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The hidden curriculum in peer-assisted learning: An exploration of case discussions and journal clubs at a Thai medical school

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Abstract

Peer-assisted learning (PAL) is a common feature of health professions education, characterised as learning from and teaching others who are from a similar background. Evaluations of PAL identify a range of positive outcomes for peer tutors/tutees but rarely address the hidden curriculum, which is a by-product of the learners' educational experiences, shaped by wider organisational influences and culture. The aim of this case study was to explore the hidden curriculum associated with two modes of PAL used in the final year of an undergraduate medical programme in Thailand: Case Discussions and a Journal Club. A naturalistic evaluation approach, incorporating multiple data sources, was used to explore students' perspectives on PAL (interviews), student and faculty behaviours during PAL (observation) and the school's formal/written curriculum (document analysis). Three themes emerged from the thematic analysis of student interviews, triangulated with the observational data (reflecting positive and negative aspects of PAL): 1) developing self as a doctor; 2) learning through dialogue and feedback; and 3) barriers to learning. New insights were gained in relation to the influence of norms and social interactions i.e. recycling materials for Case Discussions and student difficulties with English language journals. Some of the barriers to learning are inherently connected to the study context and recommendations can be made locally for PAL review, however, revealing what is being learned, in the medical habitus, intended and unintended outcomes, highlights the importance of considering the hidden curriculum as an integral part of PAL planning, implementation and evaluation.

Keywords: *Peer-assisted Learning, Peer Teaching, Hidden Curriculum, Medical Students, Medical Education*

Practice Highlights

- The hidden curriculum can affect all dimensions of an educational system, from what and how students are being taught and what is being learnt in the medical habitus, which then informs the medical curriculum and curricular development.
- New insights into the hidden curriculum associated with Peer-assisted Learning (PAL), in the context of a Thai medical school, are presented.
- By exploring and triangulating data from the written (formal) curriculum, class observations (taught curriculum) and student experiences of PAL in Journal Clubs and Case Discussions, rich data was generated.
- The findings indicated the positive influences of PAL on professional identity formation and developing empathy; difficulties experienced by students in comprehending English language journal articles and dilemmas faced by students when seeking additional feedback.
- The findings in the current study on hidden curriculum highlight the importance of considering the formal, informal, and hidden curriculum as an integral part of curriculum evaluation.

I. INTRODUCTION

Peer-assisted learning (PAL) or peer teaching refers to teaching by people of similar education, background and experience as the students/learners; an instance where neither the tutor nor tutee is a professional teacher (Henning, Weidner, & Jones, 2006; Topping, 1996). In the context of health professions education (e.g. nursing, medicine), PAL is evident at both undergraduate and

postgraduate levels and is used to support learning from peers and learning by assuming a teaching/tutor role (Tai, Molloy, Haines, & Canny, 2016). As peer-tutor and tutee are at a similar level of study/training, the teaching-learning strategy is characterised as being collaborative and cooperative, where both parties work and help each other in teaching and learning to their mutual benefit (Henning, Weidner, & Marty, 2008).

Studies of PAL in health professional education have sought to identify the effectiveness and benefits of PAL and commonly investigate the intended learning outcomes and student reactions to PAL. Studies from Asia, Australia, USA and Europe consistently, positively report student acceptance of and learning gains associated with PAL (Awasthi & Yadav, 2015; Cameron, Binnie, Sherriff, & Bissell, 2015; Li, Hua, Chen, Li, & Shi, 2015; Lorio, Florman, Gore, Housley, & Nelson, 2016; McKenna & Williams, 2017; Sahoo, Venkatesan, Myint, & Moe, 2015). These studies are valuable in advancing the understanding of learning associated with PAL, however, they often lack exploration of the hidden curriculum and how that relates to PAL. Commonly used methods of data collection, for example, student self-report and survey methods fail to capture rich data about what is happening, how and why.

Understanding how students experience and are influenced by the hidden curriculum is fundamental work in medical education (Brainard & Brislen, 2007). The hidden curriculum is defined as, "a set of influences that function at the level of organisational structure and culture" (Hafferty, 1998, p. 404). It is proposed that the hidden curriculum has more influence on learners than the formal curriculum (Dewey, 1938; Karimi, Ashktorab, Mohammad, & Abedi, 2014) and is a by-product of educational experiences, related to norms, social interactions and values (Dreeben, 1968; Karnieli-Miller, Vu, Holtman, Clyman, & Inui, 2010; Kentli, 2009; Vallance, 1973). Exploration of the hidden curriculum often involves going beyond learners' reactions and requires observation of the phenomenon of interest (Gray & Enright, 2018). To date, the hidden curriculum related to PAL in undergraduate medical education remains under investigated and, to the best of the researchers' knowledge, has not been explored in the Thai, undergraduate medical education context.

The aim of the current study was to explore the hidden curriculum in PAL from the perspective of final year medical students. In this study context, PAL underpins two types of learning activities: Case Discussions (CDs) and the Journal Club (JC) and these are outlined in the Methods section. The findings from this study are anticipated to provide insight into the hidden curriculum

embedded in this organisation and culture and how this affects students. The findings will be of interest to those using or planning to use PAL in health professions education and raise awareness of the need to consider the influence of prevailing norms, interactions and commonly held understandings as part of curriculum planning, implementation and evaluation. The research questions addressed by this study are: What are students' experiences of and attitudes towards PAL; How do students view learning associated with the roles of peer-tutor and peer-tutee; and, How does the formal/written medical curriculum relate to what is observed in PAL?

II. METHODS

A. The Setting and Research Approach

The research approach is a case study with a focus on naturalistic evaluation, where the intent was to judge the value of PAL when examined in its natural (social) context (Yin, 2009). The context was PAL as it operated as a routine part of the final (6th) year studies for medical students at a thousand-bed tertiary care hospital affiliated with Khon Kaen University in Thailand. The curriculum uses a problem-based learning approach with PAL integrated in the clinical years (4th to 6th year). Final-year medical students are required to be peer-tutors during CDs and JCs. In CDs, the peer-tutor prepares a patient case and presents this to peers (Appendix A) and in the JC the peer-tutor selects a journal article to present (Appendix B). In the final year, there were 47 students in total, with 14 attached to the paediatric placement at the time of data collection. The paediatric PAL activities were selected as the recruitment site as this was the most accessible activity for non-participant observation. This site reflected PAL across other placements sites and the researcher (AA) was a habitual attendee at these PAL sessions, thus minimising disruption of social interactions (Bonner & Tolhurst, 2002). The research approach used multiple sources of data, having an 'insider' as PAL observer (Palys, 2003) and relating this to themes developed from student accounts, which supported the generation of rich data as well as strengthening the study authenticity and validity (Miles & Huberman, 1994). A one-to-one interview approach was selected to promote in-depth exploration of individual accounts of learning, connected with their personal teaching tasks. It was also considered that the students, in a group setting, were less likely to share particular accounts. The interviews were an opportunity to capture the differences in experience as well as similarity.

B. Sampling and Recruitment

Purposive sampling (Cohen, Manion, & Morrison, 2013) was used to select participants who were all were final year students attending CDs and JC activities. Using a

teaching coordinator to disseminate the information sheet about the study and the consent form was used to minimise any perceived coerciveness of the lead researcher (as the latter was a member of the paediatric faculty). Students had daily contact with the researcher in a teaching environment, enabling questions to be asked of the researcher at any time.

C. Ethical Considerations

As the lead for data collection (AA) was a faculty member, it was established that they had no current or future teaching or assessment responsibilities related to the sample group. Written informed consent was gained from all participants, and assurance given to participants that their participation would remain confidential and they would not be identifiable from any research reports.

D. Data Collection and Analysis

To capture the influence of the hidden curriculum, multiple methods of data collection were used, to gain insight from varied perspectives and enhance the richness of the data (Kuper, Lingard, & Levinson, 2008). One to one, semi-structured interviews (Rubin & Rubin, 2011) with students were used to elicit a focused conversation about PAL experiences (Appendix C). The interviews were audio-recorded, transcribed and translated into English for coding. To ensure translation accuracy multiple samples of anonymous transcript data were subject to 'forward translation' between Thai and English by a third party to affirm translation validity (Ozolins, 2009). Multiple non-participant observations of PAL activities, involving the recording of field notes were captured, and these related to the physical environment, participant numbers and patterns of interactions. Documentary analysis involved the review of the formal/written medical curriculum and the handbook for final year students to identify how the PAL activities were represented. Thematic analysis was used to identify, analyse and report themes from the interview data (Braun & Clarke, 2006). This process involved six phases: (1) familiarisation with the data; (2) generation of initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) reporting the themes. Initial coding and theme development were undertaken by the first author, with discussion and review with the second author. Contextual, descriptive analysis was used for the observational data and document analysis. Aligned with the interpretive research approach, it is accepted that the researcher cannot be separated from the findings (Savin-Baden & Major, 2013), however, a number of strategies were used to enhance the study quality and promote trustworthiness, including assuring that the research approach was epistemologically aligned with the research aims; privileging the students' accounts of their experience and using quotations to support the findings and providing clear information about the context of the study, recruitment and participants (Lincoln & Guba, 1985).

III. RESULTS

A. Presentation of the Results

The results are organised around the themes derived from the interview data and presented as themes and sub-themes, where a theme is a pattern found across the student accounts (Braun & Clarke, 2006). Data from the observations and documentary analysis are integrated with the thematic reporting through identified interconnections, including (dis)connections between the experienced, observed and formal/written curriculum. Quotations from the interviews are presented throughout the results with quotation labels relating to gender (M/F) and the participant identification code, e.g. F1.

B. An Overview of Student Participants and the Data

1) Semi-structured interviews: A total of 14 final-year medical students (100%) in the first paediatric rotation participated in interviews, representing 30% of the year group. The characteristics of the participants are shown in Table 1. The study participants were of a similar age, educational background and ethnicity, and were reflective of the wider, medical student population.

	Final-year medical students (*n* = 14)
Mean age ± *SD* (years)	23.5 ± 0.91
Sex: Male/Female	5/9
Ethnicity	Thai
Entry to medical school	Post high school

Table 1. Characteristics of study cohort participating in the semi-structured interviews

2) Observations of PAL activities: The researcher (AA) observed 10 PAL sessions. The median and interquartile range (IQR) of participants for the eight CD sessions as well as the number of participants for JCs 1 and 2 in the first paediatric rotation are reported in Table 2. The median duration of the class for the eight CD sessions was 65 minutes (IQR 5). The duration of JC sessions 1 and 2 were 40 and 31 minutes, respectively.

Types of Participants	Median (IQR) of participants for the 8 Case Discussion sessions	Number of participants for Journal Club 1	Number of participants for Journal Club 2
Faculty	4.5 (2)	1	2
Final-year medical students	10 (2)	10	9
5th year medical students	11 (5)	6	0
Interns/residents	8 (2)	7	9

Table 2. Features of PAL sessions

3) Documentary analysis: There was no explicit, written curriculum regarding PAL in the medical curriculum document or the handbook for final year students. However, an outline of the CDs and JC (aligned with the information presented in Appendix A and B) was verbally presented during placement orientation sessions.

C. Students' Experiences of PAL: Themes and Sub-themes

Three main themes emerged from analysis of the interviews, reflecting positive and negative aspects of PAL: 1) developing self as a doctor; 2) learning through dialogue and feedback; and 3) barriers to learning, see Table 3 for an outline the themes, sub-themes and illustrative quotations.

Themes	Sub-themes	Illustrative quotations
Developing self as a doctor	Increasing confidence and skill as a teacher	*"When I was in the fourth and fifth year, I just observed the teacher and residents and didn't feel any direct responsibility for the patient. In the 6th year, I needed to be a senior and leader with respect to [other] students. Sometimes I neglected others' feeling. I forgot to pay attention to them. Sometimes the patient didn't want to answer because they may have some private or personal reason. I learned how to be concerned about the feelings of others."* (F3)
	Advancing learning skills	*"Now when I prepare to teach, I know that I have to master this topic in order to teach others. If I can teach others and help them to understand, that means I understand and I can apply this skill to communicate with others. I now advise my patients using common, non-medical language. I think these are all advantages. I think if I really understand, then I can summarise it in a simple way. I enjoy teaching…"* (F2)
Learning through dialogue and feedback	Valuing dialogue with peers for learning	*"Friends open opportunities to ask questions and we don't get nervous when friends teach."* (F9)
	Tension between wanting (teacher) feedback and concerns about initiating the dialogue	*"If I expressed my own opinion, I felt unsure as to whether or not I express myself correctly to the teacher. However, if I talk with friends, I feel free to share my ideas… If the teacher were there; I think if I said something, it could be wrong. So, I kept quiet. Finally, I'm not sure whether I understand or not."* (F2)
Barriers to learning	Difficulty with English language journals and statistics	*"In [the] journal club, my problem is the interpretation… My problem is about the result which requires the basics of statistics, and [to] know the… methods and vocabulary which I don't know… If I cannot interpret, I cannot explain to other. If we interpret incorrectly, we can make mistakes."* (M2)
	Recycling presentations	*"The good point of using copied slides was speed. I did not have to read through all the stuff, but I could read the content related to the copied slides. The bad thing for the peer-tutor was instead of having a full knowledge, by reading and making one's own slides, [was that] we got more superficial knowledge than our friends."* (F2)
	Disengagement during PAL	*"When someone speaks monotonously, uses uninteresting slides or says the same thing over and over again, I don't feel like listening at all."* (M5)

Table 3. Themes, sub-themes and supporting quotations derived from the student interviews

1) Theme 1 – Developing self as a doctor: Students strongly associated the experience of assuming the peer-tutor role as *Increasing Confidence and Skill as a Teacher* (sub-theme). This was related to teaching experiences which enhanced awareness of how it *felt* to be a teacher and a learner. These experiences provoked reflection on their actions as tutor/learner and closer examination of what other teachers (e.g. peers, residents) were doing; seeking out role models. This also acted as a motivator to use teaching strategies which would be effective and engaging. This enhanced tutor/learner empathy extended to considering patients' experiences of patient-doctor communication and how they were assuming greater responsibilities as a senior student (emerging doctor) which would demand attentiveness to others' feelings as part of being an effective communicator.

Most students reported they felt increasingly confident to teach others, including junior students, peers and, in time, other healthcare staff. This was associated with practice in the peer-tutor role and receiving supportive feedback from peers and faculty which enhanced feelings of competence and achievement.

Parallel to the emerging sense of becoming a better teacher and communicator, participants also noted that the peer-tutor role was *Advancing Learning Skills* (sub-theme). Participants highlighted the importance of spending time engaging with the PAL task, searching for and reviewing literature, preparing and practising presentations, understanding these activities as key to mastering the task, as a means of engaging in deeper learning. It was noted by some that this was an important preparation for being more self-directed in learning and was a valuable skill for future practice.

Overall, participants reported that the PAL activities promoted a sense of becoming a doctor, aligned with what they observed in practice (i.e. doctors as educators and teachers). The experience of being a peer-tutor acted as a bridge to understanding their future commitments and the teaching and learning skills required as a medical professional.

2) Theme 2 – Learning through dialogue and feedback: Participants were clear about *Valuing Dialogue with Peers for Learning* (sub-theme), as they associated PAL with opportunities to enter conversations with peers, before, during and after PAL sessions. They associated this with open and free conversation which allowed them to check their understandings, ask questions as well as build closer relationships with peers as they supported one another in learning. In contrast, participants noted

that they often felt a *Tension between Wanting (Teacher) Feedback and Concern about Initiating the Dialogue* (sub-theme). Although students valued learning from and with one another, they were at times uncertain about their knowledge, reasoning etc. and wanted clarification or guidance from faculty. Where faculty guidance was offered freely in PAL sessions or before a session (e.g. when the faculty member reviewed a presentation) this was valued; although students noted this did not always happen. Generally, students were reluctant to ask staff questions or open a conversation with a faculty member in PAL sessions. This reluctance was attributed to a range of factors, feeling too shy to ask, concerned that their question may be answered by another question, concern that asking questions positioned the questioner as 'ignorant' or lacking understanding or concern that questioning may upset the teacher.

Observational data identified that peer-tutees and peer-tutors were particularly active in discussion in the early stages of CDs. However, when faculty asked questions this would often be met with silence (it was noted that there was only one occasion during 10 observation sessions where a student asked a question when prompted by a faculty member). This silence was also evident in the more complex/discursive elements of the CDs activities. The observational data also supported students' accounts that faculty input was required, as there were two occasions where factually incorrect information was presented, and this was not corrected/identified by staff or students.

3) Theme 3 – Barriers to learning: Participants reported having *Difficulty with English Language Journals and Statistics* (sub-theme) which were a focal part of the JCs. Concerns about English language proficiency and knowledge of statistics were raised by students as barriers to learning from JCs. This was associated, for some, with feeling anxious when they perceived they could not lead an effective teaching session, based upon their own lack of understanding of the topic and method of analysis.

The majority of participants reported that they had copied presentations from friends, peers and/or the Internet (without including attributions) as part of their preparation for CDs. This was associated with 'speeding up' preparation and two reported that this activity had been supported by faculty. The practice of 'recycling' presentations and failing to attribute the work to others, but passing it off as their own (*Recycling Presentations* – sub-theme) was identified by one student (out of 14) as a form of academic dishonesty. A small number of students noted that this practice did diminish their learning when contrasted with developing their own

materials and impacted negatively on their capacity to teach.

Observational data confirmed that presentations were used which were either copied from an Internet source or a friend, without relevant attributions. Both instances were revealed when a faculty member asked about the source of the presentation content.

Finally, *Disengagement During PAL* (sub-theme) represents a range of factors which participants noted impacted upon their interest and attentiveness in PAL sessions; 70% of students noted they have slept in or through a session. Reasons offered for disengagement included: tiredness from being on-call, boredom, topic difficulty, perceived lack of value, monotonous tutor-voice and the temperature of the room.

Observational data corroborated reports of students sleeping, in addition to holding conversations with friends (unrelated to the PAL topic) and using phones. These behaviours were more notable in sessions where there was less interactivity/dialogue between tutors, tutees and teachers. It was also observed that the teaching rooms were often excessively hot, with failing air conditioning systems; the local temperature was around 30ºC to 38ºC. Additional points, not noted by students were that on three occasions there were timetabling clashes, meaning some participants could not attend and up to 70% of the one hour PAL sessions did not start/finish on time (see Table 2).

IV. DISCUSSION

To situate the findings relative to existing PAL literature for health professions education, the discussion is organised as follows: students' experiences of and learning from PAL; facilitators of learning and barriers to learning.

A. Students' Experiences of and Learning from PAL

Overall, students were positive about their PAL experiences, in particular, the learning gains from assuming the role of peer-tutor. Similar to other study findings students reported collaborating with peers as helpful in building social relationships in addition to learning from one another in a mutually supportive way (McKenna & Williams, 2017; Tai et al., 2016). Developing skills and confidence as a teacher and communicator and self-directed learner were evident from the literature and this study (Sahoo et al., 2015). In addition, this study highlights the value of PAL in nurturing a sense of empathy for those in teaching and learning roles, extending to an increased awareness of patients' emotions and perspectives when in a teaching

or clinical consultation situation. Making connections to clinical practice may be associated with participants final year status and PAL activities being integrated with workplace-based learning, therefore, promoting reflection on PAL as aiding identity formation as 'a doctor'. The PAL aims/assessments did not refer to (professional) identity formation, however, the combination of experiential learning, interaction with peers/senior staff, self-reflection and increased attentiveness to 'good' teaching role models i.e. observing doctors as teachers/educators, positions PAL, in this context, as supporting the identity formation process (Cruess, Cruess, Boudreau, Snell, & Steinert, 2014). The framing of PAL as a learning experience which shapes professional identity formation may be valuable when considering PAL design, where particular values and behaviours can be explicitly role modelled and conversations about what the 'medical professional' as teacher and communicator does, values, thinks, which may promote professional development (Hafferty, 2009).

B. Facilitators of Learning

Similar to other research findings the significance of peer-to-peer dialogue in PAL were significant for learning (Glynn, MacFarlane, Kelly, Cantillon, & Murphy, 2006). As expected, feedback from faculty and the supervisors (see Tables 1 and 2 for the supervisor roles) was also viewed as instrumental, providing reassurance and direction for students. A significant body of literature supports the requirement for faculty as well as peer feedback for learning (Brown, 2015). This was reinforced through the finding that 'incorrect' understandings were being shared during the PAL sessions, going unnoticed by faculty and students. In relation to local recommendations, exploration of faculty's perspectives on the role of faculty in providing feedback for learning – in the context of Peer-assisted (but not peer-alone) Learning may be valuable. In addition, sharing observational data about teaching-moments that appeared to support peer-to-peer dialogue in the sessions may be helpful, as well as highlighting how faculty interjections often halted further student-to-student dialogue. In relation to the organisational commitment to PAL, to support learning, there were multiple positive features identified in this study: protected time for a range of students, trainees and faculty, dedicated space, equipment, scheduling and administration for PAL events, and coordination of peer-tutee/supervisor coupling.

C. Barriers to Learning

As a counterpoint to some of the features which support learning, the influence of unintended organisational and environmental issues may have impacted negatively on

the PAL opportunities, e.g. high room temperatures; timetabling clashes and sessions starting and finishing late or being shortened. Some features may be difficult to influence but it may be important to acknowledge these challenges and to assert the importance of PAL, rather than allowing participants to interpret these as (unspoken) indicators of PAL to signal its lack of importance.

Students highlighted the taken for granted practice (transmitted peer-to-peer, and in some cases faculty-to-student) of copying presentations from one another and/or taking materials directly from the Internet to speed the process of preparation for PAL (without attributing the work to its source). Some students acknowledged that this negatively impacted on their capacity to teach as they had not fully engaged with the topic. Although this practice may be considered a form of academic misconduct in some cultures and contexts (Ison, 2018), it requires interpretation in relation to the educational system, which influences knowledge and practice regarding plagiarism (Shirazi, Jafarey, & Moazam, 2010). Gharedaghi et al. (2013) examined the knowledge of medical students regarding plagiarism and found that less than half knew how to reference in PowerPoint slides correctly. Culturally, it may be deemed inappropriate to change information received from friends/peers (to 'save face') and to respect (through copying) the words of revered scholars (Nguyen, Terlouw, & Pilot, 2006). However, the practice does present as an opportunity, in PAL, to discuss these issues, the impact on learning, different views globally, which may have particular relevance at a time of greater health professional workforce mobility (Hazelkorn, 2017).

Students' difficulties with comprehension of English language journals (Hossain, Shamim, Shahana, Habib, & Rahman, 2010; Tar, Tanczos, & Wiwczaroski, 2010) and statistics (Zhang et al., 2012) were reported as barriers to learning and echo study findings from Bangladesh and Hungary and China. This finding prompts questions locally and perhaps more broadly, about the skills required of medical graduates, cultivated during their programme of education and how the curriculum supports those outcomes. If English language proficiency (for medical practice) and statistical knowledge are important, then appropriate support may need to be considered in curricula. The nature of this case study approach enabled comparison between what was expressed in the formal (written) curriculum, the student perspectives on learning (the learned curriculum), and observations of teaching (the taught curriculum). Triangulating this type data, with information about the requirements for practice in a particular setting

(Monrouxe et al., 2018) may be valuable in identifying how different curricular facets support/hinder development as a doctor for that context.

Finally, students' reluctance to initiate a conversation with faculty or ask a question may also be culturally influenced, where faculty members are viewed as being correct, not to be questioned and treated with deference (Nguyen et al., 2006). This, coupled with students concerns about losing face, feeling silly or making others feel uncomfortable may explain this finding in this context. Rather than considering this as something to be changed, it is perhaps apt to ask: what culturally acceptable pedagogical strategies could be used to facilitate students sharing their ideas, uncertainties and questions with faculty to gain useful feedback? An additional question can be raised about the potential affordance of PAL experiences where faculty and more senior trainees are less (or not) present, either as facilitators and/or audience members. Could more student-led and implemented PAL activities enable even richer learning?

D. Study Strengths and Limitations

This is the first study, that we are aware of, exploring the hidden curriculum in PAL using a case study approach in this context. As a single site exploration, which focused on paediatric placement PAL activities, with a sample of only 14 students, readers must exercise caution in transferring findings to their own settings. However, the research approach may inform the development of PAL evaluation in other contexts, drawing upon the ideas of making comparison of the formal/written, taught and lived PAL phenomena, to reveal the hidden curriculum. Future research is also needed to examine the influence of any changes made, associated with study recommendations, seeking to understand more about how the hidden curriculum can be shaped and the impact that may, or may not have upon learning.

V. CONCLUSION

This in-depth study of PAL in a Thai medical school identified positive and negative student experiences and presented new insights about the influence of the hidden curriculum, for example, activity norms and cultural influences. The value of PAL as aiding identity development as a doctor and nurturing teaching/communication skills and the outline of organisational, social and cultural features which facilitated and/or hindered learning will be of interest to curriculum developers. Overall, the study highlights the importance of evaluating or seeking out the influence of the hidden curriculum in PAL to aid curriculum development.

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Appendix A: Case Discussion Format

Aim	To develop critical thinking skills, work collaboratively through discussion, and apply theoretical concepts to real case situations.
Participants	Final-year medical students, fifth-year medical students, interns, paediatric residents, supervisors and other faculty.
Duration	1 hour
Role of peer-tutor	Perform teacher role and lead the discussion panel, select an interesting case from the ward setting, prepare the topic, develop a PowerPoint presentation and discuss with supervisor (pre-presentation). The peer-tutor begins with the case presentation, asks and responds to all questions from the audience and facilitates clinical reasoning through discussions.
Role of supervisor	Counsellor for peer-tutor during preparation, supervises the session, helps to guide and clarify unclear issues and makes comments on the case.
Role of peer-tutees	Responsible for gathering evidence from the history and physical examination data presentation; collaborating to develop/propose problem lists, differential diagnoses; and join in with discussions. To propose the most likely diagnosis, suggest ordering and interpreting investigations, and propose management ideas.
Assessment	Peer-tutors are assessed by the supervisor in relation to: preparation, presentation (slides, references), teaching skills and ability to handle questions. The grade for the peer-tutor contributes to 10% of the grade for the placements (when summed with the grade for the Journal Club performance).
Equipment	Conference room equipped with computer, projector screen and wireless microphones.

Appendix B: Journal Club Format

Aim	To encourage and prepare students for continuing professional development as well as to support evidence-based professional practice.
Participants	Final-year medical students, fifth-year medical students, interns, paediatric residents, supervisor and other faculty.
Duration	1 hour
Role of peer-tutor	Perform the teacher role, search for literature to address a clinical practice question, select a range of interesting journal articles and the contact supervisor to select one article. Prepare a PowerPoint presentation to support the presentation of: the introduction, methods, results and discussion. This is followed by a critical appraisal of the paper by the paediatric resident.
Role of supervisor	Counsellor for peer-tutor during journal selection and preparation, to supervise the session, helps to guide and clarify unclear issues, critique the journal and summarise.
Role of peer-tutee	Ask questions, contribute to discussions.
Assessment	Peer-tutors are assessed by the supervisor in relation to: preparation, presentation (slides, references), teaching skills and ability to handle questions. The grade for the peer-tutor contributes to 10% of the grade for the placements (when summed with the grade for the Case Discussion performance).
Equipment	Conference room equipped with computer, projector screen and wireless microphones

Appendix C: Semi-Structured Interview Guide

Settling questions

- Can you tell me how many times you have prepared to teach friends in the clinical years?
- How many times do you think you have attended sessions when your friends are teaching in the clinical years?

Exploring memorable PAL sessions – as peer tutor and peer tutee

- Can you tell me about any memorable PAL teaching sessions?
- Probes: What happened, why do you think it was particularly good or it did not go so well?
- Probes: How did it feel, how does that affect learning, can you give me an example?

Exploring the peer tutor role

- How do you prepare to be a peer tutor?
- Probes: Pre-session, during and after experiences (probing reflections on learning), and will you do anything differently next time?
- Probes: What helps learning; what is less helpful for learning in this role?
- Probes: How does this learning relate to becoming a doctor?

Exploring learning from peer-tutors

- Tell me about learning from peers – how is that different from learning with faculty as tutors?
- Probe: How is it different, can you give me an example?
- Probe: How does it impact upon your learning? How does this relate to becoming a doctor?
- Probe: What is good about it, what is less helpful? Tell me more.

Thinking about PAL and your experiences are there any other comments you would like to make:

- Probe: Aspects that can be improved?
- Probe: Aspects that are missing?
- Probe: Elements you would stop or change?
- Probe: Is there anything I haven't asked you about that you think is important?