Chapter 9
Communities of Practice and Surgical Training

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Overview In this chapter, we share the theoretical notion of Community of Practice. We apply the theory to surgical training and use examples from Australia and the United Kingdom (UK). We summarize surgical training approaches then outline the theory and provide illustrations of how Community of Practice theory informs surgical training. By applying the theory to the surgical workplace, surgical trainers may improve the learning environment and thereby enhance learning experiences of medical students and junior doctors, attainment of competencies by surgical trainees and advance the production of surgical knowledge and practice.

9.1 Introduction

Changes in health services and surgical training have seen a shift from traditional apprenticeship-type learning to competency-based curricula with the workplace remaining the principal site for learning. Socio-cultural learning theories offer valuable lenses through which to observe, design for and analyse workplace learning. They acknowledge the importance of social relations for learning and the influences of cultural and historical factors in current practices. In this chapter, we consider the theoretical concept of Community of Practice described by Lave and Wenger [1] and later by Wenger [2] as a means to better understand surgical education and training within the workplace. We describe key elements – domain, community and practice and the valuable concept of legitimate peripheral

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D. Nestel et al. (eds.), *Advancing Surgical Education*, Innovation and Change in Professional Education 17, https://doi.org/10.1007/978-981-13-3128-2_9

participation. We use italics when introducing key terms in the theory. Community of Practice theory offers insights to the development of trainee, surgeon and surgeon educator identities which are further discussed in Chaps. 12, 13 and 37. We draw on our experiences of surgical training in Australia and the UK.

9.2 Contemporary Surgical Training

Over the past 30 years, surgical practice and training have changed in many ways. It has shifted from an apprenticeship model, where surgeons trained through long hours of learning on the job, a lack of a clear educational framework and an emphasis on opportunistic learning to the contemporary model – a consequence of surgical training being re-evaluated, restructured and re-modelled. Various factors have impacted this change, including the reduction of training hours, the challenges between training and service provision, 'on calls' with lack of continuity of patient care and the introduction of shift work (Chaps. 1 and 2). Unsurprisingly, these changes have had an impact on the way surgical trainees learn. In the UK, the quoted reduction in training from 30,000 to 6000 hours has meant that many trainees nearing completion of training would not have had as much clinical exposure compared to their predecessors [3]. However, the key goals of professional education remain – to steward knowledge, impart skills and instil the values of the surgical profession. This requires a balanced and integrated approach that orientates trainees to the cultural, social and humanistic aspects of surgery.

The contemporary surgical training model is now more structured. Continuous assessment and re-evaluation processes occur throughout training. Workplace assessments have been introduced, a minimum threshold of numbers required to be achieved of certain surgical procedures have been set, and logbook assessment and annual review of performances are now part of training. In addition, more emphasis has been placed on learning the importance of skills such as communication, teamwork, decision-making and professionalism.

Trainees have had to learn to adapt in order to navigate these changes successfully. They are aware that in order to succeed, they need to be able to target their learning, seek training opportunities and utilize any useful resource to achieve this goal. In addition to attending the formal structured educational days arranged by various training providers, trainees have had to explore additional avenues in order to enhance and facilitate their training. Increasingly, web-based learning resources have become available. Simulation-based learning and technical skills labs have also become a vital part of the educational process. However, while a structured educational framework is vital, a significant part of learning continues to take place while working in the day-to-day service of clinical care delivery. It is implicit, unintended, unstructured and opportunistic. Learning about how things are done by being exposed to a wide variety of different experiences is what makes surgery an exciting and rewarding specialty [4].

9.3 Situated Learning and Communities of Practice

Situated learning described by Lave and Wenger [1] views learning and development as occurring through participation in a community's activities. It is a type of learning that can only occur when an individual is immersed in a specific environment, with a specific group or type of people with a shared goal. Situated learning does not emphasize the role of a teacher or trainer, rather it argues that learning occurs through work (work-based learning) and that through engaging with other members within this environment, learners transform their understanding, roles and responsibilities as they participate [2]. Wenger describes a Community of Practice as 'groups of people who share a concern or passion for something they do and learn how to do it better through regular interaction' [2]. The Community of Practice theory posits the concept of social interaction as not only a way of learning but the vehicle of learning itself. In their ethnographic studies of craftspeople, Lave and Wenger coined the term – living curriculum – to describe this type of situated learning [1].

In a Community of Practice, there are key characteristics, namely, the domain, the community and the practice [5]. A shared domain of interest characterizes a Community of Practice. Being a member of this community implies commitment to the domain. Members interact, engage, learn from each other and share information thus creating a community. As a result, the members develop a practice where experiences, stories, problems and goals are shared as a community [5]. These concepts are summarized in Box 9.1.

Box 9.1 Examples of the Structural Elements of Communities of Practice in a Surgical Training Environment (Surgical Unit)

Key concept	Description	Application in a surgical training environment
Domain	'A community of practice … has an identity defined by a shared domain of interest. Membership therefore implies a commitment to the domain, and therefore a shared competence that distinguishes members from other people'a	The domain of a surgical Community of Practice is most likely to be the safe and effective delivery of surgical care, responsibility for evolution of surgical practice and development of surgical trainees. Depending on the boundary of the Community of Practice, the domain may be defined more specifically. Individuals may belong to many Communities of Practice at the same time, and some will fall within the overarching Community of Practice. For example, surgical trainees may have their own Community of Practice that involves them meeting informally to share experiences that advance their knowledge, practice and skills. Although their domain of interest includes safe and effective surgical care and so part of the broader surgical Community of Practice, passing the Fellowship Examinations will have prominence in their smaller community. They define themselves as others see them – as *surgical trainees* who are studying together to pass this specific exam.

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Box 9.1 (continued)

Key concept	Description	Application in a surgical training environment
Community	'In pursuing their interest in their domain, members engage in joint activities and discussions, help each other, and share information. They build relationships that enable them to learn from each other; they care about their standing with each other'[a]	The surgical Community of Practice in a hospital will have many opportunities for its members to interact. Formal interactions between members facilitate exchanges of experiences of the practice. For example, surgeons' (especially consultants and trainees) interactions in the ward, operating theatre, outpatient department and appraisal sessions, surgeons attending hospital level meetings and surgeons attending scientific conferences and surgical trainee special interest groups – all with the intent of developing and sustaining the practice. Informal interactions between members of the Community of Practice may include surgeons' opportunistic interactions in the tea room, surgeons attending hospital level meetings including corridor conversations and surgeons attending social events scientific conferences.
Practice	'Members of a community of practice are practitioners. They develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems – in short, a shared practice. This takes time and sustained interaction'[a]	This is how the community defines its activities, tools and products. This includes surgical knowledge and judgement, surgical techniques, surgical instruments, surgical practice documentation, operating theatre etiquette, surgical dress, surgical language, surgical journals and professional association websites. These are the elements of the community that help define it.

[a]Wenger and Wenger-Trayner [5]. Retrieved from http://wenger-trayner.com/introduction-to-communities-of-practice/

Learning viewed as a situated activity has as its central defining characteristic a process known as *legitimate peripheral participation* (LPP) [1]. In order for *newcomers* to learn, they must be offered meaningful opportunities to contribute towards the common goal of that community. *Old timers* in the Community of Practice can facilitate or impede any participant's progression more centrally.

9.3.1 Communities of Practice and Surgical Training

In surgical training, there are many Communities of Practice (e.g. see Box 9.1). The community can be bounded by the physical environment (e.g. clinic, theatre, ward), the surgical specialty (e.g. general surgery, orthopaedics, neurosurgery) or the level of training (e.g. foundation trainee, higher surgical trainee) [6]. Some of these Communities of Practice will include members of different professional backgrounds such as nurses, pharmacists and occupational therapists to name a few, contributing to the social aspect of learning and giving the process a broader dimension.

The different work settings are potentially very rich communities in which to learn. A clinical ward offers different affordances for learning than an operating theatre, which in turn is different to an outpatient department, and these affordances will also vary by site. Yet, the surgical trainee will interact, engage and learn with and from other healthcare professionals within that Community of Practice. Learning therefore implies a relation to not only specific activities but also social communities. It is possible to belong to several Communities of Practice at any one time.

Surgical trainees usually enter a Community of Practice as a legitimate peripheral participant, requiring supervision and assistance, thus limiting potential risks and errors. Through participation, especially with old timers, the newcomers will learn how to practice and behave within the Community of Practice. Interactions enable sharing of the richness of the community. Trainees learn how old timers walk, talk and conduct their lives, observe what other trainees are doing and appreciate what is needed to become more central in that community. An important consideration is language and how trainees need to be able to talk the talk of the community. Surgical vocabulary is distinct from other disciplines and is an integral part of how surgeons communicate. The language of a surgical Community of Practice is an important factor in helping construct an identity within that community (see Chap. 12). Fluency with the language is used is an important indicator of belonging to the community [7]. Through shared experiences, the learning curve for surgical trainees should be improved, communication skills enhanced and collaborative work encouraged. Learning in the workplace not only fosters the development of surgical knowledge and skills but also the values central to the profession [8]. Areas considered tacit in surgical education such as the importance of teamwork, professionalism and communication skills are learnt and adopted while working and engaging with these role models [9]. This whole process of learning is cyclical and eventually the newcomers (medical students, junior doctors, surgical trainees) will replace the old timers, (the registrars and consultants). Each Community of Practice has their own rules and traditions which can create difficulties for trainees as they rotate through different units having to recognize, acknowledge and negotiate this variance. Not all learning that is situated functions productively. It is not uncommon for medical students and surgical trainees to report experiences of exclusion and intimidation. The legitimacy of their participation must be created by those within the community.

9.4 How Can Knowledge of This Theory Help a Surgical Educator?

Knowledge of Community of Practice theory can enable the surgical educator to appreciate learning opportunities and challenges and the multiple influences on students and trainees in the surgical workplace. They can help newcomers to the community through orientation of people, tasks, equipment and language. They can actively facilitate opportunities for participation in meaningful activities – learning from their peers, more advanced trainees, their consultants and other healthcare professionals around them. Box 9.2 provides three vignettes illustrating ways in which Community of Practice theory can be used to view learning. Awareness of the theory will not necessarily lead to learning per se but help the surgical educator to create a more suitable context in which learning can occur.

Box 9.2 Vignettes of How Community of Practice Theory May Be Used to View Learning in Surgical Units for a Medical Student, a New Doctor and a Surgical Trainee

Medical student
Steven McFee is nervous about his surgical rotation. He is quite certain that he wants to be a rural general practitioner but appreciates the value of the opportunity to experience a regional surgical practice as part of his medical degree. There has been no orientation to the surgical rotation, and he is not really sure where he has to go on his first day. Steven ended up missing much of his rotation through failure to engage. When he did attend, he was not made to feel welcome. He was not given anything meaningful to do. When he was scheduled to go to theatre, there was no one available to show him where to change. He found his way into the right theatre but felt unwelcome. He just stood against a wall planning his exit as soon as possible. He decided that he would just learn what he could from books to pass his exams. He figured he might get a surgical rotation during internship when he hoped the experience would be improved and he would gain knowledge to inform his planned general practice career.
Community of Practice theory perspective: This is a lost opportunity to support Steven's learning even though he did not want to pursue a career in surgery. The experience has probably confirmed that surgery is not for him. Without knowing how to navigate even simple elements of surgical work – like getting changed and finding the right theatre, Steven has not even achieved legitimate peripheral participation. Even though Steven's goal for the rotation might have aligned with those of the surgical Community of Practice, he prioritized his curriculum requirements because of the absence of any meaningful engagement.

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Box 9.2 (continued)

Junior doctor

As a new graduate, Dr. Louise Peng is on a surgical rotation. She spends most of her time on the wards but has some opportunity to go into theatre. Dr. Peng is excited to be on the surgical rotation since she thinks she would like to pursue a career in surgery. She has been reading about general surgical conditions and surgical techniques. At the hospital, she has volunteered to participate in a surgical simulation research project as a subject! It has something to do with laparoscopy skills and stress. She can't wait. She hopes she will have some meaningful work in theatre. It was only a couple of weeks into the rotation when she was given the chance to go to theatre, but it was for relatively short periods. Most of her working day was on the wards. However, when she was in theatre, she was given the chance to assist. While assisting, Dr. Peng observed surgical trainees, registrars and consultants at work. She learned their language, noted their ways of interacting with each other and listened to discussions of intraoperative decision-making and of verbal and non-verbal instructional approaches at the operative site and how all members of the theatre communicated with each other. She was taught some basic operative techniques by one of the registrars. By the end of the attachment, she was managing her ward work effectively, and she was being supervised closing surgical wounds working with the registrar.

Community of Practice theory perspective: As a gradual process, Dr. Peng moved from the position of a newcomer and legitimate peripheral participant to membership of the broader surgical Community of Practice associated with her rotation. The length of the attachment prevented more central movement, but the experience seemed invaluable in helping her acquire more than basic surgical knowledge and skills but also some of the language and professional values of other members.

Surgical trainee

Dr. Wendy Black is a second-year general surgical trainee in a university teaching hospital. She participates in ward, outpatient and operating theatre activities. As part of her working day, she undertakes many tasks; some are shared with other trainees in the unit. To assist her integration into the surgical team, the lead consultant ensures that she has meaningful activities that contribute to the productivity of the surgical unit. These include the following activities:

Preoperative
- Conducting preoperative patient examination
- Selecting appropriate diagnostic and imaging tests
- Communicating operative plans to patient and relatives
- Participating in interdisciplinary surgical team meetings
- Presenting a coherent clinical assessment to colleagues

Intraoperative
- Positioning the patient for safe surgical access
- Performing common procedures under supervision
- Performing basic surgical skills (e.g. incision, diathermy, suction, retraction, suturing, etc.)
- Handling soft tissue appropriately

Post-operative
- Writing operative notes
- Conducting post-operative patient examinations
- Discharging surgical patients

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Box 9.2 (continued)

These tasks are also expected competencies for her level of surgical training. The lead consultant seeks to align needs of the surgical service with training requirements by the provision of opportunities to undertake meaningful activities.

Community of Practice theory perspective: Again, as a gradual process, Dr. Black is moving more centrally to the surgical Community of Practice than Dr. Peng who had a more transitory engagement with the community. As a surgical trainee, it is essential that Dr. Black participates fully, and the nature of the activities she is performing (all meaningful) suggests that she is becoming a key member of the team. Dr. Black is perceived by patients and other members of the healthcare team as a surgeon/trainee which affirms Dr. Black's emerging identity as a surgeon. The lead consultant has made an effort to enable Dr. Black to participate in tasks that reflect her level of ability and has encouraged the registrars to work with Dr. Black in the pre- and post-operative tasks

A second major thread with which Community of Practice theory may assist surgical educators is as an underpinning theoretical framework in educational research. It is beyond the scope of this chapter to demonstrate such applications. Box 9.3 shows an example from Quinn et al. (2014) in their study that used Community of Practice theory as an analytical lens to make meaning of a surgical journal club [10]. Additional examples are shared in Part IV of this book and specifically in Chap. 37 where Kokelaar shares his experiences of using this theory to explore the development of trainees' identities as members of a surgical laparoscopic community.

9.5 Conclusion

Socio-cultural learning theories can inform surgical training. Community of Practice theory is just one example. These theories acknowledge the importance of the workplace as a site of learning the practice of a community, where the practice is developed over time and where the culture of the social group is privileged over individual learning. Although it is not possible to design learning per se, it is possible to design for learning by considering ways in which the features of Community of Practice theory and legitimate peripheral participation occur. Although we have shared some key concepts of Community of Practice theory, it offers so much more, especially with respect to the development of professional identity. Chapters 12 and 13 develop further the ideas of Communities of Practice and the development of professional identity – of surgeons and of surgeon educators.

Box 9.3 An Example of How the Community of Practice Theory Is Used as an Analytic Framework to Make Meaning of a Surgical Journal Club
Quinn et al. (2014) used Community of Practice theory to better understand how surgical journal clubs support learning. The journal club comprised members of a surgical department (consultants, surgical trainees and students). The trainees were given a journal article to summarize and review through an oral presentation with the event occurring in a classroom arranged with rows of seats facing the presenter. Using case study method, two journal club events were observed and then purposively sampled participants interviewed individually about their experiences. The transcribed interview data was then mapped to key elements of Community of Practice. The authors reported the presence of four components of Community of Practice: *community* (learning as belonging), *meaning* (learning as experience), *identity* (learning as becoming) and *practice* (learning as doing). Although the joint enterprise and shared purpose were evident, the sense of community depended on the seniority of the participants. The most senior felt they belonged, while juniors who were on surgical rotations and could likely pursue non-surgical specialties were not engaged. Wenger describes these orientations as *peripheral* or even *outbound* trajectories. *Legitimate peripheral participation* was evidenced by the request that trainees present – a meaningful task. Ideally, the presentations would enable journal club members to discuss their relevant experiences. However, only the senior trainees' experiences and consultants' reactions seemed valued and respected. Some *newcomers* to the community deemed consultants to be the most important members to lead the journal club. Their low attendance threatened the perceived value of the activity and changed interactions between participants – less feedback was shared in their absence. Some participants clearly had expectations of *old timers* sharing their stories about practice in response to articles presented and their feedback helping to develop knowledge, skills and behaviours of the participants in the journal club. Opportunities for learning were lost for junior trainees, interns and students. Given trainees were on an inbound trajectory to the surgical Community of Practice, this seems less than optimal. By using a Community of Practice lens to view the journal club activity, the authors were able to identify elements to maintain and others to change within the journal club

References

1. Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.
2. Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge, UK: Cambridge University Press.
3. Chikwe, J., de Souza, A. C., & Pepper, J. R. (2004). No time to train the surgeons. *BMJ, 328*(7437), 418–419.

4. Cox, A. (2005). What are communities of practice? A comparative review of four seminal works. *Journal of Information Science, 31*, 527–540.
5. Wenger, E., & Wenger-Trayner, B. (2015). *Introduction to communities of practice*. [Cited 2017 July 4]. Available from: http://wenger-trayner.com/introduction-to-communities-of-practice/.
6. Gandamihardja, T. A. (2014). The role of communities of practice in surgical education. *Journal of Surgical Education, 71*(4), 645–649.
7. Rogoff, B. (1990). *Apprenticeship in thinking. Cognitive development in social context*. New York: Oxford University Press.
8. Nestel, D., & Burgess, A. (2014). Surgical education and the theoretical concept of communities of practice. *Journal of Health Specialties, 2*, 49–53.
9. Dimitriadis, P., Iyer, S., & Evgeniou, E. (2014). Learning in the surgical community of practice. *Medical Science Educator, 24*(2), 211–214.
10. Quinn, E. M., et al. (2014). Surgical journal club as a community of practice: A case study. *Journal of Surgical Education, 71*(4), 606–612.