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See one, do one, teach one:

Learning within the Community of Internal Medicine Residents

A Qualitative Case Study

By

Jessica Lind & Kristina Kron

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Supervisor: PhD Stephan Schaefer

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Abstract

Title	See one, do one, teach one - Learning within the Community of Internal Medicine Residents
Course	BUSN49, Degree Project in Managing People, Knowledge and Change
Authors	Jessica Lind & Kristina Kron
Supervisor	Stephan Schaefer (PhD), Lund University, Sweden
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Purpose	Our work aims to gain a deeper understanding of how internal medicine residents learn in order to become competent specialists.
Methodology	This research comprises a qualitative case study and follows an abductive research approach. In addition, the study emanates from the interpretative tradition. Our empirical data were generated through 12 semi-structured interviews conducted with internal medicine residents at *Munich Hospital*, our case company.
Theoretical Framework	Our study builds on previous research in organizational learning, knowledge management and various learning theory perspectives on medical education. In particular, the knowledge management strategy framework, according to Alvesson & Kärreman (2001), provides an essential theoretical foundation, which we were able to extend and nuance in more detail with the help of our empirical findings.
Contributions	The study contributes to a more profound view of a *community of practice* (CoP). Our findings reveal that the absence of an organizational learning structure allows for the emergence of an informal CoP and thus fueling the creation of an own learning structure. Moreover, we were able to derive four learning types within this CoP: "*The Networker"*, "*The Self- Directed Learner"*, "*The Uncertainty Avoider"*, and "*The Confident Teamplayer"*. These can be differentiated based on various learning behaviors, managerial intervention dimensions, and attitudes towards learning.
Keywords	Horizontal Learning, Knowledge Management, Organizational Learning, Medical Education, Communities of Practice, Self- Directed Learning

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We have learned a lot within this writing process and hope that you will get an exciting and fascinating insight into the world of resident learning in the following pages! Enjoy!

Best wishes

Jessica Lind & Kristina Kron

Lund, 20th of May, 2022

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Glossary

Term	Definition
Amboss	An app that helps physicians look up information on diagnostics and medication for reference
Cardiology	Medical field dealing with the study of the heart; sub-field of internal medicine.
Electrocardiogram (ECG)	Examination method in which the heart's activity is measured as an electrical voltage and displayed graphically as a curve.
Gastroenterology	Medical field dealing with diseases of the gastrointestinal tract; sub-field of internal medicine.
Heart Echo	Officially called *Echocardiography*; one of the most important ultrasound examinations and a type of medical imaging of the heart.
Internal Medicine	Medical field focusing on diseases affecting internal organs.
Logbook	A catalog that prescribes specific competencies to be taught that must be completed as part of the medical residency (e.g., performing a certain number of medical examinations). It documents the resident's level of training and is signed off by an authorized physician.
M & M Conference	Morbidity and Mortality conference; meetings in clinics in which critical courses of disease, e.g., death, are being reviewed systematically.
Sonography / Ultrasound	Application of ultrasound for the examination of organic tissue. It is used to create an image of internal body structures.

"*I WILL SHARE my medical knowledge for the benefit of the patient and the advancement of healthcare*" (WMA, 2022)

1. Introduction

After a long 12-hour shift at the hospital, Magnus is sitting in the car on his way home to his well-deserved evening off. As a relatively new internal medicine[1] resident, he has a sinking feeling in his stomach, as he often does at the end of his shift. He wonders whether he did the right thing with the patient today - was it right to give the patient an anticoagulant medication? Or would he have been better off rechecking the blood clotting values* beforehand? "Maybe I should have consulted with someone again... I hope the patient makes it through the night. But I guess that is in the hands of my colleagues now."*

He wonders whether he can manage to still read up on the problem of the patient's clinical picture again, although today's workday had demanded a lot of him with the 20 patients he had to care for. "Maybe I'll text my colleague again to see if the patient is stable enough before I go to bed", he wonders uneasily. He hopes he will soon become more confident in his day-to-day work and know what to do. If only he knew how to successfully master medical practice. Perhaps tomorrow he can ask his colleague to show him the heart echo examination? Although he has been very successful in his medical studies, his everyday work is often characterized by ignorance and excessive demands, and he feels that he still has a lot to learn...*

Physicians have a great responsibility that determines life and death, as their performance is directly related to the quality of patient care and patient safety (Armstrong & Parsa- Parsi, 2005). They also find themselves in a complex environment characterized by changes in health care delivery and increasingly cost-conscious and busy medical practice (Armstrong & Parsa-Parsi, 2005). Learning processes are particularly critical in clinical education because they contribute to resident development and, in turn, patient safety (Ende, 1983; Wood, 2000; Clynes & Raftery, 2008). Good training is essential and sets the stage for future careers; today's residents are tomorrow's physicians.

However, a study examining cardiac arrest team members' satisfaction with their training found that nearly half of the residents felt inadequately trained and prepared (Hayes, Rhee, Detsky, Leblanc & Wax, 2007). These findings conclude that residents perceive their training and supervision as deficient (Atkins & Williams, 1995; Kaviani & Stillwell, 2000; Clynes, 2004). Within a qualitative study that surveyed 51 Obstetrics and Gynecology residents, Teunissen,

[1] all following medical terms are marked with an asterisk (*) and explained in the Glossary on page VIII

Scheele, Scherpbier, van der Vleuten, Boor, van Luijk & van Diemen- Steenvoorde (2007) examine how residents learn. The central finding of their study reveals that learning within the residency setting is primarily based on work-related activities. Subsequent processes of interpretation and meaning construction lead to the expansion and refinement of personal knowledge (Teunissen et al., 2007). Within the context of this thesis, personal knowledge is being defined as the ability to think and act within a certain situation, following Eraut (2004). The results of Teunissen et al. (2007) highlight the importance of experience for learning. They suggest that within resident-to-specialist training the residents should work and act primarily as specialists (Teunissen et al., 2007).

Despite this contribution, a unified theory has not been brought forward to explain the processes involved in the gradual development of a resident into a competent specialist (Cheetham & Chivers, 2001).

Stoller, Rose, Lee, Dolgan & Hoogwerf (2004) mention the significant role of teamwork and leadership in effective medical practice. Additionally, Clemmer, Spuhler, Oniki & Horn (1999) emphasize the value of collaboration. In accordance, learning is not viewed solely as an individual but rather as a social and collective process that involves influences and interactions in the learning environment and occurs through the active engagement of learners (Wenger, 1998; Lave & Wenger, 1991).

Similarly, Dornan, Boshuizen, King & Scherpbier (2007) studied how medical students learn from their clinical experiences. In this study, their experiences providing patient care and collaborating with others contributed to their learning (Dornan et al., 2007). Closely related to experiential learning in the literature in the medical context is the concept of learning by doing (Lesgold, 2001). However, Nothnagle, Goldman, Quirk & Reis (2010) question this learning method, arguing that medicine, in particular, is known for acting and doing without subsequent reflection. The element "*do one*" in the title of our work also implies that learning by doing has a high value. The principle of "*See one, do one, teach one*" is based on a tradition in medical training in earlier times. However, the modern era of medicine often forces trainees to practice beyond their limits, causing stress and decreasing competence and confidence (Speirs & Brazil, 2018). Consequently, these elements can directly impact the learning environment and, thus, inevitably, learning (Speirs & Brazil, 2018).

A recent trend in medical education is the self-directed learning (SDL) approach to improve performance, especially in a medical context (Mann, 2011). Knowles (1975) describes SDL as a process in which individuals learn to diagnose their learning needs, design learning experiences, and find appropriate resources at a meta-level.

Other voices in the literature believe that experience alone, without personal reflection and mentoring from the outside, is not sufficient to shape an independent and competent clinician (Aukes, Geertsma, Cohen-Schotanus, Zwierstra & Slaets, 2007).

It becomes clear that the literature offers several learning theory approaches, all of which attempt to explain learning within medical education, with each approach having a different focus. Thus, there is no consensus on what constitutes appropriate learning in medical education; however, there is agreement on the importance of learning in the clinical context as it can ultimately influence patients' well-being (e.g., Ende, 1983; Wood, 2000; Clynes & Raftery, 2008).

When considering trainees' embeddedness in the clinical community, they assume a legitimate role in which their learning and participation contribute to the growth of the whole institution. This involves a deliberate approach; it requires that learners are actively invited into the community, receive affective and emotional support, pedagogically and organizationally assist their learning, and minimize barriers to participation through organizational support (Dornan et al., 2007). Wood (2000) confirms this by considering sharing of knowledge and experiences as central to making them helpful to learners. Once we turn our gaze to the *Geneva Declaration* of the *World Medical Association*, which dates back to the 2,500-year-old *Hippocratic Oath*, we find that knowledge sharing is an essential component:

> *"I will share my medical knowledge for the benefit of the patient and the advancement of healthcare"* (WMA, 2022)

The Hippocratic Oath is a medical vow about ethical parameters and the professional duties of a future physician, which every graduate of a German medical school takes (Parsa-Parsi, 2017). This excerpt from the Geneva Declaration underlines that the medical profession is not just about individuals knowing but also about sharing knowledge to advance the entire health care system.

Crossan, Lane & White (1999) connected individual learning and organizational-level learning, which should increase learning and knowledge sharing. The literature often clarifies that organizational learning and knowledge management overlap and are interrelated (Hislop, 2009).

Although there is a variety of knowledge management concepts (e.g., Alvesson & Kärreman, 2001; Baskerville & Dulipovici, 2006; Hislop, 2009), there is a lack of a universally accepted definition. In this thesis, we will define knowledge management as the use of various strategies that create and coordinate knowledge processes in an organization (Hislop, 2009; Jonsson, 2015).

Strategies are utilized in the pursuit to create and coordinate knowledge processes, yet, it lacks considerations of individuals' learning processes within an environment, as well as how individuals make sense and interpret these knowledge processes. We argue that these interpretations and meanings of knowledge processes are essential, as they result in individuals' learning in a particular context. Therefore, knowledge processes and individual learning processes should be considered interrelated to create successful knowledge management practices within an organization.

In particular, we recognize that medical education has a substantial discrepancy between the teaching residents should receive and the teaching they actually do receive.

Furthermore, we have shown that physicians have a great responsibility directly impacting patients' well-being. Consequently, we see inadequate training and simultaneously high responsibility as particularly critical. Therefore, we dedicate our work to the learning processes that residents go through to become competent physicians and whose knowledge contribution plays a role for the entire hospital. We focus our research on residents because we see them as novices in training who already, at this stage, assume a great responsibility that can make or break a human life. Specifically, this leads to the following research question:

➢ **How do internal medicine residents learn?**

By conducting a qualitative study, we aim to improve our understanding of how residents learn within their training processes.

In our brief narrative at the beginning of the chapter, Magnus was to represent residents and provide insight into the potential thoughts and emotions of a resident after a day of work during their medical training.

To adequately answer our research question, we included physicians within their internal medicine residency at the *Munich Hospital* for a single case study, examining how they learn in their current environment and what factors may hinder or enhance their learning process.

Our main findings show that the internal medicine residents who were part of our study perceive the learning structures and the support from the hospital as insufficient.

This lack of organizational learning structure allows informal communities of practice (CoP) to emerge and fuels the creation of their own learning structures.
Based on the knowledge management strategy framework of Alvesson and Kärreman (2001), not only were we able to explore the relevance of the community dimension in more detail, but we also even extended it. The qualitative results of our study enabled us to nuance the CoP in more detail. The four learning typologies, *The Networker*, *The Self- Directed Learner*, *the Uncertainty Avoider*, and *The Confident Teamplayer*, emerged, which differentiate the learning behavior of internal medicine residents at Munich Hospital within the CoP. These are categorized along the dimensions of managerial intervention and attitudes towards learning.

1.1 Thesis Outline

In order to explain more in depth how our results were obtained, our work is organized into the following chapters: *Introduction, Literature Review, Methodology, Empirical Findings, Discussion*, and *Conclusion*.
This chapter provided essential scientific context and elaborated on a problem statement to present the purpose of our research and the research question derived from it. Chapter 2 will elaborate on our theoretical background by first differentiate knowledge management and Organizational Learning to outline a framework for learning processes. Subsequently, we divide the influences on learning into influences by organizational structures and individual learning. We consider various learning theory perspectives that highlight different influences on individual learning in medical education. The chapter ends by outlining the particular relevance of learning for residents. Chapter 3 provides a more detailed description of the ontological and epistemological foundation that our methodology is based on. It provides information on how the empirical data was analyzed as well as its limitations. Chapter 4 presents the results of our study by first focusing on general results that apply to all participants. This is followed by a presentation of our empirical results in a breakdown of different learning types. Chapter 5 links these learning types to the literature from Chapter 2 and discusses them, whereas the last chapter, 6, summarizes our most important results and concludes with the limitations of our work and suggestions for further research.

2. Literature Review

To answer our research question on how internal medicine residents learn, the following chapter includes a selective review of the existing literature in the context of learning theory.
First, we will look at organizational learning and knowledge management. In particular, we will clarify the role of Knowledge Management in an organization and how this framework can impact learning at the individual level.
In what follows, we will focus on selected perspectives of individual learning. On the one hand, we will highlight the importance of context for learning, and on the other hand, we will show some previous findings on individual learning.
Finally, we will emphasize the relevance of learning for internal medicine residents in the clinical setting.

2.1 Organizational Learning & Knowledge Management

When members of an organization learn at the individual or group level, this is referred to as organizational learning. Primarily, it deals with how individuals' learning enables reflection and change and can therefore influence the prevailing practices and norms of the processes that exist and are established within the organization (Hislop, 2009; Jonsson, 2015). However, Hislop (2009) emphasizes that organizational learning in this context should not be viewed as the mere sum of individual members' knowledge but rather occurs when these individual learning processes influence the organization's structures.

A dominant contribution to the body of knowledge on organizational learning has come from single- and double-loop learning (Argyris & Schön, 1978), which views organizational learning as a "*process of detecting and correcting error*" (Argyris, 1977, p. 116). The term "*error*" encompasses anything that prevents organizational learning.
Another framework for organizational learning is provided by Crossan, Lane & White (1999). They established a link between individual and organizational-level learning, which ultimately contributes to more learning and knowledge sharing.

The framework consists of six learning processes that occur at the three levels of *individual*, *group*, and *organization* in either forward or feedback loops. The former begins with learning at the individual level and then continues at the other two levels. This learning process is called *exploration*, which generates and develops new knowledge at different levels (Crossan, Lane & White, 1999). On the other hand, the feedback loop symbolizes the utilization of pre-existing institutionalized knowledge or *exploitation* that affects the group level and the individual.
However, a prerequisite for utilizing pre-existing institutionalized knowledge and recognizing these effects is acquiring this knowledge in the first place, before being considered in one of these loops.
Thus, we argue that this concept does not address how members new to these exploitation loops within an organization learn pre-existing knowledge. It assumes a preliminary phase that takes place before members are integrated and relevant to the reasoning of the framework. This raises how individuals learn the existing practices within an organization.

Crossan, Maurer & White (2011) speak of the potential to unite organizational learning and knowledge management to understand how we learn and how we know. The literature often clarifies that organizational learning and knowledge management overlap and are interrelated (Hislop, 2009). Spender (2008) distinguishes the two terms, arguing that organizational learning is more about managing the creation of new knowledge in the organization, while knowledge management is optimizing economic value.

The literature on knowledge management encompasses a wide range of perspectives on epistemology. In their four discourses, Schultze & Stabell (2004) relate epistemology to social order, that is, the existence of social relations. They distinguish between the epistemology of *dualism* and the epistemology of *duality*. The former, mainly associated with the objectivist approach, considers knowledge as codifiable and strictly separates tacit and explicit knowledge. This approach will not be considered in detail since the second approach, namely the practice-based view; thus, the epistemology of duality, is essential for our research. Duality involves both/and logic, meaning knowledge is neither exclusively tacit nor explicit but always contains both elements, albeit to different degrees.
Tacit knowledge is highly personal, subjective, and challenging to codify (Nonaka, Toyama & Konno, 2000). Instead, it is seen as a supporting tool to action, but it is not itself part of that action (Cook & Brown, 1999).

In contrast, the knowledge that can be expressed and shared in a formal and systematic language, for instance in data, is *explicit knowledge* (Nonaka, Toyama & Konno, 2000).
Moreover, Schultze & Stabell (2004) assume that both physical and cognitive elements are relevant and, therefore, knowledge and human activity are inextricably linked (Orlikowski, 2002; Gherardi, 2005; Corradi, Gherardi & Verzelloni, 2010).
Cook & Brown (1999) also use the term *epistemology of practice* and refer to knowledge as *knowing* to clarify that, unlike *knowledge* it is not something one possesses but an active task. *Knowing* is, therefore, often associated with learning (Crossan, Maurer & White., 2011). Adding *knowing* to *knowledge*, according to Cook & Brown (1999), it is possible to discern the relationship between what we know (*knowledge*) and what we do (*knowing*). In this respect, despite our focus on the practice-based view, the notion of knowledge also becomes relevant because it consequently plays a significant role in successfully managing knowledge in an organization (Jonsson, 2015). Moreover, Jonsson (2015) sees an inseparable link between knowledge and learning and emphasizes that the holistic view of both concepts is mandatory for successful knowledge management. Usman, Zaveri & Hamza (2021) also see the effective and efficient management of knowledge as an essential success factor in the 21st century.

In this context, various elements within a company, such as organizational structure, organizational culture, and the design of the knowledge management strategy, can promote knowledge management (Usman, Zaveri & Hamza, 2021). The extent to which organizational structures and corporate strategies can influence knowledge and learning is discussed in more detail in the next section.

2.2 Learning through Organizational Structure

The practice-based view aims to facilitate interpersonal knowledge sharing. This requires an organizational approach and involves creating a culture in which knowledge is shared. Managers evaluate their employees on their contribution to knowledge management and not just their financial productivity (Hislop, 2009). The importance of the manager in this context is also highlighted by Nonaka (1994), who considers it the manager's task to "*set the direction, provide the field of interaction, selects the participants in the field, establish the guidelines and deadlines for projects, and support the innovation process*" (Nonaka, 1994, p. 31).

Similarly, Hiregoudar & Kotabagi (2007) found in their research that a lack of support from the environment is detrimental to knowledge creation. Hence, they view it as a critical management task to create an appropriate organizational structure, for instance an understanding of the relevance of developing new knowledge.

2.2.1 Knowledge Management Strategies

Numerous knowledge strategy concepts can be found in the literature with different approaches to how an organization can gain a competitive advantage by leveraging knowledge (Hislop, 2009).

One contribution in the literature considered relevant is Alvesson & Kärreman's (2001) knowledge management strategy framework. Figure 1 examines the influences of two dimensions from which four knowledge management approaches can be derived, depending on their degree of expression.

The *Mode of managerial intervention* dimension illustrates the extent to which management systems intervene in the behavior of organizational members and ranges from maximum control to weaker coordination. The *Medium of interaction* ranges from the *social* to the *technostructural* scale. The former refers to workers' attitudinal control which involves efforts to coordinate through norms, moral and team spirit (Alvesson & Kärreman, 2001). On the other hand, the technostructural scale includes the control of workers' behavior through channeling resources and information (Alvesson & Kärreman, 2001).

The resulting approaches are derived from the corresponding expression of the two dimensions. Normative control forms the most controlled expression. However, it is paired with a social control mechanism in which management strives to create a culture in which employees are encouraged to participate in knowledge processes. Another crucial management intervention combined with technical-structural management controls is called enacted blueprints. In this case, databases provide employees with knowledge and specific instructions on how best to do their jobs. Both of the above strategies provide little room for autonomy. The extended library is the technical-structural oriented, bureaucratic control combined with a weak form of management intervention. IT systems play a unique role that management sets up top-down, for example, in databases maintained by employees and accessible to all

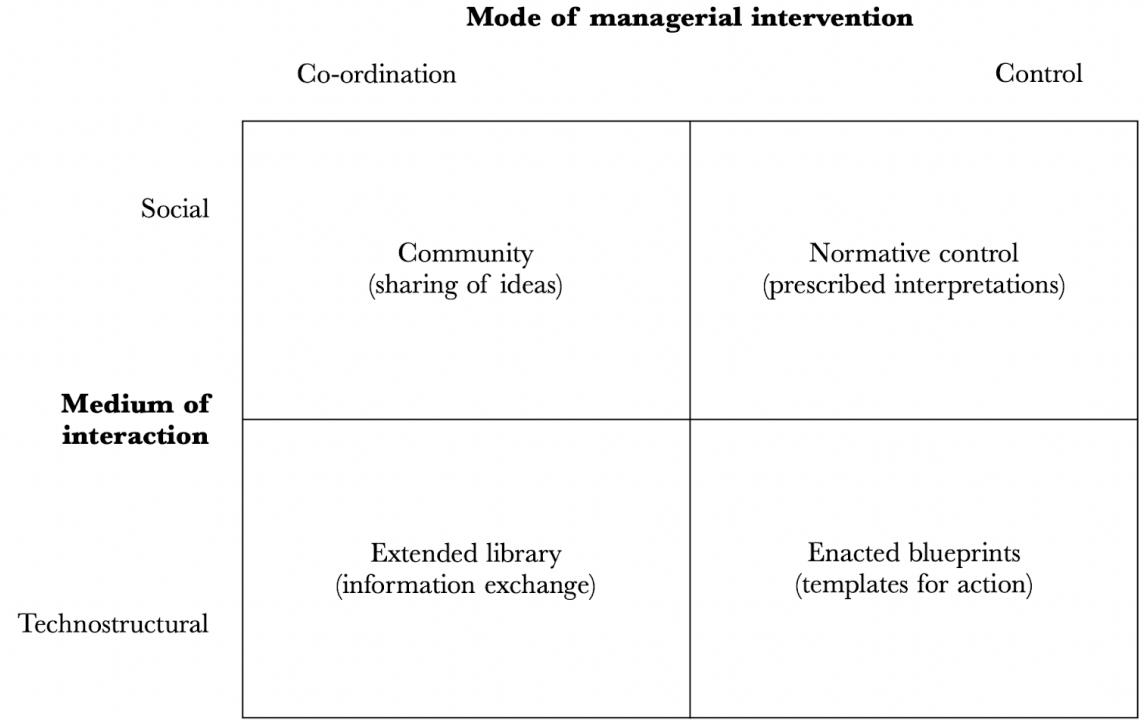

***Figure 1**: Alvesson & Kärreman's Knowledge Management Approaches (2001, p. 1005)*

The community approach to knowledge management combines the coordinated form of weak management interventions with socially-oriented management controls. This approach assumes that most organizational knowledge is tacit knowledge, which management seeks to shape by creating a positive environment and encouraging direct knowledge sharing among employees Alvesson & Kärreman (2001). Hansen, Nohria & Tierney (1999), and their concept of *personalization* as a counterpart to *codification*, propose a similar strategy for knowledge management that focuses on improving personal exchanges and social processes. Their model also focuses primarily on the transfer of tacit knowledge to be fostered within communities of practice. However, Alvesson & Kärreman (2001) emphasize that their four concepts are purely analytical models that are not empirically supported. In addition, they state that knowledge management is not exclusively pursued with one approach, but only the combination of all four approaches is efficient.

Alvesson and Kärreman's framework (2001) sees the organization as a whole, but it is questionable whether this also applies to individual departments. It can be assumed that, on a departmental level, it is challenging to use powerful management intervention and very low management intervention simultaneously, as they are mutually exclusive.

Similarly, it is formidable to use the enacted blueprint approach, where databases provide employees with knowledge and specific instructions regarding their jobs, while at the same time using a community approach with socially oriented management controls (Alvesson & Kärreman, 2001).
Therefore, it is advisable to consider the potentially mutually exclusive mechanisms at a departmental level. Aligned with that argument, we recognize differences in how individuals interpret and assign meaning to a knowledge management approach in each context. While these strategies aim to create and coordinate knowledge processes in an organization (Jonsson, 2015; Hislop, 2009), they do not consider how individuals learn in a particular context. We argue that these two aspects should be considered interrelated and influence each other to make knowledge processes fruitful within an organization.

Based on this claim, this work aims at improving the understanding on how individuals learn within an organization within a specific context. In the context of this work, we focus on residents and how they learn in the clinical setting of the hospital.

2.2.2 Learning & Development Structures

In principle, organizational initiatives to strengthen knowledge transfer can be significantly enhanced by *Human Resource Management* (HRM) practices. They can, among other things, motivate employees to participate in knowledge management activities and thus create a learning culture (Hislop, 2009).
The term "*learning*" is used very heterogeneously in the literature, and there is no generally accepted consensus to date; rather, the term represents a wide range of different perspectives. Hislop (2009) divides the term into three main types: Learning through formal education and training, learning through workplace interventions, and daily work. The latter type of learning corresponds to the practice-based view (Styhre, Josephson & Knauseder, 2006; Hong & Snell, 2008), which is given particular attention in our work. Learning is also an inherent and dynamic process (Hislop, 2009; Jonsson, 2015).

In this chapter, however, we first address the first form of learning, where the organization provides the opportunity for formal learning through specific organizational structures.

An empirical study by Monks, Conway, Fu, Bailey, Kelly & Hannon (2016) shows a positive relationship between the provision of structural learning support opportunities, such as mentoring and training, and the willingness to engage in knowledge sharing processes.
Mentoring is a formal structure that can promote informal knowledge sharing (Garvey & Williamson, 2002). Monks et. al., (2016) also see mentoring as enhancing learning. It is based on a role model relationship in which a more experienced member plays a supportive role in developing a less experienced employee (Watson & Stewart, 2017).

However, Garvey & Williamson (2002) emphasize that organizational learning structures should have a broader goal and focus on reflexivity, learning through experimentation, and critical dialogues rather than on the transmission of pure technical knowledge.
This is usually provided by the *Learning and Development department* in a company as part of HRM. Hence, learning is crucial for the individual and plays a significant role for the entire organization (Watson & Stewart, 2017).
Furthermore, the importance of *Learning and Development* is evident concerning employee performance, as it determines what actions need to be taken to align individual performance with organizational goals. Performance appraisals are particularly relevant to this evaluation, providing individuals with information about their performance and progress (Watson & Stewart, 2017). Thus, it is about providing feedback to individual employees.
Feedback is not only considered one of the most central aspects of learning in the general literature (Hattie & Timperley, 2007; Archer, 2010) but is particularly emphasized in clinical practice as a "*key step in the acquisition of clinical skills*" (Ende, 1983, p. 777). Wood (2000), Clynes & Raftery (2008) and Teunissen, Stapel, van der Vleuten, Scherpbier, Boor & Scheele (2009) also ascribe a central role to feedback on clinical performance and recognize it as the most available and influential learning method. Therefore, it is given special attention within this paper.

People work and learn and actively seek information about their performance in their environment (Ashford & Cummings, 1983). For Wood (2000), feedback is immediate information that is not only desired by learners but is also cost-effective and requires little preparation. While Wiggins (1993) and Eraut (2006) argue that feedback contains opinions and judgments about current performance and identifies opportunities for improvement, Wood (2000) views feedback as non-judgmental and non-evaluative.

Although it should be based on observations made during practical work with the trainee and may follow a period of reflection by the supervisor, it should still be an unbiased, analytical reflection of what has occurred. Clynes & Raftery (2008) divide feedback into two broad groups. One group consists of constructive, corrective, and negative feedback, emphasizing the impact of constructive feedback on the teaching and learning process. The other group includes reinforcing and positive feedback. Atkins & Williams (1995) consider feedback to significantly influence growth that can simultaneously increase self-confidence, motivation, and self-esteem.

In medicine specifically, however, the importance of feedback goes beyond pedagogy because behind the goal of training residents to become competent medical professionals is the overarching goal of ensuring patient care and patient safety (Ende, 1983; Kilminster & Jolly, 2000). Without feedback, the achievement of clinical competence is compromised because errors are not corrected, and good performance is not reinforced (Ende, 1983; Cahill, 1996). It can help to realistically evaluate clinical practice, preventing the risk of feedback resulting from the inappropriate weighting of internal and external cues (Ende, 1983; Wood, 2000). Particularly stressful work environments such as healthcare can leave much room for interpretation, and even a raised eyebrow can be misinterpreted to some degree (Ende, 1983).
However, there is consensus in the literature that feedback in medical education, despite its compelling necessity to the learning process, is either infrequent (Wood, 2000), too late, or destructive and personal (Raftery, 2001).
This may be since supervisors responsible for residents must prioritize patient care, which often simultaneously means that supervision of trainee physicians is minimized (Speirs & Brazil, 2018). This occurs especially during stressful periods when feedback to residents would be even more critical (Clynes & Raftery, 2008). The demands of patient care and trainee supervision are in tension and pose a constant problem for providing quality supervision and feedback to residents (Atkins & Williams, 1995; Clynes, 2004).

In this first part of our literature review, we have focused on the relevance of organizational frameworks for learning.
We have found that a lack of managerial support in the immediate learning environment can negatively influence knowledge creation. Therefore, it is essential to create a suitable organizational structure for learning (Hiregoudar & Kotabagi, 2007).

Here we saw that, especially in the medical environment, feedback is seen as a "*key step*" (Ende, 1983, p. 777) to ensure the growth of the individual and patient safety. At the same time, we have seen that this very feedback is rare and often destructive (Raftery, 2001).
Furthermore, we have provided insights into organizational learning and selected knowledge management strategies. These approaches (e.g. Alvesson & Kärreman, 2001; Crossan, Maurer & White , 2011) have in common that they address learning or the use of knowledge processes at the organizational level but disregard the learning processes of individuals.
One might conclude that understanding how individuals learn within an organization is irrelevant to research in organizational learning or knowledge management processes, because the literature does not clarify the scope of the impact of these learning processes on the organization's structure. However, such a view is as unproductive as asking whether the egg or the hen came first. Instead, we need to recognize a connection between the two. There must be an egg to get the hen and vice versa. Therefore, it is vital to develop a deeper understanding of how an individual's knowledge and expertise ignite in an organization. To implement this, we must first clarify how individuals learn. Therefore, we will look at the individual learning process from different learning theory perspectives in the following part.

2.3. Theoretical Perspectives in Medical Education

> *"Medical education is that broad and complex set of events, processes and influences, both deliberate and unplanned, with which the aspiring doctor is surrounded from the day of entry into medical studies until the end of practice lifetime." (Mann, 2011, p. 61)*

There has been some change in medical education: The emphasis is no longer solely on the acquisition and direct application of knowledge and skills but on developing knowledge and professional identity (Irby, Cooke & O'Brien 2010). In this way, medical educators aim to produce professionals who are competent and aware of their competence, who can self-monitor and evaluate their performance, and who continue to learn throughout their professional lives (Mann, 2011).

2.3.1 Perspectives on Learning

Various learning theories exist in medical education but often go unnoticed in clinical practice. Learning theories reflect underlying beliefs about knowledge and skills (Mann, 2011). Behaviorist, cognitivist, and constructivist learning theories are just a sampling of theoretical perspectives on learning.
In this subsection, we will first consider learning theories that focus on the individuals and their active contribution to learning. We will then move on to learning theory perspectives that focus more on the relevance of context and social interaction within the individual learning process.

The **constructivist view** sees learners not as passive recipients of information but as active knowledge producers (Mann, 2010). Consequently, the learner is a constructor of knowledge based on prior experiences and perceptions.

Another influential theory in medical education is **cognitive psychology**. It attempts to define processes such as knowledge storage, how memory works, and how people process their experiences (Merriam, Caffarella & Baumgartner, 2007). In the medical context, this is primarily concerned with the development of expertise (Bereiter & Scardamalia, 1993) and the processes of decision making (Elstein, Schwartz & Nendaz, 2002). Although this perspective is not to be neglected for the medical resident, we will not foreground it in the context of this study because our focus is less on how these cognitive processes specifically occur.

Experiential learning is central to a physician's learning and personal and professional development (Kolb, 1984). Boud, Keogh & Walker (1985) describe it as a reflection on experience to transform it into learning. Again, the emphasis is on individual learning that is to be deepened through reflection. Although the latter is a complex concept, it is nonetheless integral to all perspectives on learning and makes an active appropriation of what is learned in the first place (Schön, 1987; Moon, 2000). Cook & Brown (1999) add a cognitive component here, seeing the development and production of knowledge as the result of an individual or collective intellectual process of reflection, which is primarily a cognitive process. Kolb (1984) suggests that reflection on past experiences helps us identify gaps in our knowledge and points to the role of active experimentation, such as reading or using new strategies.

Dornan et al. (2007) studied how medical students learn from their clinical experience In this study, experiences of participating in patient care and working with others contributed to their learning (Dornan et al., 2007). Kolb (1984) also emphasized the central role of experience in the learning process, stating, "*Learning is a process whereby knowledge is created through the transformation of experience*" (Kolb, 1984, p. 38).
Teunissen et al. (2007) reached similar conclusions in their qualitative study of how residents learn on their everyday work. Their findings are related to experiential learning theory since they emphasize the importance of experience for learning and suggest that medical training should primarily consist of working and acting as a specialist (Teunissen et al., 2007).

In this context, they emphasize the importance of **learning by doing** (Teunissen et al., 2007). Kolb (1984) takes a similar view, paraphrasing the act of *doing* as a bridge between experience and the generation of new, personal knowledge. In general, there is a belief that more learning by doing is needed in most educational situations (Lesgold, 2001). Nothnagle et al. (2010) agree with this view but oppose that this is a challenge specifically in the medical field, as they detect the domination of unreflective doing within the culture of medicine. In addition, Speirs & Brazil (2018) see the danger of trainees practicing beyond their limits when doing new things without knowing what they are doing. They see this as an unjustifiable way to achieve procedural competency, especially with increasing evidence in medical education. This is particularly true when the procedures are at higher risk (Speirs & Brazil, 2018). Moreover, Lesgold (2001) notes that learning by doing has its limitations because unusual medical cases, for example, are rare; in addition, they are often taken on by established specialists (Lesgold, 2001).
Although the literature increasingly supports **reflection** as an important way to understand and acquire new concepts and improve performance, its inclusion is challenging (Mann, Gordon & MacLeod, 2009). For individuals, reflection is related to self-awareness, self-regulation, self-observation, and continuous learning.

The **self-directed learning** (SDL) approach is an emerging trend, particularly in the medical context, that has the potential to improve medical education (Mann, 2011). Knowles (1976) describes SDL as a process in which individuals take the initiative to diagnose their learning needs, design learning experiences, find resources, and assess their learning. This self-direction increases a resident's competence by enhancing curiosity, critical thinking, and increased motivation and confidence (Rosenblum, 1983).

Nothnagle et al. (2010) developed an intervention with a physician as a learning coach to help other residents independently develop learning goals and reflect on their learning experiences. His role was to illustrate learning strategies that show how they learn rather than what they learn. They state that residents need to expand their scientific knowledge continually, so they view SDL as an essential component because it allows them to actively direct their learning (Nothnagle et al., 2010). Quirk (2006) also argues that knowledge and skills quickly become obsolete, especially in the medical context. Therefore, physician education must shift to teaching metacognitive skills, which, according to SDL, are about actively managing one's learning. On the other hand, Eva & Regehr (2005) emphasize the importance of feedback from reliable and valid external sources on the path to self-improvement. Their statement is underscored by Schön (1987), who represents the opinion that learning through exclusive self-reflection can be accompanied by uncertainty, conflict, and ambiguity.

Similarly, experience alone without personal reflection and mentoring from the outside is considered insufficient to shape an independent and competent physician (Aukes et al., 2007). However, it is also well known that time is a rare commodity in medicine, which has the consequence that a supervisor is in constant tension between training the resident in the form of external feedback and patient care, with the latter taking priority when in doubt (Speirs & Brazil, 2018). This further highlights the relevance of the SDL- approach, as it seems that it fundamentally requires residents to take more personal responsibility for their learning progress.

However, it remains unclear how this approach is followed in clinical practice, considering that external feedback and reflection are essential for fruitful learning but only available in a limited way.

The literature shows that, above all, experiential learning, learning through activity (constructivist perspective), learning by doing, and SDL form relevant components in the learning processes of a resident. Additionally, it became clear that reflection processes and external feedback are crucial parts of learning. However, it remains unclear at first to what extent the immediate learning context stimulates individual learning and how individuals deal with their experiences and actions. It cannot be assumed that everyone learns the same way, so it is questionable what preferences learners develop and what factors affirm one person's learning and may hinder another. Therefore, in the following, we highlight the learning theory perspectives that address the interplay of the environment with learning.

Research in medical education has evolved considerably over the past 50 years (Norman, van der Vleuten & Newble, 2002). Learning is no longer viewed solely as an individual process but rather as a social and collective process that involves influences and interactions in the learning environment and comes about through the active engagement of learners (Wenger, 1998; Lave & Wenger, 1991).

The **behaviorist theories** consider the environment as the most important factor influencing learning and behavior. Especially in a clinical setting a supportive learning environment is crucial (Chun-Heung and French, 1997). Learning incentives, for example, are based on reward and reinforcement and are triggered by the environment. Particularly in medical education, influencing behavior through positive or negative reinforcement becomes relevant and is part of daily practice and culture.

Social cognitive theory (Bandura, 1986) encompasses the behaviorist and cognitivist perspectives. Here, the learner takes an active role in the learning process, shaped by goals, values, and experiences. A reciprocal and dynamic relationship develops between the learner's behavior and their environment (Bandura, 2001). Learning through observation takes a high priority in this perspective and emphasizes the significance of role models in medical education (Kenny, Mann & MacLeod, 2003). The concept of mentoring explained in section 2.2.2 builds on this approach. However, Speirs & Brazil (2018) emphasize that specific procedures do not occur frequently enough, and it is doubtful that residents will gain skills just by seeing a procedure.

Situated learning and **communities of practice** likewise offer a valuable theoretical perspective and are therefore essential to our work.
According to this perspective, learning is a transformative process that is intimately connected to its context and bound by participation and active engagement in community activities to enhance collective and individual learning (Mann, 2011). This active participation is also reflected in the previously discussed constructivist view, experiential learning, and learning by doing.
In situated learning, the learner is viewed not merely as an observer or imitator but as an active participant who learns from and with all community members (Egan & Jaye, 2009). For the community, situated learning provides a context and culture within which the experience can be integrated and given meaning.

When reflection occurs between and among individuals and incorporates the context of the experience, the opportunities to adopt collective norms and values are significant.
Related to the medical field, learners are actively engaged in tasks that contribute to patient care and are offered activities that match their growing skills and responsibilities (Lave & Wenger, 1991). They experience community interactions, values, challenges, and processes. Learning through participation promotes collective and individual learning; it also emphasizes the importance of learning from peers and members at all levels of seniority and centrality in the community.
This learning theory provides a combination of the previous perspectives and embeds interactive, reflective, and experiential learning within the context of a community. In this respect, communities play a crucial role in this perspective and our work, as it brings us back to our initial question of how an individual can contribute to the organization.

2.3.2 Communities of Practice

To describe the activities of a group of people who come together to pursue a joint endeavor, Lave & Wenger (1991) use the term *communities of practice* (CoP). This concept is widely used in the knowledge management literature (e.g., Amin & Roberts, 2008). In line with the practice-based view, it is based on the assumption that knowledge is associated with human activities (Hislop, 2009) and includes both individual and collective elements (Tooman, Akinci & Davies, 2016). The groups that underlie CoP are informal, as they emerge from the social interactions of their work activities (Hislop, 2009). Verburg & Andriessen (2011) describe it as a network with low formalization that arises spontaneously from the need to share knowledge and learn. Its members interact a lot with each other due to their geographical proximity.

Therefore, it can be stated that CoP can be characterized primarily by three building blocks. First, their participants possess and develop shared knowledge in a shared activity. Other characteristics include a sense of shared identity and shared or overlapping values (Brown & Duguid, 1991; Lave & Wenger, 1991). It is argued that CoP facilitates the sharing of knowledge among individuals and thus has the potential to improve organizational performance (Schenkel & Teigland, 2008). In this context, the sharing of tacit knowledge, in particular, should be facilitated within the CoP strengthened by the shared identity (Hislop, 2009).

In this context, novices or beginners enter the periphery of a community by observing and performing basic tasks. As they become more competent, they move to the center of the community. Through participation, active engagement, and the assumption of increasing responsibility, individuals adopt and appropriate the culture and community's roles, skills, norms, and values. As learners change through their participation in the community, their participation, in turn, changes the community (Mann, 2011). Learning and the development of knowledge are, therefore, inherent and fundamental aspects of the dynamics of CoP (Hislop, 2009). The knowledge that members of a CoP have and develop is highly personal. Much of this knowledge is simultaneously distributed throughout a community and its members (Hislop, 2009). In Cook & Brown's (1999) terminology, the group's members' activities, interactions, and practices can be understood as knowing. Knowledge is then collectively constituted as a group. CoP is seen in the literature as beneficial to both individuals and organizations because it can bring innovation and, on the other hand, the potential to facilitate individual and group learning and the sharing of knowledge within the community (Hislop, 2009). Participation in community discourse enables understanding of norms and values and how the community frames and solves problems and structures its view of the world (Mann, 2011).

The medical profession is a culture in which learners are socialized during learning. This socialization involves a transformation from layperson to professional that evolves over a lifetime. From situated learning and CoP perspective, refer to this as how learners become total participants in CoP medicine (Mann, 2011). Therefore, this approach is an integral part of this work.

CoP are predominantly presented in the literature in an idealistic view in which the community lives in harmony. This gives the impression that CoP bring only benefits.
A significant issue that receives less attention in the literature is the internal dynamics that CoP can shape. Even if there are no formal hierarchies, tensions within a community may result in unequal power distributions that can escalate into conflict (Lave & Wenger, 1991).
To derive to the notions of power, we follow Carlsen’s et al., (2020) interpretation of Foucalt’s (1980) work. Here, power is not expressed as a resource but as something that is produced and reproduced in the dynamics of emerging social relationships. It is embedded in people's actions, conversations, and interactions. For them, power and knowledge are a shared influence that is not separable but rather mutually constituted.

If this fact is taken into account, then the connection to the practice-based view becomes apparent, in which knowledge is equally embedded in specific contexts and practices (Hislop, 2009).

Differences in power can then trigger conflict in processes of legitimate peripheral participation when new members join the community who are less experienced and less knowledgeable than older members at the time (Mann, 2010). However, Lave & Wenger (1991) also see this as a contradiction because, on the one hand, newcomers participate more in order to form themselves into total participants, thus replacing the older members to some degree. This, in turn, requires that the older members first teach the younger ones (Lave & Wenger, 1991).

On the other hand, power can also exert a positive force and potentially open up new ways of acting and thinking (Carlsen, Clegg, Pitsis & Mortensen, 2020). They then do not speak of coercive *power over* someone but instead of a coactive *power to*. The latter is inherently cooperative and fosters imagination by building connections and collective action (Follett, 1940). The concept of *power to* extends to the ability of an individual to create knowledge opportunities for themself (VeneKlasen, & Miller, 2007) but also generate new opportunities and actions (Mathie, Cameron, & Gibson, 2017). In any case, it becomes clear that learning processes aimed at developing and using knowledge should consider issues of power (Vince, 2001).

2.3.3 Relevance of Learning for Medical Residents

Physicians today work in a complex environment characterized by changes in health care delivery. They face the challenge of ensuring patient safety while meeting the conditions of an increasingly busy and cost-conscious practice (Armstrong & Parsa-Parsi, 2005).

Residents are a not insignificant part of this scenario, influencing the quality of patient care both during their training and as the physicians of tomorrow. They take responsibility for their patients, where mistakes can have far-reaching consequences (Ende, 1983).

Adequate training of residents could enrich their knowledge and possibly contribute to organizational knowledge, assuming that fewer errors occur, which could result in improved patient care. However, the previously introduced literature in medical education has shown discrepancies between the education residents should receive and the education they receive.

Residents' ability to make sense of the world is often influenced by doubt, uncertainty, or perceived difficulty (Burke, Benson, Englander, Carraccio & Hicks, 2014).

2.4 Chapter Summary

Our literature review has shown that structures for organizational learning contribute to advancing the organization and play a significant role in the individual learning process. A central structure in this context is feedback, which should be a mandatory part of the learning process, especially in the medical context, to form a competent physician, but in reality, it is often neglected. Following the practice-based approach, we have shown that active practicing helps to learn and identified reflection, experience, and self-direction as central learning elements. It became clear that situated learning plays a central role, especially when it forms communities of practice that can replace formal organizational structures with informal structures for learning processes. We have also shown how all these learning theories influence residents' learning and how they are partially interrelated.

Although we have highlighted the importance of the learning environment, the extent to which it helps or hinders individual residents' learning remains an open question. It can be assumed that the prevailing structures are perceived differently and that some prefer autonomous and self-directed learning. In contrast, others might appreciate concrete instructions and need them for their learning process.

Lastly, we have illustrated that learning is critical for residents in medical school, as they are directly responsible for the quality of patient care and patient safety.

3. Methodology

The study was conducted by using a qualitative, abductive research approach. In addition, this study emanates from the interpretative tradition of symbolic interactionism. Data were collected from 12 semi-structured interviews with employees within our case company. The sensemaking process for the empirical material followed an open and axial coding process. The first section will describe our philosophical grounding in more detail. Subsequently, the next section will present the process of collecting data within the study. Lastly, the study will explain considerations that have been taken into account for conducting the study.

3.1 Philosophical Grounding and Research Approach

Since this study concerned residents' learning, the methods are approached by qualitative research. Qualitative research mainly focuses on, and is appropriate when, a study seeks to understand the perception of individuals' subjective and socially constructed reality (Bryman, 2018; Saunders, Lewis & Thornhill, 2019), reflecting its origin in interpretive epistemology (Bryman, 2018). The study aims to grasp how residents learn, and must therefore elicit the individuals' subjective and socially constructed perception of the driving forces for their learning. It needs a sensemaking process of the research object's subjective meaning of the social world (Saunders, Lewis & Thornhill, 2019). In addition, this study aims to understand internal medical residents' experiences and interpretations and is less interested in generalizing results to a wider population. Therefore, the study focuses on human interpretation and is most suited to research by using a qualitative approach (Bryman & Bell, 2017; Rennstam & Wästerfors, 2018; Saunders, Lewis & Thornhill, 2019). From a qualitative research perspective, social reality is furthermore viewed as dynamic. This constructionist philosophy involves frequent creation and re-creation of individuals' social reality (Bryman, 2018). Aligned with the constructionist approach explained by Rennstam & Wästerfors (2018), this study aims to interpret and comprehend the emergence of medical residents' learning, how it unfolds, and how it is getting reinforced. Thus, this study's interpretative standing point assumes a socially constructed reality.

In the previous section, we discussed the significance of social interpretations and meaningful sensemaking of our actors and the behavioral outcome of our research. This philosophy is aligned with an interpretative tradition, where the study aims to develop knowledge about the social world (Prasad, 2017). The socially constructed reality of resident doctors' ways of learning is expressed in the interviews. Subsequently, interpretations are made from these in the pursuit of understanding how resident doctors learn. In particular, it is related to symbolic interactionism. The study acknowledges that the intrinsic meaning of a social phenomena is inseparable from the individuals assigned to them (Prasad, 2017). Individuals' sensemaking of meanings from words, objects, actions, and events is derived from their self-perception. Therefore it acknowledges the polydynamic nature of social realities, which builds upon several individuals and frequently shifts shape in social interactions. These mechanisms caused by the mixture of social interactions and self-perceptions are assumed to shape how the resident doctors learn.

Furthermore, the social interactions differentiate from each other and result in different interpretations, meanings, and actions towards learning. For example, the supervisors' ways of approaching residents' queries result in different understandings and actions, influencing the learning process. These variations can also be explored from a critical perspective, where the power dimensions have significant importance for how residents learn. A critical tradition influences different interests, and interpretations are considered in the socially constructed reality (Prasad, 2017).

While the interpretative epistemology and the ontological assumptions are elucidated, there is still a need to examine the studies' methodology for acquiring scientific knowledge. This study uses an abductive approach, a combination of deductive and inductive methodology. Hence, the study utilizes existing knowledge within knowledge management but lacks hypotheses developed to prove our point. Instead, the empirical data can come with surprises and issues to which we will adapt and extend. This openness may result in rejecting theories in the interpretative process (Alvesson & Kärreman, 2007) and treating our research question as a "*moving target*" (Styhre, 2013, p. 33). In line with Saunders, Lewis & Thornhill (2019), this approach assists us to refrain from directing in our interviews, which enables the basis of the study to derive from interviewees' expressions more accurately.

Utilizing a qualitative research question does not come without its flaws. The risk of subjectivity regarding our inherent biases (Bryman, 2018) has been taken into the most significant consideration. In the pursuit of being trustworthy, different aspects have been discussed prior to our empirical acquisition. First, decisions granted along with the studies progression has been presented in a transparent way, involving both benefits and potential pitfalls. Secondly, we have considered the aspect of reflexivity. According to Finlay (1998), reflexivity can be accomplished by presenting previous experiences. While our master's program remains dominantly the same, our bachelor's programs have provided differences in approaches and width for research areas. Furthermore, one of the researchers is Swedish, and the other is German. Therefore, our experiences, values, and judgment have been discussed and understood based on cultural differences. We have also drawn upon our experiences and knowledge from two separately written bachelor's theses. Hence, we contemplate reflexivity towards our judgment, values, and beliefs as researchers prior to the study.

3.2 Research Design

Since we want to understand how resident doctors learn and which factors in the context influence the learning process of medical residents, the research object is a single organization in Germany named *Munich Hospital*. This choice is motivated by case studies' inherent facilitation of rich insight into a context where the phenomena of interest occur (Yin, 2003). While the interest is particularities rather than generalities of resident doctors' learning, this approach enables an understanding of the learning mechanisms in internal medicine. In the subsequent section, we will describe the context of the research object and our acquisition of empirical data.

3.2.1 Case Company

The study was conducted in a hospital in Germany, where residency training immediately follows basic medical training. Residency training is provided by both university and general hospitals and lasts between 3 and 6 years, depending on the specialty. The residency ends with the attainment of a certain specialty.

The hospital used for our study is *Munich Hospital*. It is a private hospital of priority care (level II) with 435 beds. In addition to modern emergency care and a wide range of treatments, it also offers specialized services that contribute to its supraregional importance. Around 22,000 patients are treated as inpatients at Munich Hospital every year. Another 30,000 patients receive outpatient medical care from more than 1,000 employees. It offers comprehensive care with a central emergency room and 16 other specialist departments, and 17 competence centers. The hospital practices Internal Medicine, Surgery, ENT, Orthopedics, Gynecology, and Geriatrics. It is recognized as an academic teaching hospital of the *Ludwig-Maximilians-University* of Munich and operates a vocational nursing school (Helios Amper- Klinikum Dachau, 2022). We conducted our study within the Internal Medicine Department. At *Munich Hospital,* this department consists of two main areas: *Cardiology** and *Gastroenterology**. Some of the staff officially work for Gastroenterology and some for Cardiology. Regardless, they have the same responsibilities during their residency and are internal medicine residents. These residents aspire to become specialists in Internal Medicine.

In Cardiology, the team consists of a chief resident responsible for the department and six senior residents. In Gastroenterology, there is one Chief Physician and four Senior Physicians. There are twenty-five internal medicine residents in both Cardiology and Gastroenterology.

3.2.2 Data Collection

The study's empirical material was collected in April 2022 through semi-structured interviews with resident doctors within the internal medicine department. This method was motivated by our pursuit to increase the understanding of the interpretations, beliefs, and feelings derived from the interviewees' subjective and socially constructed reality (Kvale, 1983; Kvale & Brinkmann, 2014).

Following the study's abductive approach, the interview guide was built with a general outline of the main topics. This decision was motivated by its flexible nature, while it still enabled coverage for the main areas relevant to the thesis. This approach empowered respondents to nuance expressions of their perceptions, and allowed a two-sided conversation (Bryman, 2018). Hence, we could be more agile and pick up new relevant directions as the conversation evolved, creating a more profound understanding (Kvale & Brinkmann, 2014).

As the execution of interviews evolved, this approach allowed us to utilize our newly acquired empirical insight for the subsequent interviews (Saunders, Lewis & Thornhill, 2007). This insight resulted in a deeper insight into the most engrossing areas within the specific context of the research objects.

As stated, broad and open-ended questions such as "*Which factors have contributed to your learning*?" built the interview guide. The open questions were crucial to attracting free responses from the respondents (Alvesson & Deetz, 2000) and decreasing the risk of biases (Saunders, Lewis & Thornhill, 2007). However, as the interview evolved, more specific questions were asked. For example, "*Why do you rather ask your colleagues for help than the supervisors?*" - these sorts of questions were ignited from explanations on the broad questions, giving them the possibility to both emphasize their standing points, reflect on what has been said and extend the empirical material for the relevant topic. Additional enablers for relevant empirical insight were intended pauses, making room for participants' reflection and elaborating on their answers (Kvale, 2007).
Regarding biases related to the data collection, the interview template was not presented to the respondents prior to the interview. This approach aimed to avoid prearranged answers. In conjunction with the presentation of ourselves and the agenda, the respondents were informed of the anonymous nature of the respondents' identities.

In order to create profound insight into the research of interest, the selection of interview partners is of significant importance (Silverman, 2016). Hence, the research objects relevant for our purposes were resident doctors within a specific department since deviations between specialties may create unwanted influences. We strategically reached out to specific respondents of interest using a purposive sampling method (Bryman, 2018). In order to understand how medical residents learn within the internal medicine specialty, we build criteria for the participants. They should 1) be resident doctors within internal medicine and, 2) operating within the same department. The latter criteria were motivated by fully grasping the context and social relations within the department. We interviewed twelve resident doctors regarding 1) the perception of their individual learning, 2) their understanding of relationships within the team, 3) interactions of learning and 4) the context of learning within the organization.

Table 1: *List of Interviewees: Internal Medicine residents at Munich Hospital, own representation.*

Learning type	Name (anonymous)	Gender	Age	Year of residency training
The Confident Teamplayer	Magnus	male	29	3
	Silja	female	29	3
	Elin	female	29	4
	Lars	male	34	4
The Self- Directed Learner	Alva	female	27	4
	Mikael	male	40	5
The Uncertainty Avoider	Nea	female	35	3
	Erik	male	31	5
	Oskar	male	30	3
The Networker	Anna	female	30	3
	Sigrid	female	29	4
	Sanna	female	28	3

3.3 Data Analysis

According to Rennstam & Wästerfors (2018), the qualitative researcher must presume the collected material's disorder from the approach. There is an inherent divergence in social events, which is also increased by the flexible nature of semi-structured interviews. In line with this, a strategy was pre-decided concerning the management of the collected material. Initially, we made a time plan for the interviews and divided the execution of interviews into two "groups". Everyone within a group was interviewed with a close interval, while the two different groups had some time in between. The gap between the two groups allowed us to transcribe the first group of interviews and categorize the data broadly to detect interesting or surprising areas. This insight was utilized in the second set of interviews. Further analysis was made after all the interviews had been executed and transcribed. In the process of analyzing the empirical material more thoroughly, we used Strauss and Corbin's (1998) techniques of open and axial coding. Hence, we approached the inherent disorder of qualitative data by creating an order of the empirical material.

Initially, in line with an open code, summaries of isolated statements were extracted from the transcribed interviews. Both of us did the process of extracting phrases, words, and metaphors from the empirical material separately.

These open codes represented broader concepts, which were transferred and abstracted into our individual excel table. Since we did these processes separately, a comparison and further discussion could be made of the divergence and similarities of our open codes and resulting categories. This approach aligns with the axial coding process (Strauss & Corbin, 1998). Further, the process involved refining categories and focusing on the deviations. We did this by shifting focus to how things were said rather than what was said. This process was motivated by the aim to avoid simplifications of our data. This process involved going back and forth between the transcriptions, categorizations, and recordings. Hence, it proposed to unfold emotions, ideals, understandings of reality, and typifications related to what respondents said, which is aligned with the reasoning of Gubrium & Holstein (1999); Rennstam & Wästerfors (2018). Particular attention was paid to pace, voice tone, and long pauses between respondents' answers. The process of refinement of categories, as well as the discussions, allowed us to "kill our darlings" and be flexible and adaptive towards the finalized research question. These categories will be further presented in the finding section.

Following the abductive approach, the study aimed to exclude biases from interpretations and categories set by us as authors. Regardless of this striving, we acknowledge the subjectivity that arises from our own experiences (Strauss & Corbin, 1997). In particular, some degree of pre-understanding within the knowledge area in the subject has arisen from our study program. However, this can be used as an opportunity to create a sort of open dialogue with the empirical material. This approach followed frequent re-negotiations, expansion, and rejection between existing knowledge and challenging knowledge to decide which theoretical information to use in the analyzing section, which required reflexivity towards assumptions and existing interpretation, leading to an improved quality of the study (Alvesson & Kärreman, 2007).

3.4 Quality Considerations & Reflexivity

The interpretative nature of the study makes individuals' subjective meanings more critical to explore than objective truths (Prasad, 2017). The insights from the case study will be context-specifically bounded, which withholds possibilities for generalizing it (Alvesson & Sköldberg, 2010). Nevertheless, quality considerations in terms of credibility have still been taken into account for delivering valuable insight into the field.

One aspect that needs to be carefully and reflectively approached is the source itself (Alvesson & Sköldberg, 2010; Schaefer & Alvesson, 2020). It involves probing and evaluating one's empirical material from a critical lens (Schaefer & Alvesson, 2020). Regardless of our belief that the respondents lack intentions or incentives to manipulate the study results, a critical lens toward the interviewees is essential. Therefore, aligned with Alvesson and & Kärreman's (2007) reasoning, we considered the degree of authenticity regarding answers that might reflect institutionalized ways of talking or inherit political incentives.

Research demands reflexiveness towards us, as authors of the study, and the context of our research (Alvesson & Sköldberg, 2010). As we are following an interpretative research tradition, the overall image of the insight presented is influenced by interpretative actions.
These interpretations, in turn, are influenced by pre-understandings within the knowledge field and other professional experiences, as well as our nationality and corresponding value system. However, considering this and not neglecting this fact might assist in questioning our "status quo"-assumptions and beliefs. This reflexivity led to many discussions of our interpretation and created a more diverse and more prosperous picture of the empirical material, including different interpretations and "truths". To reach this, we both interpret empirical material individually before discussing it. This process, aligned with the abductive approach, emphasizes finding insight that might contrast our existing knowledge. This openness makes room for new ideas and unexpected findings (Alvesson, 2003).
Furthermore, one of the authors had a connection in Munich Hospital beforehand, which might influence her to be more biased. However, this is the only prior relationship that could be salient with the company. Therefore, the other author acted as a more neutral player to benefit the study. This scenario is also one example of describing the methodology with transparency and detail, improving the overall quality of the study (Mason, 2002).

3.5 Chapter Summary

This chapter has assigned our qualitative study to the interpretative tradition, which includes the perception of subjective and socially constructed reality. More specifically, we based it on symbolic interactionism, as this study aims to interpret the emergence of resident learning and understand how it unfolds and how it is reinforced.

Residents' learning practices are expressed in the interviews, from which interpretations are derived to understand how residents learn in interaction with others.

We further presented the *Munich Clinic* as a case company. More specifically, our empirical data collection took place in twelve semi-structured interviews with residents in the internal medicine department in their first through fifth years of training.

Furthermore, the study follows an abductive approach, which allows us to use existing theories and models, but at the same time, provides room to discard theories in the subsequent interpretation process. Finally, we critically reflected on the possible limitations of our study.

4. Empirical Findings

The empirical findings consist of the material elicited from the interviews. The first section will elaborate on the context residents operate within, involving structure, processes, and procedures. Subsequently, the analysis will present common factors for learning. Lastly, the first section will discuss the differences in the initiative that the empirical material prevails, which are building four different learning types. The second section will provide a nuanced view of these learning types regarding characteristics and what distinguishes them from each other.

4.1 Context & Processes

Internal Medicine at *Munich Hospital* is divided into two areas, Gastroenterology and Cardiology. Compared to other hospitals, the Munich Hospital is relatively small, enabling residents to become more generalists because they can see a broader spectrum of medical problems. However, this means that smaller clinics cannot offer their doctors specific medical examinations as many times as a university hospital can, as it simply does not have as many patients. The physicians operate within different medical areas, depending on which shift they are assigned and therefore experience different work pressure. For example, some respondents witnessed a stressful environment in the intensive care unit (ICU). However, a stressful environment is seen as given in the medical context:

> *"And it's well known that, especially in the beginning, it's hard. And people often complain about the loads of work, and it's just seen as a given. It's not going to change because I say differently*". (Magnus)

As stated above, the residents are assigned to different shifts, which involve different tasks and responsibilities. These are built upon rotations within the hospital, and the tasks they are executing on their shifts are officially signed in a specialist catalog called *logbook**. This becomes the formal "proof" that you have done examinations on an area, learned it, and are prepared for this case in the future.

It also allows them to take further responsibility and be promoted to specialists. Most of the respondents perceived the rotations at the hospital as somewhat fragmented. The employers have assured training and development during the recruitment, yet the residents are assigned to shifts that do not coincide with the tasks and practices they need to learn for their aspirations. Only a few respondents thought their aspirations were considered in the rotation processes.
The logbook is also perceived as a disintegrated process within the hospital, where all of the respondents express misalignment between the formal process and what happens in practice. Even though residents have done specific examinations, they seem to have little idea what was signed off as executed in the catalog. Many of the respondents stated that this logbook only exists on paper, and they must be "*insanely concerned about actually getting these examinations in there.*" (Mikael). As internal medicine residents, they are convinced that they have this responsibility in practice. If the supervisors do care, it is unlikely that it will be to the extent and quality the logbook requires. Many of the respondents witnessed that examinations in the catalog get signed without conducting the required examinations. One of the respondents said:

> *"Some examinations are simply signed off even though you don't know how to do them, which I think is really questionable. Then all of a sudden you're an internal medicine specialist and you have no idea, you may have conducted the examination once yourself or not at all, that's actually quite scary"*. (Silja)

The residents explain both scenarios where they do not know what is in the logbook, meaning that they do not know how far they proceeded in their training to become a specialist. Further, they express uncertainty when they do not attain the required knowledge they should in the specific medical area, while the formalities say otherwise.
In contrast, two respondents explained that they are hindered from doing examinations that affect their career development and blamed the strained economy at the clinic. They said that assistant physicians do not cost as much as specialists. Because of this, the residents are put into areas where they are formally overtaxed. This practice area does not coincide with the specialist catalog, and they never get the training they need for further development. In addition to the cost-cutting on the personnel's development, cost-cutting involved job cuts and limited everyday work personnel. They perceived that the privatization of hospitals made cost an essential factor, and employees became numbers.

They describe the environment as chronically understaffed, which affects the possibility of learning new areas. This affects the rotations' effectiveness and what examinations to teach. One respondent said:

> *"And that we also comply with the law, that everything becomes a bit more transparent with the Working Time and things like that. That's also a big issue at Munich Hospital right now, we've had a new managing director for a few weeks, and now it's the case that these lower staffing limits that apply to nursing are always violated, so there are always too many patients being treated, and there's a fine for the management. But it's much cheaper than hiring enough staff. Just the fact that this is possible, that this law is violated again and again and there are no consequences, I find that really extreme."* (Silja)

This violation of laws shows how the economic factor affects the working conditions for the residents. The economic factor also influences their possibilities to develop through rotations aligned with aspirations. The respondents expressed that fixed rotations where examinations took place, taught, and concise with their aspirations would improve their learning process. They also pointed out that more staff would allow them to actually proceed in their rotations needed for personal development, as they are now assigned to areas because these are understaffed.

4.2 Learning

As we have presented what context the resident doctors operate within, this section will present learning enablers and hinders common for all or the majority of the respondents. All the respondents perceived that their colleagues played a significant part in their learning. Therefore, horizontal learning seems to be important for all the respondents. Furthermore, they all learned by doing the task. The execution of a task enabled them to learn that specific task.
Regarding the structure, all the respondents also expressed a lack of appreciation. Almost everyone also witnessed that they lacked training opportunities. The majority also said that IT supported them instead with theoretical knowledge.

4.2.1 Horizontal Learning

As mentioned, colleagues worked as significant enablers for learning. This involved both structured and unstructured mentoring of each other. However, the respondents have different views on how well the structured mentoring program in the clinic works. Therefore, residents learned from these. One of the respondents said that she did not learn anything from the mentoring program provided by the clinic. Another respondent said that she was lucky compared to others because she had a good learning curve during the structured mentoring phase. She was paired with someone else for a month and felt that she received support until she was more independent in her everyday work. However, residents perceive colleagues to play a significant part in showing how things work in everyday life at the hospital, which explicit knowledge cannot. These practices of unstructured mentoring seem to be a cultural norm within the clinic.

> "*The colleagues help, it's all based on a social story, otherwise I think the system will collapse. The colleagues see, okay, he's overburdened, he's just starting out, we're now doing double duty and taking on two more patients. If we didn't balance that out among ourselves, I don't think the system would work so well.*" (Erik)

It is perceived by the participants that the older ones teach the younger ones while they still are on-call duty and teach themself. One respondent said that for those who cannot understand this or cope with it, it is causing the workflow to become chaotic for everyone. The system of passing on knowledge and skills is cyclical, meaning that the older ones are taught to train the next generation of newcomers. It involves showing and explaining how it works within the clinic and how they do specific examinations and procedures. This system is perceived as both essential and friendly, and pleasant. The unstructured way also forms several "teachers", who provide divergent ways and opinions of a particular way of doing or case. Thus, younger residents can form those into the best-suited way for the individual.

4.2.2 Learning by Doing

All the respondents expressed the significance of *doing* in the learning process. Usually, they can see one do a particular task once, and then the residents do it by themselves and learn the specific task. To be "*thrown into cold water*" (Magnus) is perceived as providing a steep learning curve. This pragmatic way of learning stands for a significant part of the residents' learning in their daily work. "*See one, do one, teach one*" (Lars) is the motto by which one of the interviewees summarizes his learning. However, there is not always someone that shows how it is done before the residents try it by themselves.

In many cases, they must figure it out on their own, without the possibility of having a supervisor teach them first. Then they usually learn from their mistakes instead, which are derived from their doing. It does increase the residents' learning, yet many of the participants have negative experiences from it in the form of insecurity. The supervisors also question the residents when they try to do something they cannot, and it goes wrong. However, this is not always the case where some participants have shown how things are done beforehand. One of the participants said that the preferred way of learning is a combination of training, supervising, and learning by doing:

> "*And then I was lucky again to have a great senior physician. He was my brain, so to speak, and I was the executive, but I think that's not bad at the very beginning, when you don't necessarily understand why something is being done and you're already overwhelmed with the many things that must be done, really at the very beginning. And then you see the different clinical pictures, there aren't that many different ones, and then you see why he did what he did, and at some point, you start to ask or think to yourself, I would do this and that, and then he either says yes or no. That's the best way to learn. That's how you learn best, I think"* (Sanna)

The best way to learn is to include the executing part prior to thinking for themself. This means that the process of learning-by-doing, ideally, should be supported by someone to tell them the action they will do before one could inherit both aspects (cognitive and act of doing) by oneself.

4.2.3 Common Hinders for Learning

As the respondents value their autonomy in their everyday work, they still perceive a lack of training opportunities. For example, senior physicians should hold advanced training courses every Wednesday. These training courses are, however, mostly canceled. Some respondents express their disappointment that their superiors do not take these more seriously and want the clinic to insist on canceling them only in exceptional cases. Others want to extend it to more than one day a week. This lack of structured training opportunities is perceived to affect their learning negatively. When one of the respondents was asked if he could describe what would increase his learning curve compared to his situation today, he said:

> "*Better workflows and more education. So, I mean, our superiors are supposed to teach us actively. In reality, that's not happening here. You're working and you're learning by working. And that's something that's a structural problem, not only at our house, but the whole system. It is very monetarized, very economic, but education is very, very rare*" (Magnus)

Once again, the economic factor in the hospital influences the structure and procedures for learning.

Another aspect that all respondents expressed was missing in their current situation was the lack of appreciation from supervisors. Feedback is perceived as rare by the majority, yet appreciation is even rarer. The respondents, however, differ in how they want to be appreciated. Some respondents want appreciation verbally, such as saying "*Thank you!*" when stepping in on short notice or working overtime without compensation. This lack of appreciation has resulted in an unwillingness to do overtime for one of the participants. Others would like to appreciate that they are given structured training opportunities, conversion of overtime into training, or someone saying, "*Now I will teach you something or show you something"* (Oskar). Appreciation can also be leaves or monetary compensation or bonuses. One of the participants thought that a Christmas card, some treats, and saying "*Merry Christmas*" (Sigrid) would have shown that the supervisors appreciated the resident working during the Christmas holidays. Many respondents said they do not feel that the supervisors care about them and have no say in matters. This is perceived as affecting their learning negatively since it influences motivation and performance, especially in tough times.

However, they do feel like they are getting appreciation from patients from time to time:

> *"The appreciation comes through the patients, but the topic of appreciation is also a very sensitive one, so I personally find it really cruel how little appreciation we experience."* (Sigrid)

The residents differ in how they want appreciation, yet the level of appreciation is perceived to be so low that it is cruel. It is also perceived as a "*sensitive topic*" (Sigrid), which could mean that it is an emotionally related topic to the resident, meaning it has the potential to arouse certain feelings.

4.2.4 Initiatives

As presented in the previous analysis sections, all respondents witnessed a somewhat fragmented structure and inherent practices within the hospital concerning the support for learning and development. Therefore, the mentoring culture and horizontal learning become increasingly important for all residents. It is also common for all respondents to learn by doing and using applications to elicit explicit knowledge. Some residents perceive vertical learning as valuable for their learning and development, which they actively try to improve.
Nevertheless, we can see that respondents take specific initiatives to acquire knowledge. Initiatives, in this case, mean the actions that residents pursue in a particular direction to acquire knowledge. These initiatives differ and result in different traits for learning, which prevail in need to distinguish ways of acquiring knowledge further. This is to understand the meanings and interpretations behind it fully. The characteristics and differences elicited from the empirical material have further been developed. They can be presented in four learning types 1) *The Networker*, 2) *The Confident Teamplayer*, 3) *The Uncertainty Avoider* and 4) *The Self-Directed Learner*.

4.3 Learning Types

This section presents the four learning types derived from the empirical material. It will present the characteristics of each type and how this individual acquires knowledge in their profession. It is crucial to note that horizontal learning, utilization of applications, and learn-by-doing are salient in all learning types. However, one main difference is the degree of dependence on others to acquire knowledge. Secondly, they differ in their interactions within the vertical hierarchy as well as the interpretations and meanings derived from it.

4.3.1 The Networker

The Networker relies on others to acquire knowledge. They tend to have a good relationship with senior physicians and colleagues. This group uses the strategy to acquire knowledge through mentors. The experienced senior physicians are always approachable, and they help them if they need it. However, they also are aware that they are in a fortunate position. The label of the Networker is derived from their ability to reach such a fortunate position, where they acquire knowledge from mentors, colleagues, and supervisors. They show skills in networking as they maintain and nurture relationships, which result in learning opportunities. This type perceives that the senior physicians give them room to practice in alignment with what they aspire to and encourage the residents to do advanced training.

> *"He said, make sure you do an advanced training and that's what I did, and you learn an insane amount and it's very structured. Our senior physicians are incredibly nice and if I go to the Sonography* and practice, that is, "pre-sound" and then say, "I think the patient has this and that", I can always call a senior physician, someone always comes down, so really in 90% of cases someone explains it to me nicely."* (Sanna)

The Networker has a positive learning experience from the advanced training, as well as from interactions with supervisors. This statement also shows the perceived support from the more experienced doctors. The residents in this group feel lucky to be trained and can rely on the more experienced staff. Furthermore, they perceive getting uncoordinated feedback.

It could involve administrative tasks or acute problems for which the group calls the senior physicians and gets supervision. However, they are aware that this does not happen for everyone.

> "*We have not yet managed that all of us residents have a regular conversation with the boss every year. I mean, I've been in close contact with him and he's always given me feedback, so you get feedback from the senior physicians in a rather uncoordinated way*." (Anna)

The Networker knows that they are fortunate to get feedback. Their close relationship with the senior physicians enables them to be one of the residents getting feedback. In addition, it seems like this group has received coordinated feedback on individual projects within the year and has coordinated meetings where they talk with the supervisor about their development.

This group also has good relationships with their colleagues. They learn many medical practices from older colleagues. In order to learn new things, they approach older colleagues that inherit the desired skill. The respondents have found a few mentors that showed them how to do specific examinations when they got stuck. This group perceives that they value each other in the team and feel like they get encouraged and supported when they are insecure about their abilities. They also exchange opinions and knowledge with each other during and after the shift, and then they discuss what has been done and what could have been done better. Furthermore, the team meetings held once a week are perceived as valuable for improvement and alignment in the team. This also allowed them to plan for upcoming obstacles.

Regarding initiatives outside of working hours, the group goes to training to meet others in the profession and learn more about their specific development areas. One of the respondents also attended *M & M Conferences**. Her strategy was to find a mentor there whom she could discuss cases with. This possibility allowed her to learn from an experienced doctor whom she could call and discuss with. Overall, this group acknowledges that the mentoring program provided by the clinic does not give this to them. They must take the initiative to find a mentor that will help them evolve.

4.3.2 The Confident Teamplayer

This type relies on others for acquiring knowledge, and almost exclusively this involves horizontal learning. Therefore, the choice of name for this type of learner includes not only these primarily horizontal learning styles but also shows that they are proactive in teaching others. In order to do this, we assume that they are convinced they can pass on knowledge, which is why we attribute a certain degree of self-confidence to them. They also perceive they themselves have learned from more experienced colleagues:

> "*Most of what I have learned, I have learned from colleagues of the same age or at eye level, a little bit of "Jugend forscht"*[2]*, sometimes something together, one has already done that, then he shows you a little bit*" (Lars)

Furthermore, they use *Amboss** to acquire explicit knowledge. However, this group will ask about colleagues' choice of medication rather than looking it up on applications. This group expresses a great fit between colleagues and sees this group dynamic as the main reason for still working at the clinic. They describe the context as very team-based and that everyone is dependent on each other to practice successfully. Many of them are dissatisfied with many aspects of the structure, yet the team spirit and willingness to help and jump in are highly valued. This team spirit is described as friendly rather than collegial and is thought to be why many people still are working in the clinic. If it were not for this, many would no longer be there:

> "*So we don't have that big of a competition, we're basically trying to survive together*." (Magnus)

The view of the collegial relationship that they are trying to survive together could be understood as a sense of shared responsibility towards each other. It also prevails the informal responsibility they feel to support each other in their everyday work. It is perceived that the older ones teach the younger residents, whereas the older ones explain, show, and give feedback to the youngsters:

[2] "*Jugend forscht"* is Germany's best-known competition for young people to get them excited about science and technology and find and promote talent (Stiftung Jugend forscht e.V., 2022)

> **"***It's actually part of everyday life that you always have people with you, to whom you also show and explain things.*
> *You pass on knowledge and also skills and also often different people have different opinions on one thing or how he does it, then you can look a little bit how you do it best for yourself*" (Silja)

The utilization of different ways of doing practices forms the younger residents. At the same time, its divergent nature contributes to residents' own decision-making regarding which "how-to" fits the specific individual best. The younger ones orient themselves based on the information they can elicit from colleagues' knowledge. They also copy how they structure their days and behave in certain situations. This is done by shadowing or working in groups. It is, however, acknowledged that they have to take on the initiatives to ask and teach themselves through colleagues. It is up to everyone how to get further. Asking colleagues is also perceived as increasing the diversity of knowledge, where different viewpoints can guide a better decision. The rotations support learning opportunities, as they can learn something new from different colleagues.

This group asks colleagues rather than superiors and shows resistance to asking supervisors. They perceive that older colleagues are more understanding than supervisors generally. It is also due to the proximity, where colleagues are easily accessible compared to the supervisors. The exceptions for asking senior physicians are when tasks are advanced, as it is legally required for a senior physician to execute the tasks. Involvement of senior physicians also occurs if there is a specific favorite senior physician that is working. For example, one of the respondents includes two senior physicians in his decision-making, while he tries to exclude two. He has the perception that the two favored senior physicians value his learning process and solutions and involve him in the decision-making. Another respondent has one favorite senior physician he perceived as the best one, who is very knowledgeable and structured. Although, this is not given, and the resident needs to be proactive in maintaining their relationship.

> "*I get along very well with him and he also likes to teach things. If you ask him why it is not like this or like that, he will work it out with you. You have to talk to him often, that's this proactive thing again. So basically you are responsible for your career and what you do with it is what comes out*" (Lars)

This statement highlights the importance of taking the initiative. The support functions within the system are not enough to acquire knowledge efficiently. Instead, the residents need to be proactive. In this case, the proactivity involves nurturing relationships with more experienced doctors.

The Self-Confident Teamplayer is perceived as lacking feedback, appraisals, and training from supervisors. They receive rather negative feedback or criticism. This silence from senior physicians means that it has to be correct if they do not say anything. If something has gone wrong, they will have already heard it. This lack of constructive feedback led the group to acquire learning feedback.

> *"I've actually got almost none of that. So constructive feedback about what you're doing well, what you're doing badly, what could be done better, that would certainly be good, but it doesn't work like that. I only got feedback from time to time in between, but not really any that got me any further."* (Elin)

The respondent feels that the communication does not improve her learning curve because it does not involve strengths, weaknesses, and improvement areas. Overall, this group does believe that constructive feedback and appreciation would improve their working environment.

The superiors are supposed to teach them actively, but the Confident Teamplayer does not experience it happening in practice. They are learning when they work and utilize colleagues' learning instead. Education is scarce. Instead, they take the initiative to get their colleagues' feedback and help each other evolve. Even if this group wants to have training and support from senior physicians, they still value their autonomy. They still want the senior physicians to leave room for them to do what they want, be able to structure their days, and make decisions on their own. However, if they need someone to show them something, they want to be able to get that. It is a balance between being supported yet having autonomy. Magnus, for example, wishes:

> "*To actually have someone who does it with you, at least for one or two times. Often they just throw you into cold water and you can try to figure out things on your own*" (Magnus)

This need to support is also fueled by criticism when things go wrong. On the one hand, this group means that they are left with making decisions on their own.

On the other hand, they will be criticized if they do things wrong. This context makes the colleagues very valuable for this group because they can get support from them.

4.3.3 The Uncertainty Avoider

The Uncertainty Avoider differs from other types by its extensive use of self-correcting, reflecting, and self-directed mechanisms, which involve reflecting on tasks and improvements, questioning one's procedures, and correcting one's behavior to learn. The labeling of this group is derived from its avoidance of criticism and the risk of losing respect by pursuing self-directed initiatives. They typically express resistance to asking senior physicians:

> "*Most of the time, it's actually a very nice way of dealing with us, I have to say. The one director or the two senior physicians, they roll their eyes sometimes because you ask them something. You don't like to ask them either. But if something happens, you actually pull yourself together more, present the patients in a more orderly fashion, as you once learned, as it should always be. Which sometimes gets lost a bit. But then you only get short answers, and the most necessary things are said.*" (Nea)

This group enjoys the way senior physicians deal with the residents, even though it is "*harsh*" (Magnus). They do not like to ask them, but when they do; it fuels self-correction and the resident acts in a more orderly fashion. Nevertheless, this group is satisfied with this way of dealing with them. They feel that they are allowed to ask anything if they give it a bit of thought themselves first. This group also says that some senior physicians are approachable:

> *"From senior physicians, it depends on the type, but you also always notice when something didn't go well, you get trouble"* (Erik)

However, the Uncertainty Avoider does not express support from senior physicians to a greater extent than that. One of the respondents refers to some physicians as "*lunatics*" and especially points out that she has a problem if she is on the same ward with this senior physician. Another respondent said that it was terrible at the beginning of his residency. This was when everything was overwhelming, and he felt that he had no support from anyone.

During the first two years of his residency, he was about to give up. Now, he is having fun and is normalized towards lacking information. They are working on their own, doing their job of duty. However, they feel like supervisors expect that everything should always go right, and if something goes wrong; their supervisor pillories them:

> "*He used to be extreme, at some meetings he would bang some ECGs* on the wall and say or ask what you were thinking. Also in front of everybody. That's just the way it is with us. That's probably how he learned it in his training, that's how it's done*." (Nea)

The behavior of the senior physician can be understood as public humiliation, as they question the resident's competency in front of all the others. The resident has, in one sense, normalized the "*harsh*" (Magnus) way of being treated at the hospital, as it is "*just the way it is.*" (Elin). This could, despite the normalization, be understood as a negative experience that residents are likely to avoid as much as possible.
However, most of the other senior physicians were described as moderate. Nevertheless, this group feels that criticism is usually expressed so that it does not come across as constructive. They also have the feeling that the senior physicians think, "*what an idiot*" (Erik), when they ask questions, regardless of whether what the resident said was right. Instead, they rather ask colleagues questions and do not dare to ask superiors. They are driven by the fear that the senior physician will lose respect for them or that they will be labeled as incompetent.

Furthermore, they describe that there were also "*many tears in the beginning*" (Nea). This was because they got a significant amount of negative feedback, and barely any positive feedback. Therefore, many give up quite early because they need to have a "*thick skin*" (Nea) to survive. In addition to that, this group emphasizes self-reflection and self-correctness in their learning. When mistakes are made, and they get into trouble with the senior physicians, they must reflect on it, learn, and draw conclusions. Then they have to pull themselves together and do it better next time. Mistakes or bad events are learning possibilities for this group, where they read through cases after work and put them into practice the next day. One of the participants also said that they must learn how to deal with mistakes, even if someone dies. In the end, they need to become numb to it while still trying to do better next time. They are often alone with their problems, worries, and questions. This leads to many self-reflections on how they could improve.

Since this group values being perceived as respected, they tend not to ask others. Instead, their learning initiatives involve self-reflection, self-correction, and using their spare time to read up on knowledge:

> "*I think it's more expected that it works and if you're not good at it, then sit down and learn that, that's completely harsh, of course there are other colleagues, but I think that's the mindset in the hospital. If you don't perform well, they tend to say, what a fool, he should sit down, because the others have to do the same. I had to fight for it myself or teach it to myself and if someone doesn't do it, then it's not in the sense of "Come on, I'll teach you something now" but rather you lose respect.*" (Oskar)

The Uncertainty Avoider perceives that there is a risk of losing respect from others if they ask someone to teach them something. It could be understood as a fear of "*losing face*" (Nea) which drives the clinician to sit down and learn by themselves.
This group believes that there is a lack of managerial support in feedback, appraisals, and training. The feedback they receive is without the little potential for improvement. To get feedback, they must demand it. Some of the participants have one senior physician whom they can ask and receive constructive feedback. These are rare situations, yet, when occurring, they influence the learning process positively. The same activeness they need to attain to receive joint meetings for feedback. This meeting has, however, when it occurred, not been structured enough to bring value to this group.

4.3.4 The Self- Directed Learner

Lastly, this analysis involves the Self- Directed Learner. The label of this type is derived from its strategy to acquire knowledge by itself. They distinguish from other types by learning much on their own, where initiatives to utilize explicit knowledge and training courses are highlighted. They continuously look up things via learning platforms or applications at work and put them into practice. One of the respondents operates with the learning platform *Amboss*, which she also used during her education.:

> "*What is often used is an app that was also used during my studies. Amboss, for example, which is the largest German reference work. In the meantime, everyone has a smartphone in their pocket so that such things can be looked up again, even on rounds. You have a question with a drug interaction and then you quickly look it up in your drug app. That's not really targeted learning, but that's what I meant by learning by doing*" (Mikael)

The participant means that he uses the application when encountering a problem and utilizes the information in practice; this is how he learns by doing. Besides this, the initiative that participants take is to note everything they believe is worth knowing in their everyday work. This group also engages in online training and reads journals and conferences during their spare time. These activities are all up to themselves, and there are no benchmarks on these aspects. The group feels like they are forced to read up on their own in addition to their clinical work.
There are *M & M conferences** that they can attend in their free time. The strategy for these groups is to utilize these to acquire knowledge. There is also an individual professional association called *Bund Deutscher Internisten* (*Association of German Internists*), where you can become a member. The membership in this group is valuable due to the magazines that they then receive about innovations within the medical profession. One of the respondents said that it is always "takeaways" (Mikeal) from these magazines that you can internalize and use in your everyday work. The learning never stops since there are many changes and innovations in medicine. In addition to these, this group read other journals that are sometimes discussed in the hospital-internal training courses.

> "*So what you learn from the clinic in terms of theoretical knowledge, that's maybe 10 - 20%, the rest you have to work out in your free time.*" (Mikael)

The statement shows the need for proactiveness in order to acquire knowledge. In this case, the group picks up theoretical knowledge during their free time.
This group also perceives that training possibilities require to be initiated by themself. They are entitled to three days of mandatory training. The choice of topics and actively planning of the training days are entirely left to their own devices. This group thinks that they have to take the initiative for being able to utilize their training days. Since the training is absent from their everyday work, it is terrible for the clinic. Therefore, they are not encouraged or supported to pursue their training days.

The members of this type have a good relationship with the senior physicians. They had an excellent experience shadowing the senior physicians when they were new at the hospital. However, they did not learn the best from this way. Generally, they ask their colleagues and look up things they do not know rather than going to senior physicians. However, this is more because of proximity.
Nevertheless, one of the participants thinks they are sometimes left on their own devices too much. This group acknowledges the lack of feedback and appreciation. Primarily, they are dissatisfied with the lack of appreciation, which they also see as a hindering and demotivating factor for learning:

> *"Little comes from the superiors, and especially when you're willing to step in a shift at short notice, that's not appreciated, and that's what sticks in the end. So you make an effort, and ultimately it is not rewarded."* (Alva)

4.4 Chapter Summary

In this chapter, we presented our empirical findings that emerged during the twelve interviews. All interviewees felt that the hospital's learning structure and supporting processes were inadequate. Structural barriers to learning were mainly named as a lack of feedback and appreciation, which according to some statements, harms the motivation and performance of the residents. Instead, the typical way of learning is executing tasks (by doing) and using collegial knowledge (horizontal learning). Moreover, the empirical material shows that respondents take specific and different initiatives to acquire knowledge and expertise. These initiatives differ and lead to different learning characteristics. Taking different initiatives has allowed us to further distinguish the types of knowledge acquisition to fully understand the meanings and interpretations behind them.
Thus, four different types of learning have been developed and will be related to the literature and further discussed in the following chapter.

5. Discussion

To approach our research question of how residents learn, this chapter will relate the empirical results of our qualitative study to the literature presented in Chapter 2. Certain aspects set the residents apart regarding how they are acquiring knowledge. This mainly concerns the direction and preference of how to learn, which can be derived from different interpretations and meanings that respondents perceive. These differences prevail over the need to nuance CoP further to fully understand its meanings and interpretations. Therefore, the first section will build upon Alvesson & Kärreman's (2001) framework, where a magnifying glass is put on *Communities*. This will result in the framework presenting four learning types within a CoP. These will be broadly characterized by two dimensions: the degree of managerial intervention and the attitude to acquiring knowledge. The second section will elaborate further on the four resulting learning types, their characteristics, positions within the framework, and how they are distinguished.

5.1 Communities

The empirical findings prevail on the significant role colleagues have in enabling learning. The role of colleagues is in line with the practice-based view and Communities of Practices (CoP), where knowledge is assumed to be associated with human activities (Hislop, 2009) and includes both individual and collective elements (Tooman, Akinci & Davies, 2016). The horizontal learning is rooted in the resident's shared philosophy; the more experienced colleagues teach the less experienced colleagues, while they still are on-call duty and teach themselves. Learning through everyday work is also assumed in the epistemology of practice (Styhre, Josephson & Knauseder, 2006; Hong & Snell, 2008), while the system of sharing knowledge in shared activities characterizes a CoP (Brown & Duguid, 1991; Lave & Wenger, 1991). The shared philosophy of passing on knowledge among members, presented in the empirical material, is a common culture in the medical profession. It involves a transformation from layperson to professional that evolves over a lifetime. From a situated learning and CoP perspective, this is referred to as how learners become total participants in CoP medicine (Mann, 2011).

Characteristics of CoP are that these communities arise spontaneously from the need to share knowledge and learn (Hislop, 2009). As the structure in the organization tends to be perceived as very unsupportive towards the residents' learning processes, the need to learn horizontally becomes crucial. One of the respondents said, "*we are trying to survive together*" (Magnus), showing the need they have for horizontal support among each other. Also, the residents emphasize the proximity to interact since they work so close to each other. In addition to these, as in CoP (Hislop, 2009), residents' working methods emerge from social interactions during their work activities. This philosophy also aligns with the assumptions derived from situated learning, where learning is inseparable from the context and social relations and practices (Mann, 2010). In fact, the whole system is built on horizontal support among members.

The analyses further prevail that horizontal learning is not formal; instead, it is based on a social story where everyone sees this philosophy as given. The residents perceive this shared philosophy, and insight on what is given in the context also prevails in the sense of shared identity and shared values (Brown & Duguid, 1991; Lave & Wenger, 1991). However, the initiatives and, in accordance, the behaviors related to learning activities tend to be separated between learning types. This difference might be explained using assumptions from situated learning, where context and culture provide specific experiences and meanings. Residents experience the community's interactions, values, challenges, and processes (Lave & Wenger, 1991). It is reasonable to assume that these experiences will be interpreted differently and be given various meanings to learning, regardless of the sense of shared identity and values as a community.

All in all, the residents are operating in a context aligned with the three building blocks of a CoP described by Brown & Duguid (1991); Lave & Wenger (1991), where participants share knowledge in a shared activity. The resident also has a sense of shared identity and shared values. Integrating this into Alvesson and Kärreman's (2001) knowledge management strategy framework, residents operate in a context referred to as Community (sharing of ideas).

5.2 Framework of Learning Types withing Communities

The purpose of the paper is to understand how residents learn medical practices. As stated in the previous section, the context is considered aligned with the characteristics of a CoP. This context also follows Alvesson & Kärreman's (2001) communities (sharing of ideas). In line with a CoP, learning elements are common for all the residents. For example, horizontal learning is crucial for the residents' learning process (Lave & Wenger, 1991; Hislop, 2009). The residents also learn by executing the specific task at hand. Hence, they also learn by doing. This aspect of learning is crucial in previous research (Teunissen et al., 2007; Lesgold, 2001) and a bridge between experience and the generation of new, personal knowledge (Kolb, 1984).

While some practices are standard for all, certain aspects of how they acquire knowledge set the residents apart. This mainly concerns to which extent the residents take a particular direction to acquire knowledge, which is based on the residents' preferences. The preferences to acquire knowledge can be derived from different interpretations and meanings that respondents perceive. These interpretations and meanings, in turn, form the initiatives (the direction) that the residents take to acquire knowledge. For example, we can see that all respondents use applications on their phones to elicit explicit knowledge. However, they differ in the extent to which this initiative is preferred. The preference inheres specific meanings and interpretations of the context, which forms the initiative (direction) towards using these applications (or not) to acquire knowledge.

These differences between initiatives show the need to nuance CoP further to understand the meanings and interpretations behind it fully. Building on Alvesson & Kärreman's (2001) framework, this thesis, therefore, magnifies the context of communities (sharing of ideas) and provides a framework for examining the differences in CoP concerning the learning processes of residents. It contributes to a more nuanced view of how actors learn in the context of a community (sharing of ideas) and CoP.

The residents' preferences, which will form the initiatives, can broadly be categorized into two dimensions. Alvesson & Kärreman (2001) makes a distinction between social (attitudinal control) and technostructural (behavioral control) types, where the first one refers to efforts of coordination through attitudes and the latter refers to coordination through behavior. This forms the dimension *medium of interaction*.

Following our argument for the need to nuance CoP further, the framework provided in this thesis magnifies Alvesson & Kärreman's (2001) *communities*. Therefore, it will involve the dimension that they labeled "*social*" (attitudinal control). However, as the empirical finding prevails, there are differences in interpretation of the norms and attitudes that the social dimension refers to (Alvesson & Kärreman, 2001). Therefore, the social medium of interaction will be further divided into the relationship-oriented and self-directed attitude toward learning. Hence, the first dimension builds on the social medium of interaction and is labeled as *attitude toward learning*.

The latter builds upon the degree residents acquire knowledge by relying on others or are self-directed. These attitudes and initiatives are categorized into self-directed learning or relationship-oriented learning. On the one hand, self-directed learning involves the preferences and, therefore, initiatives toward learning using non-relational sources. These could be magazines, independent training courses, applications, and journals. It is also learning through self-reflection and self-correction, which involves reflecting on tasks and improvements, questioning procedures, and correcting one's behavior to learn.

On the other hand, relationship-oriented learning involves the preferences, hence, initiatives to acquire knowledge through others. These could be peers, mentors, or other individuals that excel in the individual's learning. Although it differs between types, relationship-orientation may also involve learning from supervisors.

The second dimension is the degree of managerial intervention, which is taken from and has the same meaning as Alvesson and Kärreman's (2001) *managerial intervention*. This dimension explains the degree to which managerial intervention affects the learning processes. This involves all activities where supervisors transfer knowledge and knowing to the individual, different sorts of feedback processes, and training. It also involves more indirect influences, such as interactions between a supervisor and employee that affect the subordinates' initiatives and preferences for learning.

This thesis builds upon Alvesson & Kärreman's (2001) framework and magnifies the context of communities (sharing of ideas). From this, it provides a framework for examining the differences in CoP concerning the learning processes of residents. It contributes to a more nuanced view of how actors learn in the context of a community (sharing of ideas) and CoP.

The differences in learning processes are broadly explained by the two dimensions: the attitudes for learning (self-directed or relationship-oriented) and the degree of managerial intervention (high or low). The model further builds on the assumptions of situated learning, where learning is inseparable from its context and social relations and practices (Lave & Wenger, 1991). However, how these are experienced and interpreted will inform individuals of different ways of acting. These differences result in different initiatives toward learning, shown by the arrows within the model. As stated, initiatives are treated as actions that residents pursue in a specific direction in order to acquire knowledge. These initiatives form the framework of four learning types 1) *The Confident Teamplayer,* 2) *The Networker*, 3) *The Uncertainty Avoider* and 4) *The Self-Directed Learner*.

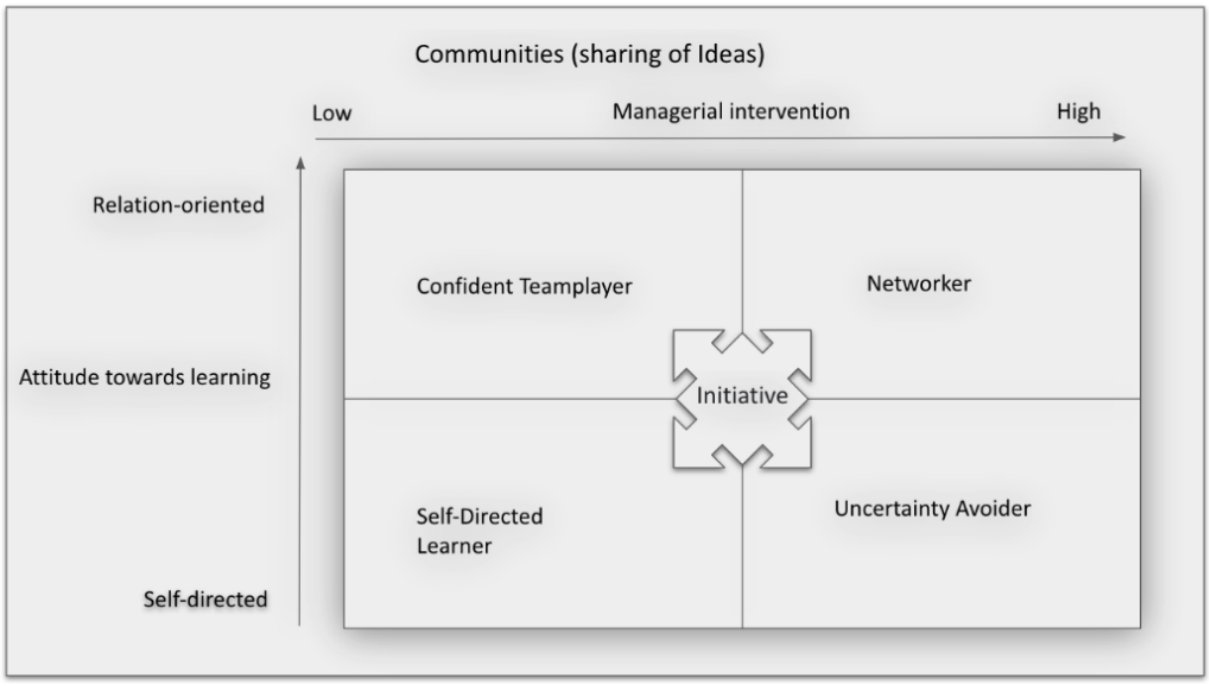

Figure 2: *Learning Types within Communities (sharing of ideas), own representation*

What is important to note is that the framework only magnifies the context of *communities*. If we were to zoom out again, the dimensions and corresponding categorizations described by Alvesson & Kärreman (2001) are still viable and aligned with the framework presented here. This means that, compared to the Confident Teamplayer and Self-directed Learner, the Uncertainty Avoider and Networker have more similarities with Alvesson & Kärreman's (2001) *normative control.* It is also somewhat possible to say that, compared to the relationship-oriented types, the self-directed types are more aligned to Alvesson & Kärreman's *extended library*.

This is because of the similarities in utilizing technical means; IT, and information processing. However, one distinct difference is that the people within this framework are not provided with this technology. The self-directed types take the initiative to learn through technical means. Therefore, these similarities are not discussed further than that.
Nevertheless, it is essential to note that all learners are within a context of communities. Therefore, the framework assumes that all learning types acquire knowledge horizontally from peers and pursue tasks at hand (learn by doing). Furthermore, the framework acknowledges power as inherent in social relationships, positive power, and its effects (Carlsen et al., 2020), as well as possible tensions within a community resulting in unequal power distributions (Lave & Wenger, 1991). In the following section, the different learning types will be further examined.

5.2.1 The Networker

The Networker is categorized with a high managerial intervention, as their interactions with supervisors form their way of acquiring knowledge. This involves the relationships they nurture with senior physicians and supervisors, as well as their opportunities for acquiring knowledge through feedback, internal training courses, and appraisals. In addition, they are classified as relationship-oriented since the Networker relies on others to acquire knowledge. This is done through colleagues, supervisors, and external mentors.

The Networker relies on others for acquiring knowledge, both horizontally and vertically. Thus, their attitude toward acquiring knowledge is relationship-oriented. This group tends to have a good relationship with senior physicians and colleagues and has a strategy to acquire knowledge through mentors. This strategy involves both senior physicians and older colleagues. Monks et al. (2016) see mentoring as an opportunity to improve learning. It is based on a role model relationship in which a more experienced member takes a supportive role in developing a less experienced employee (Beardwell, 2017). Here, the learner takes an active role in the learning process, shaped by goals, values, and experiences. A reciprocal and dynamic relationship develops between the learner's behavior and their environment (Bandura, 2001). This mentoring process is general for all the groups, yet the Networker differs by strategizing the mentorship in everything they do.

It involves finding specific mentors and creating relationships with those both horizontally and vertically. *Mentoring* is a formal structure that can foster informal knowledge sharing (Garvey & Williamson, 2002). However, the formal mentoring program is not considered valuable for the majority. The residents acknowledge that they must take their own initiatives to find mentors to help the residents evolve. Therefore, the unstructured mentorships that the residents acquire could be considered to enable their learning.

This group is one of two labeled as relying on others rather than the types that are more self-directed in their attitudes toward acquiring knowledge. Nevertheless, the networkers take self-directed initiatives outside working hours; the group goes to training to meet others in the profession and learn more about their specific development areas. However, the strategies for these activities are relationship-oriented, as it involves finding mentorship.

The experienced senior physicians are always approachable, and they help the networkers when needed. However, the networkers also are aware that they are in a fortunate position. For example, feedback is rare, which is typical for the medical field (Wood, 2000; Raftery, 2001). This rarity may be rooted in the fact that supervisors responsible for residents must prioritize patient care, which often simultaneously means that the supervision of trainee physicians is minimized. This occurs especially during stressful periods when feedback to residents would be even more crucial (Clynes & Raftery, 2008). The demands of patient care and trainee support are conflicting tension and pose a constant problem in providing quality supervision and feedback to residents (Atkins & Williams, 1995; Kaviani & Stillwell, 2000; Clynes, 2004). However, this group has been favored in this aspect and received uncoordinated feedback from the seniors. Because of its rarity, it could be considered a privilege.

Furthermore, Clynes & Raftery (2008) and Wood (2000) emphasize the pivotal role of feedback on clinical performance, recognizing it as the most available and influential learning method. Therefore, it could also be considered a perk and a positive aspect.

The reason why the Networkers receive this privilege and perk may be explained by considerations of power as produced and reproduced in the dynamics of emerging social relationships (Carlsen et al., 2020). According to Carlsen et al. (2020) power is embedded in people's actions, conversations, and interactions. As they know they are in a fortunate position and express that they get along well with their superiors, this perk and privilege may be derived from their actions, conversations, and interactions that result in their reception of feedback. This reasoning also applies to their view on receiving appraisals and training.

One could also say that it is the knowledge and knowing of the “how-to” of receiving these perks and privileges which result in them getting these. This reasoning aligns with the argument that knowledge is equally embedded in specific contexts and practices (Carlsen et al., 2020). In addition to this, it seems like this group also received coordinated feedback on individual projects within the year and have coordinated meetings talking with the supervisor about their development. Performance appraisals are particularly relevant for this evaluation and provide individuals with information about their performance and progress (Beardwell, 2017). It is, therefore, a matter of providing feedback. This type also perceives that the senior physicians give them room to practice according to their aspirations and encourage the residents to do advanced training.

The Networkers have more influence from managers than the Confident Teamplayer. This influence is derived from feedback, appraisals, and the involvement of supervisors. Because of these elements' rarity, it is considered perks and privileges that the networker receives. This may come from the knowledge of “how-to” receiving these perks and privileges. One could argue that the practice of this knowledge (“how to” receive perks) also aligns with the approach left of communities, "normative control." Normative control involves efforts from management to encourage employees to "buy into" the culture and create certain attitudes and values toward organizational knowledge processes (Alvesson & Kärreman, 2001). As the networkers receive these perks and privileges by acting in specific ways, it is reasonable to assume a rewarding mechanism that may influence their behaviors. Nevertheless, they are still positioned within the communities and cannot be defined by a normative control approach. However, this group does have more splashes of normative control approaches than the groups on the left side of the framework.

5.2.2 The Confident Teamplayer

The Confident Teamplayer are positioned in the framework with low managerial intervention, as their primary source for acquiring knowledge is derived from horizontal learning. This type utilizes the benefits of a CoP, which also prevails its dependence on others to acquire learning. These individuals are, therefore, relationship-oriented in their attitude towards knowledge.

The Confident Teamplayer is relationship-oriented in their attitude to acquiring knowledge and represents the essence of characteristics within a CoP. They inherit the three cornerstones of CoP since the group relies almost exclusively on horizontal learning for acquiring knowledge, and the team identity and shared values are very united (Brown & Duguid, 1991; Lave & Wenger, 1991). For example, the group dynamic is expressed as the main reason for still working at the clinic. It is very team-based, and everyone is dependent on each other to practice successfully, which shows the participant's activities of sharing knowledge in shared activities (Brown & Duguid, 1991; Lave & Wenger, 1991). Further, the team spirit and willingness to help out, jump in, and share knowledge are embedded in how they do things at the clinic. It is understood by each other and described as friendly rather than collegial. These examples show the sense of shared identity and shared or overlapping values (Brown & Duguid, 1991; Lave & Wenger, 1991).

Further, shared values are salient as it is perceived that the older ones teach the younger residents while the older ones explain, show, and give feedback to the youngsters. The values of sharing knowledge among members are the essence of how this group learns. The confident learner takes the initiative to learn from others, teaches himself, and receives teaching from colleagues to acquire learning.

This shared identity within CoP improves tacit knowledge sharing (Hislop, 2009). The younger ones orient themself based on the information they can elicit from colleagues' knowledge. They do this by shadowing the older ones and working in groups. These activities are aligned with the reasoning of Mann (2011), where beginners enter the periphery of a community by observing and performing basic tasks. As they become more competent than before, they move to the center of the community. The Confident Teamplayer also copies how the colleagues structure their days and behave in certain situations. Over time, they learn how to do this by themselves. According to Cook & Brown's (1999) terminology, this is the group's members' activities, interactions, and practices that can be understood as knowing. From copying and observing to knowing specific to the clinic, this process shows that through participation, active engagement, and the assumption of increasing responsibility, individuals adopt and appropriate the culture and community's roles, skills, norms, and values (Mann, 2010). This statement is shown by the interviewees explaining their history within the clinic regarding learning. However, since we have not had the opportunity to observe the group over time, we cannot speak of detailed evolvement and changes within the community due to their participation. However, this form of dynamic is not the aim to study.

Instead, it is to understand the dynamic in the sense of relations within the community and how it affects the residents' learning initiatives.
Asking colleagues is also perceived as increasing the diversity of knowledge, where different viewpoints can guide a better decision. CoP is seen in the literature as beneficial to both individuals and organizations because it can bring innovation (Hislop, 2009), which may be positively influenced by the diversity of points of view provided by horizontally learning from different colleagues. The rotations are perceived as supporting learning opportunities, as they can learn something new from different colleagues. CoP provides the potential to facilitate individual and group learning and the sharing of knowledge within the community (Hislop, 2009).

As stated, the Confident Teamplayer's attitude toward acquiring knowledge is relationship-oriented. As all groups are within the communities' approach, all groups operate with interaction as a medium. However, there are some differences. The Confident Teamplayer uses Amboss to acquire explicit knowledge, yet, this group asks colleagues about choices of medication rather than looking it up by themselves through explicit knowledge sources. This attitude differs from groups categorized as more self-directed.

The Confident Teamplayer asks colleagues rather than superiors and shows resistance to asking supervisors. They perceive that older colleagues are more understanding than supervisors generally. As this can be interpreted as a loss of essential knowledge, which we will elaborate on further later in the section, it is, on the other hand, also exert a positive force and potentially open up new ways of acting and thinking. These new ways align with coactive "*power to*" (Carlsen et al., 2020) because the resistance to asking supervisors makes the bonds strong between the team members. It may be the driving force in creating the sense of trying to survive together. The *power to* is inherently cooperative and fosters imagination by building connections and collective action (Follett, 1940). Since it is given that most of the community members cannot expect help from senior physicians, they need to help each other and take initiatives towards building connections and acquiring knowledge through collective actions. Carlsen et al. (2020) believe that power produces reality. Regarding knowledge, the reality for the Confident Teamplayer is to acquire knowledge by taking collegial initiatives. However, except for power dynamics, it is also, due to the proximity, where colleagues are easily accessible compared to the supervisors (Verburg & Andriessen, 2011).

On the other hand, of resistance to senior physicians, the Confident Teamplayer does have one or two senior physicians called out as favorites. These are included in the decision-making, while attempts to exclude other senior physicians are expressed. CoP is predominantly presented in the literature in an idealistic view in which the community lives in harmony. This idealistic view gives the impression that CoP brings only benefits. However, tensions within a community may result in unequal power distributions that can escalate into conflict (Lave & Wenger, 1991). In this case, the group expresses the unequal power distribution towards the more learned, the senior physicians, who do not have formal power over the residents as their boss.

Nevertheless, they have the authority and power from their expertise. Therefore, the residents are dependent on the senior physicians. Conflicting to this, they perceive most senior physicians as less understanding, resulting in the exclusion of their expertise by simply not asking them for help. Carlsen et al. (2020) render power as something that is produced and reproduced in the dynamics of emerging social relationships rather than a resource. The perception of the senior physicians is dependent on how they interact in the working environment, where the favored senior physicians like to teach things and are structured and knowledgeable.

Interestingly, the residents do not talk about the same senior physicians. Instead, their social relationship with the individual forms from whom they can acquire knowledge. Like the Networker, the knowledge from more experienced is not given, and the resident needs to be proactive in maintaining their relationship.

This group's managerial intervention is low, whereas one reason for this is derived from the group's resistance to asking senior physicians. However, they have one or two specific favorite senior physicians that they tend to turn to while excluding other supervisors. The Confident Teamplayer also does not receive the perks of feedback and yearly appraisals from superiors, which motivates the positioning of low managerial intervention. It also fuels the group's reliance on the collegial exchange of knowledge and feedback. The residents express that they perceive feedback from time to time; however, it is perceived as non-constructive feedback with no potential for improvement. Therefore, according to Wiggins (1993) and Eraut (2006), this cannot be viewed as feedback as it involves opinions and judgments about current performance and identifies opportunities for improvement. Wood (2000) also views feedback as non-judgmental and non-evaluative. Therefore, this is labeled as criticism rather than feedback.

However, there is consensus in the literature that feedback in medical education is rare despite its mandatory necessity in the learning process (Wood, 2000). This consensus is aligned with this group's perception of the rarity of feedback.

Aligning this insight with single and double-loop learning (Argyris & Schön, 1978), where an error encompasses anything that prevents organizations' learning, there is an extensive error in the feedback processes for this group. Since feedback is emphasized in clinical practice as a "*key step in the acquisition of clinical skills*" (Ende, 1983, p. 777), this aspect may cause the Confident Team Worker to lose learning. In addition to these, the group also lacks training opportunities. Learning through formal training and education are, however, contrasting with learning through a practice-based approach through everyday work (Styhre, Josephson & Knauseder, 2006; Hong & Snell, 2008). Therefore, there is a tension between the expressed need for more training and the practice-based learning as they operate today.
All in all, these groups are labeled with low managerial intervention and a relationship-oriented attitude toward learning. This categorization is derived from the Confident Teamplayer's value of the team and taking initiatives towards acquiring knowledge horizontally rather than vertically. The reliance on others for learning also reveals their attitude toward learning.

5.2.3 The Uncertainty Avoider

The Uncertainty Avoider is categorized as having attitudes towards self-direction rather than relying on others. They are also presented in the framework with a high managerial intervention. The latter may appear contradictory as the Uncertainty Avoider still perceives an initial lack of managerial support. This is explained by the fact that their self-directing initiatives toward learning are fueled by criticism, fear, and the risk of losing respect or being perceived as incompetent by their superiors. These experiences drive the Uncertainty Avoider type to initiatives towards self-directed learning, self-reflection, and self-correction.

With this learning type above all, reflective learning about the experiences in medical practice is of high importance. They participate and learn when reflecting on that experience afterward (Boud, Keogh & Walker, 1985).

Cook & Brown (1999) believe that there is always a cognitive aspect to this, which is necessary for intellectual reflection to develop knowledge from it. Thus, it can be described as a type of "*trial and error*" strategy, although errors negatively affect this type of learning. Kolb (1984) suggests that reflection on past experiences helps us identify gaps in knowledge. Again, a parallel can be drawn with the Uncertainty Avoider, as residents belonging to this group do not want to do anything wrong, want to maintain the respect of others, and therefore put much effort into their continuing education themselves. They show traits of SDL by trying to fill these very knowledge gaps to prevent mistakes and thus avoid asking others for advice in the first place. They learn in a self-correcting and self-directing way, whereby learning through exclusive self-reflection always includes uncertainty, conflict, and ambiguity (Schön, 1987).

Wood (2000) assigns several roles to a supervisor as an educator in the health sciences who have in common that they share their knowledge and experience for the benefit of the learner. This group of learners cannot confirm this. On the contrary, they often, especially in the early days as residents, feel left alone and thus feel forced to take their knowledge acquisition into their own hands. Mann (2011) argues that differences in power can trigger conflict in processes of legitimate peripheral participation when new members join the community who are less experienced and less knowledgeable than older members at the time (Mann, 2011). This process requires, however, also that the older members first teach the younger ones (Lave & Wenger, 1991). While the Uncertainty Avoiders perceived a lack of learning from the older members (senior physicians), it may trigger a conflict. However, in this case, a conflict happens inside the individual rather than with the older member. This, in turn, may excel self-directed initiatives as an alternative way to acquire learning. From this perspective, "power to", or power as a positive force, becomes relevant. While the external pressures in the context (senior physicians' interaction with the resident) do foster the residents' imagination to new ways of attaining knowledge (become self-directed), it is not in line with Follet's (1940) cooperative nature. The "power to" salient in this case is the potential residents show to form their learning path (VeneKlasen, & Miller, 2007) and utilize the individual's creation of new possibilities and actions (Mathie, Cameron, & Gibson, 2017).

The self-directed actions are further fueled by the need to reflect and elaborate independently on a question as a prerequisite to asking supervisors for their opinion, as they, otherwise, experience criticism and fear of being perceived as incompetent.

This is aligned with Carlsen et al. (2020) considering power as embedded in people's actions, conversations, and interactions. The adverse outcomes of the interactions and conversations with the supervisors drive the Uncertainty Avoider type to specific actions; these are initiatives towards self-directed learning, self-reflection, and self-correction. They believe this approach is preferable as they maintain their respect in the clinic, which unfolds the produced and reproduced mechanisms of power derived from social relationships (Carlsen et al., 2020). This is because the social relationship between resident and supervisor, in this case, has an inherent mechanism of self-correction as it benefits the resident to maintain the desired power position to be respectable and competent towards its supervisor.

Similar to the Networker, one could argue that the characteristics of the Uncertainty Avoider also somewhat align with the approach left of *communities*, which is Alvesson and Kärreman's (2001) *normative control*.
The group still appreciates the superiors' disciplinary effects, so they "buy into" the culture (Alvesson & Kärreman, 2001). Furthermore, the Uncertainty Avoider experiences the importance of being perceived as competent and respected. Therefore, it is reasonable to assume that Uncertainty Avoiders act in a specific way to acquire knowledge that avoids negative experiences (criticism, losing respect). Thus, aligned with normative control, they create certain attitudes and values towards organizational knowledge processes (Alvesson & Kärreman, 2001). In this case, there is avoidance of punishing mechanisms that influence their behaviors toward self-direction rather than influences from rewarding mechanisms.
Nevertheless, it is still within the communities and cannot be defined as a normative control approach. However, similar to the Networker this type does contain more elements of normative control approaches than the groups on the left side of the framework. Although, the intent for this type of managerial intervention cannot be concluded.

The fear of looking foolish is decisive for residents in the Uncertainty Avoider learning type, so they initially want to avoid asking a "*stupid question*" (Erik) to senior physicians. Teunissen et al. (2009) explain this behavior in their study by the fact that the "*feedback costs*" (p. 910) perceived by the feedback recipient are considered too high. In addition, they were able to determine that the resident's feedback-seeking behavior depends in part on the supervisory style of the attending physicians (Teunissen et al., 2009). Cahill (1996) complemented this by finding that a good supervisor provides constructive criticism and does not allow inaccurate practices to continue.

These findings can also be confirmed in this type of learning. For example, a particular senior physician, referred to by a resident as a "*lunatic*" is more likely not to be sought out as a provider of feedback, primarily because he seems to have a well-known tendency to make that feedback abusive, personal, and in front of everyone present. The relevance of feedback to the achievement of clinical competence has been highlighted extensively in the literature (e.g., Ende, 1983; Eva & Regehr, 2005; Teunissen et al., 2009;) and in this thesis. Atkins & Williams (1995) address that feedback can contribute to personal growth and increase self-confidence and self-esteem.

Several other studies (Semmer & Jacobshagen, 2010) suggest how practices such as constructive feedback or the opportunity to ask for advice can increase an individual's self-esteem.

Self-esteem for this type of learner specifically would mean that their insecurity is increasingly suppressed, and they are aware of what they are capable of. We found in this research that the structures in internal medicine residents' everyday work are not designed to receive feedback on their performance. If they want constructive feedback, they must ask for it actively; if they do not ask, they do not get feedback. However, feedback from the outside is highly relevant to their learning process (Eva & Regehr, 2005), and staying away can potentially lead to repeating the same mistakes (Cahill, 1996). This, in turn, increases the risk of negative feedback, which reinforces the Uncertainty Avoider's position and discourages them even more from actively asking someone for advice. A kind of vicious circle is created.

At this point, it should be noted that all learning types are nevertheless within a CoP. Therefore, the Uncertainty Avoider still uses the option of asking his colleagues, albeit to a lesser extent than other learning types. Suppose he would now increasingly check with his colleagues instead of the supervisor. The CoP would likely be further strengthened, and the absence of formal organizational structures would become even more apparent.

In addition, mentoring could be a way for this type of learner not to be directly dependent on managerial interventions but still receive feedback and have a point of contact. This would also strengthen informal knowledge sharing (Garvey & Williamson, 2002) and help them be more confident in their daily lives.

Also of interest in this context is an influencing factor specifically relevant to medical practice when a non-routine case occurs.

Expertise related to these exceptional cases is more difficult to obtain in the day-to-day professional practice of a resident because the right situations rarely occur. They are often handled by established specialists rather than residents (Lesgold, 2001). It becomes clear that it is challenging to acquire the full range of medical knowledge by oneself, especially in medicine.

For this, organizational structures that ensure that learners, who have a legitimate role in the community, actively contribute to the institution's growth would be fundamental. However, this requires reception of affective and emotional support, pedagogically and organizationally supported learning, and minimization of barriers to participation through organizational support (Dornan et al., 2007). This contrasts with the statements of Uncertainty Avoiders, as they doubt the pronounced existence of these structures and criticize a lack of feedback, recognition, and support by their supervisor. Hiregoudar & Kotabagi (2007) mean that the lack of support from the environment is detrimental to knowledge creation.

Therefore, it becomes managerially relevant, albeit reluctantly, because they show the need for reassurance from the senior physician. This need for support contrasts with their overcoming it. The latter is based on previous negative experiences with their supervisors, some of whom become indignant or abusive when asked questions. This negative experience is consistent with the literature, recognizing that medical education is primarily associated with destructive and personal feedback (Raftery, 2001).

5.2.4 The Self- Directed Learner

The Self- Directed Learner is classified as having an attitude toward self-direction with low managerial intervention. This type does not learn from senior physicians to a greater extent. Instead, the Self- Directed Learner distinguishes from other types by acquiring knowledge through magazines, journals, applications, and independent training courses. This initiative prevails the self-directed attitude that this type of learner has, which naturally categorizes these individuals as relying on themself to acquire knowledge.

The Self- Directed Learner focuses on his self-study and acquires explicit knowledge primarily through learning platforms (e.g., Amboss), professional journals, and continuing education. He takes responsibility for his learning and is self-directed as much as possible.

This parallels Garvin, Worthington, McGuire, Burgetz, Forster, Patey, Gerin- Lajoie, Turnbull & Roth's (2017) statement that practicing physicians are primarily responsible for their lifelong learning to maintain competence. Self-directed learning is related to increased curiosity, critical thinking, better decision-making, motivation, competence, and self-confidence. These are essential attributes of physicians that fundamentally argue for self-direction (Rosenblum & Darkenwald, 1983).

In medicine, there is a growing focus on the importance of learner self-direction (Mann, 2011). Quirk (2006) even suggests that medical education should shift more toward teaching metacognitive skills, as knowledge and skills quickly become obsolete in the medical context.

The Self- Directed Learners take care of their continuing education and online training, so they are more likely to perceive techno-structural means to acquire knowledge. On the one hand, they, therefore, appreciate the structure provided by the hospital, for example, advanced training. On the other hand, they are aware that they nevertheless pick up a lot via "*learning by doing*" and that the experiences and participation in everyday medical life are essential factors that then, in turn, influence their choice of means for self-direction.

Lave & Wenger (1991) assume that learning is no longer just an individual but a social and collective process that involves the influences and interactions in the learning environment and comes about through the learner's active engagement. The Self- Directed Learner strives to increase his knowledge - but manages this mainly independently, receiving little outside guidance on directing his learning. This is consistent with Nothnagle et al. (2010) criticism of SDL. In addition, the self-direction of this type of learner is not necessarily voluntary, as he resorts to self-directed learning because, in his view, organizational structures offer him little room for alternatives. Often, the Self- Directed Learner feels left alone and tries to compensate for this through active self-direction. Here the influence of CoP may become relevant because even though the Self- Directed Learner tries to help himself primarily, he/she simultaneously interacts with colleagues in order to acquire knowledge, as all the learning types are horizontal learners. However, compared to the Confident Team Player and the Networker, the Self-Directed Learner takes self-directed initiatives rather than relationship-oriented.

Situational learning as an active participant who learns from and with all community members (Egan & Jaye, 2009) is most relevant to this type of learner in the context of the patient due to group restraint and considerable self-direction. The learner is actively engaged in tasks that contribute to patient care (Lave & Wenger, 1991).

For the community, situated learning provides a context and culture within which the experience can be integrated and given meaning. When reflection occurs between individuals and incorporates the context of the experience, the opportunities to adopt collective norms and values are significant (Lave & Wenger, 1991). The extent to which the Self- Directed Learner is involved in these collective norms and values of CoP remains an open question.

According to our empirical results, the Self- Directed Learner presents little managerial intervention compared to the other learning types within CoP. Even though this type of learner makes every effort to acquire as much explicit knowledge as possible and self-direct independently, he has no clue about his performance or potential development areas. As a critical voice on SDL, Eva & Regehr (2005) emphasize the importance of feedback from reliable and valid external sources on the path to self-improvement. Experience alone, without personal reflection and mentoring from outside, is not sufficient to develop a resident's competencies towards becoming a specialist (Aukes et al., 2007). However, the COP and horizontal learning may inform the residents. As self-directed behavior may be influenced by Carlsen et al.'s (2020) interpretation of power, where power is embedded in actions, conversations, and interactions, the empirical material cannot conclude this relationship. For example, the Self- Directed Learner utilizes actions of looking up things by themself and then learning by doing it rather than asking senior physicians for help. The reason for this may be embedded in social relationships, for example in interactions and conversations, yet it cannot be stated. What can, however, be said is that this group shows the potential to create knowledge opportunities for themself, which is aligned with the *power to* concept used by VeneKlasen, & Miller (2007). Possibilities and actions (acquiring explicit knowledge through AMBOSS, magazines, and independent training courses) are created, which shows the "*productive and generative potential of power*" (Mathie et al., 2017, p. 57).

Chun-Heung and French (1997) believe that clinical teaching and learning require a supportive environment. This could include feedback from the supervisor in this context, as this is something the Self- Directed Learner misses and has in common with the other learning types, despite their independent learning strategy. However, this learner type's lack of recognition is particularly evident, which harms his learning. Maslow (1943) recognized in his pyramid of needs that people crave recognition and appreciation, among other things, and that these significantly impact their self-confidence, motivation, and perceived ability.

In addition, Ventrice (2003) places particular importance on managerial recognition, finding in his research that 70% of the most meaningful recognition came from a manager. The opportunity for personal growth through training or teaching is part of such recognition (Semmer & Jacobshagen, 2010). In this context, this would mean that allowing rotations to different departments to be completed as part of residency training would also be a type of recognition.

Table 2: *Comparison between learning types within CoP, own representation*

	The Networker	**The Confident Teamplayer**	**The Uncertainty Avoider**	**The Self- directed Learner**
Attitude toward learning	Relationship-oriented	Relationship-oriented	Self-directed	Self-directed
Managerial intervention	high	low	high	low
Learning strategy	Horizontal & vertical learning, mentors	Horizontal learning through colleagues & selected mentors	Self- reflection Self- correction	Non- relational sources, e.g., journals & trainings
Power influence	social relationships; receiving perks & privileges from superiors	social relationships; fuels CoP	social relationships; fuels self-correction due to negative experiences with supervisors	On its own; "*power to*"
Main source of feedback	superiors	peer	peer	lack of feedback
Social level	group	group	individual	individual

We have learned about the different learning types that were unfolded from the empirical research. A significant issue that receives less attention in the literature is the internal dynamics that CoP can shape (Lave & Wenger, 1991). As power aspects have been acknowledged in the framework of learning types, the internal dynamic that corresponds with each learning type has prevailed. This internal dynamic, in turn, results in inevitable tensions within the CoP that correspond to different learning types. Even if there are no formal hierarchies, tensions within a community may result in unequal power distributions that can escalate into conflict (Lave & Wenger, 1991). In this case, tension refers to contradictions that may escalate into conflicts.

However, these refer to an internal conflict within the individual rather than conflicts on a group level. The tensions are also derived from the power aspect related to the specific learning type.

Table 3: *Comparison between tensions within the learning types, own representation*

	The Networker	**The Confident Teamplayer**	**The Uncertainty Avoider**	**The Self- Directed Learner**
Tension within CoP	No salient tension	need for more structured learning & current practice-based learning	Dependence on superior & simultaneous resistance to superior	Independence & CoP affiliation

As shown in Table 3, there is no salient tension within the Networker, as actions, context, and strategy coincide. On the other hand, the Confident Teamplayer misses structures in the sense of regular feedback, appreciation, and training. On the other hand, the same lack of structure allows the emergence of a community of practice, where horizontal learning and practice-based learning are central components. This presents a tension between the need for autonomy and structure in learning.

The Uncertainty Avoider shows the resistance to acquiring knowledge from supervisors because of the fear of losing respect, as well as experiencing bad encounters. However, they show the need for reassurance from the senior physician, as these are the ones holding the knowledge. This need for support contrasts with their overcoming it, which forms the tension between the dependency of superiors and resistance of superiors.

Finally, the Self- Directed Learner acquires knowledge through independence. However, this contradicts the very essence of a CoP, where shared meanings and identity are cornerstones of its existence (Brown & Duguid, 1991). This contradiction in the approach of learning and operating context forms the tension between independence and being part of the CoP.

5.3 Chapter Summary

Referring to our research question, how medical residents learn, we identified in this chapter that there are similarities and differences in their learning behavior.

Starting with the commonalities, we were able to show that all medical residents are part of a community of practice characterized primarily by horizontal learning and knowledge sharing within the community. The existence of this community is due to the lack of structural support in their learning. The perception of insufficient learning structures is primarily due to the lack of feedback, which all of them consider a deficit.

However, as we proceeded, we found that residents' learning preferences differed within the CoP. Hence, we provided a more precise nuance of the community dimension in Alvessson & Kärreman's framework (2001) based on our empirical material. This resulted in the four learning types 1) The Confident Teamplayer, 2) The Networker, 3) The Uncertainty Avoider and 4) The Self- Directed Learner. As summarized in Table 2, these exhibit different learning preferences based on how residents use horizontal or vertical interactions. It should be emphasized that despite the identified differences in learning behaviors, they are nevertheless all learning within the CoP.

With all these insights, we shed further light on how medical residents learn.

The next chapter will conclude our study, build on the key findings just presented, and demonstrate our study's empirical and theoretical contribution.

6. Conclusion

Our qualitative case study aimed to explore how internal medicine residents learn. In order to answer this research question, we related our empirical findings to the literature in the previous chapter, thus recording our theoretical contribution.
In the following, we will now review our empirical findings and summarize to what extent our research question was answered and what theoretical contribution we were able to make in the context of this study.
Thereafter, we will outline the limitations of our study and present suggestions for further research. Finally, we will give some implications for medical practice.

6.1 Theoretical Contributions

The purpose of the paper is to understand how residents learn medical practices. Our findings shows that official learning structures and support from the hospital are perceived as insufficient by residents. This lack of organizational structure allows an informal community of practice to emerge and fuels the creation of their own learning structures. Therefore, the research question, "*How do internal medical residents learn?*" is answered in the context aligned with Alvesson and Kärreman's (2001) Community (sharing of ideas) and CoP. Here, residents share knowledge in a joint activity and have mainly a shared sense of identity and meaning (Brown & Duguid, 1991). The common ground of identity and meaning is derived from the informal and given philosophy of doing things within the context. The saying "*see one, do one, teach one"* is one example of this.
Another example is how horizontal learning is self-evident, where residents are trying to survive together. These common grounds are aligned with the shared ways of learning found in the research; horizontal learning and learning by doing. These two aspects have been found to be significant factors for how residents learn.

However, certain aspects set the residents apart regarding how they are acquiring knowledge. This mainly concerns the direction and preference of how to learn, which can be derived from different interpretations and meanings that respondents perceive.

Therefore, the study complements CoP with learning types and contributes to a more profound view of the community of practice.
This is provided by a framework of learning types within *communities*. The differences in learning processes are broadly explained by two dimensions: the attitudes toward learning (self-directed or relationship-oriented) and the degree of managerial intervention (high or low). This, in turn, results in four different learning types 1) The Confident Teamplayer, 2) The Networker, 3) The Uncertainty Avoider and 4) The Self- Directed Learner. These learning types contribute to the research question by explaining four different ways residents learn. The main characteristics of the learning types are further summarized in a comparative framework in chapter 5.2.4 to enable a better comparison between them.

Furthermore, the framework acknowledges that power is inherent in social relationships, positive power and its effects (Carlsen et al., 2020), as well as possible tensions within a community resulting in unequal power distributions (Lave & Wenger, 1991). The consideration of power enabled this study to contribute with a detection of tensions within the CoP related to learning types, which also is presented in a comparative nature.

Hislop (2009) emphasizes that organizational learning happens when individual learning processes impact the organization's structures. However, this study assumes that individuals with organizational knowledge and knowing need to exist as a prerequisite to impacting organizational structures. Therefore, it acknowledges the link between these two and their relevance for research within the organizational learning field. It argues for the significance of having a more profound understanding of how an organization's knowledge ignites and allows individuals to contribute to organizational learning. Hence, the insight provided in the study is essential to consider as a pre-step in order for individuals to cross the threshold of organizational learning.

Furthermore, the complementing learning types contribute to the knowledge management field and, in particular, to knowledge management approaches. These strategies aim to create and coordinate knowledge processes in an organization (Hislop, 2009; Jonsson, 2015), while the learning types prevail common and different grounds for learning in a CoP. The framework acknowledges that differences will be in how individuals interpret and assign meanings to a knowledge management approach in a specific context.

The learning types complement and provide an outside-in perspective of learning relevant to understanding and considering the creation and coordination of successful knowledge processes in an organization. Therefore, the ordinary and different aspects that enable learning in a context should interrelate with creating knowledge management approaches within an organization.

6.2 Limitations of the Study

In chapter 3.4, we have noted some aspects where our study reaches its methodological limits. In the following, we would like to point out additional elements that could not be considered within the scope of this study.

The first thing to mention is that our research results only show the snapshot of a hospital or a specific department. Therefore, we are not able to generalize the findings obtained. While we capture the relevance and complexity of learning in a clinical context, readers must evaluate for themselves the extent to which these findings are transferable to other settings.

In addition to this, our study is limited in that our surveyed audience contained only residents who have been in internal medicine residency training for five years or less. Consequently, this does not allow us to conclude physicians who have been in training longer.

Furthermore, we only consider the specialty of internal medicine here, which includes Gastroenterology and Cardiology. Consequently, our contribution cannot be generalized to other medical specialties.

Furthermore, we have not had the opportunity to observe the group over time and therefore cannot speak of detailed development and change within the community due to their participation. However, this form of dynamics is not the goal of this study. Instead, the goal is to understand the dynamics in terms of the relationships within the community and how they impact the learning initiatives of the residents.

Finally, it is essential to note that our learning type model is based on certain assumptions. This model is applicable in a context where a structure is lacking and sharing tacit knowledge and COP are essential. All learning types are based on horizontal learning, and individuals learn by doing.

6.3 Opportunities for Further Research

Building on the limitations mentioned in the previous section, further research is needed to draw general conclusions about residents‘ learning processes, as our findings are from only one specific context. Therefore, we suggest further research on learning processes within communities of practice, including other clinical environments.

Different forms of power and their impact on CoP are also a topic that could be explored further to understand better the influence of interactions and relationships on the learning process.

Section 5.2.4 addressed the tension between residents' autonomy and organizational regulation, which we likewise see as a different potential area of research. In this respect, we could analyze how more robust managerial intervention and overall, more prescribed structures could influence the dynamics of the CoP and possibly the learning types we have identified.

Beyond that, our typology *The Networker* contains exclusively female interview partners. Therefore, it would be equally interesting to investigate whether gender exerts specific effects on initiatives and individual responses to the given context in learning behavior and whether women may adopt different learning strategies than men.

Another potential area of research would be to compare with a department of Internal Medicine of a university hospital. It is known for increasing its focus on research and teaching. In this respect, it would be interesting to know whether the training of these residents offers more structure and is more focused on learning.

Lastly, in this study, we only investigated the learning behavior of medical residents in a clinical context. However, there is an intensive and close collaboration with the nursing staff. Therefore, it would be interesting to determine what role they play in the CoP and whether they can support or inhibit medical resident learning.

6.4 Practical Implications

If we consider the results of this study paired with the findings from the literature, we want to highlight our recommended consequences for the medical practice at this point. The insights it offers can be used further to exploit the educational potential of the clinical workplace.

The central contribution of our study was to highlight learning types within a CoP.

We demonstrated that horizontal modes of organizing, in particular, are prevalent in medical education. Residents create their structures and strategies to learn because supervisors do not have enough time in the tension between patient care and education. These horizontal communities, therefore, seem to be specific to medicine. In a sense, internal medicine residents are thus following the SDL trend as they self-direct their learning within the CoP. However, the degree of self-direction slightly differs between the learning types. Therefore, we recognize the necessity and practical relevance of CoP in the medical learning process and believe that this autonomy should indeed be maintained and that too much organizational regulation could risk disrupting these CoP structures and hindering the full development of the learning process.
However, we also see that the reality of "*see one, do one, teach one*" in today's medical practice brings trainees to dangerous limits that negatively impact their learning environment. Therefore, they should be reconsidered from the ground up and supplemented or even replaced by other methods. The seemingly prevailing motto "*fake it till you make it*" should be considered critical, especially with this high responsibility in medicine.
Even though CoP and SDL are necessary in the medical world, we nevertheless recommend that a certain degree of supervision is indispensable.

"*I WILL SHARE my medical knowledge for the benefit of the patient and the advancement of healthcare*"- this promise should not only apply to the horizontal level but also involve the supervisors and the entire hospital, especially considering that the latter has actively advocated for training with the employment contract.
Despite the SDL approach, the literature and our findings became increasingly clear how important feedback is in the learning process. Considering the responsibility of physicians, SDL is not sufficient but requires feedback from the outside. Specifically, our suggestion is to conduct a performance appraisal at least once a year. Furthermore, we see it as essential to show appreciation and recognition to the residents in addition to this principle. This deficit is common to all our learning types, has the potential to improve the learning environment of residents at Munich Hospital significantly, and does not cost much time or money to turn today's medical residents into competent and motivated physicians of the future.

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