A model of teaching and learning in the operating theatre

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INTRODUCTION This paper extends the work of an earlier publication by the same author which reported the findings of a case study designed to investigate how medical students learn and are taught in the operating theatre. The earlier paper was descriptive in nature, examining the challenges students face as learners in theatres. These were conceptualised around 3 key domains: the challenge posed by the physical environment; the challenge of the educational task, and the challenge of managing and negotiating a role as a participant in the professional workplace of theatres. This paper focuses exclusively on the third domain. It presents an interpretive model of teaching and learning in the operating theatre, drawing largely on conceptual frameworks developed within the literature on learning in work-based settings.

METHODS A multimethod strategy included observation in theatres, interviews with students and surgeons, and a student survey. The themes that characterised the case were identified and the relationships among these themes were explored, leading to the development of the model. Symbolic interactionism provided the underlying theoretical framework.

CONCLUSION In any particular theatre session, the way in which learning evolves or is obstructed for any student, and the shape that teaching takes, depends on the interpretations that the student and the surgeon make in ‘sizing up’ the teaching and learning environment. How surgeons and students interpret and respond to each others’ behaviour, style, attitude and even demeanour, has consequences for the way teaching and learning develop. The concepts of legitimacy and trust underpin these interpretations and are central to understanding the processes of teaching and learning in this setting.

KEYWORDS education, medical undergraduate/methods; clinical competence/standards; operating rooms; educational measurement/standards; learning/methods.

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INTRODUCTION

A previous paper by the same author presented the initial findings from a case study conducted at an Australian university. The aim was to investigate how medical students learn and are taught in the operating theatre.

The previous paper was descriptive in nature. Student learning in theatres was conceptualised around 3 domains. Firstly, to have a truly effective learning experience, students need to learn to negotiate the physical environment of the operating theatre as a workplace, to learn the protocols, to familiarise themselves with the working culture, and to learn to cope with the emotional impact of surgery and tensions that may arise amongst the members of the various teams as they go about their work. Secondly, they need to have a clear sense of the learning objectives, whilst attending to the formal assessment requirements set by the university. Thirdly, and most importantly, they have to learn to negotiate the social relations of work, to find a legitimate role to play in order to participate in the ‘community of practice’ constituted by the operating theatre and its personnel.
This paper focuses exclusively on the third domain and moves on from description to present an interpretive model of teaching and learning in theatres (Fig. 1). It is the first model of teaching and learning in this setting to be presented in the literature on surgical education.

METHODS

Research methods were combined in a ‘multimethod’ strategy, consisting of 2 group interviews with students, 12 observations in theatres, 15 in-depth student interviews and 10 in-depth interviews with surgeons. These qualitative methods were chosen ‘to gain access to the motives, meanings, actions and reactions of people in the context of their daily lives’.

A questionnaire was designed to locate the perspectives of the interviewed students within the larger cohort of 237 final year students, using items derived from the qualitative data. Questionnaire items relating to attitudes were rated using a 5-point Likert scale ranging from ‘Strongly agree’ to ‘Strongly disagree’. Students were also asked to rate the frequency of certain teaching and learning behaviours using a 5-point scale ranging from ‘Occurred in all or almost all of the theatres I have attended’ to ‘Occurred in few or none of the theatres I have attended’. The questionnaire was well received, with a response rate of 83% (n = 197).

Students self-selected for the group interviews, but were selected randomly for the in-depth interviews. The more personal approach of ‘snowball’ sampling was used for the surgeons. The interviews were unstructured but relied upon the technique of funnelling. This involved starting the interview with an open-ended invitation to the surgeon or student – for example, ‘Tell me about your experiences of teaching/learning in the operating theatre’ – and then guiding them as necessary towards specific issues. Theatres were selected to represent the main surgical rotations.

What is already known on this subject

In terms of reported studies in medical education we know the least about teaching in the operating theatre. The few published studies have focused on identifying appropriate content and effective behaviours for teaching, using mainly quantitative methods.

What this study adds

The author argues that trust, legitimacy and peripheral participation define the possibilities for learning in theatres and presents a model which focuses on the dynamics of teaching and learning as processes which unfold in social interaction, capturing some of the complexity of the operating theatre by using qualitative research methods.

Suggestions for further research

Further research is needed to examine the usefulness of the model in other medical programmes or in other equally dynamic, multidimensional, work-based settings in higher education generally.

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Figure 1 The dynamics of teaching and learning in the operating theatre.
Transcripts of the interviews together with field notes from the observations were analysed using ‘immersion/crystallisation’, which involves prolonged immersion into and experience of the text on the part of the researcher, leading, through reflection, to crystallisation of the text. Cycles of immersion and crystallisation are repeated until a final interpretation is reached. Conceptual labels were developed using the constant comparative method. The survey data were analysed using sss Version 8. (For a more detailed account of the methods and analysis, see Lyon 2001.)

Symbolic interactionism provided the theoretical framework. The central notion is that human behaviour is based upon meanings which people attribute to situations. Behaviour is not ‘caused’ in a mechanical way, but continually constructed and reconstructed on the basis of people’s interpretations of the situations they find themselves in. This paper explores the ‘meaning perspectives’ of students and surgeons as they engage in interaction in the professional workplace of the operating theatre.

**Context**

*The operating theatre – a work-based environment*

Students in the final years of their medical programme undergo most of their training in the medical workplace, at their allocated hospital, where they attend the operating theatre as part of their surgical studies with the aim of developing general medical understanding. In this setting patient care comes first. The surgical procedure, its type, rarity, complexity and progress determine the timing of all events, including teaching. Complicated procedures require intense concentration on the part of the surgical, anaesthetic and nursing teams, sometimes over many hours. The operating theatre is a noisy, busy and sometimes tense workplace. It can be a confronting, unpredictable and disorienting place for the medical student as learner, and a challenging place in which to teach.

**FINDINGS**

**Participation and involvement – keys to learning in the operating theatre**

It was clear from talking to the students that they got the most out of their experiences when they were acknowledged as junior members of the surgical team with a role to play, rather than simply being present as observers. One student expressed the view succinctly:

‘... if you have a role as an assistant you’re actually doing it, you’re going to be much more alert and being involved in what’s happening. When you’re an observer you really are relying upon the doctor to draw you in all the time, you know ... it’s easy to drift off ... whereas when you’re actually at the site of the operating field ... when you have a role you’re actually focused on what’s happening all the time ... you’re involved with the surgeon, I really think surgery needs that.’ (Interview; student 5)

Analysis of the data from the student survey (Table 1) shows a significant correlation between

<table>
<thead>
<tr>
<th>Questionnaire items</th>
<th>Correlation (Pearson’s r) with item: Time I have spent in the theatre has been useful for my learning</th>
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</thead>
<tbody>
<tr>
<td>I have assisted the surgeon with basic surgical procedures</td>
<td>0.25*</td>
</tr>
<tr>
<td>I approach the surgeon and ask to scrub in</td>
<td>0.25*</td>
</tr>
<tr>
<td>I have no clear part to play in the team</td>
<td>−0.20*</td>
</tr>
<tr>
<td>I prefer to scrub up and get involved when I go to theatre</td>
<td>0.16*</td>
</tr>
<tr>
<td>I find I get more teaching if I show I’m interested</td>
<td>0.37*</td>
</tr>
<tr>
<td>Surgeons look for clues from me to see if I’m interested</td>
<td>0.29*</td>
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</tbody>
</table>

* Significant at the <0.01 level (2-tailed).
† Significant at the <0.05 level (2-tailed).
items indicative of students having a part in the team, or a preference for having a part, and positive perceptions of the usefulness of time spent in theatre.

Opportunities for assisting are highly prized. Students have a ticket to attend the operating theatre by virtue of their enrolment in the medical programme but typically in large city teaching hospitals they find themselves last in line in the specialist training queue, behind the intern, the resident, the basic surgical trainee and the advanced surgical trainee. In contrast, during their rural term, at smaller district or community hospitals with no training queues, medical students often find themselves promoted to the role of surgical assistant, directly involved with the surgeon. Scrubbing in, standing at the table, getting involved, even if only in a minor way, allows the student to be part of what is going on and affords an opportunity to engage actively with the learning experience. In the survey 83% of students gave high ratings to their surgical training queue, behind the intern, the resident, the basic surgical trainee and the advanced surgical trainee. In contrast, during their rural term, at smaller district or community hospitals with no training queues, medical students often find themselves promoted to the role of surgical assistant, directly involved with the surgeon. Scrubbing in, standing at the table, getting involved, even if only in a minor way, allows the student to be part of what is going on and affords an opportunity to engage actively with the learning experience. In the survey 83% of students gave high ratings to their surgical training queues in these smaller hospitals. Having a role to play and participating in the shared work of theatres as a junior assistant was a dominant theme in student feedback:

‘When I was in my rural term, there’s only the surgeon, the registrar and you, so they let you do suturing, they’ll show you what they’re doing, it’s a very personal interaction and you feel you’re not at the bottom of the ladder after everyone else. … it was a good feeling, you learn a lot.’ (Interview; student 8)

‘… it’s more of a learning experience if you actually scrub in and you assist. … in my rural term I was scrubbed in … and I found it really educational like learning from the surgeon and the anaesthetist. It was really good and I did learn a lot.’ (Interview; student 9)

‘… on my rural term we were practically paged to come down to help … and you would be assisting … I learnt more in theatres in that rural term than I’ve probably ever done here [in the city teaching hospital].’ (Focus group; student C)

‘… you’re not there just to attend, you’re there also as part of the team, so it’s a more encompassing experience.’ (Interview; student 15)

These findings support Wenger’s proposition that learning is most significant where it offers a way of being, of developing a satisfying identity by engaging with others and contributing to a joint enterprise.

‘Sizing up’

The process of ‘sizing up’ lies at the centre of the model presented here of teaching and learning in theatres (Fig. 1).

Surgeons and medical students are engaged in a continuous dynamic of observation of each others’ behaviours. For their part, surgeons have to consider the needs of different learners in theatres and decide how to distribute valuable teaching time and opportunities for involvement in the team. They ‘size up’ the medical students, interpreting their behaviour particularly as it relates to motivation and commitment. These interpretations have an effect on how they, in turn, respond as teachers:

‘I think you tend to respond more to a student who has got enough “go” in him to, you know, even challenge you with why you’re doing it, or something like that, rather than one that stands there passively in a situation where you’re hardly aware that he is there.’ (Interview; surgeon 5)

‘We probably do it [respond more to the motivated students] subconsciously, yet we try not to. And I think that’s going to be, you know, inevitable, that the students who show a lot of interest, perhaps are going to get a little more attention from all members of the team, intern, registrar and consultant.’ (Interview; surgeon 9)

‘If we have an enthusiastic, polite group of students who … if they come in and they’re well dressed and they’re well behaved and they’re polite and they ask intelligent questions and specifically request that you tell them something, you find yourself warming to them and falling overboard to teach them and it’s inspirational for the surgeon. Surgeons are human and if there’s somebody there who’s full of enthusiasm and obviously gone to the trouble to read something up about it in advance, and specifically requests that you show them [this or that], you can’t help getting stimulated by their interest and responding accordingly. Whereas if you ask a few questions or you make a few forays and the student stands there looking not only ignorant but uninterested then you find yourself not even bothering to talk to them. That’s a fault on the part of the tutor I suppose but it’s also a fault on the part of the student.’ (Interview; surgeon 2)
This surgeon’s comments were almost exactly mirrored by a student I spoke to during one particular observation:

[Descriptive note] Student A talked about yesterday’s experience with another surgeon – not so useful he says. He says he tried asking the odd question but the surgeon didn’t seem very responsive, but A says it was partly his fault because he didn’t ask many questions because the surgeon didn’t seem very approachable – You have to show interest to get them to teach – you have to be proactive, but yesterday it wasn’t so easy to ask questions because the surgeon wasn’t very approachable. It was partly his fault and partly mine.’ (Observation 12)

One surgeon referred to the dynamic between the student and the surgeon as a ‘reflexive process’ based around approval given and received:

‘That feedback [student’s approval of the surgeon as teacher] is absolutely critical. Some surgeons are better at overriding that and I think, in a sense, almost forcing a learning experience on students who are reluctant, but others recognise the signals and close up, take much less notice of the students, are not stimulated to stop and explain what is going on, or to demonstrate the pathology if it’s particularly interesting. I think it’s a reflexive process, the more interested the student is, the more interested the surgeon is and the more interested the surgeon is, the more the student gets out of it.’ (Interview; surgeon 1)

This surgeon’s assessment was borne out in the survey data, which revealed a highly significant correlation between items indicating a sense of the ‘reflexive process’ and a positive perception of learning outcomes (Table 1, last 2 items). Another surgeon talked about the character traits he looks for in students:

‘Surgeons are a driven type … and I suppose we expect to see that in the students that we’re going to take an interest in. If a student’s lackadaisical, laid back, yes, it’s our responsibility to teach them something but, you must admit, that makes it very hard for a teacher to be really interested in teaching you, if you’re not showing any interest. So, I’m afraid, I will fulfil my responsibility but I find it difficult and I would see that as a flaw in their [students’] approach.’ (Interview; surgeon 10)

Motivated students for their part, who are keen to participate, take stock, ‘sizing up’ the learning opportunities, ‘sussing out’ the responsiveness of the surgeons, the attitudes of the nursing staff and anaesthetists, the number of other learners and the nature of the operation itself. They seek out ‘student-oriented’ (student; observation 5) surgeons who are willing to teach them and involve them. They take note of how surgeons treat their registrars, they watch how surgeons interact with fellow students, and/or they rely on intuition and first impressions:

‘… when they treat their registrars poorly and abuse them or tell them they’ve done something wrong in front of us in a very degrading way you think, “Well, gosh, if the registrar’s being treated like that how’s a student going to be treated?”’ (Interview; student 2)

‘… if someone is known as being a really stroppy person who asks the student lots of hard questions and gets really annoyed when they can’t answer them, people [students] avoid those surgeons’ lists like the plague.’ (Group interview; student L)

‘… you go on your first impressions. A surgeon that’s willing to teach will go: “Welcome, why don’t you scrub up?” and that’s an indication that they want you to get involved. It’s just one of those intuitive things I guess.’ (Interview; student 1)

Students described at interview how they think their own behaviour is interpreted by the surgeon and the effect of their behaviour as students on the way teaching develops:

[Descriptive note] I asked the student what advice she would give to a new student:

‘Well, introduce yourself to the theatre nurses and to the surgeons and try to be as involved as possible. If you don’t look like you’re keen to be involved then they won’t be keen to involve you. They [surgeons] have students change [in rotations] on them every 2 or 3 weeks and so I suppose the drive for them to involve the students will sort of wear down, but if they find a student that engages them a little bit, then they’ll be more interested.’ (Interview; student 4)

‘If you ask them if you can scrub up, they sort of think, “Oh,” you know, “You’re a bit more interested than other people” … so they tend to explain more things.’ (Interview; student 12)

Students interpreted the use of questions as a form of clue seeking by the surgeon, describing surgeons as
Erickson and Shultz identify trust as an essential component of the learning environment. They refer, from their research in school classrooms, to the consequences for learning behaviours when trust is absent:

‘... sometimes the surgeon, if you don’t know them, will say, “Well do you know anyone on the list?” ... sort of feeling you out for exactly how involved you are ... the surgeons, they do test you. The surgeon asks you, “And so what would be the four main classes of cancer in the thyroid?” and when you can pop them out, it’s like a tick, “OK, I can talk to this student more, she’s deserving more of my attention, we can enter into some rapport.”’ It is a test.’ (Interview; student 5)

[Descriptive note] The student says some surgeons will begin a session by asking them some hard questions, ‘like a test’, and their teaching will depend on how the student responds, whether the student appears interested or is at least trying. (Observation 6)

One surgeon confirmed what these students had understood to be the meaning of surgeons asking questions:

[Descriptive note] The surgeon talked about teaching and how he responds to different students. ‘If the student is lack lustre, if he or she says, “I don’t know” to questions, rather than trying to work out an answer, I feel, why bother? I’ll give something if they give something.’ (Observation 12)

Incorporating elements of previous theory into the model of teaching and learning in theatres

The importance of trust

Erickson and Shultz identify trust as an essential component of the learning environment. They refer, from their research in school classrooms, to the consequences for learning behaviours when trust is absent:

‘... students do not consider it safe to be scrutinised while they are attempting to master new knowledge and skill, they may try to hide their incompetence or even to avoid attempting to learn altogether. Especially in situations in which students do not feel affiliated with their teacher, or in which their attempts to affiliate are not reciprocated by the teacher, it may seem safer to the student to try to maintain face by refusing to try to learn rather than to risk loss of face by trying to learn, failing, and being exposed in that unsuccessful attempt.’ (p 470–1)

Whilst school classrooms are ‘semipublic arenas for the display of interest and/or competence’, operating theatres in large city teaching hospitals, with their multiple levels of specialist trainees and professional theatre staff, are considerably more public. Getting involved carries with it a risk for the medical student as novice – the risk to self-image of making an error or stepping out of line in an unfamiliar environment that is driven by numerous protocols, rules and conventions. More than 70% of students indicated their agreement with the questionnaire item ‘It’s easy to be made to look a fool in theatre’. At interview they recounted a myriad of ways this could be done: mistaking the identity of key players; breaching infection control measures (in so many different ways); wearing the gown incorrectly; forgetting to introduce themselves to the ‘right’ person; always seeming to be in the wrong place; not knowing how to pass the surgical instruments or turn on/off a piece of equipment; asking ‘stupid’ questions or not knowing the correct answers, etc.

When lack of knowledge or skill is seen as failure, and where students are conscious of appearing foolish and making mistakes, survival becomes equated with anonymity and active inquiry is replaced by passivity. Trust in the ‘learning milieu’ as a safe environment for learning is essential if the medical student on a 4-week attachment is to become involved and come forward to actively seek out a role to play in the surgical team. The stakes are raised when those interested in pursuing a career in surgery feel they have to be on their guard. A total of 60% of students agreed with the questionnaire item ‘If I wanted a career in surgery it would be wise for me to watch my behaviour in theatre’. Trust cannot be taken for granted. It is something students ‘suss out’ in any particular theatre session.

The perception of trust has a bearing too on the surgeon’s behaviour as a clinician and teacher. Because of the medico-legal and ethical issues that must be considered whenever a surgeon invites students or surgical trainees to participate in surgical procedures, he or she needs to be able to trust the student(s) to act competently.

The importance of legitimacy

Trust is a key factor determining the way that teaching and learning develop, as is the perception by the surgeon of the legitimate place of the medical student as a learner in the theatre. If the surgeon, or another senior member of the surgical team, does not acknowledge the medical student as having a
legitimate place, does not or cannot respond, is unable or unwilling to take a role as teacher, the potential for learning is limited.

The operating theatre and its personnel constitute a ‘community of practice’ with an established culture, and a shared repertoire of meanings that develop through the sustained pursuit of a shared enterprise. Students on a short surgical rotation enter any particular theatre as an outsider or newcomer. They must be granted legitimacy in order to gain access to the practice:

‘If a community [of practice] … rejected a newcomer for some reason, that person would have a hard time learning. … legitimacy can take many forms: being useful, being sponsored … being the right kind of person … In traditional apprenticeship, the sponsorship of a master is usually required for apprentices to be able to have access to the practice. … Granting the newcomers legitimacy is important because they are likely to come short of what the community regards as competent engagement. Only with enough legitimacy can all their inevitable stumblings and violations become opportunities for learning rather than cause for dismissal, neglect, or exclusion.’ (p 101)

Surgeons who believe that the operating theatre offers a useful learning opportunity (and some tend less toward this view) seek ways to promote motivated students up the training queue, ‘sponsoring’ the students into the community of practice, inviting them, as and when appropriate, to scrub up and take a place at the table. They legitimise the student and his or her participation to other members of the professional workplace, acting as an advocate on the student’s behalf. During an observation a student explained how this works in terms of the hierarchy of the operating theatre personnel:

[Descriptive note] The student says the whole theatre, all the staff, … are under the ‘control’ of the surgeon. He explains: ‘If he says, “Jump”, everyone asks, “How high?” If he makes room for students, then all the theatre staff make room for the student. If he doesn’t, then no one else makes room for us.’ The student refers to the surgeon as the ‘boss’, creating a role for the students ‘so that everyone acknowledges the students’. The student mimics the surgeon, saying: ‘“Look”, he [the surgeon] says, “these guys are learning”.’ (Observation 5)

Students who come to theatre with a positive intent to learn recognise the need to gain legitimacy. They promote their presence as learners ‘earning points’ (surgeon 10) by showing interest, preparedness, motivation or prior experience, by behaving professionally and having the confidence to initiate interaction:

[Descriptive note] I questioned the student about whether she asks to scrub in or waits to be invited:

‘I guess I’d ask, … as long as I was in a situation where I was … had enough credibility to ask, I’d seen the patient before and knew something about what’s happening and it was an appropriate operation to scrub in on.’

I asked her how she establishes ‘credibility’:

‘You see the patient beforehand, you know all about their story and physical signs, maybe you’ve seen the surgeon before in unit meetings or on ward rounds. Perhaps the surgeon knows you by name and you’ve turned up on time, behaved professionally, told them who you are and they trust you.’ (Interview; student 3)

If the student is successful in achieving legitimacy, and if the surgeon trusts and has confidence in the student’s ability to assist, he or she will act as a sponsor or advocate, when the situation is appropriate, creating a legitimate role for the student as a ‘peripheral participant’ with the potential for positive learning outcomes:

‘… what happens when you have experience, it’s like they can let you do it and they know that you know what you’re doing … after my orthopaedic experience [overseas elective], when I did orthopaedics back here and I showed interest in it they actually let me participate in it … when you start a term [rotation] sometimes people talk to you about, like what do you want to be and what are you interested in and … I mentioned to him that I did a bit of orthopaedics previously … and basically it came out that I had some theatre experience … He showed me a couple first and when he felt comfortable that I knew what I was doing, and he was able to supervise me in case something went wrong, he let me in, allowed me to do it and it was pretty good.’ (Interview; student 9)

Implications of the model for surgical education

Recommendations for improving educational practice in the operating theatre have been made in a previous paper. Here the focus is specifically on the
case study findings in relation to the importance of trust, legitimacy and peripheral participation for student learning in theatres.

**Trust**

Departments of surgery should ensure that all students are given a comprehensive orientation to theatres rather than having to 'pick things up' in passing. They will then be less likely to make mistakes, and more likely to feel confident enough to engage actively. Surgeons will in turn be more likely to trust them to be competent to play a role, even if only a minor role, as a member of the team. Faculty development workshops should use findings such as those reported here to highlight the students’ experience of the curriculum and the consequences for learning behaviours if students feel they cannot trust the surgeon, as teacher and advocate, to create a ‘safe’ climate for learning.

**Legitimacy**

Departments of surgery should have a coherent and well articulated view of the medical student’s role and place in the training queue and of the expectations regarding the student’s role as participant. This should include a list of the appropriate or essential surgical procedures that constitute the student’s experience of surgery, in order to guide members of the various professional teams in theatres and to overcome misunderstandings that arise from different perceptions of the student’s role. If it is agreed that the medical student has a legitimate right as a learner in the operating theatre, then it behoves the surgeon to acknowledge his or her role as teacher. To this end, what is needed is a measure of cultural change and an educational campaign directed at surgical educators to reinforce the commitment to teaching.

**Peripheral participation**

Communication and negotiation of teaching and learning opportunities at the beginning of theatre sessions would go some way towards avoiding clashes in expectations between students and surgeons. Whitman and Lawrence recommend that surgeons who anticipate being able to do little teaching in any theatre session, because of the complexity of the case or the large numbers of other learners, discuss this with the medical students prior to the procedure and encourage students to scrub only if they understand and are willing to accept their strictly observational role. They suggest that some cases should be limited to either students or residents, not both. Inviting students to theatre sessions on days when some of the other learners in the training queue are committed on the wards is another strategy. It is also important for surgery to continue to explore teaching and learning opportunities outside large city hospitals, in rural or community hospitals, in day surgery centres and private rooms.

**CONCLUSION**

There are few published empirical studies of teaching and learning in the operating theatre. Of these, the main research effort has involved identifying appropriate content and teaching behaviours, and designing instruments to measure the frequency of these behaviours. These empirical studies provide valuable material for faculty development programmes designed to help surgeons to teach, but they have missed the opportunity to examine the dynamics of teaching and learning in the operating theatre. Underlying their approach is a one-dimensional, static view of teaching and learning. Teaching is viewed as a "treatment", as an independent variable that produces an effect on the learner.

Findings from the case study reported here suggest that it is more useful to think of teaching and learning in the operating theatre as social processes that develop in the complex interactional setting of the workplace environment. This paper has focused on what is missing in the literature on surgical education, namely, the student’s experience of the curriculum as it is enacted in the operating theatre and, more specifically, the meaning perspectives of surgeons and students which affect teaching and learning behaviours. Surgeons and medical students, in their actions together, constitute a learning environment. Like the school pupils and their teachers who were the subject of Erickson’s research, surgeons and medical students are engaged in a 'reciprocal exchange of phenomenologically meaningful action', imputing symbolic meaning to the other’s actions, taking their own actions in accord with the meaning interpretations they have made.

Medical students say their most valuable learning experiences occur when they engage in the practice of surgery by getting involved, standing scrubbed in at the table, rather than being removed from it as passive onlookers. Motivated students use strategies...
to promote themselves to gain the surgeon’s trust and to gain legitimacy by presenting themselves as deserving students, showing interest and intent, motivation, professional behaviour and respect. They seek out ‘student-friendly’ surgeons whom they, in turn, can trust: surgeons who acknowledge their roles as teachers and are willing to act as advocates for medical students, inviting them to get involved and participate in the practice of the operating theatre. Legitimacy and trust, and the opportunity for peripheral participation, define the possibilities for learning in this setting.

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CONFLICTS OF INTEREST

None.

ETHICAL APPROVAL

Ethical approval for this research was granted by the ethics committees of the University of Sydney and the Central Sydney Area Health Service, Sydney, New South Wales, Australia.

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