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

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Abstract

Medical education programs are responsible for educating medical students to meet the demands of a complex and fast-changing healthcare system, that requires competent, reflective, robust, and engaged students who can collaborate in interdisciplinary settings. In this article, we examine and discuss how social identities affect medical students' learning approaches regarding how, what, and why they learn in clinical 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 found that medical students' social identities as well as the clinical problem-based practice were strongly associated with how, what, and why they learn. We highlight that there is a very fine balance to be found between the assumed and assigned social identities in clinical problem-based medical education if a learning outcome of high quality is to be ensured.

Introduction

Learning to become a physician is a multidimensional transition involving the development of medical expert knowledge, skills, behavior, attitudes, and professional identity (Wilson, Cowin, Johnson, & Young, 2013). Barnett (2012) describes this transition as a dynamic journey with an unknown destination, and this uncertainty is not tempered by skills or knowledge alone but is also a matter of personal characteristics and learning practice. Klitgaard et al. (2022) and Luthy et al. (2004) argue that 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.

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 (PBL) can embrace these challenges (Barnett, 2009; Savery, 2006; Tan, Van Der Molen & Schmidt, 2016; Walker et al., 2015). PBL is intended to support medical students to acquire professional acumen and facilitate the transition through collaborative group work, in which complex authentic real-life problems are solved as an approach to integrating

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disciplinary knowledge and skills with educational and clinical applications (Barrows, 1996; Billet, 2009; Boud & Feletti, 1998; Bowen, 2011; Stentoft, 2019). Barnett (2012) argues that this work-integrated approach to learning is only a part of the equation and does not necessarily focus on how medical students learn and understand their relationship to the 'clinical' world in a time of transition and uncertainty. Parallel to the increasing interest in PBL, research in professional identity development in medical students has been given much attention in recent years (Hefler & Ramnanan, 2017; Passi, Peile, Thistlethwaite, & Johnson, 2010; Sharpless et al., 2015). Several studies have shown that a strong professional identity is acknowledged as an important component of preparing graduate medical students for the transition into physician practice (Cruess, et al., 2014; Jarvis-Selinger et al., 2019; Passi et al., 2010; Van den Broek et al., 2020). When professional identity is described in the literature, it is often framed as a static position that can be achieved and includes a certain set of characteristics and academic competencies, which differs from the social identity approach used in this paper. Burford (2012) and Van den Broek et al. (2020) have earlier described the relevance of the social identity approach for research on professional identity development in medical education and propose a model that includes a content-dependent and dynamic perspective on professional identity development while still accounting for the individual psychological processes involved (Tajfel & Turner, 2004).

Regarding the challenging transition described above, this article will examine and discuss how clinical PBL sets the scene for medical students' social identity development with a particular focus on how, what, and why they learn.

Professional learning and social identity approach

In this study, we apply both professional learning and social identity theory as a lens to study how, what, and why medical students learn in clinical PBL, thus including a social perspective as well as a practice perspective on learning. When referring to learning in clinical practice, our focus is on professional learning, which is closely associated with workplace learning and work-based learning and consists of a nexus of social norms, values, thoughts, activities, actions, behavior, interaction, and communication (Hager, Lee & Reich, 2012). According to Kemmis et al., professional learning is a process of initiation into new practices and is to be seen as a transition that 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 in which they are situated.

Social identity 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 during the learning practice (Ashforth et al., 2016). 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 are affiliated 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 concerning the professional community, for example, 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).

The combination of professional learning and social identity theory encompasses the duality between the contributions to learning developed by participating in clinical PBL and how medical students prefer to engage in and learn from these activities. This theoretical approach includes not only learning aspects solely related to the clinical PBL setting but also considers the medical students' personal characteristics and their dynamic relationships with their particular learning contexts. That is, how medical students perceive themselves in the clinical PBL, and how and the degree to which they identify as a member of the professional groups is intrinsically

related to how they approach learning in a specific educational setting (Niemi, 2003; Van den Broek et al., 2020; Worthman, 2006). Integrating ideas from social psychology (i.e., social identity theory) and professional learning allows us to explore how the clinical PBL sets the scene for medical students' social identity development concerning how, what, and why they learn.

Method

In our previous study of how clinical PBL sets the scene for medical students' social identity development, we identified three prominent social identities that medical students either assumed themselves or were assigned by professionals, peers, and patients: Social identities as a medical student, as a nearly physician, and as a colleague (Johansson et al., 2022). At first glance, these prominent social identities seem to be those that are the most taken for granted. However, the analysis showed that these social identities were expressed among the medical students in different ways depending on their personal characteristics as well as the clinical PBL setting (Johansson et al., 2022). Therefore, in this study we decided to use these three prominent social identities as an analytical frame to gain insight into how medical students' social identities affect how, what, and why they learn in clinical PBL.

Medical education at Aalborg University is a six-year PBL education in which the first three years are founded on solving real-life patient cases in groups, self-directed learning, peer-learning, collaboration, project-based group work, and a few short clinical residencies at Aalborg University Hospital (AAU, 2020a). The three final years, which are also founded on the PBL principles, are spent in clinical practice in different wards at Aalborg University Hospital, hence the term clinical PBL, providing supervised patient care, attending conferences, working with authentic patient cases in groups, and developing interdisciplinary collaboration. According to Stentoft (2019), the PBL medical curriculum enhances medical students' abilities, for example, to solve problems, reflect, give and receive feedback, promote critical thinking, and enhance self-directed learning. The PBL medical curriculum at Aalborg University allows medical students to adopt the everyday life of a physician to a greater extent and thereby reduce uncertainty, which prepares them for the future (AAU, 2020b). Recognizing the potential uniqueness of this clinical PBL, our intent with this comprehensive ethnographic study was to gain new knowledge of the medical students' experiences as a feasible means to explore and understand how they utilize different social identities in their learning outcomes. To acquire this insight, Schatzki (2012) argues that the researcher has no choice but ethnography, that is, to conduct observations and interviews. He further states that there is no alternative to spending time with, joining in with, talking to and watching, and socializing with the medical students involved (Schatzki, 2012). 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 and provides an insight into what they do. The researcher becomes embedded in ongoing relationships with research participants while collecting data. This 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 and 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. The ethnographic research we gathered during a two-year period relied on participant observations, field notes, informal conversations, and individual in-depth interviews.

Subjects

The medical students involved in this study were recruited according to purposive and snowballing sampling, as outlined by Patton (2002) and have been pseudonymized in accordance with GDPR. This method ensured that we would reveal several perspectives and provide a broad range of insight into how medical students' social identity affects their approach to learning. The first author carried out 240 hours of direct observation and eight hours of individual semi-structured interviews of seven medical students during their seventh, eighth, and tenth clinical semesters at Aalborg University Hospital.

Data analysis

In this study, we revisited our ethnographic data from a previous study to examine and gain new knowledge about how the three prominent social identities as a medical student, as a nearly physician, and as a colleague (Johansson et al., 2022) affect how, what, and why medical students learn in clinical PBL. These three social identities were identified in our previous study and 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.

In addition to selective attention to 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, by revisiting and familiarizing ourselves with the data, then generating initial codes, then searching for themes and afterwards reviewing the themes, and defining and labeling the prominent selected themes, and finally providing concluding remarks. In stage one, the transcripts and field notes were re-read to immerse ourselves in the data again. Stage two of the analysis was guided by the three prominent social identities to identify the codes. In stages three and four, data were organized into themes concerning the relation between medical students' social identities and their approach to learning. This was done by examining the coded data and engaging in extensive discussion, in which themes were reviewed within the research group. To move 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.

Results and analysis

The excerpts below are drawn from both our ethnographic data sources and provide snapshots of the relation between medical students' social identity development and how, what, and why they learn in the clinical PBL. Figure 1 gives a brief overview of the analytical structure and shows how social identities are related to medical students' learning approaches. Social identity as a medical student is at the core of the assumed and assigned social identities, therefore it is placed in the center, and the learning potentials are listed below the social identities. The arrows indicate how medical students in clinical PBL constantly move back and forth between the assumed and assigned social identities, because this identification process draws on both their personal characteristics as well as the learning context they are situated in (Haslam, 2017).

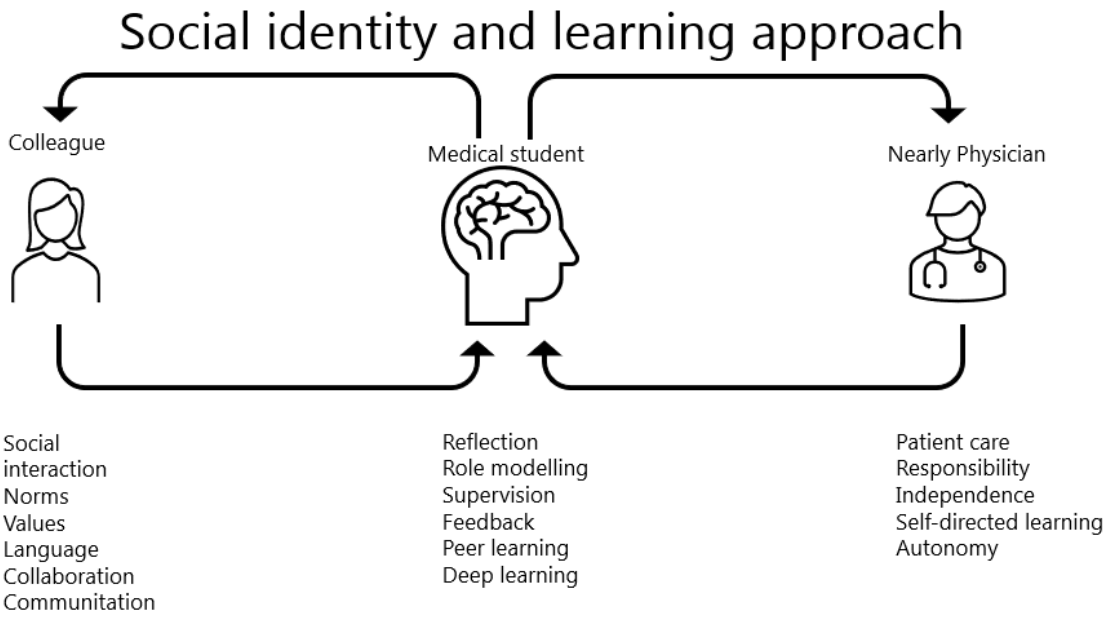

Figure 1: The relation between social identities and learning approaches.

'Learning approach as a medical student' is the first section, then 'Learning approach as a nearly physician', and finally we will analyze the 'Learning approach as a colleague'.

Learning approach as a 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 from and direct supervision by their supervisors and the influence that the clinical PBL has on their approach to learning.

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

> **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 know from the textbook, 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 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 supports their ability to solve clinical problems and reflect on how, what, and why they learn in clinical PBL.

> **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. In 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 afterward, 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 think, act and behave as a medical student with an intensive focus on learning rather than behaving as a physician at the hospital. This approach to learning allows her to focus and reflect on how, what, and why to be learned in clinical PBL. She also expresses that as a medical student she 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 examinations, Michael thinks out loud to inform the physician of his thoughts and findings. Doing so allows him to receive direct supervision during the examination and reflect on the clinical problem-solving that he is doing. To expand his learning skills, he also uses 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 about what he hears, sees, and feels. The physician comments and asks questions. Michael wants to develop his own practice so he asks 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?
>
> **Michael:** I'd appreciate it if you (the physician) could give me some tips and ideas on how to perform the objective examination.
>
> Michael (observation, fifth-year medical student)

Like Michael's case above, Chris examines a child patient with direct supervision and feedback from the junior 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 senior physician is called to supervise the examination. The attending senior physician uses role-modeling to show Chris and the other junior physician how to examine a small child more appropriately and gently explains what she is doing, how, 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 was 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)

As summarized below the extracts show how the clinical PBL context sets the scene for medical students' social identity development and further how the social identity as a medical student affects how, what, and why they learn.

- How: through real patient learning, hands-on, reflection, role-modeling, supervision, feedback, and peer-learning.
- What: to connect theory with practice, internalize what is observed, imitate, build up self-confidence, deep learning.
- Why: to take more responsibility and begin to think, act, and behave as a physician.

Learning approach as a nearly physician

The medical students show and describe that engaging independently in the clinical practice by providing patient care and taking responsibility is important to how, what, and why they learn. Below, James shows a high degree of autonomy and responsibility by going directly to the emergency department without first conferring with any physicians. A high degree of self-directed learning is present when James of his own volition starts 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 a locum in the acute ward has given him the clinical skills to behave, think and act as he does.

> Immediately following 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: "That's not necessary, we just go down to the emergency department – I find that's the best place to learn."
>
> **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)

As a self-directed learner with a high degree of independence and autonomy, Pia indicates that when the clinical context assigns and lets her assume the social identity as a nearly physician by allowing her to perform as one, it sometimes affects her focus on learning. In this respect, the focus is often directed from learning approaches such as role-modeling, direct supervision, peer-learning, and 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 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 casework with my peers. So, for me it's a bit of judging what I'll learn the most from, it's sometimes a tough decision. On the other hand, I think casework is 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 a 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 for the tasks in the ward as if he were employed as a junior physician. Assuming and assigning a high degree of responsibility and autonomy increases his focus on performing, solving clinical tasks, 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.
>
> **Chris:** Is it OK if I examine these two patients - I've seen them before?
>
> **Physician:** Yes, that's fine.
>
> […]
>
> **Chris:** We just get on with the tasks, and we're not afraid to take on responsibility. […] We're quite self-driven, we prefer the physicians to leave us alone so that we can get on with the work.
>
> 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 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 examined in more depth.
>
> Chris (observation, fifth-year medical student)

As summarized below the extracts show show how, what, and why medical students learn when the clinical PBL context allows medical students to assign the social identity as a nearly physician and they are ready to think, act and behave as a physician.

- How: doing what a physician does through examining patients on their own with indirect supervision, taking responsibility, engaging, and participating in ward rounds.
- What: students embody the craft of medicine and clinical procedures and develop competencies, knowledge, skills, clinical understanding, and disposition to perform.
- Why: students do so to act more independently and support the challenging transition from medical student to a nearly physician.

Learning approach as a colleague

To become a part of the professional community in the ward with 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 assuming and assigning the social identity as a colleague.

James states that social interaction, language, and communication are 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 affects his approach to learning and further expands his learning opportunities.

> **James:** I've felt like a part of the team of physicians in all the wards I've been affiliated with, and that also shows especially after you've worked in a ward where your colleagues still say hello to you and know your name. Even after the first semester in my first ward, gynaecology 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'll ask 'What's your name", and you've already got a connection.
>
> James (interview, fifth-year medical student)

Michael describes that social interaction, collaboration, showing initiative, and the ability to adapt to the context play an important role in 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 must 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 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 allows them to develop their professional language, collaborative, and communicative skills. Interacting with professionals and engaging in clinical tasks are 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.
>
> 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 states that her learning opportunities expand. 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 in a ward where they want to teach us. Physicians that see one as a burden affect you and you don't want to challenge yourself, because you feel insecure and uncomfortable.
>
> Maria (observation, fifth-year medical student)

As summarized below the extracts show how, what, and why medical students learn when the professional communities with which they affiliate allow them to assign the social identity as a colleague and the medical students perceive themselves as a colleague as well.

- How: through social interaction and collaboration with physicians, engaging, taking initiative, and participating in clinical activities.
- What: acquiring social norms and values of the professional communities, professional language and, subsequently, their motivation to learn.
- Why: to identify as a member of a privileged professional community who collectively shares particular professional knowledge, language and practices. Assuming and assigning social identity as a colleague also strengthens the medical student's relation to the physicians and thereby expands their learning opportunities.

The analysis has shown how clinical PBL sets the scene for medical students' social identity development regarding how, what, and why they learn. Clinical PBL allows medical students to acquire professional acumen, solve complex authentic real-life problems, reflect, give and receive feedback and supervision, develop critical thinking, and enhance self-directed learning. Clinical PBL allows medical students to learn from and adopt the everyday life of a physician to a greater extent, which is strongly related to the distinctive transition of coming to think, act and behave as a nearly physician. Personal, social, and professional development is always and only a process of being engaged and emboldened into practice, even when the medical student is learning alone or from participation with others in shared activities in clinical PBL. A medical student who is allowed to think, act, and behave as a physician tends more to approach the task as a physician, compared to one who is not. When social identity as a medical student is more salient than social identity as a nearly physician or colleague, medical students perceive themselves more as members of the group of peers and less as physicians or colleagues. As shown in the analysis above, and summarized in the table below, the medical students' social identities as well as the clinical PBL setting contribute to how, what, and why they learn. The table also presents a selection of factors in the clinical PBL that influence how the medical students think, act and behave as a medical student, as a nearly physician, and as a colleague.

Learning perspective	Social identity as a medical student	Social identity as a nearly physician	Social identity as a colleague
How	Through real patient learning and hands-on experience, reflection, role-modeling, supervision, feedback and peer learning.	Through engagement in clinical practice, by doing what a physician does through examining patients on their own with indirect supervision, taking responsibility, and participating in ward rounds.	Through social interaction and communication, collaboration with the physicians, and taking initiative, engaging, and participating in everyday life in the wards.
What	To connect theory with practice, reflect on the clinical activities and own practice, internalize what is observed, imitate physicians, and build up self-confidence, and deep learning	To embody the craft of medicine and clinical procedures, develop competencies, knowledge, skills, clinical understanding, and disposition to perform.	To acquire social norms and values of the professional communities, developing interest in subject matters, professional language, and, subsequently, their motivation to learn.
Why	To take more responsibility and begin to think, act, and behave as a physician.	To think, act, and behave more independently as a physician to support the challenging transition from medical student to nearly physician.	To identify as a member of a privileged professional community who share particular professional knowledge, language, and practices.
Medical students assume and assign social identity as a medical student when: Students find the clinical task too difficult. Students feel insecure and incompetent in relation to a clinical task or examination. Students participate and engage to a lesser extent in clinical activities. Physicians schedule student activities. Physicians do not allow them to participate and engage in clinical activities. Physicians are busy and under great work pressure. **Medical students assume and assign social identity as a nearly physician when:** Students feel self-confident, skilled, competent, and experienced. Students feel respected by physicians and other professionals. Students take initiative as self-directed learners. Students show eagerness to learn and be challenged. Students engage and participate independently in clinical activities. Physicians see them as motivated, competent, and skilled medical students. Physicians allow students to examine patients under indirect supervision. Physicians allow students to participate in ward rounds. **Medical students assume and assign social identity as a colleague when:** Students perceive themselves as a colleague and as a member of a team of professionals. Students are respected and acknowledged by physicians. Students show commitment to the group of physicians at a professional and social level. Physicians demonstrate credibility and trustworthiness to them. Physicians include them in their everyday practice.			

Table 1: Summarizes how medical students' social identities affect how, what, and why they learn and what allows them to think, act and behave as they do in clinical PBL.

Discussion

This research aims to explore how social identity affects medical students' approach to learning in clinical PBL. As presented in Table 1., our findings show that medical students' social identities are closely related to how, what, and why they learn in clinical PBL. The positive contributions from clinical PBL and experiences with solving real-life authentic problems have been long acknowledged in medical education (Billett, 2009). Furthermore, clinical PBL is often seen as a dominant instructional setting where medical students acquire the "tricks of the trade" needed for the transition from medical student to physician (Spencer, 2003). A high degree of autonomy, responsibility, and the opportunity to engage and participate actively in the everyday life of a physician and, further, how to think, act, and behave as a professional are all results of clinical PBL as presented in the analysis. At first glance, clinical PBL seems like the perfect pedagogical approach, although we find it important to discuss the role that clinical PBL plays in supporting medical students´ balancing of multiple social identities and how social identities affect learning. Furthermore, no definitive way of educating different individuals is available, and the learning output in clinical PBL is complex and depends on multiple factors such as the medical students themselves, the clinical PBL setting, the professionals, the supervisor, the peers, and the patients. Each one of these factors contributes to a particular social identity and learning approach. For example, when observing or receiving direct supervision during an examination, medical students tend to identify as a medical student and focus on connecting theory with practice, role modeling, imitation, getting feedback, and reflecting on how, what, and why they learn. When practicing patient care and carrying out examinations on their own under indirect supervision, medical students tend to identify as a nearly physician and primarily focus on embodying the craft of medicine and clinical procedures and workflow in the wards, which requires a high degree of engagement and participation, and therefore does not leave much time to analyze and reflect on how, what, and why they learn.

On the one hand, identifying as a nearly physician allows the medical students to acquire knowledge about patient-centeredness from the patients, rather than from physicians. In other words, education about patient-centeredness and acquirement of clinical skills and competencies are not reduced solely to role modeling on other physicians. If learning about and from patients solely happens through physicians, the learning will bypass the patients, and medical students may feel insecure or incompetent in their early patient examinations. The literature on how medical students and patients encounter each other in clinical PBL is unexplored (Bleakley & Bligh, 2008; Bleakley, Bligh & Brown, 2011). This means that there is not enough knowledge about how medical students might learn how, what, and why in relation to patients in a way that challenges their prevailing focus on gaining medical expertise. On the other hand, too much focus on independence, work, autonomy, and responsibility in the clinical PBL setting often does not allow medical students time and space for reflection, which Biswas (2015) and Sanders (2009) claim is the key to assisting medical students develop the clinical experience required in the transition from medical student to physician. According to Biggs (2011), students relate to the subject matter along a continuum of the following two ways: (1) focus on what the task is about, engage, participate, and seek to understand the 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 the deep learning approach) or (2) focus on completion of task-requirements and memorize what is needed in the most efficient way possible; this learning approach is characterized by a focus on specific facts, rote memorization strategies, and selective information processing (known as the surface learning approach). Dolmans et al. (2016) argue that clinical PBL encourages and motivates students towards a deep learning approach in which medical students are essentially preoccupied with trying to understand and reflect upon how, what, and why they are learning. Furthermore, Dolmans et al. (2016) argue that time and space for reflection and self-directed learning are

important components to enhance deep learning, which suggests that medical students identifying as a nearly physician can acquire a high degree of deep learning if the clinical PBL setting allows time and space for reflection, feedback, and supervision. Deep learning approaches are more desirable from the faculty and educator perspective, as they are associated with more positive educational outcomes, including the development of various social identities, intention to keep studying, long-term knowledge retention, and academic achievement level (Haslam, 2017; Platow, Mavor & Grace, 2013). Thus, clinical practice is not only 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 in order to secure a medical education of high quality. Nevertheless, affording the opportunities to do so can be challenging, because social identities and social interactions with the physicians are content dependent and vary from setting to setting and are rarely made explicit.

The social identity of a colleague is central to medical students' experiences of belonging to the in-group of professionals and the ward with which they are affiliated. Performing as a colleague is in this study identified as interacting, communicating, behaving, thinking, and acting like a colleague by internalizing the norms, beliefs, and values of the professionals. Enculturating may, at first, appear to have little to do with learning. However, this is what medical students practice in clinical PBL to gain new knowledge and to "become" nearly physicians. The clinical PBL setting 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 the behavior with great success (Brown et al.,1989). Our findings are supported by existing research that has 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 requires participation, engagement, initiative, social interaction, and communicative skills. Our results show how this required participation and engagement can be challenging for some medical students. According to Davidson, Gilles and Pelletier (2015), medical education can be challenging for introverted medical students who find it challenging to interact, involve themselves, and participate in the professional community. Further, Davidson, Gilles and Pelletier (2015) 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, engagement, and participation, which may exclude them from assuming and assigning social identity as a nearly physician and doing what a physician does.

There is a fine balance to be found between not enough and too much independence, responsibility, and autonomy in the clinical PBL setting. The implications of the presented considerations in our study seem to point towards the balance between the challenges in the clinical PBL setting, social interactions, and the medical student's perception of themselves. It seems reasonable that to further understand how, what, and why medical students learn in clinical PBL, 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 the particular learning context.

Conclusion

In our study, we found that medical students' social identities as well as the clinical PBL were strongly associated with how, what, and why they learn. When medical students think, act, and behave as a medical student, they learn through reflection, role-modeling, direct supervision, feedback, and peer learning. When they behave, think, and act as a colleague, they focus on social interaction, norms, values, language, collaboration, and

communication. And finally, when medical students behave, think, and act as a nearly physician, they primarily learn and embody the craft of medicine by active engagement and participation in clinical practice through indirect supervised patient care, carrying out examinations, and by taking responsibility. There is a nuanced balance to be found between the assigned and assumed social identities in order to enhance a learning outcome of high quality in clinical PBL. By only assuming and assigning social identity as a medical student, the students will miss important situated knowledge and learning from the clinical practice, but on the other hand, if the medical students primarily assume and assign social identity as a nearly physician, they will miss academic outcome and important time to critically reflect upon own professional practice. During our ethnographic fieldwork, it became clear that clinical PBL is a very challenging pedagogical frame within which to learn and navigate because it is difficult to predict what will happen: that depends on various contextual and personal factors. Therefore, we advocate for the importance of design practices in higher education to enhance the students' possibilities to think, act, and behave as a student, as a professional, and as a colleague. Curriculum and educators play an important role in understanding and enhancing students' social identity development and their opportunities to engage and participate actively in practice. Educators need to be aware of the affordances and possibilities in the learning environment, which requires insights derived from learning practices in higher education and social identity development, as recommended in this paper.

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