected essays*. Basic Books.

Van der Geest, S. & Finkler, K. (2004). Hospital ethnography: Introduction. *Social Science & Medicine*, 59(10), 1995–2001.

Gibbons, M. (1987). Introduction: The politics of interpretation. In Gibbons, M. (Ed) *Interpreting Politics.* (p.1-31) New York University Press.

Gioia, P., & Pitre, E. (1990). Multiparadigm Perspectives on Theory Building. *The Academy of Management Review*, 15(4), 584–602.

Glaser, R., & Bassok, M. (1989). Learning theory and the study of instruction. *Annual Review of Psychology*, 40, 631–666.

Goodson, L., & Vassar, M. (2011). An overview of ethnography in healthcare and medical education research. *Journal of Educational Evaluation for Health Professions*, 8(4), 4–4.

Green, B. (2009). Introduction: Understanding and researching professional practice. In B. Green (Ed), *Understanding and researching professional practice* (pp. 1–18). Sense Publishers.

Haslam, S. (2017). The social identity approach to education and learning: Identification, ideation, interaction, influence and ideology. In: Mavor K, Platow M, Bizumic B, editors. *Self and social identity in educational contexts* (pp.19-53). Routledge.

Hurwitz, S., Kelly, B., Powis, D., Smyth, R., & Lewin, T. (2013). The desirable qualities of future doctors - A study of medical student perceptions. *Medical Teacher*, 35(7), e1332–e1339.

Hammersley, M. (1990). *Reading Ethnographic Research: A Critical Guide*. Longman.

Hammersley, M. (1992). What is wrong with ethnography ?: Methodological explorations. Routledge.

Hammersley, M., & Atkinson, P. (2007). *Ethnography Principles in practice*. (3rd ed.). Routledge.

Harkins, P. & Petty, R. (1982). Effects of task difficulty and task uniqueness on social loafing. *Journal of Personality and Social Psychology*, 43(6), 1214–1229.

Hefler, J., & Ramnanan, C. J. (2017). Can CanMEDS competencies be developed in medical school anatomy laboratories? A literature review. *International Journal of Medical Education*, 8, 231–238.

Hager, L. A., & Reich, A. (2012) *Practice, Learning and Change: Practice-Theory Perspectives on Professional Learning*. Springer

Hmelo-Silver (1995) Problem-based learning: Development of knowledge and reasoning strategies. In *Proceedings of the seventeenth Annual Conference of the Cognitive Science Society*. Hillsdale NJ: Erlbaum

Hmelo-Silver (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review,* 16, 235-266.

Hogg, M. A. (2006). Social identity theory. In P. J. Burke (Ed.), *Contemporary social psychological theories*. Stanford University Press.

Hogg, M.A. & Gaffney, A.M. (2018). Group Processes and Intergroup Relations. In Wixted, G. & Ghetti, S. (Ed) (4th ed.) *Stevens' Handbook of Experimental Psychology and Cognitive Neuroscience, Developmental and Social Psychology*. John Wiley & Sons, Incorporated.

Illeris, K. (2005). A comprehensive understanding of human learning. In P. Jarvis & S. Parker (Eds.), *Human learning: An holistic approach* (pp. 87-100). Routledge.

Jarvis-Selinger, D., Pratt, D., & Regehr, D. (2012). Competency is not enough: Integrating identity formation into the medical education discourse. *Academic Medicine*, *87*(9),1185–1190.

Jenkins R. (2008). *Social Identity*. 3rd ed. Routledge.

Jhala, M. & Mathur, J. (2019). The association between deep learning approach and case-based learning. *BMC Medical Education*, 19(1), 106–106.

Johansson, Nøhr, S. B., & Stentoft, D. (2020). A Scoping Review of the Relation between Problem-Based Learning and Professional Identity Development in Medical Education. *Journal of Problem Based Learning in Higher Education*, 8(2), 25–41.

Johansson, N., Nøhr, S., Klitgaard, T., Vardinghus-Nielsen, H., & Stentoft, D. (2022a).How clinical problem-based medical education sets the scene for identity development in medical students. *Interdisciplinary Journal of Problem-based learning.* In review.

Johansson, N., Nøhr, S., Klitgaard, T., Vardinghus-Nielsen, H., & Stentoft, D. (2022b). Clinical problem-based medical education: A social identity perspective on learning. *Dansk Universitetspædagogisk Tidsskrift.* In review.

Kemmis, S., McTaggart, R., & Nixon, R. (2014). *The Action Research Planner: Doing Critical Participatory Action Research*. Springer.

Kemmis, W. J., Edwards-Groves, C., Hardy, I., Grootenboer, P., & Bristol, L. (2014). *Changing Practices, Changing Education*. Springer.

Kirch DG, Gusic ME, Ast C. (2015). Undergraduate Medical Education and the Foundation of Physician Professionalism. *JAMA*, 313(18), 1797–1798.

Klitgaard, T., Stentoft, D., Skipper, M., Grønkjær, M., & Nøhr, S. B. (2021). Struggling to fit the white coat and the role of contextual factors within a hospital

organisation - an ethnographic study on the first months as newly graduated doctors. *BMC Medical Education*, 21(1), 74–74.

Klitgaard, T. L., Stentoft, D., Johansson, N., Grønkjær, M., & Nøhr, S. B. (2022). Collaborators as a key to survival: an ethnographic study on newly graduated doctors' collaboration with colleagues. *BMC Medical Education*, 22(1), 1–9.

Kluijtmans, E., Akkerman, S., & Tartwijk, J. (2017). Professional identity in clinician-scientists: brokers between care and science. *Medical Education,* 51(6), 645–655.

Kramer, M., & Usher, A. (2011) Work-integrated learning and career-ready students: examining the evidence. *Toronto: Higher education strategy associates*

Leung. (2002). Why is evidence from ethnographic and discourse research needed in medical education: the case of problem-based learning. *Medical Teacher*, 24(2), 169–172.

Lave, J., & Wenger, E. (1998). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science*, 5, 1–9.

Luthy, C., Perrier, A, Perrin, E., Cedraschi, C., & Allaz, A. (2004). Exploring the major difficulties perceived by residents in training: a pilot study. *Swiss Medical Weekly,* 134(41-42),612-17.

Maudsley, G., & Strivens, J. (2000). Promoting professional knowledge, experiential learning and critical thinking for medical students. *Medical Education*, 34(7), 535–544.

McConnell-Henry, T., James, A., Chapman, Y. and Francis, K. (2010). Researching with people you know: issues in interviewing. *Contemporary Nurse*, 34 (1), 2–9.

McNeill, Kathleen G; Kerr, Annelise; Mavor, Kenneth I. (2014). Identity and norms: the role of group membership in medical student wellbeing. Perspectives on *Medical Education*, 3(2), 101–112.

Moher, D., Stewart, L., & Shekelle, P. (2015). All in the family: Systematic reviews, rapid reviews, scoping reviews, realist reviews, and more. *Systematic Reviews*, 4(1), 183–194.

Monrouxe, L. (2009). Negotiating professional identities: dominant and contesting narratives in medical students' longitudinal audio diaries. *Current Narratives*, (1),41-59

Monrouxe, L. (2010). Identity, identification and medical education: why should we care? Medical Education, 44(1), 40–49.

Monrouxe, R., Rees, C. E., & Hu, W. (2011). Differences in medical students' explicit discourses of professionalism: acting, representing, becoming. *Medical Education*, 45(6), 585–602.

Murray, I., & Savin-Baden, M. (2000). Staff development in problem-based learning. *Teaching in Higher Education*, 5(1), 107–126.

Neufeld, & Barrows, H. S. (1974). The "Mcmaster Philosophy": An approach to medical education. *Journal of Medical Education*, 49(11), 1040–1050.

Neville, N., Norman, G. & White, R. (2019). McMaster at 50: lessons learned from five decades of PBL. *Advances in Health Sciences Education: Theory and Practice*, 24(5), 853–863.

Norman & Schmidt (1992) The psychological basis of problem-based learning: A review of the evidence. *Academic Medicine, 67*, 557-565.

Oakes P. (1987). The salience of social categories. In: Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher S. D., & Wetherell, M. S., eds. *Rediscovering the Social Group: A Self-Categorization Theory* (pp. 117–41). Blackwell.

O'Brien, B., & Irby, D. (2013). Enacting the Carnegie Foundation call for reform of medical school and residency. *Teaching and Learning in Medicine*, 25(1), 1–8.

O´Reilly, K. (2005) *Ethnographic Methods*. Routledge

Orlikowski, B., & Baroudi, J. J. (1991). Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research*, 2(1), 1–28.

Palincsar, A. S. (1998). Social constructivist perspectives on teaching and learning. *Annual Review of Psychology*, 49, 345–375.

Passi, Doug, M., Peile, E., Thistlethwaite, J., & Johnson, N. (2010). Developing medical professionalism in future doctors: a systematic review. *International Journal of Medical Education*, 1, 19–29.

Patton, M. (2015). *Qualitative research & evaluation methods*: *integrating theory and practice* (4. ed.). SAGE Publications, Inc.

Platow, M, J., Mavor, K. I. and Grace, D. M. (2013). On the role of discipline-related self-concept in deep and surface approaches to learning among university students. *Instructional Science*, 41(2), 271–85.

Pink, S. (2015). *Doing sensory ethnography* (2. ed.). Sage Publications.

Pitkala, K. H., & Mantyranta, T. (2003). Professional socialisation revised: Medical students' own conceptions related to adoption of the future physicians role- a qualitative study. *Medical Teacher* 25(2),155–60.

Postmes, T., & Branscombe, N.R. (2010). Sources of social identity. In: Postmes, T., Branscombe. N.R., eds. *Rediscovering Social Identity* (pp. 1-12). Psychology Press.

Pratt, M. (2003). *Disentangling collective identities. In Identity Issues in Groups* (Vol. 5, pp. 161–188). Emerald Group Publishing Limited.

Prince et al. (2005). General competencies of problem-based learning (PBL) and non-PBL graduates. *Medical Education*, 39(4), 394–401.

Quirk, M. (2006). *Intuition and metacognition in medical education keys to developing expertise*. Springer.

Ramsden, p. (2003). *Learning to teach in higher education* (2nd ed.) Routledge

Rashid, M., Hodgson, C., & Luig, T. (2019). Ten tips for conducting focused ethnography in medical education research. *Medical Education Online*, 24(1), 1624133

Rasmussen, Kruse, S., Holm, C., Rasmussen, J., Kruse, S., & Holm, C. (2007). *Viden om uddannelse : uddannelsesforskning, pædagogik og pædagogisk praksis* (1. udgave.). Hans Reitzel.

Rosenblum, Kluijtmans, M., & ten Cate, O. (2016). Professional Identity Formation and the Clinician–Scientist : A Paradigm for a Clinical Career Combining Two Distinct Disciplines. *Academic Medicine*, 91(12), 1612–1617.

Savery, J. (2006). Overview of problem-based learning: Definitions and

distinctions. Interdisciplinary Journal of Problem-Based Learning, 1(1), 9–20.

Schatzki, T. (2012). A primer on practices. In: Higgs, B. R., Billett, S., Hutchings, M., & Trede, F. (Ed) *Practice-Based Education: Perspectives and Strategies* (PP. 13–26). SensePublishers.

Schmidt, H., & Rikers, R. (2007). How expertise develops in medicine: Knowledge encapsulation and illness script formation. *Medical Education*, 41(12), 1133–1139.

Sharpless, Baldwin, N., Cook, R., Kofman, A., Morley-Fletcher, A., Slotkin, R., & Wald, H. S. (2015). The Becoming: Students' Reflections on the Process of Professional Identity Formation in Medical Education. *Academic Medicine*, 90(6), 713–717.

Smith, C. (2012). Evaluating the quality of work-integrated learning curricula: a comprehensive framework. *Higher Education Research and Development*, 31(2), 247–262.

Smith, Samantha E; Tallentire, Victoria R; Cameron, Helen S; Wood, S Morwenna (2013). The effects of contributing to patient care on medical students' workplace learning. *Medical Education*, 47(12), 1184–1196.

Spaulding, W. (1969). The undergraduate medical curriculum (1969 model): McMaster university. *Canadian Medical Association Journal*, 100(14), 659–664.

Spencer, J. (2003). Learning and teaching in the clinical environment. *BMJ*, 326, 591-4.

Spradley, J. (1979). *The ethnographic interview.* Holt, Reinhart and Winston.

Spradley, J. (1990). *Participant observation* (repr.). Harcourt Brace Jovanovich College Publishers.

Steiner-Hofbauer V, Schrank B, Holzinger A. (2018) What makes a good doctor? *Wien Medical Wochenschr*, 168, 398–405.

Stenberg, U., Haaland-Øverby, M., Fredriksen, K., Westermann, K., & Kvisvik, T. (2016). A scoping review of the literature on benefits and challenges of participating in patient education programs aimed at promoting self-management for people living with chronic illness. *Patient Education and Counseling*, 99(11), 1759–1771.

Stryker, B. & Burke, P. (2000). The Past, Present, and Future of an Identity Theory. *Social Psychology Quarterly*, 63(4), 284–297.

Smyth, L., Chandra, V., & Mavor, K. I. (2018). Social identification and normative conflict: When student and educator learning norms collide. *Journal of Applied Social Psychology*, 0(0).

Smyth, L., Mavor, K. I., & Gray, L. R. (2019). Not just who you are, but who you were before: Social identification, identity incompatibility, and performance-undermining learning behaviour in higher education. *Journal of Community & Applied Social Psychology*, 29(6), 474–491.

Smyth, L., Mavor, K. I., & Platow, M. J. (2017). Learning behaviour and learning outcomes: the roles for social influence and field of study. *Social Psychology of Education*, 20(1), 69–95.

Smyth, L., Mavor, K. I., Platow, M. J., & Grace, D. M. (2017). Understanding social identity in education: The modifying role for perceived norms. In K. I. Mavor, M. J. Platow, & B. Bizumic (Eds.), *Self and Social Identity in Educational Contexts*. Abingdon: Routledge.

Smyth, L., Mavor, K. I., Platow, M. J., Grace, D. M., & Reynolds, K. J. (2015). Discipline social identification, study norms and learning approach in university students. *Educational Psychology*, 35(1), 53–72.

SST (2013). https://www.sst.dk/-/media/Udgivelser/2013/Publ2013/De-syv-l%C3%A6geroller.ashx

Tajfel, H. (1978). *Differentiation between social groups: Studies in the social psychology of intergroup relations*. Academic Press.

Tajfel, H. & Turner, JC. (2004). The social identity theory of intergroup behavior. In Jost, JT, Sidanius, J, eds. *Political Psychology: Key readings* (pp.367-90). Psychology Press

Tan, C., Van Der Molen, H., & Schmidt, H. (2016). To what extent does problem-based learning contribute to students' professional identity development? *Teaching and Teacher Education*, 54(1), 54–64.

Teunissen PW, Westerman M. (2011) Junior doctors caught in the clash: the transition from learning to working explored. *Medical Education*. 45(10), 968–970.

Turner, J. C. (1991). *Social Influence*. Milton Keynes: Open University Press.

Turner, J.C., & Oakes, P.J. (1986). The significance of the social identity concept for social psychology with reference to individualism, interactionism and social influence. *British Journal of Social Psychology*, 25, 237-252.

Trede, F. (2012). Role of work-integrated learning in developing professionalism and professional identity. *Asia-Pacific Journal of Cooperative Education*, 13(3), 159–167.

Turner, J. C. (1982). Towards a cognitive redefinition of the social group. In Tajfel, Henri (Ed.), *Social identity and intergroup relations* (pp. 15-40). Cambridge University Press.

Turner, J. (1987). *Rediscovering the social group: a self-categorization theory*. Basil Blackwell.

Turner, J.C. and Onorato, R.S. (1999). Social identity, personality, and the self-concept: a self-categorization perspective", in Tyler, T.R., Kramer, R.M. and John, O.P. (Eds), *The Psychology of the Social Self* (pp. 11-46). Psychology Press.

Van den Broek, Sjoukje ; Querido, Sophie ; Wijnen-Meijer, Marjo ; van Dijk, Marijke ; ten Cate, Olle. (2020) Social Identification with the Medical Profession in the Transition from Student to Practitioner. *Teaching and Learning in Medicine*, 32(3), 271–281.

Van der Geest, Sjaak & Finkler, K. (2004). Hospital ethnography: introduction. *Social Science & Medicine* (1982), 59(10), 1995–2001.

Wagoner, H. & Hogg, MA (2016). Uncertainty and group identification: Moderation by warmth and competence as cues to inclusion and identity validation. *Self and Identity*, 15(5), 525–535.

Wagoner, H. & Hogg, MA (2020). *Uncertainty-Identity Theory. In Encyclopedia of Personality and Individual Differences* (pp. 5652–5659). Springer International Publishing.

Walker, A., Leary, H., Hmelo-Silver, C., & Ertmer, P. (2015). *Essential readings in problem- based learning: Exploring and extending the legacy of Howard S. Barrows* (pp. 5-15). Purdue University Press.

Wallford, G. (2008) The nature of educational ethnography. In G. Walford (Ed.), *How to do Educational Ethnography* (p.186). London: the Tufnell Press.

Weurlander, Maria; Lönn, Annalena ; Seeberger, Astrid ; Hult, Håkan ; Thornberg, Robert ; Wernerson, Annika (2019). Emotional challenges of medical students generate feelings of uncertainty. *Medical Education*, 53(10), 1037–1048.

Willem, S., Dolmans, D., & Cees, C. P. M. (1999). Profiles of effective tutors in problem-based learning: scaffolding student learning. *Medical Education*, 33(12), 901–906.

Wilson, Ian; Cowin, Leanne S; Johnson, Maree; Young, Helen (2013). Professional Identity in Medical Students: Pedagogical Challenges to Medical Education. *Teaching and Learning in Medicine*, 25(4), 369–373.

Wijnia, Loyens, S. M. M., Derous, E., & Schmidt, H. G. (2015). How important are student-selected versus instructor-selected literature resources for students' learning and motivation in problem-based learning? *Instructional Science*, 43(1), 39–58.

Wood, D. (2003). Problem based learning. *BMJ*, 326(7384), 328–330.

Wortham, S. (2006). *Learning identity: The joint emergence of social identification and academic learning*. New York, NY: Cambridge University Press.

Yew, Chng & Schmidt (2011) Is learning in problem-based learning cumulative? *Advances in Health Science Education* 16 (1),449–464

Zaborenko RN & Zaborenko L (1978). *The doctor tree: Developmental stages in the growth of physicians*. Pittsburgh University Press.

11. APPENDICES

OVERVIEW OF OBSERVATIONS AND INTERVIEW

Pseudonym	Year	Term	Ward number	Observations Total	Interview (1) (2)
James	2017/18/19	7/ 8/ 10	1, 2, 3	52 hrs	(1) & (2)
Maria	2017/18/19	7/ 8/ 10	1, 4, 5	56 hrs	(1) & (2)
Mike	2018	8	1	8 hrs	
Mia	2018	8	1, 4, 6	48 hrs	(1)
Lone	2018	8	2	8 hrs	
Mikael	2018/19	8/ 10	2	44 hrs	(1) & (2)
Chris	2019	10	2, 3	24 hrs	(2)
Total				**240 hrs**	**8 hrs**

Overview of the participants pseudonyms and when and where they were observed and if they participated in one or two interviews.

OBSERVATION NOTES

Tid og sted	Situation	Observation	Tematik	Opmærksomhed
3/4- 2019 XXX afd.	Morgenkonf.	Alle de studerende og jeg sidder til morgenkonferencen placeret som altid langs væggen lige inden for døren til venstre. [1] er meget optaget af de patinter der bliver drøftet til morgenkonferencen og sidder og tager notater. [1] sidder helt fremme på stolen og virker meget ivrig, men flere af de andre studerende er mindst lige så optaget af at kigge rundt på de læger der er tilstede. €"Jeg er lige blevet opereret og kører derfor på halv kraft og er i realiteten sygemeldt." [1] diskuterer de CT-scanninger der bliver vist med de andre medstuderende. Det er tydeligt at hans engagement er højt. [1] og [7] sidder som de eneste studerende kun i t-shirt og bukser. De er de eneste af de medicinstuderende der ikke har kittel på. Største delen af lægerne har også kitler på foruden den ældre overlæge der også blot er iført t-shirt og bukser. Efter morgenkonferencen går han og [7] direkte ned i modtagelsen uden at konferere med nogen læger. På vej ned i modtagelsen spørger jeg ham om: #"skal du ikke finde den læge du skal gå sammen med i dag?" €"Det er ikke nødvendigt, vi går bare ned i modtagelsen, det er her jeg lærer mest."		# mig € Medicinstud % Læge § Medstuderende $ Sygeplejerske & Pårørende

An excerpt of my field notes conducted in a ward.

	Case	De udleveret cases er uddrag fra aktuelle patientjournaler. Underviseren ridser oplysningerne op de har til rådighed og lader de studerende summe lidt i grupper. Det de skal finde ud af, er hvilke informationer de mangler og hvad de vil undersøge og hvorfor. De studerende er meget engageret og der i alle grupper foregår diskussioner af de udleveret cases. Jeg kan se hvorfra jeg sidder at de studerende bruger både fagbøger, noter, sundhed.dk, promedicin og dansk selskab for pædiatri og PRI (kliniske retningslinjer) [1] og [5] lister alle informationer op og kobler dem så efterfølgende sammen. De tre udleveret patientcases gennemgås og diskuteres i plenum. Underviseren stiller mange spørgsmål til de studerende og de overvejelser de har gjort sig og om de har overvejet andre differential diagnoser i forhold til de fund der er gjort. Caseunderviseren stiller mange spørgsmål og kommer ikke med svar. Og er der ting der mangler at blive belyst så giver hun de studerende flere oplysninger at arbejde med i stedet for selv af komme med svaret. De studerende er virkelig på arbejde og skal i høj grad bruge deres problembaseret læringskompetencer.		

An excerpt of my fieldnotes conducted during clinical casework

INTERVIEW GUIDE (1) 2018

Subject	Questions	Notes
NOTE	***Remember to follow their experiences and thoughts – be curious and engaged!!!!***	
	What is it like to be a medical student?	
	How do you experience yourself as a part of the clinical practice?	
	Do you feel competent to carry out the tasks and meet the requirements?	
	How do you experience the transition from the everyday life at the university to the clinical practice?	
	How do you experience the shift between clinical practice and clinical case work? And do you change into your own clothes?	
	Do you remember what it was like to put on the white coat for the first time and how it felt?	
	How was your first encounter with a patient? And how did you prepare?	
	What considerations do you have before examining a patient? And what is important to in the relation to patient care?	
	Do you sometimes transcend your own barriers in the clinical practice?	
	Are there situations that you are trying to avoid? And why and how?	
	What is your focus when observing other physicians and what do you notice?	
	Do you compare yourself with other physicians? And how?	
	What is particular important to you when you are writing patient journal?	
	How do you solve problems during the day? Do you try on your own or do you ask for help right away?	
	How do you apply your prior knowledge to new situations?	
	Where do you primarily find professional inspiration – looking at other physicians (role-models) or/ and reading (research papers, clinical guidelines.)?	
	Do you remember a given situation where you used your problem-based learning skills or competencies?	

INTERVIEW GUIDE (2) 2019

Subject	Question	Notes
Identity		
	You will graduate soon, and how do you feel about that?	
	Are you ready to take the Hippocratic oath? And how do you feel about that?	
	What about the responsibility that follows the Hippocratic oath?	
	Can you describe how the expectations from other professional has affected your behaviour and learning during your clinical practice?	
	Have you experienced yourself as a part of the group of professionals on the wards?	
	Do you often reflect upon your own behaviour and how you contribute on the wards?	
	How does it affect you if a physician confronts you after you have made a mistake?	
	When you have solved a problem on your own and obtain recognition from professionals, how does that make you feel?	
	Do you think of how and when to use technical terminology on the ward?	
	Do you perceive yourself as a colleague on the wards and why?	
	How do you perceive yourself in relation to other medical students?	
	What is a good physician in your opinion? And how do you see yourself as a future physician?	
PBL		
	What has been most important for you to achieve and learn during medical education?	
	What do you do to learn in the clinical practice (final years of clinical problem-based medical education)?	
	How do you find evidence-based information when working the on the ward or doing clinical casework?	
	Is there a connection between solving clinical cases and providing patientcare?	
	How and when do you ask for feedback or supervision on the ward or during clinical case-work?	
	How do you use your skills and competencies learned on the bachelor, in the clinical practice?	

	How does the language affect your learning in the clinical practice?	
	How does the clinical practice contribute to your learning?	
Ideas		
	What has been the best thing about the medical education at Aalborg University, and why?	
	Where have you learned the most, and why?	
	What has been the most difficult part of the medical education, and why?	
	What does a perfect medical education look like according to you, and why?	

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A Scoping Review of the Relation Between Problem-based Learning and Professional Identity Development in Medical Education

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ABSTRACT

There is a substantial amount of research pointing to the benefits of pedagogical approaches such as problem-based learning (PBL) and the importance of developing professional identity as a physician in medical education. The aim of this review is to investigate the existing literature concerned with the relation between PBL and professional identity development in undergraduate medical students. We performed a scoping review of six electronic databases to map out how the relation between PBL and professional identity development in undergraduate medical students is presented in the existing literature. Eight peer-reviewed full text articles were retrieved as eligible for review. The most important conclusion from our work is that even though the topic of professional identity development in medical education has been studied quite extensively, there is a lack of knowledge about how new types of pedagogical approaches such as how a PBL curriculum influences medical students' professional identity development.

INTRODUCTION

Today medical educations around the world have to meet the demands from the fast-changing societies and healthcare systems, and furthermore medical knowledge and the way of treating complex diseases are rapidly expanding (Boyd & Fortin, 2010; Stenberg, Haaland-Øverby, Fredriksen, Westermann & Kvisvik, 2016). To keep pace with such requirements and changes,

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a high-quality education and practice that prepare medical graduates for the work as a physician is essential (Boyd & Fortin, 2011).

Professional identity development is a substantial theme in the research field of medical education, and is also acknowledged as a way of preparing graduate medical students for the work as physicians (Cruess, Cruess, Boudreau, Snell & Steinert, 2014; Passi, Doug, Peile, Thistlethwaite & Johnson, 2010). Similar research indicates that a strong sense of professional identity enhances robustness and preparedness to the transition from medical student to physician (Dolmans, De Grave, Wolfhagen & Van Der Vleuten, 2005; Lohfeld, Neville & Norman, 2005; Sharpless et al.,2015; Tweed, Bagg, Child, Wilkinson & Weller, 2010). Therefore, the importance of developing professional identity has been emphasised by international guidelines in medical education by organisations as Royal College of physicians and surgeons of Canada, Accreditation Council for Graduate Medical Education and Tomorrows Doctor (Franco, Franco, Severo & Ferreira, 2015; Maudsley & Strivens, 2000) and seems to have high priority on the medical educational agenda (Hefler & Ramnanan, 2017; Passi, Doug, Peile, Thistlethwaite & Johnson, 2010; Sharpless et al., 2015). Besides medical expert knowledge, medical students have to learn to think and act appropriately in their professional positions, understanding workplace cultures, meet the expectations of patients, relatives and other professionals, be effective in working with different stakeholders, and discerning in making judgements about ethical issues (Alba & Barnacle, 2007; Cruess, Cruess, Boudreau, Snell & Steinert, 2014; Sharpless et al., 2015). This leads us to the point that the curriculum in medical education has an important and meaningful role to play in supporting students' professional identity development and is to be seen as a vital source in the transformation to becoming a physician.

Parallel to the increasing interest of professional identity development in medical education, research in PBL has been given much attention over the last decade (Barnett, 2009; Savery, 2006; Walke, Leary, Hmelo-Silver, Ertmer & Lafayette, 2015).

Most researchers agree that PBL displays the following four characteristics: (a) a focus on complex, real world problems that has no one right solution, (b) based on group work, (c) students gain new information via self-directed learning and (d) teachers facilitate the learning process (Boud & Feletti, 2013; Hmelo-Silver, 2004; Walke, Leary, Hmelo-Silver, Ertmer & Lafayette, 2015). A PBL curriculum that involves these characteristics facilitates medical students to learn in ways that mirror professional practice and to attain high-level competencies and transferable skills, and therefore assists the demands of preparing the medical graduates for clinical practice (Barrows, 1990; Murray & Savin-Baden, 2000).

The competencies that PBL a curriculum offers the graduate students as collaborative skills, self-reflection, critical thinking, self-directed learning and solving real-life problems is the key to assisting medical students in making a smooth transition to the clinical setting (Barrows &

Tamblyn, 1980; Boud & Feletti, 2013; Tan, Van Der Molen & Schmidt, 2016). In addition to these competencies, PBL also brings the medical students into real-life situations either with real patients or cases that mirrors real life situations as a learning resource and the need for cooperation and communication with other professionals, which enhance confidence, motivation and satisfaction (Bleaklet & Bligh, 2008; Maudsley & Strivens, 2000).

Having noticed that PBL curriculum and professional identity development independently were prevalent in the field of medical education research we set out to explore the scope of existing literature which present the relation between PBL and professional identity development in a medical education context.

To identify and uncover the volume of medical education research about the relation between PBL and professional identity development we decided to conduct a scoping review and thus the research question we seek to answer is as follows:

> How is the relation between problem-based learning and professional identity development represented in the field of medical education research?

Since it is not unreasonable to assume that PBL curricula reinforce a certain professional identity development and mindset, which is unique to the PBL pedagogy, it is important to explore the existing research to gain new knowledge about how PBL a curriculum affects the professional identity development of medical students.

METHOD

This scoping review used the established scoping review framework delineated by Arksey and O'Malley because it enabled researchers to identify and summarize known literature on a given topic regardless of study design (Arksey & O'Malley, 2005; Levac, Colquhoun & O'Brien, 2010). Furthermore, Arksey and O'Malley drew four common reasons why a scoping review might be conducted: (a) to examine the extent, range and nature of research activity, (b) to determine the value of undertaking a full systematic review, (c) to summarize and disseminate research findings, (d) to identify research gaps in the existing literature (Arksey & O'Malley, 2005; Levac, Colquhoun & O'Brien, 2010). All four of these reasons supported our aim for conducting this scoping review as we sought to examine the volume, range and nature of papers that investigates the relation between PBL and professional identity development in medical education.

To guide the search strategy, we used the five key phases that one must go through when conducting a scoping review as outlined by Arksey & O'Malley (2005) and Levac, Colquhoun & O'Brien (2010): First starting point was to identify and formulate the research question to

guide the search strategy. Second, to identify relevant studies, through scoping the literature as comprehensively as possible. Third, to select the relevant studies which, involved inclusion and exclusion criteria based on the research question. Fourth, the charting was used to extract data from each of the included studies and a descriptive analytical method was used to extract contextual or process-oriented information from each study. Finally, collating, summarizing, and reporting the results which demanded consistency and clarity.

We have chosen to follow Arksey & O'Malley's (2005) and Levac, Colquhoun & O'Brien (2010) guidelines for scoping reviews. We consider this approach to be appropriate to the topic of our study in accordance with what has been defined as the overall purpose of conducting scoping reviews; a form of knowledge synthesis that addresses an exploratory research question aimed at mapping key concepts, types of evidence and knowledge gaps in the literature.

Search strategy and selection criteria

Based on our research question, the following keywords were identified to manage the literature search: medical education OR medical student OR medical students AND identity AND problem based learning OR problem-based learning. These keywords in the mentioned order together with relevant synonyms were combined to reflect the specific search string that was used to search relevant databases:

((“medical education” OR “medical student” OR “Medical students”) AND identity AND (“problem based learning” OR “problem-based learning”)).

We systematically searched the following six databases: PubMed, Scopus, ProQuest, PsychINFO, EBSCOhost and Medline. In keeping with the intention of scoping reviews as outlined by Arksey and O'Malley (2005) and Levac, Colquhoun & O'Brien (2010), these databases were selected to give comprehensive coverage and concerned with medical education or higher education, because research in medical education is not necessarily published in medical education journals.

To encircle the specific topic of our scoping review, we employed a number of criteria for inclusion as well as exclusion of studies derived from the research question. Studies were included for further review if:

- Problem based learning/problem-based learning was mentioned in either the title, abstract or keywords
- Identity was mentioned in either the title, abstract or keywords
- The study was conducted in the context of undergraduate medical education

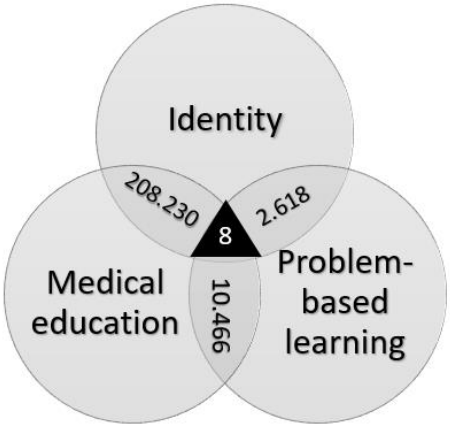

Figure 1. Volume of identified papers in six databases used in the scoping review concerned with PBL, Medical education and professional identity.

In addition to the scoping review, a preliminary search was conducted to strengthen the relevance of our scoping review. As shown in Figure 1, research in identity and medical education is well represented with 208,230 identified papers and 10.466 papers were identified relating to research in PBL and medical education. 2.618 papers were identified relating to PBL and identity and only 8 papers met the inclusion criteria derived from the research question.

In order to limit our search, studies were excluded if they were not available in English. Books, book chapters, conference abstracts and non-reviewed publications were also excluded. Having performed the initial literature search using the specific search string outlined above, we continued to sort the articles by employing the criteria for inclusion and exclusion in the following three steps: First we identified and removed the duplicates from the first search, we used the reference manager Mendeley. Second, the abstracts of the remaining articles were sorted manually, in the sense that titles, abstracts and keywords were manually screened.

In this step, only the articles conducted in a medical education context with a primary focus on undergraduate medical students' and mentioning problem based learning/ problem-based learning and identity in the title, abstract or keywords were included. Third, the full-text version of the remaining articles was retrieved and included for in-depth analysis. To ensure the eligibility of the selection of articles guided by the research question, the inclusion and exclusion process, was assessed jointly by three researchers.

The search and identification process of the literature search is presented in Figure 2.

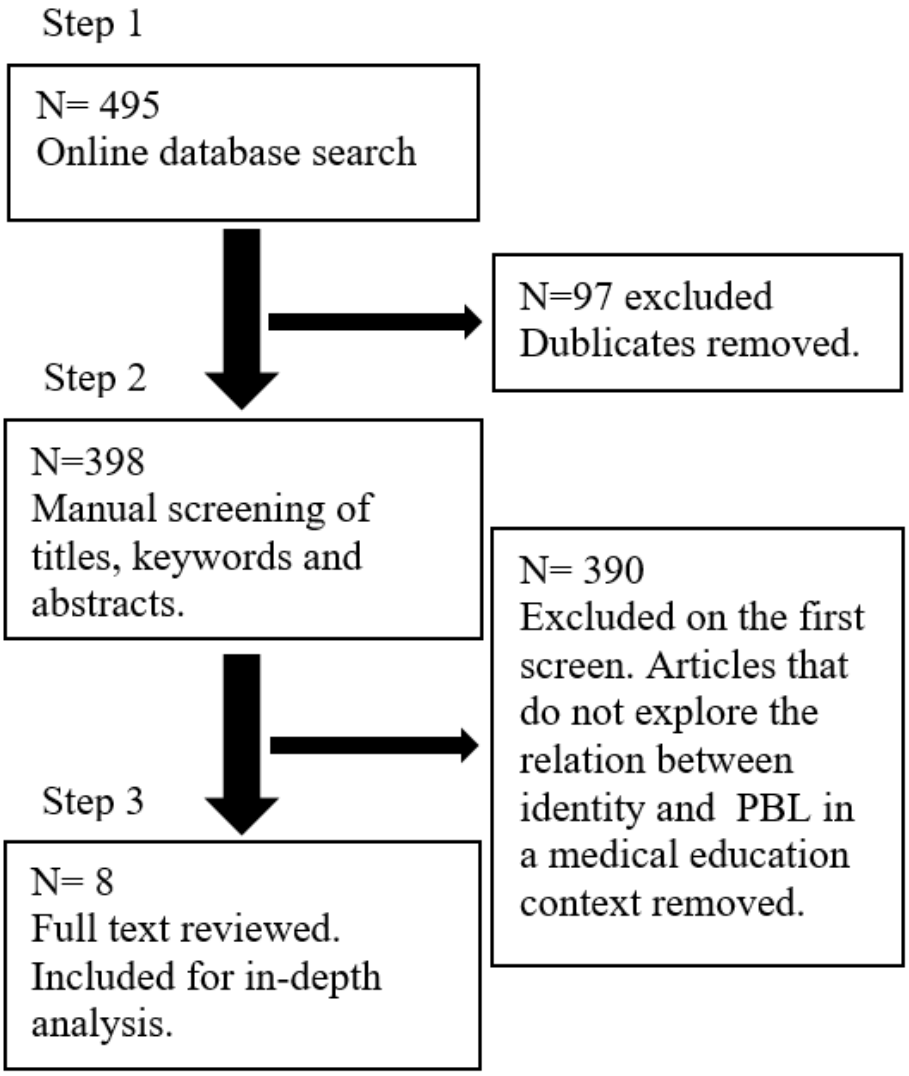

Figure 2. Search and identification flowchart.

The principal strength of this scoping review was the detailed search strategy designed to cover all the research that studies relations between PBL and undergraduate medical students' professional identity development.

RESULTS

The search was conducted on October 10, 2018 and included six databases PubMed (23), Scopus (35), ProQuest (377), PsychINFO (21), EBSCOhost (17) and Medline (22), which yielded in total 398 articles, which were potentially relevant, when duplicates were removed. After further screening of the 398 titles, keywords and abstracts, in accordance with inclusion and exclusion criteria, 8 full text articles were retrieved for detailed review, as shown in table 1 below. The very limited number of articles for review testifies Fig. 1 to the lack of studies which explicitly examine the relation between professional identity development and PBL.

Ref. nr.	Database	Authors	Year	Title	Journal
[1]	Scopus	Bell, K., Boshuizen, H. P. A., Scherpbier, A., & Dornan, T.	2009	When only the real thing will do: Junior medical students' learning from real patients.	*Medical Education*, *43*(11), 1036–1043
[2]	MEDline	Berkhout, J. J., Helmich, E., Teunissen, P. W., van der Vleuten, C. P. M., & Jaarsma, A. D. C.	2018	Context matters when striving to promote active and lifelong learning in medical education.	*Medical Education*, *52*(1), 34–44.
[3]	Scopus	Evensen, D. H., Glenn, J., & Salisbury-Glennon, J. D.	2001	A qualitative study of six medical students in a problem-based curriculum: Toward a situated model of self-regulation.	*Journal of Educational Psychology*, *93*(4), 659–676.
[4]	Scopus	Badenhorst, E., & Kapp, R.	2013	Negotiation of learning and identity among first-year medical students.	*Teaching in Higher Education*, *18*(5), 465–476
[5]	PsycINFO	Imafuku, R., Kataoka, R., Mayahara, M., Suzuki, H., & Saiki, T.	2014	Students' Experiences in Interdisciplinary Problembased Learning: A Discourse Analysis of Group Interaction.	*Interdisciplinary Journal of Problem-Based Learning*, *8*(2), 1–18.
[6]	EBSCOhost	Imafuku, R., Kataoka, R., Ogura, H., Suzuki, H., Enokida, M., & Osakabe, K.	2018	What did first-year students experience during their interprofessional education? A qualitative analysis of e-portfolios.	*Journal of Interprofessional Care*, *32*(3), 358–366.
[7]	ERIC	MacLeod, A.	2011	Caring, competence and professional identities in medical education.	*Advances in Health Sciences Education*, *16*(3), 375–394.
[8]	ProQuest	Reddy, S., & McKenna, S.	2016	The Guinea pigs of a problem-based learning curriculum.	*Innovations in Education & Teaching International*, *53*(1), 16–24.

Table 1. Articles included for full text review (in-dept analysis).

During the analysis of the 8 included articles, three main themes appeared relevant to discuss in relation to the research question. Firstly; the methodology used in the articles, secondly; how professional identity is conceptualized and finally how the relation between PBL and professional identity in medical education is visible. Themes that in one way or another can be regarded as a framework for the later discussion of the consequences or impact that a PBL curriculum has on undergraduate medical students´ professional identity development.

Nature of research

Of the 8 articles (see Table 2) for full text review, 7 contained empirical content utilizing qualitative approaches to data collection such as interviews, observations, self-reported statements and learning portfolio interviews, to investigate the relation between PBL and professional identity development in a medical education context [1,3-8]. The observations in the articles [4,5,7] were all conducted during PBL group sessions, group meetings or tutorials and the interviews in these articles were performed after or during the observation period. The articles using retrospective data as interviews [1,4,7,8], e-portfolios [6] and self-reported statements [1] were analyzing or interpreting the learner's own experiences with PBL. The last article [2] was identified as conceptual, since it is contained conceptual principles about current knowledge on enhancing active learning in PBL, and furthermore introduced some theoretical frameworks that may foster the understanding of the relation between active and self-regulated learning and professional identity development.

Ref. nr.	Research participants	Type of research
[1]	Third year medical students	Empirical (*self-reported statements*)
[2]	Conceptual article	Theory
[3]	First year medical students	Empirical (*observations and interviews*)
[4]	First year medical students	Empirical (*interviews*)
[5]	Third year medical students	Empirical (*video-recorded data*)
[6]	First year medical students	Empirical (*written e-portfolios*)
[7]	Undergraduate medical students	Empirical (*observations and interviews*)
[8]	Undergraduate medical students	Empirical (*interviews*)

Table 2. Learning context, research participants and type of research.

Conceptualization of professional identity

Professional identity in the included articles often refers to what a physician is, described as a representation of a position or a self, achieved in stages over time during which the characteristics, values, and norms of the profession are internalized through social interaction, agency, learning, reflection, acting, and feeling like a physician [1-8]. The authors of the 8

papers argue that professional identity is an adaptive developmental process that occurs both at the individual level of the medical student and as a result of socialization into a clinical role and professional community. Contained within these analytical descriptions from the articles, some principles of professional identity are brought forward: Professional identity development is a dynamic and developmental process that occurs in all medical students; professional identity is the result of social interaction and active participation in clinical practice; and professional identity develops from a series of identity transformations that occur primarily during periods of transition [1-8]. Each of the included articles contributes to various ways of examining the concept professional identity and thereby emphasises the challenge of doing research on professional identity development.

Relation between PBL and professional identity development in medical education

Below in table 3 the identified themes are listed to give an overview of the PBL concepts that are identified in the articles as influencing the professional identity development.

Themes in articles	References
Social interaction	[1-8]
Self-reflection	[1,2,3,5,7,8]
Proffesional community	[1,2,3,5,6,7,8]
Problem solving	[5,6,7,8]
Self-directed learning	[2,3, 5,8]
Cultural enviroment	[2,3,4,5,7,8]
Learning	[1,3,4,5,6,8]
Real patient learning	[1,2,5,6,7,8]
Active participation (agency)	[1-8]
Communication/ Language	[1,2,4,5,6,7,8]
Negotiating subject positions	[4,5,6,7,8]
Opportunities for learners	[2,3,4,7,8]
Rolemodel	[2,6,7]

Table 3. PBL Themes that are represented in the included articles.

The results indicates that professional community, real patient learning, cultural environment, social interaction, agency and communication are important PBL competencies that affect professional identity development. Of the 8 articles 6 recommend PBL as pedagogical approach to enhance professional identity development in undergraduate medical students' [1-3,5-7]. Thus 2 of the 8 articles problematized PBL in regards to the need for active participation, communication skills, opportunities for learners and learners as equal participants in the group sessions to generate learning [4,8]. These articles claim that PBL is best suited for capable students [4,8].

The three identified themes 1) nature of research, 2) conceptualization of professional identity and 3) relation between PBL and professional identity development in medical education deliver different perspectives on the connection between PBL and professional identity development, which will be discussed below.

DISCUSSION

Educational focus on professional identity development serves the need of preparing the medical graduates for the work as physician (Cruess, 2006; Hafferty, Michalec, Martimianakis, & Tilburt, 2016). Competencies as critical thinking, self-reflection, self-directed learning, communication and problem-solving skills have been emphasized as important goals of medical education, which also affect the developmental process through which medical students' form his or her professional identity (Niemi, 1997). However, little is known about how PBL curricula affect the professional identity development and the learning context and environment through which the personal experiences of the undergraduate medical students are elaborated. Thus, to our knowledge, this is the first scoping review conducted with the aim to explore and identify the existing literature concerned with the relation between PBL and professional identity development in a medical education context.

As presented in the results section the volume of research examining the relation between PBL and professional identity development is very limited despite the importance of professional identity development in medical education. In order to reduce the identified research gap, the purpose of this discussion is to inspire and contribute for further research, by discussing different theoretical approaches to professional identity development and alternative research methodologies to explore the relation between PBL and professional identity development in medical education.

New methodological approaches can apply important knowledge to medical education

As our results show, none of the included articles used ethnographic material to explore the relation between PBL and professional identity development in medical education. Thus, various social researchers have previously suggested that professional identity is primarily acquired through active participation in a professional practice, by observing how others behave and how they embody the values and behaviors of the profession (O'Brien & Irby, 2013). This argument suggests that social research in medical education can profitably take advantage of ethnography or methodological triangulation to better understand the complexities of the medical students' professional identity development in relation to PBL. Conducting ethnographic studies or methodological triangulation the researcher will gain a thorough insight into the process in which the medical students develop their professional identity. To produce knowledge that can explain this dynamic and complex development process, Leung (2002) suggest that one has to employ methods such as participant observation and unstructured

interviewing and put emphasis on the influence of the curriculum. Moreover, the formal, as well as the informal PBL curriculum, contains important knowledge to the research field of professional identity development. To go beneath the surface of the existing research and produce new knowledge, ethnography or method triangulation will allow us to untangle this research field and give a deeper understanding of how a PBL curriculum transforms the students (Leung, 2002). While other types of qualitative methods such as interview, self-reported statements and portfolios may be used to investigate students' perceptions, they cannot uncover the influence of prior socialization or learning on their perceptions.

Professional identity development in medical education

As the results shows in this scoping review the individual level is more or less absent. Thus, these new theoretical lenses could put forward new and interesting perspectives on the relation between PBL and professional identity development and thereby contribute to a unique approach to the delivery of undergraduate medical PBL curriculum.

The reviewed articles affiliate with a certain perspective that points out the need of the undergraduate medical students' to engage in a professional community to develop a professional identity. The theoretical perspective, can be closely tied to the concepts of community of practice (CoP) presented by Lave and Wenger. They suggest that social interaction between individuals enhance learning, and that CoPs emerge when those who wish to share a set of common approaches and shared knowledge and standards that create the basis for action, communication, problem solving, performance, and accountability (Wenger, 2001). CoP as a concept and PBL is often seen as a particularly helpful relation because they appear to reflect the reality of both medical education and practice (Dolmans & Schmidt, 1996; Lave & Wenger, 1998). A perspective that seems to capture the description of the practice of medical education that is presented in the included articles [1-3,5-8] and the idea that becoming a member of a community of practice is one of the major ways in which students begin to form their professional identities, often through as a dynamic process of legitimate peripheral participation (Lave & Wenger, 1998). It should be kept in mind that CoPs illustrate only one way of expressing the development of professional identity. Therefore, the research field demands attention towards the role of the individual and new theoretical approaches in a varied manner to explore and support the PBL curriculum improvement.

Social identity theory can subject the positions available to the medical students to a critical examination and support the preferred theoretical lens on CoP and turn the research focus towards the importance of the environment and context in which the PBL is practiced.

Tajfel & Turner (2004) and Jenkins (2014) propose that social identity theory refer to the way in which we understand ourselves to be a member of a group, along with an emotional connection to our group membership(s). As such, group membership is a very central aspect within all our identities. In the context of real patient learning, case work, group work and the

learning environment in which the medical students work and learn contributes to their social identity in different ways: through their developing sense of self as a member of the group of students or physicians, and as a member of the department in which they work. Furthermore, the engagement within the work as a physician and the level to which they are included, also contribute to their professional identity (Turner, 1987). Another theoretical perspective presented by Jarvis-Selinger, Pratt & Regehr (2012) claims that professional identity development is an adaptive process occurring at two levels: the individual level of psychological development, which occurs primarily within the individual; and the collective level, whereby the individual learns through interaction in the social context (Jarvis-Selinger, Pratt & Regehr, 2012). Students' learn and make meaning of their environment through the mental structures or schemata they develop. As students learn and develop, these schemata become increasingly complex and form the basis for self-reflection, self-directed learning, problem-solving and communication skills (Dolmans & Schmidt, 1996; Tajfel & Turner, 2004).

PBL as a catalysis for developing professional identity in medical education

PBL is often a debated medical education pedagogy and has been widely recognized as a progressive student-centered active learning approach and currently underpins the philosophy of the entire medical education curriculum (Barrows, 1990; O'Brien & Irby, 2013; Quirk, 2006). Even though there is no universal definition of what constitutes PBL and a conceptual uncertainty lingers in the literature both in terms of its underlying philosophy and in how it is executed. Thus, PBL advocating an experience-based learning environment that encourages collaboration to identify what to learn and how to solve a problem and they apply their new knowledge to the problem and reflect on what they learned of the strategies used (Barrows, 1996; Hmelo-Silver, 2004; O'Brien & Irby, 2013; Schmidt & Rikers, 2007).

Medical education appears enraptured with the intention of developing professional identity in medical students to prepare them and make them "fit in" to the work life (Hafferty, Michalec, Martimianakis, & Tilburt, 2016). PBL as defined by Barrows (1996) intend to prepare the students in the transition from medical school to working life by putting the students in real life learning environments. Cruess & Cruess (2014) argue that students should be supported in the transition to becoming a physician and that medical schools ought to devote more attention to the development of professional identity. In this respect, we would like to add on this perspective of Cruess & Cruess (2014), even though training in professional identity development at medical school most certainly will help medical students adjust in their career. We believe that an extended focus on the relation between PBL and professional identity development is needed during the transitions in the whole education program. With a perspective on medical education as a site of occupational socialisation and a site where the PBL curriculum sets the agenda for learning, then Hafferty (2016) argue that socialisation theory could contribute to an insight into identities that medical students assume. Furthermore, Hafferty addresses socialisation theory as a theory we can draw upon in exploring topics such

as behaviour, attitudes, self-image, self-reflection, occupational culture, values, norms and emotions (2016).

The development of professional identity in undergraduate PBL medical education serves an important purpose (Barrows, 1990; Murray & Savin-Baden, 2000) and to our knowledge, this is the first scoping review conducted to summarise the existing research currently available on this topic and to that end we encourage to further research to bridge the knowledge gap identified.

CONCLUDING REMARKS

In this paper, we have presented a scoping review of a sample of the research literature about the relation between PBL and professional identify development. More specifically, we have tried to answer the following question: How is the relation between problem-based learning and professional identity development represented in the field of medical education research? As it turned out, there was not much evidence in the sample of included articles on PBL we reviewed that could be used to clarify the specific relation between PBL and professional identity development in medical education. We found that none of the 8 included articles explicitly conceptualized professional identity or PBL, but used the concepts as common terms. However, we could identify a pattern of the use of professional community, that could be used to provide an adequate unifying picture of what affects professional identity development in medical students.

The most important conclusion that can be drawn based on the findings we have been able to produce, is that even though the topic of professional identity development in medical education has been studied quite extensively, there is a lack of knowledge about how new types of pedagogical approaches such as a PBL curriculum influences medical students' professional identity development. Thus, it is impossible to draw any final conclusions on how PBL affect the professional identity development in medical students and therefore more and varied research is needed.

References

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32.

Badenhorst, E., & Kapp, R. (2013). Negotiation of learning and identity among first-year medical students. *Teaching in Higher Education*, *18*(5), 465–476.

Barnett, R. (2009). Knowing and becoming in the higher education curriculum. *Studies in Higher Education*, *34*(4), 429–440.

Barrows, H. (1990). Inquiry: The pedagogical importance of a skill central to clinical practice. *Medical Education, 24*(1), 3–5.

Barrows, H. (1996). Problem-based learning in medicine and beyond: A brief overview. *New Directions for Teaching and Learning*, *68*(1), 3–12.

Barrows, H., & Tamblyn, R. (1980). *Problem-based learning: An approach to medical education*. New York, NY: Springer.

Bell, K., Boshuizen, H., Scherpbier, A., & Dornan, T. (2009). When only the real thing will do: Junior medical students' learning from real patients. *Medical Education, 43*(11), 1036–1043.

Berkhout, J., Helmich, E., Teunissen, P., Vleuten, C., & Jaarsma, A. (2018). Context matters when striving to promote active and lifelong learning in medical education. *Medical Education, 52*(1), 34–44.

Bleakley, A., & Bligh, J. (2008). Students learning from patients: Let's get real in medical education. *Advances in Health Sciences Education, 13*(1), 89–107.

Boud, D., & Feletti, G. (1997). *The challenge of problem-based learning* (2nd ed.). London: Kogan Page.

Boyd, C., & Fortin, M. (2010). Future of multimorbidity research: How should understanding of multimorbidity inform health system design? *Public Health Reviews, 32*(2), 1–18.

Cruess, S., & Cruess, R. (2004). Professionalism and medicine's social contract with society. *Virtual Mentor, 6*(4), 185–188.

Cruess, R., Cruess, S., Boudreau, D., Snell, D., & Steinert, D. (2014). Reframing medical education to support professional identity formation. *Academic Medicine, 89*(11), 1446–1451.

Dall'Alba, G., & Barnacle, R. (2007). An ontological turn for higher education. *Studies in Higher Education, 32*(6), 679–691.

Dolmans, D., De Grave, W., Wolfhagen, I., & Van Der Vleuten, C. (2005). Problem-based learning: Future challenges for educational practice and research. *Medical Education, 39*(7), 732–741.

Dolmans, D., & Schmidt, H. (1996). The advantages of problem-based curricula. *Postgraduate Medical Journal, 72*(851), 535–538.

Evensen, D., Salisbury-Glennon, J., & Glenn, J. (2001). A qualitative study of six medical students in a problem-based curriculum: Toward a situated model of self-regulation. *Journal of Educational Psychology, 93*(4), 659–676.

Franco, R., Franco, C., Severo, M., & Ferreira, M. (2015). General competences on medical professionalism: Is it possible? *Medical Teacher, 37*(10), 976–977.

Hafferty, F. (2016). Socialization, professionalism, and professional identity formation. In R. Cruess, S. Cruess, & Y. Steinert (Eds.), *Teaching medical professionalism: Supporting the development of a professional identity* (pp. 54–67). Cambridge: Cambridge University Press.

Hafferty, F., Michalec, B., Martimianakis, M., & Tilburt, J. (2016). Alternative Framings, Countervailing Visions: Locating the "P" in Professional Identity Formation. *Academic Medicine, 91*(2), 171–174.

Hefler, J., & Ramnanan, C. (2017). Can CanMEDS competencies be developed in medical school anatomy laboratories? A literature review. *International Journal of Medical Education, 8*(1), 231–238.

Hmelo-Silver, C. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review, 16*(1), 235–266.

Imafuku, R., Kataoka, R., Mayahara, M., Suzuki, H., & Saiki, T. (2014). Students' experiences in interdisciplinary problem-based learning: A discourse analysis of group interaction. *Interdisciplinary Journal of Problem-Based Learning, 8*(2), 1–18.

Imafuku, R., Kataoka, R., Ogura, H., Suzuki, H., Enokida, M., & Osakabe, K. (2018). What did first-year students experience during their interprofessional education? A qualitative analysis of e-portfolios. *Journal of Interprofessional Care, 32*(3), 358–366.

Jarvis-Selinger, D., Pratt, D., & Regehr, D. (2012). Competency is not enough: Integrating identity formation into the medical education discourse. *Academic Medicine, 87*(9), 1185–1190.

Jenkins, R. (2014). *Social identity* (4th ed.). London: Routledge.

Lave, J., & Wenger, E. (1998). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.

Leung, W. (2002). Why is evidence from ethnographic and discourse research needed in medical education: The case of problem-based learning. *Medical Teacher, 24*(2), 169–172.

Levac, D., Colquhoun, H., & O'Brien, K. (2010). Scoping studies: Advancing the methodology. *Implementation Science, 5*(1), 1–9.

Lohfeld, L., Neville, A., & Norman, G. (2005). PBL in undergraduate medical education: A qualitative study of the views of Canadian residents. *Advances in Health Sciences Education, 10*(3), 189–214.

MacLeod, A. (2011). Caring, competence and professional identities in medical education. *Advances in Health Sciences Education, 16*(3), 375–394.

Maudsley, G., & Strivens, J. (2000). Promoting professional knowledge, experiential learning and critical thinking for medical students. *Medical Education, 34*(7), 535–544.

Murray, I., & Savin-Baden, M. (2000). Staff development in problem-based learning. *Teaching in Higher Education, 5*(1), 107–126.

Niemi, P. (1997). Medical students' professional identity: Self-reflection during the preclinical years. *Medical Education, 31*(6), 408–415.

O'Brien, B., & Irby, D. (2013). Enacting the Carnegie Foundation call for reform of medical school and residency. *Teaching and Learning in Medicine, 25*(1), 1–8.

Passi, V., Doug, M., Peile, E., Thistlethwaite, J., & Johnson, N. (2010). Developing medical professionalism in future doctors: A systematic review. *International Journal of Medical Education, 1*, 19–29.

Quirk, M. (2006). *Intuition and metacognition in medical education keys to developing expertise*. New York, NY: Springer.

Reddy, S., & Mckenna, S. (2016). The Guinea pigs of a problem-based learning curriculum. *Innovations in Education and Teaching International, 53*(1), 16–24.

Savery, J. (2006). Overview of problem-based learning: Definitions and distinctions. *Interdisciplinary Journal of Problem-Based Learning, 1*(1), 9–20.

Schmidt, H., & Rikers, R. (2007). How expertise develops in medicine: Knowledge encapsulation and illness script formation. *Medical Education, 41*(12), 1133–1139.

Sharpless, S., Baldwin, S., Cook, S., Kofman, S., Morley-Fletcher, S., Slotkin, S., & Wald, S. (2015). The becoming: Students' reflections on the process of professional identity formation in medical education. *Academic Medicine, 90*(6), 713–717.

Stenberg, U., Haaland-Øverby, M., Fredriksen, K., Westermann, K., & Kvisvik, T. (2016). A scoping review of the literature on benefits and challenges of participating in patient education programs aimed at promoting self-management for people living with chronic illness. *Patient Education and Counseling, 99*(11), 1759–1771.

Tajfel, H., & Turner J. (2004). The social identity theory of intergroup behavior. In J. Jost & J. Sidanius (Eds.), *Political psychology: Key readings* (pp. 276–293). New York, NY: Psychology Press.

Tan, C., Van Der Molen, H., & Schmidt, H. (2016). To what extent does problem-based learning contribute to students' professional identity development? *Teaching and Teacher Education, 54*(1), 54–64.

Turner, J. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford: Basil Blackwell.

Tweed, M., Bagg, W., Child, S., Wilkinson, T., Weller, J., & Tweed, M. (2010). How the trainee intern year can ease the transition from undergraduate education to postgraduate practice. *The New Zealand Medical Journal, 123*(1318), 81–91.

Walker, A., Leary, H., Hmelo-Silver, C., & Ertmer, P. (2015). *Essential readings in problem-based learning: Exploring and extending the legacy of Howard S. Barrows* (pp. 5–15). West Lafayette, IN: Purdue University Press.

Wenger, E. (2001). *Communities of practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.

PAPER II (SUBMITTED)

Paper 2: (Submitted)

How clinical problem-based medical education sets the scene for identity development in medical students.

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Interdisciplinary Journal of Problem-based learning

How clinical problem-based medical education sets the scene for social identity development in medical students.

Abstract

In this article we examine how clinical problem-based medical education sets the scene for social identity development in medical students. According to Crossley and Vivekananda-Schmidt (2009) social identity development relates to medical students' professional behaviour, acting and thinking and affects how medical students approach learning in problem-based medical education. Therefore, it is important to gain new knowledge about which social identities are at stake in problem-based medical education. We conducted an ethnographic study at Aalborg University Hospital, involving 7 medical students for 240 hours of participant observation and 8 hours of semi-structured interviews. During the analysis we were able to identify three prominent social identities that medical students either assumed themselves or were assigned by professionals, peers and patients: *Social identity as medical student,* as *nearly physician,* and as *colleague.*

How clinical problem-based medical education sets the scene for social identity development in medical students.

Introduction

In this article we argue that social identity development are moderating components affecting medical students' professional behaviour, acting and thinking and is important components influencing how medical students approach learning in problem-based medical education. Therefore, it is of great importance to gain knowledge about which social identities are at stake in problem-based medical education and how the curriculum sets the scene for social identity development in medical students in connection with the future development of medical education of high quality.

PBL originated in the late 1960s in medical education to enable a smoother transition of medical students into clinical practice and prepare them better to *fit* into the workplace as future physicians (Boud & Feletti, 1998). Students work in collaborative groups to identify what they need to learn to solve real-life cases (Barrows, 1990; Barrows, 1996; Dolmans et al., 2005; Schmidt et al., 2019) and engage in self-directed learning and problem-solving where they apply their prior knowledge to the problem and reflect on what they have learned (Schmidt et al., 2019; Hmelo-Silver, 2004). This learning approach gives the medical students the ability to apply their experiences from preclinical casework to provide supervised patient care during their clinical stays. Today principles of PBL are widely used around the world and the practice is continuously expanded (Barnett, 2009).

In medicine, as in all professions, identity development is closely tied to education as curriculum provides the framework and boundaries for how students are expected to behave, think and act. PBL is one particular pedagogical approach based on solving authentic problems, group work, collaboration, real patient learning and engaging in professional

communities. These key components are reflected in curriculum and inevitably influence students' identities and their perceptions of what it means to become a physician (Barrows & Tamblyn, 1980; Boud & Feletti, 1998; Johansson et al., 2020; Tan et al., 2016). It is in the years of medical learning that extent from gaining medical expert knowledge and clinical experience the medical students acquire the craft of medicine (Sharpless et al., 2015). Besides the medical expert knowledge, medical students have to learn to think, act and behave according to their professional positions, dealing with workplace cultures, working together with different stakeholders and discerning in making judgements about ethical issues (Sharpless et al., 2015; Cruess et al., 2014).

In our previous literature review we summarised that several studies recommended PBL as a pedagogical approach to enhance identity development in medical students (Johansson, Nøhr & Stentoft, 2020). Furthermore, we identified a gab in empirical research justifying this assumption (Johansson et al., 2020; Cruess et al., 2014; Passi et al., 2010).

Understanding this relation is essential for a high-quality medical curriculum development, but is also important in relation to many other educations involving real-life practice. According to existing literature in higher education identity development is related to the students learning potentials and can have implications for their future practice post-graduation (Johansson et al., 2020).

This study aims to examine and understand how clinical PBL, in which medical students are purposefully engaged in supervised patient care, ward rounds and groupwork solving real-life patient cases, sets the scene for identity development. We used the lens of *social identity theory* to explore the salient social identities that medical students are assigned or assume during clinical PBL medical education. This led to the following research question: Which prominent social identities does clinical problem-based medical education assign medical students and what characterises them?

The Social identity approach

Who we are (assumed), and who we are seen to be (assigned), is at the centre of the social identity approach. Jenkins (2008) argues that social identity is not something that one can *have* or not; it is something that one *does*. The social identity approach asserts how individuals` sense of self – who they think they are and, hence, how they think, behave and act – is influenced by the group to which they are affiliated and by the internalised sense of *social identity* that they achieve from their group memberships (Burford, 2012; Haslam, 2017).This suggests that a given social identity define individuals' sense of self (e.g., as 'us medical students' or 'us physicians'), leads to a particular behaviour that is qualitatively distinct from behaviour that is informed by personal identity (Burford, 2012; Haslam, 2017; Brewer, 2001; Tajfel & Turner, 1987).

Crossley and Vivekananda-Schmidt (2009) and Monrouxe (2009) emphasise the importance of the performative elements of social identity to *fit in*. A medical student who is 'doing what a physician does' is more similar to the stereotype of 'physician' than someone who does not. When social identity as physician is more *salient* than identity as a medical student, medical students perceive themselves less as medical students and more as members of the group of physicians. Turner (1987) and Crossley & Vivekananda (2009) argue that the learning situation in which learners fit into and engage within and afforded by professionals, mutually contribute to social identity development and approach to learning. This socialisation is a dynamic social identity-making process allowing individuals to negotiate changes to their contributions to the professional community. Thus, socialisation is about learning to *fit in* by acquiring new expert knowledge and skills about social identities and constructing group identity in relation to the profession (Haslam, 2004). According to Turner & Onorato (1999),

this alternate to a group identity involves a corresponding switch in motives, values, norms, beliefs, competencies, subject knowledge and language and expectations.

By examining why medical students do things they do or why they behave, think and act like they do helps us to understand what characterises social identity development in medical students in a clinical PBL setting. And further, how clinical PBL sets the scene for the assumed and assigned social identities.

Method

Ethnography as methodological approach and social identity theory both emphasises the mutual influence of the natural environment on the participant's behaviour, thinking, acting, norms and values and vice versa (Hammersley & Atkinson, 2007, Leung, 2002).

Given these theoretical principles, it is quiet logical, then, that ethnography is considered the methodology of choice to explore medical students' everyday lives (Leung, 2009) and their social identity development during the final three years of clinical PBL medical education.

Our study relied on participant observations, informal conversations, field notes, and individual in-depth interviews to explore how medical students' behave, act and think during clinical practice and go beyond what they say to what they do (Hammersley & Atkinson, 2007). Furthermore, participation in the daily routines provided the opportunity to gain insight into the clinical culture and context of the groups that we are studying, while also allowing us to experience the conditions of being a medical student, which supports the ability to produce valid explanations for their thoughts, actions and behaviour. The ethnographic approach allowed us to explore how medical students experience their identity development retrospectively (interviews) and include information on their practices and surroundings (observations).

Participants and setting of problem-based and clinical education

To explore how clinical PBL medical education sets the scene for social identity development in medical students, we used observations of the medical students in various learning situations within Aalborg University Hospital (AAUH), such as clinical casework, clinical lectures, ward rounds, patientcare, and conferences. Participants for the study were recruited according to purposive and snowballing sampling (Patton, 2002). This ensured that we would reveal different perspectives and provide a wide range of information about medical students' identity development in clinical practice. The first author conducted 240 hours of fieldwork and 8 hours of semi-structured interviews, as shown in figure 1. Given our interest and focus on how clinical PBL medical education sets the scene for social identity development in medical students, we will not consider demographic attributes in this study. As shown below in figure 1, seven medical students were recruited for the present study and observed for extended periods during clinical practice at AAUH.

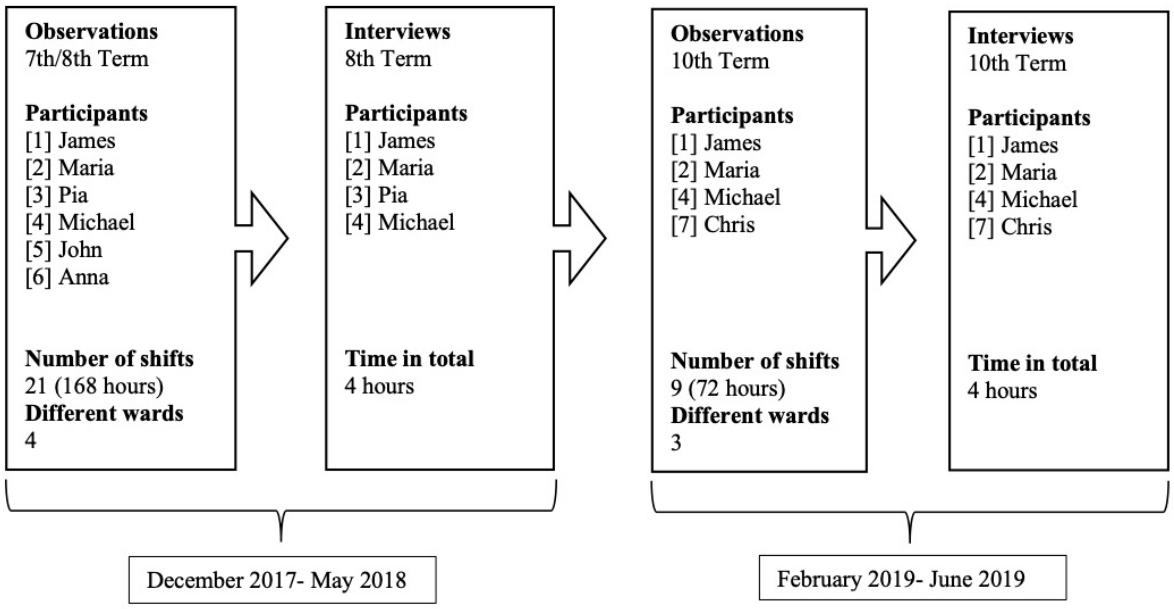

Figure 1. Overview of participant involvement and their pseudonym.

PBL medical education at Aalborg University includes cases and project work based on authentic problems, self-governed group work, collaboration with different stakeholders, and clinical practice. This pedagogical approach provides medical students with abilities, e.g., to act independently, problem-solve, reflect, give and receive feedback, critical thinking, and enhance self-directed learning (Stentoft, 2019). During the final three years of the clinical PBL medical education, the students' spent most of their time at Aalborg University Hospital providing supervised patient care and solving real authentic patient cases under supervision from physicians who are educated according to the PBL principles at Aalborg University. Our data have sufficient information power because we collected voluminous longitudinal data based on observations, informal conversations, field notes, and individual in-depth interviews, which increases the potential transferability of the findings to other medical educations (Malterud et al., 2016). Furthermore, this ethnographic study's longitudinal nature also allowed us to explore the participants' unique experiences and identity development over a period of time. The inclusion of in-depth interviews allowed us to return to the informal conversations and observations with participants, enabling them to clarify and expand on her or his experience. Finally, involving all authors in the approach to data analysis encouraged rigour and reflexivity.

The social identity theory informed ethnographer

There are important epistemological concerns in relation to researcher positioning in social identity theory informed ethnography. Ethnographic approaches acknowledge that a researcher’s preconceptions affect their interpretation, description, and analysis (Klein & Myers, 1999). Furthermore, ethnographers balance between roles as participant and observer, insider and outsider with the primarily assignment to document an empirical set of social and cultural practices. Despite, the researcher will to a lesser or greater degree influence the practice being studied (Clifford & Marcus, 2005; Gadamer et al., 2013), the primary

ontological principle here is that the activities taking place exists independently of the researcher. In this current study the focus is on how medical students assume and assign social identities while engaging in professional communities in clinical PBL practice and the ethnographer's presence to a lesser degree affect the medical student's behaviour, acting and thinking.

Data collection and analysis

The approach to analysis can be described as a thematic analysis utilising an abductive framework with inspiration from Braun and Clarke (2006) and Kiger and Varpio's (2020) analytical guidelines: (1) familiarising yourself with your data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report. The abductive approach followed a process in which several codes and themes emerged from iterative alternate between the ethnographic data and social identity theory perspectives and preconceptions. However, in the initial stages of the analysis, we strived to be open minded by recognising the complexity and various perspectives. The initial inspiration and knowledge of clinical PBL medical education and social identity theory functioned as a guide to understand and identify what characterises social identity development in medical students in clinical PBL medical education.

In stage one, the first and fifth author separately read and re-read the transcripts and field notes to be immersed in the data and secure reliability. In stage two, we coded inductively and made subsequent refinements to codes through discussion. In stage three and four, data were organised into themes through examining the coded data and engaging in extensive discussion reviewing themes. For moving from stage four to five, themes and supporting data were circulated to all authors for further interrogation and critical reflection. And finally, the identified themes were utilised to analyse all data.

Results and analysis

All participants in this study experienced various forms of social identities during the period of the ethnographic study. We could point at several social identities through the analysis, though three assumed and assigned social identities appeared as particularly prominent: identity as *medical student,* as *nearly physician,* and as *colleague.* In the following sections, extracts from the ethnographic observations and individual in-depth interviews of Maria, James, Chris and Michael are presented to explore what characterises these three social identities and how clinical PBL sets the scene for the assumed and assigned social identities.

Identity as medical student

Social identities are dynamic and rely on the context and social interaction, and it is not entirely up to the participants to decide when a medical student's identity is more salient than identity as physician or as colleague. The accessibility, which refers to the group identity's availability, plays a crucial role in identity development. For example, in James and Michael's case, the physicians chose to educate them by the bedside, thereby assigning the stage for a social identity as medical student to assume and interact as medical students who are supposed to watch and learn.

> *"The physician explains to James that focus is important in this kind of physical examination and what to pay attention to. The physician has a very pedagogical approach and explains all that she does and why she does so".*
> (James, observation)

> *The physician said to Michael, "I will handle the next patient***,** *it is a very complex case, which involves some psychosocial problems."*
> (Michael, observation)

The observation below show how James assumed the student identity himself and displayed behaviour as one by presenting himself as medical student and utter that he will consult a

physician after the examination. James is doing and behaving as a medical student to make sure that the parents felt comfortable.

> *"As we enter the patient ward, James presents himself by name and as a medical student. He informs the parents that he will consult the results of the physical examination with a physician. After the examination, James asks the physician to examine the patient too. He said to the physician that it is important that the parents feel comfortable".*
> (James, observation)

When the participants engage in the clinical PBL practice, it leads to a particular behaviour related to the conception of the social identity. In the following example, Maria and her peers are assigned the social identity as medical students by the physicians and how the conference room is furnished. The participants also assume the medical student identity by behaving and doing what is expected of them.

> *"The morning conference is about to start, and the physicians are busy preparing their presentation of the ward cases. I am seated with the medical students, along the wall as we are told. Even though there are several empty seats around the table in the conference room, not one of us (medical students and I) is invited to sit at the table and join the discussions. As an observer, I got this strange feeling of "us and them" because of how the room is furnished and the missing interaction between the physicians and the medical students."*
> (Maria, observations)

Allowing medical students to act and behave independent as self-directed learners and solve authentic problems as critical thinkers by engaging them in clinical practice is essential to PBL. It allows them to engage in the professional community as medical students and learners. These observations and narratives indicate a clear distinction between being a medical student and a part of the workforce, despite their clinical practice participation. Also, social identity as medical student is affected by the students themselves, the professionals, the patients, and the environment.

Identity as nearly physician

All the participants show or express situations where they feel and act like physicians; they do what they do because of who they believe they are – their identity as a nearly physician. As a part of the identity development, the participants show readiness to assume the responsibility to examine and consult patients independently. In these situations, the physicians invite the medical students into their in-group and offer them accessibility to the group identity and assign them the physician identity, which differs from the medical student group. Several examples show that the participants assume and assign identities as nearly physicians by self-stereotyping as physicians and feel attributes associated with physicians in situations where the physician identity becomes salient and accessible. In some cases, James, Michael, and Chris showed a high degree of independence, autonomy, and readiness to behave and act like a physician and find it exciting and improving for their learning and educational outcome.

> *"My presence here at this ward has allowed me to examine patients on my own […] I already now feel that I am prepared to the life after the study and take the responsibility as a physician; certainly, I do".*
> (James, observation)

> *"When the patients arrive at the emergency room, James acts very independently. He goes through the patient's journals and briefly consults the physician on duty, and then he carries out the physical examination on his own with supervision afterward".*
> (James, observation)

> *"At the morning conference, I heard James and Chris agree that doing the (physicians) work on their own without a physician by their site is much easier. Following the physician around only consume time from the real work".*
> (Michael, observation)

> *"Sometimes you are the one with the responsibility, with the patient right in front of you. I do not think that much about it, so I am excited about it. I really like the responsibility. I do not construe it as negative, rather as positive to act and think as a physician".*
> (Michael, interview)

> *"I think that I have taken more responsibility than intended […] I have been more like a freelancer and examined patients on my own. Of course, I have consulted the physicians on duty according to the physical examinations I have done. In this case, I have learned more to do so on my own and assumed a high degree of responsibility".*
> (Chris, interview)

Maria also showed readiness to assume the identity of a physician when assigned by the nurses and physicians. However, she occasionally expressed some degree of uncertainty if she felt that the responsibility was beyond her competencies and found the medical student identity more salient in these situations.

> *"[…] if it is only a physical examination and they (nurses) introduce me to the patients as 'now the physician has arrived to examine you' it is ok, because that I feel competent to do so. However, if the examination involves decision making about medication or something else, then I do not see myself as a physician".*
> (Maria, interview)

> *"Her supervisor asked her if she is ready to carry out the consultation on her own, which she accepts. Shortly after, we leave the office and walk down the aisle toward the patient waiting for a cancer treatment consultation. She is nervous; she blushes and speaks in a faltering voice to the patient. […] on her own in the examining room, responsible for asking the right questions, acting as a physician".*
> (Maria, observation)

Solving authentic problems, engaging in self-directed learning, applying prior knowledge to the problem, and reflect on what is learned are premises of PBL. Allowed and encouraged to examine patients independently with subsequent feedback, take responsibility, decide how and what to learn, collaborate, and no need for direct feedback are issues that affect behaviours, norms, and thoughts in medical students. As seen, clinical PBL medical education allows medical students to *fit* into the professional community by behaving, acting and thinking like a physician. Clinical PBL medical education intends to enable a smoother transition of medical students into clinical practice and prepare them better for the work as a physician, aligning with assuming and assigning social identity as nearly physician (Boud & Feletti, 1998; Barrows, 1996).

Identity as a colleague

The participants utter that good workplace relations increase the feeling of belonging to a group of colleagues. As seen in the excerpt below, social identity as a colleague depends on

the participants' ability to fit in and the professional's readiness to collaborate. James, Chris, and Michael express that being a part of the professional community and contributing to the wards' assignments are vital to their behaviour and feeling as colleagues.

> *"I have felt like a part of the gang in all the medical wards I have worked in. That feeling is confirmed when the physicians still say hello to you and mention your name after the time on the wards. The colleagues say hello and good morning to me because they recognise me and not just someone they have seen before, but someone they have had some good experiences together with".*
> (James, interview)

> "*Yes, of course, it is essential, when interacting with your colleagues. First of all, to understand what is said, but also to appear professional and knowledgeable somehow".*
> (Chris, interview)

> *Author: "Do you feel like a colleague if you assume responsibility on your own?" Respondent: "Certainly, I do, that is for sure. Furthermore, I feel that it is more exciting to work at the ward if the physicians can see that I contribute to the assignments in a positive way".*
> (Michael, interview)

On the contrary, being a part of the professional community, Maria described how uncertainty and demotivation appear when tensions exist between different social identities.

> *"Some physicians are better to include us as colleagues and let us examine patients on our own […]. It is also more exciting to work on a ward where the physicians want to educate us. Physicians who see us as a burden affect the learning output, and you do not dare to try on your own".*
> (Maria, observation)

PBL is a pedagogical approach that offers medical students the opportunity to solve problems in collaborative groups together with professionals and thereby assume the social identity as colleague. The extracts above show the importance of belonging to the professional community. When assuming or being assigned an identity as colleague, medical students tend to take more responsibility, feel more motivated to learn and behave professionally.

The analysis demonstrates how the nature of clinical PBL curriculum sets the pedagogical frame and affect a certain identity development in medical students. Above, we have

identified three prominent social identities that recurred among all participants: identity as medical student, as nearly physician, and as colleague.

Discussion

By analysing ethnographic materials through a lens of social identity theory, we get a new and important view of medical students' social identity development in clinical PBL settings. For example, by adopting the physicians' beliefs, values, and norms, the medical students perceive and react to clinical situations. In this, they show consideration for their possibilities for learning about medical topics.

As outlined in the introduction, PBL aims to facilitate students' learning in ways that mirror professional practice. A professional practice where they have to collaborate, solve problems, follow up with research, prepare their explanation to other physicians, and determine the course of treatment, action, or solution that best addresses the diagnosis (Barrows, 1990; Barrows, 1996; Dolmans et al., 2005; Schmidt et al., 2019). PBL supports medical students in gaining knowledge about professional practice and provides them with the opportunity to begin to think and behave like physicians (McNeill et al., 2014).

Is it desirable to foster social identity development as nearly physician or as colleague in medical students and let them assume the responsibility as seen in the results or do, we need to pay some attention to the possible identity development that PBL offers and what can be gained or lost in terms of learning and professional expertise? On the one hand, if the medical students show readiness to fit in as a physician, should they be treated as a trainee physician rather than medical students to encourage their social identity development? McNeill et al. argue that doing and feeling like a physician has some positive implications for wellbeing and revealed that identity and wellbeing are related, with a strong identity providing a buffer of resilience (McNeill et al., 2014). On the other hand, there are potential risks of taking too

much responsibility and become overconfident; medical students should not be encouraged to over-reach their competence. Too much autonomy may prevent them from receiving feedback and important learning points from medical experts and may compromise patient safety (Gillespie et al., 2021). Furthermore, there is a risk that identifying less as a medical student may reflect perceptions of reflection and learning as being distinct from being a nearly physician, despite medical practice containing the need to be a life-long learner.

This study indicates that the implications of a PBL need some consideration. First, if the medical students identify as nearly physicians and as colleague, it will encourage their professional identity development. Second, it can have an inhibitory effect on their focus on learning and self-reflection and gaining medical expert knowledge as a medical student. Using clinical PBL as a pedagogical approach in medical education, a fine balance is to be found between the social identities to ensure that the medical students are well prepared as future physicians.

However, our limitations should be considered before drawing conclusions. In terms of our use of snowball sampling, a further collection of ethnographic data, including a broader group of medical students in other clinical settings at other hospitals, would help us achieve a richer and more comprehensive understanding of how clinical PBL medical curriculum affects medical students' social identity development. Further research should investigate how social identity influences how, what, and why medical students learn in clinical PBL medical education. These findings are particularly important to strengthen research into the relation between clinical PBL medical education and social identity development (Johansson et al., 2020). Such research should investigate factors that encourage learning in PBL clinical settings. This could add to the theoretical and educational literature on transfer across contexts and direct curriculum development toward models that optimise learning in medical education.

Conclusion

As shown above medical students during clinical PBL medical education assume and assign different social identities. Though, the most prominent social identities were as *medical student,* as *nearly physician,* and as *colleague.* These social identities were either assumed by themselves and their ability to fit in and the salience of the professional community or group to which they are affiliated or assigned by peers, patients, or professionals. As the empirical data indicates, social identities are closely related to the clinical practice defined by the clinical PBL medical curriculum and suggests that the value medical students gain from belonging to a group or professional community depends on the situation and the extent to which they positively evaluate their own group against out-groups. Therefore, we assume that clinical PBL medical education is as much about learning to behave, act, think and communicate like a physician as it is about learning the content of the medical curriculum. Undoubtedly, focusing on the relation between social identity development in medical students and learning potentials will entail adopting new methods of collecting and analysing *how*, *what,* and *why* medical students learn. This knowledge will provide a deeper understanding and insight into how we might develop future medical students' approach to learning. Awareness of social identity issues in clinical PBL medical education may be a tool to enhance learning in its own right. It may provide a structure and a consciousness to support medical student reflection, through which they can consider whether they are behaving, acting, and thinking as *medical student* or *nearly physician* or *colleague* in relation to what they have to learn and how. It is essential knowledge, given that a strong social identification with a social category is closely related to learning approaches.

We believe that the results provide further insights into the complex social dynamic of medical students' identity development during clinical PBL medical education. And

hopefully, this will initiate further research in understanding the nature of how social identity development is related to *how*, *what* and *why* medical students learn in clinical PBL medical education.

References

AAU handbook. (2019) Policy for research data management. https://www.handbook.aau.dk/document?contentId=402570

ALLEA. (2017) The European Code of Conduct for Research Integrity. (Rev. Ed.) All European Academics. Berlin. https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

Barnett, R. (2009). Knowing and becoming in the higher education curriculum. *Studies in Higher Education*, 34(4), 429–440.

Barrows, H. (1990). Inquiry: The pedagogical importance of a skill central to clinical practice. *Medical Education*, 24(1), 3–5.

Barrows, H. (1996). Problem-based learning in medicine and beyond: A brief overview. *New Directions for Teaching and Learning*, 68(1), 3–12.

Barrows, H., & Tamblyn, R. (1980). *Problem-based learning: An approach to medical education*. New York: Springer.

Boud, D., & Feletti, G. (1997). *The challenge of problem-based learning*. New York: Routledge.

Brewer, M. (2001). The Many Faces of Social Identity: Implications for Political Psychology. *Political Psychology*, 22(1), 115–25.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.

Burford, B. (2012). Group processes in medical education: learning from social identity theory. *Medical Education*, 46(2), 143–152.

Clifford, J., & Marcus, G. E. (2005). *Writing culture: The poetics and politics of ethnography*. California: University of California Press.

Crossley, V., Vivekananda-Schmidt, P. (2009). The development and evaluation of a Professional Self Identity Questionnaire to measure evolving professional self-identity in health and social care students. *Medical Teacher*, 31(12), 603–607.

Cruess, R. L., Cruess, S. R., Boudreau, J. D., Snell, L., & Steinert, Y. (2014). Reframing Medical Education to Support Professional Identity Formation. *Academic Medicine*, 89(11), 1446–1451.

Dolmans, De Grave, W., Wolfhagen, I. H. A. P., & Van Der Vleuten, C. P. M. (2005). Problem-based learning: future challenges for educational practice and research. *Medical Education*, 39(7), 732–41.

Gadamer, H., Weinsheimer, J., & Marshall, D. G. (2013). *Truth and method.* New York: Bloomsbury Academic.

Gillespie, H., McCrystal, E., Reid, H., Conn, R., Kennedy, N., & Dornan, T. (2021) The pen is mightier than Sword. Reinstating. Patient care as the object of prescribing education. *Medical Teacher*, 43(1), 50–57.

Hammersley, M. & Atkinson, P. (2007). *Ethnography Principles in practice*, 3rd ed. New York: Routledge.

Haslam, S. (2004) *Psychology in organizations: The social identity approach*. 2nd ed. London: Sage.

Haslam, S. (2017). The social identity approach to education and learning: Identification, ideation, interaction, influence and ideology. In: Mavor, K., Platow, M., & Bizumic, B., editors. *Self and social identity in educational contexts* (p.19-53). New York: Routledge

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review, 16*, 235–266.

Jenkins, R. (2008). *Social Identity*. 3rd ed. New York: Routledge.

Johansson, Nøhr, S. B., & Stentoft, D. (2020). A Scoping Review of the Relation between Problem-Based Learning and Professional Identity Development in Medical Education. *Journal of Problem Based Learning in Higher Education*, 8(2), 25–41.

Kiger, M., & Varpio, L. (2020) Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical Teacher*. Published Ahead of Print.

Klein, H. K., & Myers, M. D. (1999). A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems. *MIS Quarterly*, 23(1), 67–93.

Leung, W. (2002). Why is evidence from ethnographic and discourse research needed in medical education: the case of problem-based learning. *Medical Teacher*, 24(2), 169–172.

Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample Size in Qualitative Interview Studies: Guided by Information Power. *Qualitative Health Research* ,26(13), 1753–60.

Maudsley, G., & Strivens J. (2000) Promoting professional knowledge, experiential learning and critical thinking for medical students. *Medical Education*, 34(7), 535–44.

McNeill, K. G., Kerr, A., & Mavor, K. I. (2014). Identity and norms: the role of group membership in medical student wellbeing. *Perspectives on Medical Education*, 3(2), 101–112.

Monrouxe, L. (2009) Negotiating professional identities: dominant and contesting narratives in medical students' longitudinal audio diaries. *Current Narratives*, (1), 41–59

Passi, V., Doug, M., Peile, E., Thistlethwaite, J., & Johnson, N. (2010). Developing medical professionalism in future doctors: a systematic review. *International Journal of Medical Education*, 1, 19–29.

Patton, M. (2002) *Qualitative research & evaluation methods.* 3rd ed. California: Sage publications.

Savery, J. (2006). Overview of problem-based learning: Definitions and distinctions. *Interdisciplinary Journal of Problem-Based Learning*, 1(1), 9–20.

Schmidt, H., Rotgans, J., & Yew, E. (2019) Cognitive constructivist foundations of problem-based learning. In: Moallem, M., Hung, W., & Dabbagh, N., editors. *The Wiley handbook of problem-based learning* (p.25-51). Hoboken: New Jersey John Wiley & Sons, Inc.

Sharpless, B. N., Cook, R., Kofman, A., Morley-Fletcher, A., Slotkin, R., & Wald, H. S. (2015). The Becoming: Students' Reflections on the Process of Professional Identity Formation in Medical Education. *Academic Medicine*, 90(6), 713–717.

Stentoft, D. (2019) Problem-based projects in medical education: extending PBL practices and broadening learning perspectives. *Advances in Health Science Education: Theory and Practice*, 24(5), 959–69.

Walker, A., Leary, H., Hmelo-Silver, C., & Ertmer, P. (2015). Essential readings in problem-based learning: Exploring and extending the legacy of Howard S. Barrows (pp. 5-15). West Lafayette, IN: Purdue University Press.

Tajfel, H., & Turner, J.C. (2004). The social identity theory of intergroup behavior. In Jost, J.T., Sidanius, J., eds. *Political Psychology: Key readings* (pp.276-93). New York: Psychology Press.

Tan, C., Van Der Molen, H., & Schmidt, H. (2016). To what extent does problem-based learning contribute to students' professional identity development? *Teaching and Teacher Education*, 54(1), 54–64.

Turner, J. C. (1987). A self-categorization theory. In: Turner, J.C., Hogg, M.A., Oakes, P.J., Reicher, S.D., Wetherell, M.S., editors. *Rediscovering the social group: A self-categorization theory* (p. 42-67). Oxford: Blackwell.

Turner, J. C., & Onorato, R.S. (1999). Social identity, personality, and the self-concept: a self-categorization perspective, in Tyler, T.R., Kramer, R.M. & John, O.P. (Eds), *The Psychology of the Social Self* (pp.11-46). New York: Psychology Press.

PAPER III (IN REVIEW, MINOR REVISION)

Paper 3: (In review, minor revision, resubmitted 01.09.2022)

Clinical problem-based medical education: A social identity perspective on learning.

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How, what and why medical students learn in a clinical problem-based medical education: A social identity perspective on learning

Abstract

In this article we examine and discuss how problem-based learning (PBL) as an educational framework in practice, sets the scene for social identity development, with a certain focus on how social identity affects how, what, and why students learn. We conducted an ethnographic study at Aalborg University Hospital, involving 7 medical students for 240 hours of participant observation and 8 hours of semi-structured interviews. During the analysis we were able to identify how a strong social identification with the prominent social identities as *medical student,* as *nearly physician,* and as *colleague,* is closely related to how medical students approach learning. The implications of the presented considerations in our study seem to point towards the balance between the challenges in the learning context and learning focus in relation to the expected learning outcome.

How, what and why medical students learn in a clinical problem-based medical education: A social identity perspective on learning

Introduction

In this article we will examine and discuss how problem-based learning (PBL) as an educational framework in practice sets the scene for social identity development with a certain focus on how social identity affects how, what, and why students learn. When examining how, what, and why students learn in PBL in higher education, social identity development is one of the key foundational concepts helping to capture the essence of who individuals are and, thus, why they behave, think and act as they do, in relation to the learning context (Ashforth et al., 2016). According to existing research in higher education, social identity development is related to the students' approach to learning (Crossley & Vivekananda, 2009; Johansson et al., 2020; Johansson et al. 2022) and can have important implications for their future practice as professionals (Monrouxe, 2010). Therefore, understanding how social identity affects learning, is essential for a high-quality higher education curriculum development.

Some of the intentions with PBL is to provide students with abilities, e.g., to solve authentic real-life problems, reflect, collaborate and enhance self-directed learning to enable a smoother transition from student into a profession and prepare students better to fit into the workplace (Boud & Feletti, 1998; Stentoft, 2019). To support this transition PBL sets the scene for students to engage in collaborative group-work to solve authentic real-life cases where they apply their prior knowledge to the problem (Barrows, 1990; Barrows, 1996; Dolmans et al., 2005; Schmidt et al., 2019) and engage in self-directed learning and reflection upon what they have learned (Schmidt et al., 2019; Hmelo-Silver, 2004). These key

components of PBL are reflected in curriculum and inevitably affect students' social identities and their perceptions of what it means to become a professional (Barrows & Tamblyn, 1980; Boud & Feletti, 1998; Johansson et al., 2020; Tan et al., 2016). Besides the academic knowledge, students must learn to behave, act, and think according to their future professional positions, norms, values and workplace cultures, collaborate with many different stakeholders (Sharpless et al., 2015; Cruess et al., 2014).

Social identity theory claims, that students' sense of self – how they behave, think and act – is influenced by the context and the professional community to which they affiliate and by the internalized sense of social identity that they achieve from their group memberships (Burford, 2012; Haslam, 2017). This means that social identities define students' sense of self in relation to the professional community e.g., as 'us', 'we' or 'them' and leads to a certain way of behaving, thinking and acting that is qualitatively different from that informed by their personal identity (Brewer, 2001; Burford, 2012; Haslam, 2017; Tajfel & Turner, 2004). According to Crossley & Vivekananda (2009) and Turner (1987) the learning situation into which students fit, engage within and is assigned to by professionals, contribute to their social identity development and approach to learning. Therefore, social identity development in higher education plays a central role in understanding how students change how they conceptualize the world around them and how they experience, organize, learn and relate to the subject matter. Jarvis-Selinger et al. (2019) and Monrouxe (2010) argue that social identity development is as important as acquiring professional expertise during education. Understanding learning as a more content-dependent and social process, involving not only aspects strictly related to the learning processes, but must also take into consideration the student and his or her dynamic relationships with their particular learning context. This statement, that a complete understanding of how students learn without considering the learning context as well as the social and personal aspects of students, is hardly achievable.

In our previous study of social identity development in medical students in clinical PBL medical education, we identified three prominent social identities that medical students either assumed themselves or were assigned by professionals, peers and patients: Social identities as *medical student,* as *nearly physician,* and as *colleague* (Johansson et al., 2022). These three prominent social identities will in this study function as an analytical frame to gain new knowledge about how the relation between PBL in practice in higher education and social identity, affect students' approach to learning. Since it is not the clinical PBL medical education itself that is important, but rather, how the relation between PBL in practice and social identity sets the scene for how, what, and why students learn, our findings can be used in many other PBL settings as well.

Despite our former contribution to the research field of PBL and social identity development in higher education, there remains a gap in the understanding of how social identity affects students' approach to learning (Johansson et al., 2021). With the purpose of contributing to the growing evidence on social identity development in students and PBL, we will examine how social identities affect how, what, and why medical students learn in clinical problem-based medical education. A study that is essential to curriculum development in higher education and will provide knowledge about educating engaged and knowledgeable professionals by taking social identity development into account. Furthermore, it can help students understand the complexities of workplaces and how best to engage in workplace activities to learn.

Method

Medical education at Aalborg University is a six-year PBL education where the first three years is founded on solving real-life patient cases in groups, self-directed learning, peer-learning, collaboration, project-based group work and a few short clinical stays at Aalborg

University Hospital (AAU, 2020a). The three final years, which are also founded on the PBL principles, are spent in different wards at Aalborg University Hospital providing supervised patient care, attending conferences, working with authentic patient cases in groups and developing interdisciplinary collaboration and professional reflection skills. According to Stentoft (2019) PBL medical curriculum enhances abilities, e.g., to problem-solve, reflect, give and receive feedback, promote critical thinking, and enhance self-directed learning. So to speak, PBL medical curriculum at Aalborg University allows medical students to a greater extent to adopt the everyday life of a physician and thereby reduce uncertainty and prepare them for the future (AAU, 2020b). As the principles of PBL are student centered, the physicians play an important role in facilitating reflection and critical thinking, providing direct supervision during examinations and patient care, educating clinical cases, giving feedback and supporting the medical students in becoming a complete physician 'medical expert' (AAU, 2020b).

Recognizing the potential uniqueness of this PBL medical curriculum, our intent with the comprehensive ethnographic study was to gain new knowledge of the medical students' experiences as feasible to explore and understand how they utilize different social identities to their learning approach.

We chose an ethnographic approach to explore how social identities affect medical students' approach to learning. Our qualitative research gathered during a two-year period relied on participant observations, field notes, informal conversations, and individual in-depth interviews. According to Hammersley and Atkinson (2007) and Leung (2002), ethnography emphasizes the influence of the social and environmental context on the participants' behavior, thinking, and attitude and goes beyond what they say to what they do. The ethnography has traditionally examined social contexts, observing what happens, listening to what is said, and asking questions. The researcher becomes embedded in ongoing

relationships with research participants to collect data, which is particularly valuable in understanding the influence of social and cultural norms. (Hammersley & Atkinson, 2007), which is a crucial element in social identity research. According to Atkinson & Pugsley (2005) and Pope (2005) ethnography is a rich and detailed methodology and, thus, well suited for studies of clinical educational settings that offer 'other ways of understanding how social identities affect medical students' approach to learning' that can have an important impact on medical education.

Subjects

The medical students involved in this study were recruited according to purposive and snowballing sampling, as outlined by Patton (2002). This method ensured that we would reveal several perspectives and provide a broad range of insight about how medical students' social identity affects their approach to learning. Given our interest in social identification and learning approach within collectives, we will not give thought to demographic attributes in this current study. The first author carried out 240 hours direct observation and 8 hours individual semi-structured interviews of seven medical students, during their 7^{th}, 8^{th} and 10^{th} clinical semester at Aalborg University hospital.

Data analysis

In this study we revisited our ethnographic data in order to examine and gain new knowledge about how the three prominent social identities as *medical student*, as *nearly physician,* and as *colleague*, (Johansson et al., 2022), affect how, what and why medical students learn in clinical PBL medical education. These three social identities that we identified in a previous study, will be used in this study as an analytical guide to pay selective attention to how medical students approach learning. According to Hastrup (2010) the advantage of selective attention is particularly noticeable when the analytical task is to examine a specific issue.

Even with a selective attention on the data and guided by previous findings the approach to analysis in this current ethnographic study can be described as a thematic analysis utilizing an abductive analytical framework inspired by Braun and Clarke (2006) and Kiger and Varpio's (2020) six phases of thematic analysis: first revisiting and familiarizing with data, then generating initial codes, then searching for themes and afterwards reviewing the themes, and defining and labeling the prominent selected themes, and finally conducting concluding remarks. In stage one, the transcripts and field notes were re-read to be immersed in the data again. Stage two was guided by the three prominent social identities to identify the codes. In stage three and four, data was organized into themes concerning the relation between medical students' social identities and their approach to learning, through examining the coded data and engaging in extensive discussion reviewing themes within the research group. For moving from stage four to five, themes and supporting data were circulated to all authors for further interrogation and discussion. Finally, the identified themes were utilized to analyze all data.

Guided and inspired by social identity theory, PBL pedagogy and findings from Johansson et al. (2021) and Johansson et al. (2022), we found the abductive thematic analysis supported by a selective attention useful to identify robust patterns across the dataset concerning our research question.

Results and analysis

The excerpts below are drawn from the ethnographic data sources and provide snapshots of situations in which medical students engage in learning situations. Figure 1 gives a brief overview over the analytical structure and shows how social identities are related to medical students' learning approach. Social identity as a medical student is the core of the assumed and assigned social identities, therefore it is put in the center and below the social identities the learning potentials is listed. The arrows indicate how medical students in the clinical

practice constantly move back and forth between the assumed and assigned social identities which is highly context dependent (Haslam, 2017).

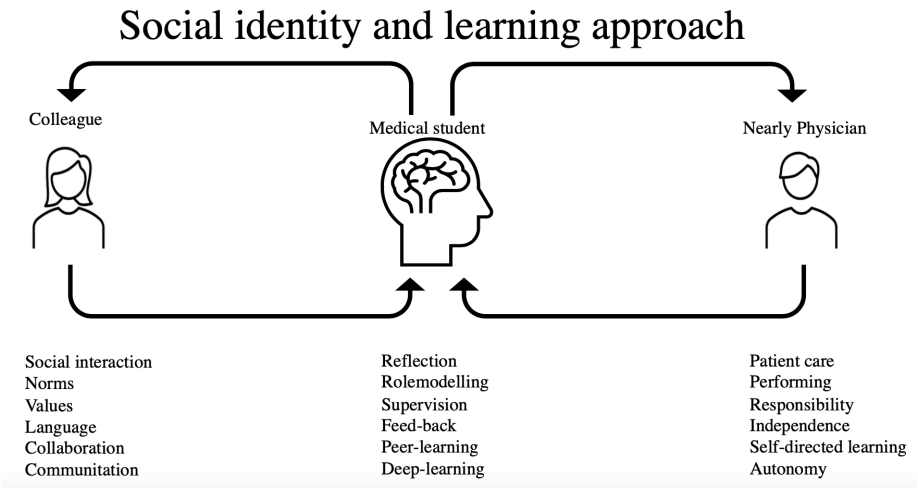

Figure 1 The relation between social identities and learning approaches.

'Learning approach as a medical student, is the first section, then 'Learning approach as nearly physician, and finally we will analyze the 'Learning approach as colleague '. What is important to notice, according to the analysis, is that all medical students' participating in our ethnographic study behave, think, and act like a medical student, a nearly physician, and a colleague. Furthermore, it is important to notice that the identified learning approaches are expressed by all the medical students somehow and the excerpts presented in each section are only limited selection of data representing the themes.

Learning approach as medical student

The medical students highlight the importance of peers, role-modeling, reflecting upon their practice and the expectations from their learning environment. Furthermore, they all emphasize the importance of feedback and direct supervision from their supervisors and the influence that the clinical and educational practice has on their approach to learning.

James is aware of his role as a medical student and focuses on how he approaches learning and what and why he learns. He highlights more than once, that he himself is responsible for learning and describes how he uses prior knowledge and experiences to meet the professional and social demands in clinical and educational practice. Furthermore, he emphasizes that reflection on own practice and examining real patients enhances his learning output. Thus, he explains that taking responsibility as a medical student sometimes challenges the thoughts of being good enough. Thoughts that affect all medical students, he said.

> James: As to what a croup patient looks like, well, I've met such a patient, and therefore my picture is much clearer than what they [medical students who have spent less time in practice] know from the textbook, because the book, that's just words on a page, whereas what I have in my mind is a picture of a real patient that I can relate to, so it's the practical work in the wards that gives me the highest degree of learning outcome, and it's been especially high when I've pushed myself so far that if I take the next step, then I'll fall.
> Author: […] do you often reflect on your practice when you get home or when you're at work?
> James: It's impossible not to do so, because … did I do well enough, the doctors who took over after me, did they see the same as I did or did they spot something I overlooked; there's always this sense of .. did I perform well enough - that's what everybody's struggling with, I guess.
> *James (interview, fifth year medical student)*

Below Maria explains that direct supervision from the physicians, followed by feedback, improves her learning output, and supports her self-confidence as a medical student. During the supervision and feedback sessions, she reflects upon her own practice and uses her prior knowledge and clinical experiences, a process that develops and refines her existing knowledge. Both James and Maria express that clinical practice is important for their learning outcome and support their ability to solve clinical problems.

> Author: How do you feel about physicians being present and supervising your medical interviews and examinations?
> Maria: It's given me more self-confidence, because they're there to help me, so I feel OK about it. At the beginning I was very nervous and thought a lot about what they thought about me, if I did well enough, but I don't think about that so much any longer. It also gives me a chance to get some useful feedback afterwards, I learn a lot from that.

> Author: What's it like, being here at the hospital?
> Maria: Practice is so much better than theory - you can read and read, but you remember things so much better when you've seen it, when you've been in the thick of it. So I'm so happy I chose to study at Aalborg University because Aalborg has so much more focus on practice.
> *Maria (observation, fifth year medical student)*

Pia finds it important to act, think and behave as a medical student with an intensive focus on learning and not as a physician at the hospital. That approach to learning gives her the opportunity to focus on how and what to be learned in the clinical practice. She also expresses, that she as a medical student, is responsible for her own learning and prioritizes what is important for her to learn.

> Pia: I also think of myself as a medical student, I don't think of myself as a physician when I'm here. I think that I'm still here to learn; for me it's like .. if I'm asked to do things that don't make sense in terms of my learning, then I speak up, because that's not what we're here for, we're students at the hospital, not employees, that's always at the back of my mind. Because when you're enrolled in a medical study like Aalborg University's, which has most of its master level as practical hospital learning, then you've got to stay focused yourself that I'm here to learn, not to do all the work that's perhaps hard and boring but needs doing, that's something I keep in mind
> *Pia (interview, fourth year medical student)*

During examination, Michael thinks out loud to inform the physician of his thoughts and findings. Doing so gives him the opportunity to receive direct supervision during the examination and reflect upon the clinical problem-solving that he is doing. To expand his learning skills, he also used role-modeling by asking the supervising physician to show him some tips and tricks on how to examine a patient. Michael's awareness of doing what is expected as a medical student, sets the scene for how the physician teaches him and affects how and what is learned.

> When examining the patient, Michael thinks out loud what he hears, sees and feels. The physician comments and asks questions. It is obvious that Michael wants to develop his own practice as he asks a good deal of questions to the physicians about the procedure.
> Michael: How do you normally listen here?, Should the hips be examined too?, What about the pulses in the feet?, he asks the physician. […]
> Michael: I'd really appreciate, if you (the physician) could give me some tips and ideas on how to perform the objective examination.
> *Michael (observation, fifth year medical student)*

Similar to Michaels's case above, Chris examines a child patient with direct supervision and feedback from the attending physician. During the examination, Chris must use his prior knowledge and problem-solving skills to reflect upon the findings and the attending physician's questions. During the examination the attending physician is called to supervise the extermination. The attending physician uses role-modeling to show Chris and the other physician how to examine a small child more appropriately and gently and explains how, what she is doing and why.

> It is Chris who presents his findings of the patient to the senior physician on call, and afterwards they discuss the findings and possible treatment plans. The senior physician on call very much acts as a supervisor; she does not give a lot of answers but asks a lot of questions about various treatment options. The way the senior physician on call physically examines the baby is very different from the way that Chris and the junior physician did it earlier in the day. The senior physician shows how it is possible to examine the baby more calmly by allowing it to stay in its mother's arms, instead of putting it down on the bed during the examination. This way of carrying out the examination and the tips that the senior physician gave to Chris and the junior physician were highly relevant and useful in many other examination situations, and not something easily acquired by reading a textbook. It was all about experience and knowledge sharing.
> Chris (observation, fifth year medical student)

The extracts above show how the clinical PBL context influences how medical students assume and assign social identity as a medical student. Further, it is clear that the social identity as a medical student relates to and affects how the medical students approach learning more deeply through reflection, direct supervision, feedback and role-modeling.

Learning approach as nearly physician

The medical students show and describe that engaging independently in the clinical practice by providing patient care, performing and taking responsibility is important to their learning outcome. Below James show a high degree of autonomy and responsibility by going directly to the emergency department without confronting any physicians. A high degree of self-

directed learning is present then James himself starts on his own to read the medical journals of the patients in a very independent and systematic way. He utters that his real-patient experience from his work as locum in the acute ward has given him the clinical skills to behave, think and act as he does.

> Right after the regular morning conference James and Chris go directly down to the emergency department. While walking there, I (author) ask him 'aren't you supposed to find the physician you're paired up with today?' He answers me 'That's not necessary, we just go down to the emergency department - I find that's the best place to learn.' James immediately starts reading up on the patients in the ward, and I question them about the systematic approach to reviewing a patient. Both James and Chris agree on the methodology: read the referral notes, analyze the blood tests, study previous the notes, and finally look at the medications list.
> Chris: The medications list is really important because it refers to a lot of important information such as diagnoses and important notes.
> James: The systematic approach is learned gradually and in particular during locum in physician jobs. It's very much a question of experience, but it also depends on the ward you work in.
> *James (observation, fifth year medical student)*

Pia indicates, that when the clinical context lets her assume and assign social identity as physician by letting her perform as one, sometimes affect her focus on learning. As self-directed learner with a high degree of independence and autonomy, the focus is often directed from learning approaches such as role-modeling, direct supervision, peer-learning, reflection to performing and indirect supervision.

> Pia: […] but when I'm seeing patients, I feel just as competent as the newly graduated physicians, because I can also … they also phone the attending physician when in doubt, so in that respect I actually feel just as competent.
> Pia: I think that sometimes, at least that's what sometimes happens to me, you end up taking on that physician role a bit too much and take on too many tasks, and that can sometimes affect my participation in our case-work classes. But I feel I learn as much from examining patients as I do from case-work with my peers. So for me it's a bit of judging of what I'll learn the most from, it's sometimes a tough decision. On the other hand, I think case-work are extremely interesting and highly relevant.
> *Pia (interview, fourth year medical student)*

When the clinical context allows Chris to assume and assign the social identity as nearly physician, he performs very independently and shows a high degree of autonomy as a self-

directed learner. Chris puts a lot of effort and engagement into the clinical practice by behaving, thinking and acting like a nearly physician. He examines patients independently under indirect supervision and takes responsibility concerning the tasks in the ward as if he was employed as a junior physician. Assuming and assigning a high degree of responsibility and autonomy increases his focus on performing, solving tasks in ward, and providing patient care and examinations.

> When Chris arrives at the emergency department, he says good morning and goes straight to the computer to get an overview of the patients. He is very quick to get started on the tasks as if he was an experienced physician.
> Chris: Is it OK if I examine these two patients - I've seen them before?
> Physician: Yes, that's fine.
> […]
> Chris is quick to seek out the tasks that he most wants to work with. He is very independent and very dedicated to taking part in the ordinary work in the ward. If I did not know any better, I would have assumed he was one of the junior physicians.
> Chris: We just get on with the tasks, and we're not afraid to take on responsibility. […] We're quite self-driven, actually we prefer the physicians to leave us alone so that we can get on with the work. Then we confer with them later.
> It is very interesting to see how Chris primarily works independently and just takes on tasks. He's rarely given tasks.
> The physician utters to Chris that she is in a hurry as there are five patients in need of examination.
> Physician: I really can't see how I'm going to finish the round, I am really busy, I've got five patients waiting, it's really busy today.
> Chris: I'll do the round, I've got plenty of experience from my temp job in the Emergency department, so it's no problem for me to do it.
> Physician: Well, if you don't need me to follow you, then …
> The physician is quick to leave the responsibility with Chris, and he is quick to take it on. The first two patients are discussed briefly, as to what Chris needs to be particularly aware of and examine in more depth.
> Chris (observation, fifth year medical student)

The excerpts above show that when the clinical PBL context allows medical students to think, act and behave as a nearly physician and they assume and assign the social identity as nearly physician they focus on performing and autonomy, self-directed learning, taking responsibility and acting independently. Learning approaches that support a particular focus on clinical procedures and developing medical expertise but often overshadows the need for e.g., reflection, direct supervision and feedback, peer-learning and role-modeling.

Learning approach as colleague

To become a part of the professional community in the ward to which the medical students are affiliated, they express the need for acquiring social norms, values, language, and communication skills. Furthermore, they describe how important their ability to collaborate is in relation to assume and assign the social identity as colleague.

James utters, that social interaction, language and communication is a premise for becoming a colleague. Furthermore, he describes that 'being a part of the team' by acting, thinking and behaving in accordance with the norms and values in the wards affect his approach to learning and further expand his learning opportunities.

> James: I've felt as part of the team of physicians in all the wards I've been affiliated, and that also shows especially after you've worked in a ward when your colleagues still say hello to you and know your name. Even after the first semester in my first ward, gynecology it was, people still say hi and good morning, not just as someone they recognize but as someone, they've had a good experience with before.
> […] and instead show some initiative e.g. by saying 'Hey, Kim, you work in the neonatal unit today, don't you? I think it would be super interesting to see what you're doing, so is it OK if I join you?' In 9 out of 10 cases the answer is 'Yes, of course, come along."
> And they they'll ask 'What's your name", and you've already got a connection, so yes, I've felt I was part of the team of physicians in almost all the wards I've worked in, practically without exception, and that's very much down to me making an effort, to get a better time while in the ward, to become part of the team, and that's also how you build up a network."
> *James (interview, fifth year medical student)*

Michael describes that social interaction, collaboration, showing initiative and the ability to adapt to the context plays an important role in relation to being included in the professional community. According to Michael, assuming and assigning social identity as a colleague, provides more options to learn. Although he sometimes finds it challenging to constantly interact and collaborate with different professionals in different wards, he sees it as an important learning approach.

> Michael: It's always the same every time you start in a new ward, every time you follow a new physician, you have to prove yourself, show what you're made of, and it's hard, and you don't always feel up to it. But if you do, and it has become routine to just go ahead and get down to it, prove to the staff that you can do it, and next time there's an opportunity, they'll trust you more, and then they'll trust you even more, and gradually you've built up a relationship of trust, and that's the way to move forward. And you can always ask, that's also a way to show commitment and engagement, and if they know you're somebody who's interested and always says 'Hey, this is something I'd like to learn to do', then they'll hardly ever say 'No, that's not possible. So, if you don't volunteer, if you don't show initiative but just go along and do as you're told, then very little happens.
> *Michael (interview, fifth year medical student)*

In the excerpt below, Chris and James include the physician in their professional discussion on a current issue of a patient case. Involving the physician gives them the opportunity to develop their professional language, collaborative, and communicative skills. Interacting with professionals and engaging in the clinical tasks, is described above by Michael and James as important to their learning opportunities.

> […] Chris and James start discussing the patient, fluently and using professional terminology, despite the patient not being diagnosed yet. They discuss what the diagnosis might be. They both enter the databases PubMed and sundhed.dk and start searching.
> James: I'm certain that […] because it says here (and reads aloud from an article found on PubMed).
> Chris: No, it can't be that because she hasn't got these symptoms.
> James: No, you probably right, but what the heck can be then?
> They discuss for about 5 minutes, and it is very interesting to hear their reflections, because they both reflect aloud. After a short while they include the junior physician on call to join their discussion. It is interesting to observe the equality of the participants in the discussion. If you did not know otherwise, you would believe it was three junior physicians discussing, and not two students and a qualified physician.
> *Chris (observation, fifth year medical student)*

When Maria is included in the professional community and takes initiative by engaging in the tasks in the ward, she utters that her learning opportunities expands. Furthermore, she feels more confident and motivated to learn. This excerpt shows the complexity of navigating in a

clinical PBL context and illuminates how the context is affecting the way medical students approach learning.

> Author: Do you sometimes feel like a colleague?
> Maria: Some wards are better to include us and give us the opportunity to examine patients on our own. In these situations where I examine patients on my own, I learn a lot. It is also more exciting and motivating to be on a ward where they want to teach us. Physicians that see one as a burden affects you and you don't want to challenge yourself, because you feel insecure and uncomfortable.
> *Maria (observation, fifth year medical student)*

The medical students express above that social interaction, taking initiative, collaboration, communication and their ability to fit in by adapting the norms and values in the wards to which they are affiliated expand their learning opportunities. They experience that assuming and assigning social identity as a colleague gives a higher degree of responsibility, motivation, trust, and the possibility of acquiring social norms and values.

The analysis has illuminated the importance of the performative elements of social identity to *fit in*. A medical student who is allowed to think, act and behave as a e.g. a physician, more tends to approach the task as a physician, compared to someone who is not. When social identity as a medical student is more *salient* than social identity as nearly physician or colleague, medical students perceive themselves more as members of the group of peers and less as physicians or colleagues. The learning context in which the medical students fit into and engage within and afforded by professionals contribute to how, what and why they learn. This dynamic social identity-making process allows individuals to negotiate changes to their contributions to the professional community and approach to learning.

Discussion

By exploring how medical students' social identities as members of various professional communities is related to their actual learning, we bring together the context and learning with particular aspects of learning potentials. More specifically, this research aims to explore how social identity influences how, what and why medical students learn in clinical PBL medical education. Our findings show that medical students' social identification with the social identities as a *medical student,* as *nearly physician and* as a *colleague,* is closely related to how they approach learning and how, what, and why they learn.

These findings provide support for the value of integrating perspectives from social identity theory into the approach to understanding learning from a medical student's learning perspective. Furthermore, it gives the opportunity to adjust and develop medical education according to the expected and desirable learning outcome.

Assumed social identities, as well as assigned by professionals, suggest that medical students' approach to learning, always is affected by the educational context. By looking at how medical students identified with the different social categories approached learning and performed, we can understand why medical students approach learning the way they do and how to develop curriculum.

As categorized as a *medical student,* the medical students often act as reflective practitioners who can identify essential professional problems and seek direct supervision and feedback and use it for developing new knowledge. Reflective learning intends to improve learning, and when this occurs in the clinical and educational setting, is often called reflective practice (Schön, 1983). The *medical student* category usually appears when the participants lack the ability to solve indeterminate problems. They can solve straightforward problems independently using their theoretical knowledge and novice experiences, which Schön (1983) referred to as "technical rationality." Thus, Schön (1990) argues this approach is limited as most professional problems are not routine but messy, indeterminate situations. So how can

medical students acquire intuitive knowledge and "gut feeling"? Biswas (2015) and Sanders (2009) claim that feedback and reflective practice is the key to assist the medical students in developing clinical experience required to trust that intuition and "gut feeling" and enhance the learning opportunity. According to our findings, feedback and reflection are attached to the social identity as a *medical student* and is vital to gain professional competencies (Wald, 2015; Sanders, 2009), supporting the active, constructive process of professional identity development (Niemi, 2003; Wald, 2015). Niemi (2003) and Wald (2015) argue that critical reflection on *being* and *doing* is emphasized within the professional identity process and approach to learning in conjunction with reflective practice.

As seen in our study, PBL medical education also allows medical students to be categorized as *nearly physicians,* enhancing a different set of learning potentials. When participants categorize as a *nearly physician,* they change their primary focus from a learning perspective to a performance perspective, using their novice expertise and practicing the clinical procedures (local know how) independently. Entering the ward and doing what the physicians are doing and taking responsibility allows the medical students to elaborate mental models to mobilize these when they encounter similar future actions (Sandars,2009). This professional expertise can be developed by encouraging repeated exposure to clinical practice and widening this field with further theoretical knowledge (Wald, 2015). So professional expertise is more than just theoretical knowledge or technical rationality. Experience, intuition, and local know-how also plays a crucial role in problem-solving and decision making. Professional expertise allows the medical student to look beyond the routine and be open to situations that don't feel quite right (Biwas, 2015). A process of constant reflection-on-action is an important requirement for developing professional expertise (Sandars, 2009). When medical students are provided with opportunities to explore and reflect upon their thoughts, philosophies, and practices concerning the learning environment, they are more

likely to see themselves as active change-agents and lifelong learners within their professions (Mezirow, 2000).

The social identity as a *colleague* is central to medical students' experience of belongingness to the in-group of professionals and the ward to which they are affiliated. Doing as a colleague is in this study identified as interact, communicate like one and behave, think and act like one by internalizing norms, beliefs, and values of the professionals. Enculturating may, at first, appear to have little to do with learning. However, it is what medical students practice in PBL to gain new knowledge and 'becoming' future physicians. The authentic learning environment encourages medical students to consciously, and unconsciously adopt the professionals' behavior and belief systems. Given the opportunity to observe and practice *in situ* the behavior of professionals, pick up relevant jargon, imitate behavior, and gradually begin to act by the norms, medical students internalize them with great success (Brown et al.,1989). Our findings are supported by existing research that identified belongingness as a potentially important factor for producing learning as professional language, social behavior, norms, values, and attitudes (Hogg & Turner, 1985; Goodenow, 1992). This learning outcome in clinical PBL medical education requires engagement, initiative, social interaction, and communicative skills. Our results show how this required engagement can be challenging for the medical students. According to Davidson, Gilles & Pelletier (2015) medical education can be challenging for introverted medical students who find it challenging to interact, involve and participate in the professional community. Further, they state that silent medical students tend to be identified as low-achieving students and are perceived by the professionals as being the least intelligent and most likely to be exposed to responsibility, which may exclude them from contributing to the clinical tasks and doing what physicians do The *colleague* category does not just have affective consequences in the form of in-group cohesion but also has substantial effects on intergroup communication. Communication is a

means of creating and reinforcing group boundaries through language use, and social identity also influence how information is transmitted and received (Burford, 2012). Information passed from in-group to out-group members may be encoded (stored) differently, leading to the more accurate recall of information derived from in-group members and the greater valuing of in-group sources (Burford, 2012).

There is a fine balance to be found between not enough and not too much autonomy in the setting of educational and clinical PBL medical education. The implications of the presented considerations in our study seems to point towards the balance between the challenges in the learning context and learning focus in relation to the expected learning outcome. It seems reasonable that in order to further the understanding of how and what medical students learn, we need to understand how medical student learning is connected to how medical students see themselves and think about themselves, and how these aspects relate to each other. However, there are limitations of the current study that need to be discussed and potentially addressed in further research. In this study we focus on how social identity affects how and what medical students learn. More comprehensive measures of the learning outcomes, possibly including both qualitative and quantitative assessments of the learning outcomes would allow us to make stronger predictions in relation to the quality of medical student learning outcomes and curriculum development. Finally, in terms of our findings, a further insight into other social identities, would help us to achieve a richer understanding of how social identity influence leaning potentials in medical students and their learning output.

Conclusion

This study provides valuable evidence on the interplay between medical students' social identities assumed and assigned in clinical PBL curriculum, and the ways in which they approach learning, and indirectly on how they perform. Thus, strong social identification with

the social identities as a *medical student,* as *nearly physician,* as a *colleague* seems to be closely related to how medical students approach learning and how, what, and why they learn. These findings are important, as they allude to the nature of the relation between social identities, learning and professional achievement in PBL medical curriculum. Although the medical students' social identities represent an important component of the whole picture, it is indirectly affecting learning outcomes. Findings that have essential implications at a practical level, as it suggests that by understanding how medical students assume and assign social identities and how they work, as well as how they relate to what medical students 'do' in the educational and clinical context of learning, we can effectively help students in adopting qualitatively superior approaches to learning and implicitly improving the quality and outcomes of their learning. By integrating a more holistic understanding of medical student learning in curriculum design, medical educational institutions can provide programs that are better suited to match medical students' expectations and at the same time ensure that they achieve their full learning potential.

References

AAU. (2020a). Curriculum for B.sc. in medicine faculty of medicine. Aalborg University. https://studieordninger.aau.dk/2021/26/2467

AAU. (2020b). Curriculum for M.sc. in medicine faculty of medicine. Aalborg University. https://studieordninger.aau.dk/2020/23/1848

Ashforth, B. E., Schinoff, B. S., & Rogers, K. M. (2016). "I Identify with Her," "I Identify with Him": Unpacking the Dynamics of Personal Identification in Organizations. *The Academy of Management Review*, 41(1), 28–60.

Atkinson, P., & Pugsley, L. (2005). Making sense of ethnography and medical education. *Medical Education*, 39(2), 228–234.

Barrows, H. (1990). Inquiry: The pedagogical importance of a skill central to clinical practice. *Medical Education*. 24(1), 3–5.

Barrows, H. (1996). Problem-based learning in medicine and beyond: A brief overview. *New Directions for Teaching and Learning*, 68(1), 3–12.

Barrows, H., & Tamblyn, R. (1980). *Problem-based learning: An approach to medical education*. New York: Springer.

Biswas, A. (2015). Gut feeling: Does it have a place in the modern physician's toolkit? *Medical Teacher*, 37(4), 309–311.

Boud, D., & Feletti, G. (1997). *The challenge of problem-based learning*. New York: Routledge.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.

Brewer, M. (2001). The Many Faces of Social Identity: Implications for Political Psychology. *Political Psychology*, 22(1), 115–25.

Brown J., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher,* 18(1),32—42.

Burford, B. (2012). Group processes in medical education: learning from social identity theory. *Medical Education*, 46(2), 143–152.

Collins, A., & Kapur, M. (2014). Cognitive Apprenticeship. In R. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (Cambridge Handbooks in Psychology, pp. 109-127). Cambridge: Cambridge University Press.

Crossley, V., Vivekananda-Schmidt, P. (2009). The development and evaluation of a Professional Self Identity Questionnaire to measure evolving professional self-identity in health and social care students. *Medical Teacher*, 31(12), 603–607.

Cruess, R. L., Cruess, S. R., Boudreau, J. D., Snell, L., & Steinert, Y. (2014). Reframing Medical Education to Support Professional Identity Formation. *Academic Medicine*, 89(11), 1446–1451.

Davidson, B., Gillies, R. A., & Pelletier, A. L. (2015) Introversion and medical student education: challenges for both students and educators. *Teaching and Learning in Medicine*, 27(1), 99–104.

Dolmans, De Grave, W., Wolfhagen, I. H. A. P., & Van Der Vleuten, C. P. M. (2005). Problem-based learning: future challenges for educational practice and research. *Medical Education*, 39(7), 732–41.

Goodnow, C. (1992). Strengthening the Links Between Educational Psychology and the Study of Social Contexts. *Educational Psychologist*, 27(2), 177–196.

Hammersley, M., & Atkinson, P. (2007). *Ethnography principles in practice*. 3rd ed. London: Routledge.

Haslam, S. (2017). The social identity approach to education and learning: Identification, ideation, interaction, influence and ideology. In: Mavor, K., Platow, M., & Bizumic, B., editors. *Self and social identity in educational contexts* (p.19-53). New York: Routledge

Hastrup, K. (2010). *Ind i verden : en grundbog i antropologisk metode.* (2. udg.). Hans Reitzel.

Hmelo-Silver C. (2004). Problem-Based Learning: What and How Do Students Learn? *Educational Psychology Review,* 16(3), 235–266.

Hogg, T., & Turner, J. (1985). Interpersonal attraction, social identification and psychological group formation. *European Journal of Social Psychology*, 15(1), 51–66.

Jarvis-Selinger, S., MacNeil, K. A., Costello, G. R. L., Lee, K., & Holmes, C. L. (2019). Understanding Professional Identity Formation in Early Clerkship: A Novel Framework. *Academic medicine*, 94(10), 1574–1580.

Jenkins R. (2008). *Social Identity*. 3rd ed. New York: Routledge.

Johansson, N., Nøhr, S., & Stentoft, D. (2020). A Scoping review of the relation between problem-based learning and Professional Identity Development in Medical Education. *Journal of Problem Based Learning in Higher Education*, 8(2), 25-41.

Johansson, N. Nøhr, S., Klitgaard, T., Vardinghus-Nielsen, H., & Stentoft, D. (2022) How clinical problem-based medical education sets the scene for identity development in medical students. *Interdisciplinary Journal of Problem-based learning.* In review.

Kiger, M., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical Teacher*. 42(8), 846–854.

Leung, W. (2002). Why is evidence from ethnographic and discourse research needed in medical education: The case of problem-based learning. *Medical Teacher*. 24(2), 169–172.

Mezirow, J. (Ed.). (2000). *Learning as transformation: Critical perspectives on a theory in progress*. San Francisco: Jossey-Bass.

Monrouxe, L. V. (2010) Identity, Identification and Medical Education: Why Should We Care? *Medical education*, 44(1), 40–49.

Niemi, P. (2003). Medical students' professional identity: self-reflection during the preclinical years. *Medical Education*, 31(6), 408–415.

Patton, M. (2002) *Qualitative research & evaluation methods.* 3rd ed. California: Sage publications.

Pope, C. (2005). Conducting ethnography in medical settings. *Medical Education*, 39(12), 1180–1187.

Salomon, P., & Perkins, N. (1998). Individual and Social Aspects of Learning. *Review of Research in Education*, 23, 1–24.

Sandars, J. (2009). The use of reflection in medical education: AMEE Guide No. 44. *Medical Teacher*, 31(8), 685–695.

Savery, J. (2006). Overview of problem-based learning: Definitions and distinctions. *Interdisciplinary Journal of Problem-Based Learning*, 1(1), 9–20.

Slay, H. S., & Smith, D. A. (2011). Professional identity construction: using narrative to understand the negotiation of professional and stigmatized cultural identities. *Human Relations,* 64(1), 85–107.

Schmidt, H., Rotgans J, Yew E. (2019). Cognitive constructivist foundations of problem-based learning. In: Moallem, M., Hung, W., & Dabbagh, N., editors. The Wiley handbook of problem-based learning, p.25–51. John Wiley & Sons, Inc.

Schön, D. (1990). *Educating the reflective practitioner : toward a new design for teaching and learning in the professions*. Jossey Bass Wiley.

Schön, D. (1983). *The reflective practitioner: how professionals think in action*. Routledge.

Sharpless, B. N., Cook, R., Kofman, A., Morley-Fletcher, A., Slotkin, R., & Wald, H. S. (2015). The Becoming: Students' Reflections on the Process of Professional Identity Formation in Medical Education. *Academic Medicine*, 90(6), 713–717.

Stentoft, D. (2019) Problem-based projects in medical education: extending PBL practices and broadening learning perspectives. *Advances in Health Science Education: Theory and Practice*, 24(5), 959–69.

Tajfel, H., & Turner, J.C. (2004). The social identity theory of intergroup behavior. In Jost, J.T., Sidanius, J., eds. *Political Psychology: Key readings* (pp.276-93). New York: Psychology Press.

Tan, C., Van Der Molen, H., & Schmidt, H. (2016). To what extent does problem-based learning contribute to students' professional identity development? *Teaching and Teacher Education*, 54(1), 54–64.

Turner, J. C. (1987). A self-categorization theory. In: Turner, J.C., Hogg, M.A., Oakes, P.J., Reicher, S.D., Wetherell, M.S., editors. *Rediscovering the social group: A self-categorization theory* (p. 42-67). Oxford: Blackwell.

Wald, H. (2015). Refining a definition of reflection for the being as well as doing the work of a physician. *Medical Teacher*, 37(7), 696–699.

Walker, A., Leary, H., Hmelo-Silver, C., & Ertmer, P. (2015). *Essential readings in problem-based learning: Exploring and extending the legacy of Howard S. Barrows* (pp. 5 – 15). West Lafayette, IN: Purdue University Press.

Yew, E., Chng, E., & Schmidt, H. (2011). Is learning in problem-based learning cumulative? *Advances in Health Sciences Education : Theory and Practice*, 16(4), 449–464.

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