Identifying opportunities for peer learning: an observational study of medical students on clinical placements

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Running Head: Peer learning on clinical placements

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Abstract

Phenomenon

Peer assisted learning (PAL) is frequently employed and researched in pre-clinical medical education. Fewer studies have examined PAL in the clinical context: these have focussed mainly on the accuracy of peer assessment, and potential benefits to learner communication and teamwork skills. Research has also examined the positive and negative effects of formal, structured PAL activities in the clinical setting. Given the prevalence of PAL activities during preclinical years, and the unstructured nature of clinical placements, it is likely that non-formal PAL activities are also undertaken. How PAL happens formally and informally, and why students find PAL useful in this clinical setting, remains poorly understood.

Approach

This study aimed to describe PAL activities within the context of clinical placement learning, and to explore students’ perceptions of these activities. An ethnographic study was conducted to gather empirical data on engagement in clinical placement learning activities, including observations and interviews with students in their first clinical year, along with their supervising clinicians. Thematic analysis was used to interrogate the data.

Findings

On average, students used PAL for 5.19 hours per week in a range of activities, of a total of 29.29 hours undertaking placements. PAL was recognised as a means of vicarious learning, and had greater perceived value when an educator was present to guide or moderate the learning. Trust between students was seen as a requirement for PAL to be effective. Students found passive observation a barrier to PAL, and were able to identify ways to adopt an active stance when observing peers interacting with patients. For example, learners reported that the expectation that they had to provide feedback to peers after task observation, resulted in them taking on a more critical gaze where they were encouraged to consider notions of good practice.

Insights

Students use PAL in formal (i.e. tutorial) and non-formal (e.g. peer observation and feedback on the ward; discussion during lunch) situations in clinical education and find it useful. The educator is crucial in fostering PAL through providing opportunities for learners to practice
together, and in helping to moderate discussions about quality of performance. Student engagement in PAL may reduce passivity commonly reported in clinical rotations. Further directions for research into PAL in clinical education are identified along with potential strategies that may maximise the benefits of peer to peer learning.
**Introduction**

Medical students spend a significant proportion of their educational experience undertaking clinical placements\(^1\). The hospital or clinic can be a challenging learning environment, relying on different skills to classroom learning\(^2\). While clinical staff facilitate students’ learning in the clinical environment, students may also receive assistance from their peers. While the ‘patient as educator’ has been gaining momentum in recent literature\(^3,4\), peers have been recognised as an educational tool in medicine for many decades\(^5\)–\(^7\). Peer Assisted Learning (PAL) may help students make the most of their clinical placements, without additional clinician burden\(^8,9\).

PAL has been defined as “people from similar social groups, who are not professional teachers, helping each other to learn and by so doing, learning themselves.”\(^10(p1)\). Aside from knowledge and skill gain, speculated benefits of PAL include learners developing communication and teamwork skills, and forming collegial relationships with other students\(^8,11–14\). PAL may take many forms including students teaching each other, collaborating on a piece of work, discussing cases, situations, or dilemmas, observing another student’s performance and providing formative feedback, or summative assessment in the form of a grade\(^15\). PAL is now a regular feature of preclinical education, most commonly in problem based learning\(^16\), clinical skills teaching\(^17–20\) and gross anatomy teaching\(^21–23\), where students have been shown to perform as well as, or better than, their conventionally teacher-educated classmates.

The role of peers is less explicit in non-formal, workplace-based learning, compared to carefully structured classroom activities\(^24\). On clinical placements, students learn mainly through observing and participating in the work they will later perform independently, in a kind of apprenticeship\(^25–27\). Students’ agency and self-direction is important in making the most of available experiences\(^28\); workplace-based learning requires a degree of activity even in observation, distinctly different to the passive positioning as bystander\(^29,30\). Workplace and experiential learning has been said to involve guidance and assistance from ‘journeymen’, who are not yet masters, but have experience in the trade or skill\(^14,27,31\). This may be analogous to the ‘near peer’ roles of junior doctors: residents have held various responsibilities for the clinical education of medical students over the years\(^32–35\). Near-peers have also been successful in teaching clinical skills\(^20,36\).
Same-level peer learning has been implemented in clinical settings in a number of ways. Peer assessment has been used successfully during clinical placements\textsuperscript{37–41}: students valued feedback from their peers, but were divided as to whether their peers should be identified, and whether peer assessment should count towards final grades. Students also reported experiencing tension regarding peer discussion groups, as students felt there was a trade-off between gaining ward experience, and participating in PAL\textsuperscript{24}. However, vicarious learning through observing peers in action may afford equal or greater learning opportunities than being immersed in the clinical activity itself, when there is an expectation of provision of subsequent commentary on performance\textsuperscript{29}.

Little is known about what medical students naturally do with their peers on clinical placements: peers are rarely mentioned in studies of student clinical activity\textsuperscript{42–49}, despite workplace learning theory recognising the contribution of peers\textsuperscript{27}. Indeed, the “black box” of \textit{how} and \textit{what} students learn in clinical education has only recently been opened\textsuperscript{1}. Few studies mention student interaction, none of which could be considered recent\textsuperscript{50–52}. While our previous work used a survey\textsuperscript{12} to identify the types of PAL students participated in during clinical placements, we were unable to elicit detailed and rich description of \textit{how} PAL was used to optimise learning on clinical placements. This present paper reports on an ethnographic study, which aimed to investigate not only the nature of informal PAL interactions on clinical placements, but the mechanisms by which PAL was seen to be beneficial.

**Aims**

This study aimed to:

1. Describe the frequency and nature of PAL activities, as compared to individual or teacher-led activities, on clinical placements
2. Explore students’ experiences of PAL activities to identify the features of successful PAL interactions during clinical placements

**Methods**

**Study design**

An ethnographic approach\textsuperscript{53–57} was used to investigate students’ experiences of PAL in the clinical environment. Observation of day-to-day student activity and interviews with both students and their supervisors were used, necessitating a focus on a small group of students.
O’Brien et al\textsuperscript{58} recently used a work-sampling technique to compare quantitative observational data of medical students’ activities in two different placement models. This involved taking “snapshots” of student activity at ten minute intervals, with comparisons made on the basis of percentage time undertaking types of activities (e.g. direct patient care, education, personal). However, we wished to develop a deeper understanding of how clinical placement PAL activity contributed to learning\textsuperscript{59}. The focus of the study was also narrower than the seminal study by Becker et al\textsuperscript{60}, where a team of sociologists studied the medical student experience over four years, involving observations and interviews with entire cohorts of students at the University of Kansas. Therefore, an observation phase spanning 80-100 hours was planned, which would also include informal interviews with learners and supervisors in the workplace.

The researcher conducting the observations was a recent medical graduate, with prior knowledge of the hospital environments, who had attended a week-long training course in qualitative research methods, including interview and observation techniques. The researcher’s similarity to the participants in terms of age and background was thought to assist in being able to conduct observations without disrupting patient care and students’ learning. However, this was not a true “insider” perspective, as the researcher was more a ‘close outsider’.

**Hospital sites and selection rationale**

Medical students at Monash University are admitted to a Bachelor of Medicine/Bachelor of Surgery (MBBS) either directly from school (five year course) or as a graduate entry student (four years total; the equivalent first two years are taken in an extended first year). The curriculum is both horizontally and vertically integrated, with problem-based learning (PBL) cases used to integrate material across the discipline themes. The final three years of the degree are spent on clinical placements, which are offered in both metropolitan, regional and rural locations (“clinical schools”): Year 3B covers medicine and surgery; Year 4C covers obstetrics & gynaecology, paediatrics, psychiatry and general practice, while Year 5D is a pre-internship year, including aged care, emergency, speciality and elective rotations.

Year 3B students (in their first clinical year) at a single clinical school were invited to participate in the research project. The school allocates students to one of three hospitals as a “base” hospital; these sites vary in their size and case mix. Students at the smallest (Hospital
A, 229 beds, generalist) and largest (Hospital B, 640 beds, with speciality and intensive care) were targeted in order to capture diversity of clinical experiences.

The opportunity for participation in general ward activities at a Year 3 level was hypothesised to be higher at Hospital A, while students at Hospital B may receive less supervision on wards, therefore increasing the potential for PAL to be employed. Students typically undertake formal learning activities such as bedside tutorials and problem-based learning in allocated small groups of five to six students. Each group has a voluntary group leader, agreed upon by group members, who is responsible for communicating with supervisors. Groups are then further divided into pairs for allocation to inpatient unit attachments; on emergency department rotations, specific shifts are allocated to ensure that no more than one or two students are present at any time. Student learning activities could include participating in ward rounds and day-to-day patient care, clinical case conferences (including pathology and radiology), and attending related outpatient clinics, in addition to independent clerk of patients. Students have previously been exposed to various types of PAL in their campus-based years, in the form of PBL tutorials, clinical skills tutorials where peer observation and feedback are encouraged, group work and group assignments, along with optional peer learning activities.61

Sample characteristics and selection

Group leaders were asked to submit an expression of interest after the researcher had explained the aim and methods of the research to the student cohort, and group consensus had been reached on participation in the research project. One group per site volunteered to be involved in the research; this convenience sample was observed for one week at two time points, resulting in four weeks of observation (Table 1). At Hospital A, students were observed on general medicine and emergency department rotations. At Hospital B, students were observed on oncology and acute general surgical rotations. Observations centred around three students per site, with five students in each group: the remaining two students per group were involved peripherally in the observations. Of the closely observed students, four were male; one entered the program as a graduate, while two were international students (Table 2). Within these groups, a particular student (the ‘anchor’) from the group was shadowed for half a day to a day at a time. This anchor was chosen pragmatically on the basis of all involved students’ intended attendance at placements, the activities that they intended to engage in, e.g. ward rounds, outpatient clinic, clerk of patients independently or in a group, bedside
tutorials, and classroom tutorials, and their comfort with having an observer with them for extended periods of time. These matters were clarified directly with the students.

**Activities prioritised for observation**

Specific activities were prioritised for observation, including bedside encounters, tutorials, lunch time and common room discussions, as students reported these activities to be rich in PAL in a prior survey. Depending on student activities, different students were shadowed to gain exposure to a broader complement of potential student activities. On some days, no students were available for observation. Supervisors allocated to the student groups were invited to participate in an interview; both supervisors who consented were consultant physicians. While both ward and emergency department rotations were initially observed, it was found that on emergency department placement, students were constantly occupied with activities related to the work, such as clerking patients, reporting to senior medical officers, and performing basic clinical skills such as venepuncture and cannulation. Little time was available for PAL, moreover, the student being observed on this rotation confirmed that the placement roster was organised to avoid student overlap, thereby reducing the chance of PAL to virtually nil. The emergency department rotation was subsequently excluded from the analysis of student activity.

**Data collection**

Data collection methods were trialled by two researchers (JT and EM) as part of a pilot to ensure that field notes and recordings could be taken “on the run” during activities such as ward rounds and tutorials. A total of 84 hours was spent observing students. Field notes were hand written by the researcher JT. Where possible, the researcher also audio recorded student peer-to-peer conversations (1.5 hours). Students also participated in free-form interviews based on the observed events (2.9 hours), outside of the hours of observation. Semi-structured interviews were held with supervisors (Appendix A), focusing on how they used PAL, and how they perceived it was useful for students’ learning (1 hour). End of observation reflective focus groups (Appendix B) were also conducted with students, which enquired about changes in their PAL practice in their first clinical year (1.75 hours total). Participants were therefore able to share their insights into why and how certain peer encounters took place, and their perceptions about the impact of peer engagement on learning. In order to capture differences in clinical environments (the impact of context on PAL opportunities) and the change in PAL practice over time, observations were structured in one-week blocks at two time points during the year, approximately 10 weeks apart.
Certain activities were not observed: though access to bedside tutorials was requested, not all supervisors were comfortable with an observer, especially during student summative assessments. The format of clinical placements involved a “back to base” day per week where students spent their time wholly in lectures and classroom tutorials. This day was not included as part of the research as the focus was on students’ ward-based activities.

No identifying patient details were recorded as part of the field notes, including within student discussion of patients.

Data analysis
For the purposes of this study, instances of PAL were defined as occasions where students interacted with each other to increase understanding (knowledge) or ability (skills), which may come under Topping & Ehly’s definition of “peer education”, where credible and reliable information is relayed between and discussed by peers. Therefore, any situation where there was peer interaction for learning was considered PAL.

The time gap between the initial and subsequent observations allowed for reflection on and analysis of findings from the initial data collection period, prior to the later observations (Table 1). This iterative process allowed the researcher to focus on emergent themes and hone observations on activities which contained PAL. Field notes, interview notes and audio recordings were transcribed by the researcher JT, and a professional transcription service was used for interview recordings. All transcripts were de-identified with pseudonyms used for students and supervisors. Data were entered into NVivo 10 for analysis. JT and EM used thematic analysis to examine the transcripts separately and then met to discuss the coding framework. At this level, codes were derived inductively, and related largely to types of activities students undertook (e.g. peer feedback, peer sharing, peer observation, peer teaching, ward round, tutorial), and perceptions of PAL (e.g. attitudes to PAL, relative value of PAL). JT then coded all transcripts using this framework, and using a process of abstraction, JT and EM examined commonalities across PAL related codes, and clustered these into higher order themes. This process attended to the second aim of this paper; to identify features of successful PAL. Through this process, a feature of unsuccessful learning, being passivity, was also identified. These themes and illustrative quotations were then shared with the research group (BC and TH) for further discussion and validation. Any disagreements in opinion were resolved through discussion.
Activity categories (e.g. authentic work – time spent on rounds and undertaking required clinical tasks including patient care; non-work learning activities – tutorials, lectures, practising clinical examination skills; other) and time spent with peers or alone were identified from the field notes, which recorded the activities of all six observed students. Time stamped entries were entered into Microsoft Excel 2010 to calculate average times for both sets of information. Within the learning activities observed, instances of peer assisted learning were also identified from the field notes and hours spent on PAL were calculated as a subset of all learning activities.

Ethics approval
This project was reviewed and approved by the Monash Health Human Research Ethics Committee, approval number 13167L, and subsequently approved by the Monash University Human Research Ethics Committee, approval number CF13/2174 – 2013001117. Participants in the study were required to provide written consent; the consent form allowed varying levels of consent from merely being observed, to being interviewed with notes taken, to having the interviews recorded on a digital device.

Results
The average time per week spent on ward placements (i.e. medicine, surgery and oncology) was 29.3 hours. This comprised 9.4 hours spent participating in authentic work activities, 11.9 hours per week undertaking learning activities and the remaining 8.0 hours was split between independent study, meal breaks, social interactions with other students, and waiting for activities and tutorials to commence.

PAL was observed to occur throughout the range of student learning activities, in ward work and bedside tutorials, and it also occurred away from the ward and organised learning activities, such as in the student common room or library. On average, students used PAL for 5.2 hours per week, spread across the range of learning activities in Figure 1. Students spent two-thirds of their total placement time in the presence of other students. In the ward-based weeks, participants were observed to spend only 12.5 hours of placement time alone, without the company of fellow students (Figure 2). Student activities during the general medicine week are detailed in Table 3, which demonstrates PAL was used outside of ‘work' and other scheduled activities.

Four key themes emerged from the observational and interview data:
1. Learning through active watching and listening: the value of vicarious learning;
2. Students’ trust in and judgement of each other are built over time;
3. The educator is influential in PAL;
4. Passivity in observation: being ‘the fly on the wall’ is an impediment to learning

These themes characterised students’ experiences of learning on the ward with their peers.

Learning through active watching and listening: the value of vicarious learning

Students found opportunities to learn from each other on the wards; typically in the form of watching each other in practice. This took the form of clerking patients in pairs where the history and examination taking would be observed by a peer. Students also prized their bedside tutorials as places to learn how to be a doctor, not only from watching the peer perform a task but also from listening to the supervisor’s feedback on the observed task. Part of their learning in this setting was vicarious, where observation and internal processing of another student’s performance (and how this compared to their own approaches to tasks) allowed them to incorporate this information into their own practice:

*The registrar suggests that Sean and Ken examine some patients during the ward round, and introduces them to the patients. Sean and Ken examine one patient each, with the other student observing. They report their findings to each other first, and then later to the registrar, with the other student also listening*

Field Notes, Hospital B, Week 1, Day 3

’They will learn from their mistakes, and then we learn from what they’re good at. Because some [students] are very good at phrasing their sentence or instructions, like how you are going to do this, can you do this for me. So, I just stole their phrases, in a way.’ – Ken, Hospital B, interview

’Because you see other people [students] interviewing patients, and you sort of get an idea where your level is at, in terms of [your] peers’ – Sean, Hospital B, interview

’I’ve certainly learned from watching my peers under that exam situation and hearing the feedback, which is a little bit more directed’ – Hayley, Hospital B, interview

“If the students weren’t interacting with each other at all, you’d have no sense about where you were - in relation to the other people […] They kind of get a better sense of where they are in relation to the others, which I think is good.” – Daniel, supervisor, Hospital A

Students’ trust in and judgement of each other are built over time
Students noted that the utility of PAL, particularly in relation to peer based feedback, only came after students felt comfortable with each other towards the end of the year:

‘At the start of the year, for example, bedside tutorials, I was a bit intimidated: [a] supervisor that you didn’t know, patients, having to perform in front of four people that you didn’t know, whereas I suppose as the year progressed, everyone got used to that and comfortable with that idea and comfortable around each other too.’ – Hayley, Hospital B, interview

Students also felt that gains in clinical knowledge helped them participate in PAL more effectively, when they had more clinical experience to be able to comment on their peers’ performance.

‘as we improved throughout the year, our feedback got better, more specific but again, the feedback we gave at the start of the year was probably, “You should actually listen to the aortic valve in this second intercostal space on the right side rather than the left.” That sort of thing. [...] and then it developed; “So what manoeuvres, dynamic manoeuvres, can you do to make it better?” It developed into, “All right. Now I’m going to quiz you on at what point you’d want to consider replacement” and those sort of things’ – Hayley, Hospital B, interview

‘At the start, it’s difficult, mostly with trying to think of something positive, trying to think of something how to improve. But now, it’s a lot easier, because we know those histories a lot better ourselves. So then we know if that person hasn’t asked these three questions - like, yes, next time, remember to ask those. [...] Now we can give a lot more constructive feedback.[...] I remember at the start of the year, giving feedback, - yes, maybe say one point. But now we can give, - we can talk to two or three more.’ - Jack, Hospital A, Focus Group

Students believed their ability to partake in PAL evolved over time, and attributed this to increased social comfort with each other, increased familiarity with feedback processes and increased understanding of clinical practice (the reference point for all feedback). Educators also saw this happening:

“I think a good analogy is being foreigners, in a new country, arriving in a new country. When you first arrive, nobody can speak the language, so all you really do is smile at each other and stick together and give each other support. After have been in that country for a year, some of you can speak the language pretty well, and you’ve got a grasp, and others are still struggling - there’s a natural kind of order that ensues, where people can see that this person seems to be on top of it, I’ll ask them.” - Mariah, supervisor, Hospital B

The educator is influential in PAL

The influence of the educator in prompting productive PAL was a key finding in the data set, both in the observations and the interviews. Educators encouraged students to use PAL under
their supervision, such as in bedside tutorials. Supervisors interviewed supported the use of peer observation and peer feedback and pointed out the irony that these student-driven activities often needed to be initiated by the educator. Sending forth questions to learners was seen as a key strategy to encourage peers to draw on their own resources, and to deflect reliance on the educator as the knowledge source:

“[One PAL strategy I use is ] where one of the students will do a history or examination, while the others are observing. [...] I’ll try and facilitate that by - often, students will come to always put their hand up and ask me, “Should I do this, or should I do that, or what do I do next?” so I might put it back to the students and the others who are watching, and say, “What do you think?” [...] Then, after we see the patient, there will be a discussion. We sit around and might discuss what the findings were, the differentials and how we might approach further investigation and management. Then we’ll go around the group to go over a few things, and give an opportunity for questions.” – Daniel, supervisor, Hospital A

“What I promote is to go together in groups to the bedside to observe each other taking histories and doing examinations. I believe that is one of the most valuable peer learning activities in the clinical environment.” – Mariah, supervisor, Hospital B

One student had had a particularly good experience of bedside tutorials, where the educator did ensure that all group members were involved in the process, even if they weren’t “in the spotlight”:

Hayley: Also, watching my supervisor when I’m not doing it, watching the person who is doing it and the feedback on all that is so useful as well because as you would have seen in our tutorials, we have a discussion about things afterwards. [...] and initially, the person who did it would have to give their feedback - I mean, present back then - and maybe answer some questions, but then was open to all of us. So it’s very active learning, even if you weren’t doing it.

Interviewer: Even if you’re not in the spotlight, there’s still lots to learn.

Hayley: Active learning, yes. You were being questioned afterwards so you had to pay attention.

Interviewer: Yes. So that really depends on the supervisor running it?

Hayley: Definitely. Certainly.

Focus Group, Hospital B
Supervisors’ prompts also encouraged students to practise their clinical skills with their peers, outside of tutorial times. In this example, some patients were not available at the time of the tutorial. The supervisor then encouraged one student to return the following day to see the patient, with two others observing the peer, in lieu of the supervisor. They would then be responsible for reporting back in the following tutorial:

Lots of people are not able to be examined [during the tutorial]. The supervisor reassures them that it’s okay, and suggests that two people are watching while doing the examination [the following day], then report back at next tutorial.

Field notes, Hospital B, Week 2, Day 3

During the ward round, Connie asks Hayley to accompany her to see the patient they were going to see yesterday in the tutorial. Hayley agrees. Connie also mentions that they should clerk the patient that another resident suggested would be interesting to see. They agree to see these patients directly after the ward round.

Field notes, Hospital B, Week 2, Day 4

Students also believed that further educator encouragement of PAL would help them gain further clinical experience, and ensure that students worked together: This is likely due to authority of the educator, serving to validate PAL as a legitimate learning method.

Interviewer: If someone said, "Look, it's a really good idea to get out with someone else on the wards as third-years and see patients with someone else with you," would that sort of thing have made a difference, do you think?

Jack: I think if they had told us to, within our group rotation groups, if they had said, "You and you," or, "You guys form three pairs, and this pair is allocated here; this pair is allocated here; this pair is allocated here. Here, I'm introducing you to the reg, and go." Then I think they'd work, much more together. Because, one, they're a team; two, they've been put together, so they sort of have a bit of an obligation to each other.

Chad: I agree with that point.

Focus Group, Hospital A

Passivity in observation: being ‘the fly on the wall’ is an impediment to learning

Despite students reporting they found watching others valuable, particularly when they had to do something on the basis of the observation (such as provide feedback to a colleague or
perform the same procedure subsequent to the observed event), students also reported that being the ‘fly on the wall’ during ‘work’ activities was less valuable for their learning: a lost opportunity for PAL. Some students indicated that staff rarely made effort to teach or involve the students during their observational role. They even used the language ‘passively watching’, implying that a more active form of watching can occur with more fruitful implications for learning.

‘Surgery and anaesthetics - I didn't love. Not a huge amount of teaching really. Going to the theatre, most of the time you're just passively watching. Maybe scrub in and hold something. The surgery and anaesthetics - they'd just say go, that's where the theatre is - there's no other teaching at all.’ - Jack, Hospital A, interview

‘There were definitely days where it was a bit like, "I've come on this ward round. I've been sent to get the folders the whole time. I'm always running to get a folder while they're seeing a patient. I'm missing out on the patients or I'm not allowed in the room. They don't really care that I'm here. I haven't really learnt very much.’ – Hayley, Hospital B, interview

Despite being directly involved throughout the ward round, students’ physical positioning also indicated times where they were relegated to the background:

The final year student walks next to the registrar; Chad trails behind but runs ahead to open the ward door occasionally. Chad is hanging back behind the registrar and the final year student while the intern has been searching for patient files […] The final year student, intern, and registrar are at the desk, with Chad standing behind them. They move around to look at the computer, and Chad is still standing furthest away when they are looking at investigations on the computer.

Field Notes, Hospital A, Week 1, Day 1
Summary

Students overall were able to use and articulate why and where PAL was useful for their learning in the clinical environment. Situations that were specifically designed for learning, such as bedside tutorials and case-based discussion, with supervisors present, were perceived to be very useful, and frequently involved elements of PAL. While PAL is traditionally seen as occurring away from the aegis of the supervisor, the data suggest PAL was most used and valued when an educator prompted the peer engagement. Students identified that they were less satisfied with the ‘work’ activities they attended when they adopted a passive observational role, without clinician or peer commentary, prompts or questions to stimulate learning.

Discussion

This research represents one of the few observational studies of PAL on clinical placements. Previous observational studies have focussed on study activity in relation to program aims and patient care activities, with little examination of PAL. In this study, PAL was found to be a common thread through both formal and informal activities on placement, taking up one sixth of students’ time. Only one previous self-report study quantified the time peers contributed to student learning: O’Sullivan and Weinberg reported the senior peers’ role in student education was minimal, with a mean of 0.01 hours teaching (or 0.7% of the student’s total placement time) per day. Compared to these figures, the observed PAL activity appears high, though the efficacy of PAL compared to other learning activities is unknown beyond student self-report.

Students in this study spent almost thirty hours per week on clinical placements, with approximately one-third of their time devoted to participating in clinical ‘work’, and over one-third on specific learning activities. This observed activity breakdown is similar to the student activities reported by Worley et al. In other studies of student clerkship activity in the US, UK, New Zealand and the Netherlands, students reported spending between 40 and 48 hours per week on clerkships, or between 11.5 and 13.1 hours per day on placements with an average 6.5 hours per day spent in learning activities. These figures are all substantially higher than the observed student activity in this study; this may be partially explained by the four-day per week placements observed, as compared to five-day per week placements elsewhere, but the discrepancy could also represent self-report bias from students.
Students clearly articulated the value of dedicated ‘learning time’ with peers, such as bedside tutorials. This occurred even if they were not undertaking the task themselves and receiving feedback on their own performance. This may be an example of the ‘hidden curriculum’, where educator attitudes towards specific activities influence student perceptions of those activities: clinicians find the time to give tutorials, yet are perceived to be less concerned with student learning during patient care activities. The ability to identify with the person undertaking the ‘practitioner’ role (e.g. observing a student during the tutorial instead of a qualified doctor on ward rounds) may influence students’ perceptions of the utility of a clinical activity. An alternative explanation for this phenomenon may be that students require validation and authentication of their learning activities by an expert: Murray et al. found supervised interactions were valued more than unsupervised and self-directed learning interactions. Students additionally perceived that their role in the work team (e.g. fetching files) took them further away from learning opportunities. Byrne and Cohen also reported that students perceived such “scut work” did not contribute substantially to students’ sense of responsibility and skill development. This challenges Lave & Wenger’s concept of ‘Legitimate Peripheral Participation’, where menial tasks are initially allocated to novices, until trust and acceptance are gained, and additional responsibilities are awarded for higher-risk tasks. Students may need to be better oriented to their roles in patient care when they commence placements, with increasing responsibility and involvement as they progress. Moreover, educators may need to ensure that allocated menial tasks are authentic in nature, i.e. not asking the student to repeat work that has been done by the intern.

Workplace learning theory suggests that students learn best by observation and participation, rather than through specific learning activities tailored to their needs. However, the findings of this observational study suggest that the value attributed to participating in authentic work activities was contingent on prompts and invitations for engagement by peers or teachers. Without invitations or cues such as feedback after performance, or questions for students on ward rounds, the students took on ‘passive observation’ roles. This was viewed as less satisfying than when they had a task to complete, even if this task entailed watching a fellow student take a history, and providing feedback. The data strongly suggest that when taking an observational role, students respond well to explicit tasks to become more involved and to maximise the value of vicarious learning. Stegmann et al. has demonstrated that structured vicarious learning (i.e. students watching with an observational script) can be more effective than undertaking the task itself within a simulation education environment. Tools to
hone the observer’s gaze, such as ‘assessment criteria’ or reflective observational prompts (open ended questions relating to peer’s performance strengths and areas for improvement) may help students to use the time spent on the wards more actively, and induce students to reflect further on the experiences they have been part of. The potential for modifying passive observation to active learning through undertaking PAL with such tools requires more research.

The observational data indicate that peers use each other as a discussion partner to invite reflection. Having a ‘buddy’ was also seen to reduce the perceived risk of participating in learning. The clinical environment is described as “much more threatening than the seminar room”28(p360) and such strain can limit learning2,67. There is safety in numbers, and it has been reported that student motivation to be involved increases with confidence in their abilities68, which may be provided by peer support. Students reported that, over time, not only did their trust in their peers develop, but they also were able to form better judgements of quality (standards), and of others. While peers may contribute to the development of evaluative judgement69, this may indicate that students are also concerned about the “blind leading the blind”13, and their need for input from experienced educators, especially as novices. Structured peer observation and feedback activities as suggested above may reduce this concern.

Formal activities have been implemented in allied health clinical education to promote peer engagement, including a peer observation record and written feedback log, where both peers and supervisors were invited to document feedback on the learner’s performance9. Undergraduate physiotherapy students who were required to complete a quota of PAL activities per week felt this was more of an imposition than those who were merely presented with the resources to promote engagement70. The impact of mandating such learning activities and their effect on student performance has yet to be investigated within a medical education setting. These activities, designed to promote PAL, may be best introduced to students during an orientation or transition program as an optional learning activity, in the discussion of opportunities for learning on the wards. Likewise, the skills required for supervisors to promote PAL engagement (such as the prompts outlined in the illustrative quotes) might be built into professional development workshops or short courses to become embedded within supervisory practice rather than viewed as mandated activities that need to be added to existing practices.
Limitations
This study was conducted at two clinical placement sites that hosted students from a single university. Only two groups of students were observed, with a total of six interviewed participants. Of these, two were the foci of observations, and the majority of the illustrative quotes arose from these students, as proportionately more time was spent with them, and they were more willing to reflect and discuss their experiences with the researcher. These students may have participated in greater, or fewer, ward based activities, depending on the location and structure of their clinical placements, and their individual interests and motivations. The presence of the researcher may have also caused the students to behave differently to what they might have otherwise done (i.e. the Hawthorne effect).

The aim of the PAL research was for illumination rather than generalizability\textsuperscript{71}. The observations captured the type and frequency of PAL activities occurring on clinical placements, whilst student and supervisor interviews provided insights into the value and perceived efficacy of those activities. Capturing students at different levels of experience, and across different hospital networks may add to the data set and reveal additional insights. Likewise, given the emergent themes on the key role of the supervisor in facilitating PAL, it would be wise to focus future research on targeted observation of both learners and educators in action.

The effect of PAL, in terms of performance outcomes, was not captured in this research. Determining the impact of PAL on clinical performance requires complex experimental designs, and should be the focus of future studies of PAL in clinical education.

Conclusion
Student self-direction and supervisor teaching capability have previously been viewed as key drivers for success in clinical learning. This observational study reveals that PAL may also play an important role in assisting students to make the most of their placements. Students had relatively little formal teaching, compared to the amount of time spent independently learning, and participating in clinical activities, or ‘work’. PAL was recognised as a learning strategy, especially during tutorials. Students reported that their capacity to engage in PAL evolved over time, and attributed this to increased social comfort and trust, increased exposure to feedback, and increased understanding of the standards and goals of clinical practice. As the target for ‘good practice’ became clearer, students expressed that they were more comfortable in providing judgements on others’ performance.
Educators have a key role to play in encouraging students to use PAL to greater effect during ward based activities. Inviting ‘active observation’ using reflective tools or checklists and formalising peer feedback post observation may be important mechanisms to encourage vicarious learning. Students may then find that their time spent on ward-based activities isn’t just work, but learning, after all.

**Acknowledgments**

Special thanks to the medical students and clinical supervisors who agreed to be observed and participate in the research.

**Declaration of Interest**

The authors have no declarations of interest

**References**


62. QSR International Pty Ltd. NVivo qualitative data analysis software. 2012.


Figures

**Observed learning activities - per week (hours)**

- Clinical skills, 1.50
- Near peer learning, 0.47
- Lecture, 0.78
- Formal tutorials, 4.62
- Bedside tutorial, 2.06
- Ward work, 2.16
- Informal tutorials, 0.28

Figure 1 Breakdown of types of learning activities

**Time spent with or without peers - per week (hours)**

- Alone, unstructured activity, 12.46
- More than one peer, unstructured activity, 9.92
- Near peer, unstructured activity, 0.87
- More than one peer, unstructured activity, 4.03
- One peer, unstructured activity, 9.12

Figure 2 Time spent with or without peers
### Tables

**Table 1 Observation Schedule**

<table>
<thead>
<tr>
<th>Hospital A</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation</td>
<td>Educator interviews</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hospital B</th>
<th>Week 6</th>
<th>Week 7</th>
<th>Week 8</th>
<th>Week 9</th>
<th>Week 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation</td>
<td>Hypothesis generation</td>
<td>Observation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2 Participants’ characteristics**

<table>
<thead>
<tr>
<th>Hospital A</th>
<th>Hospital B</th>
</tr>
</thead>
<tbody>
<tr>
<td>21, male, undergraduate</td>
<td>22, female, undergraduate</td>
</tr>
<tr>
<td>25, male, graduate</td>
<td>22, male, undergraduate*</td>
</tr>
<tr>
<td>21, female, undergraduate</td>
<td>22, male, undergraduate*</td>
</tr>
</tbody>
</table>

* denotes international student
<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM</td>
<td>8:30 ward round</td>
<td>8:30 ward round</td>
<td>Lectures</td>
<td>8:30 ward round</td>
</tr>
<tr>
<td></td>
<td>11:00 organise a tutorial for 1pm</td>
<td>(clarifying knowledge &amp; events with each other)</td>
<td>9:20 student arrives, paper round</td>
<td>9:45 cannulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11:30 radiology meeting</td>
<td>10:00 self-directed learning on ward</td>
<td>(peer observation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(keeping each other company)</td>
<td>(taking histories, doing examinations with a peer)</td>
<td>11:45 ward round finishes; jobs on ward</td>
</tr>
<tr>
<td>PM</td>
<td>12:00 consultant arrives</td>
<td>12:00 Grand round</td>
<td>Classroom Tutorials</td>
<td>12:35 lunch</td>
</tr>
<tr>
<td></td>
<td>12:10 “escape” to lunch &amp; chat with other students</td>
<td>students go to lunch</td>
<td>13:00 Skype tutorial – Hospital B consultant</td>
<td>13:40 cannulation – peer supervision</td>
</tr>
<tr>
<td></td>
<td>12:45 set up tutorial room</td>
<td>13:40 socialising in common room</td>
<td>14:40 tutorial with Year 5 student (peer teaching)</td>
<td>14:15 end of intern rotation afternoon tea on ward</td>
</tr>
<tr>
<td></td>
<td>13:08 Skype tutorial – Hospital B registrar</td>
<td>14:00 go to ward</td>
<td>15:35 tutorial ends, socialising &amp; break</td>
<td>15:15 peer tutorial</td>
</tr>
<tr>
<td></td>
<td>14:15 leave tutorial to grab some food before cover shift</td>
<td>14:15 impromptu tutorial from HMO</td>
<td>16:05 “clinical” bedside tutorial (discussion only in meeting room peer teaching)</td>
<td>(one student explains a concept to the other)</td>
</tr>
<tr>
<td></td>
<td>15:00 shadow cover shift intern</td>
<td>14:55 hang around on ward</td>
<td>16:00 leave hospital for extracurricular activity</td>
<td>16:00 leave hospital for extracurricular activity</td>
</tr>
</tbody>
</table>

Bold = formal, pre-arranged teaching, be it from a peer or staff member

Italics & underline = Peer learning component
Appendix A – Supervisor interview schedule

What is your definition of peer assisted learning? (i.e. what activities come under PAL?)

What types of PAL have you used in your teaching sessions?
    What has been effective?
    What doesn’t work?

What do you think are the benefits of PAL? What are the drawbacks?

What changes, if any, have there been in students’ use of PAL as they spend more time on clinical placements?

Appendix B – Reflective focus group schedule

To get you started thinking about peer assisted learning, firstly let’s discuss a definition of PAL. What is PAL? Who do you consider your peers? What types of activities do you see as peer assisted learning?

What are the benefits and drawbacks of using PAL?

How have you used PAL effectively?

Can you describe a situation where you’ve tried to use PAL and it didn’t work?

How have your supervisors encouraged or discourages different learning strategies? What about your friends/colleagues?

Thinking back to your preclinical years, (i.e. 1st and 2nd year), have any of your learning experiences then led you to use any particular style of learning? (e.g. has it made you use PAL more or less?)

How do strategies you’ve used on clinical placements differ from classroom learning?

Do you like PAL? Why/why not? What would encourage you to use PAL more? (e.g. resources, guidance, workshops on how to teach/give feedback)