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MONOGRAPH

Supporting Students' Transition to University and Problem-Based Learning

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Abstract Although originally designed as a pedagogical approach in graduate-entry medicine, problem-based learning (PBL) has been widely implemented in undergraduate medical, science and social sciences programmes. Although it is generally acknowledged that support is required for learners new to PBL, this has not been well-described for undergraduate programmes, leaving some students feeling out of their depth. In this submission, we offer a number of broad considerations and practical suggestions to support learners' transition to PBL and to university. This support is particularly important in a higher education landscape of learner-centeredness and social accountability in a globalising world of increasing learner diversity.

Keywords Higher education · Problem-based learning · Scaffolding · Self-directed learning · Undergraduate medicine

Abbreviations

BU	Bond University
LI	Learning issues
PBL	Problem-based learning
LO	Learning outcomes

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Background

When Barrows and Tamblyn [1] designed problem-based learning (PBL) for the McMaster University medical programme in the 1960s, applicants required an undergraduate degree and were selected with particular qualities, attributes and skills such as being motivated, being able to cope with ambiguity, good interpersonal skills and the ability to self-assess and assess peers [2]. Almost 50 years later, a 'hybrid' form of PBL (PBL supplemented by lectures, etc.) has been widely implemented not only in graduate-entry programmes but also in many undergraduate programmes across the higher education sector [3–5]. Since the majority of learners in undergraduate programmes are generally 17 or 18-year-old school-leavers, it is unlikely that they will be independent learners or problem-solvers, and having only recently graduated from a more teacher-centred paradigm, their past didactic educational experiences may be a potential barrier to the learning required in PBL. It has thus been acknowledged that many require considerable support to develop the skills necessary to become self-directed, independent learners [2, 6, 7].

One of the authors (MM) has spent almost 20 years designing or revitalising PBL in undergraduate medical programmes in different cultural contexts. The second author (CM) has considerable experience in developing resources to promote critical thinking in learners across a range of undergraduate health professional and biomedical science degrees, including medicine. As Bond University (BU, Australia) colleagues involved in developing and delivering a renewed undergraduate PBL curriculum (e.g. home-grown patient cases; phased, spiral approach to small group learning) in 2013, the case we put forward in this article is underpinned by the range of scaffolds we have systematically introduced (particularly in the first year of the programme) over the last 4 years [8]. Many of these supports and processes have been in response to student

and PBL facilitator (tutor) feedback which happens largely as part of the PBL process.

Before offering our insights of how we have tailored PBL for a medical programme comprising largely school-leavers, it is perhaps necessary to define what is meant by scaffolding as well as provide a brief description of the BU spiral approach to small group learning in the first 3 years of a 5-year undergraduate medical programme. Although 'scaffolding' is not a term used by Vygotsky, it is associated with his socio-cultural theory of learning, most notably in the context of the concept of a zone of proximal development (ZPD) [9]. Scaffolding has been defined as the distance between what a learner can do with and without help [10, 11] and was introduced by Wood and colleagues in 1976 as a metaphor to operationalise Vygotsky's ZPD [12]. In our approach to scaffolding in PBL, Mercer and Fisher's proposal has been a useful guide [13]. Those researchers assert that to be considered as scaffolding, a learning and teaching event should (1) enable the learners to undertake a task that they would not have been able to manage on their own; (2) be intended to bring learners to a state of competence which will allow them to eventually complete the task on their own; and, (3) be followed by evidence that learners have achieved a greater level of independent competence as an outcome of the scaffolding.

The BU Small Group Learning Approach in the Early Years of the Undergraduate Medical Programme

BU offers accelerated degrees as the academic year comprises three 14-week trimesters. The undergraduate medical degree is thus completed in 4 years and 8 months, with students starting in May of Year 1 and finishing in October of Year 5. In 2013, after 2 years of curriculum planning and case development, a renewed curriculum was introduced, with Year 1 being a *guided*, *hybrid PBL* approach (two semesters), followed by three semesters of *hybrid PBL* (Year 2). Compared with 'pure' PBL in which learners define and meet their own learning outcomes almost entirely through self-study, in a hybrid PBL approach, other learning opportunities (e.g. 'lectures', practicals) are scheduled to assist learners to meet the learning outcomes generated during the PBL tutorial [3–5, 14, 15]. During the first five semesters of the 'hybrid' PBL at BU (Years 1 and 2), learners are expected to develop a range of skills and attributes to enable them to work independently in Year 3, a transition year that prepares students for 2 years of full-time clinical immersion. Twice a week in Year 3, learners self-manage their small groups as they explore virtual patients using the Bond Virtual Hospital 'app' before convening in groups of 20–22 students with clinicians to present and discuss their 'patients' [8].

With approximately 80% of BU's first-year students regarded as 'school-leavers' (the remaining 20% being graduates) and with Biology not being a prerequisite for admission, their well-being and transition to university life is considered as important as their academic adjustment to PBL. In approaching their transition from a biopsychosocial perspective [16, 17], cognisance is taken of Maslow's hierarchy of needs [18], i.e. in order to reach self-actualisation, learners' physiological, psychological and social needs must be met.

We believe that the suggestions and strategies that we describe will assist educators to ease students' transition to university and facilitate their adjustment to the learning required in PBL. This is particularly important in today's globalised world of social responsibility and accountability and increasing learner diversity.

Stating Our Case

In making a case for scaffolding learning and supporting students in undergraduate PBL programmes, Box 1 offers a summary of our suggestions. The rationale for each will follow.

Box 1. Suggestions for scaffolding learning at the outset of an undergraduate PBL programme

Assist learners' transition to university and PBL
- *Consider a phased approach to PBL*
- *Schedule a bonding session for each PBL group and the facilitator (tutor) prior to the first PBL tutorial*
- *Suggest that each student in the PBL group identifies a 'critical friend'*
- *Schedule a one-on-one session for each student with the PBL facilitator early in the semester*
- *Garner feedback on learners' experiences in the first few weeks of the programme*

Stay true to the PBL philosophy
- *Ensure PBL facilitators are well-trained*
- *Make sure that the PBL process is followed*

Develop learners' ability to self-assess and their self-directed learning skills
- *Begin developing learners' reflective skills as a prelude to self-assessment and continuous improvement*
- *Create an LI (Learning Issue) Tracker role to ensure that the expected Learning Outcomes (LOs) are achieved*
- *Ensure that LIs are appropriately phrased and prioritised*
- *Provide a list of recommended textbooks and ensure that facilitators guide learners to the texts*
- *Encourage learners to prepare for supplementary sessions by providing Session Guidelines*

Progressively develop critical thinking and reasoning skills (as a prelude to clinical reasoning)
- *Make critical thinking activities interactive, engaging and fun*
- *Foster students' inductive and deductive reasoning skills*
- *Develop students' ability to generate and critique a hypothesis*

Assist Learners to Transition to University and PBL

The majority of students who study in an undergraduate medical programme will be school-leavers and so may be as young

as 17 or 18. Not only would attending university require an often seismic academic adjustment, for some, this might also be the first time they have had to live away from their families or look after themselves. After the initial euphoria of being accepted into medical school and 'being a medical student' has passed, the reality of what lies ahead academically and professionally is often emotional and stressful. As it is well-documented that a reasonable proportion of medical students are depressed or at-risk of depression [19], educators have a responsibility to minimise this stress by providing learners with various avenues of support academically as well as in terms of their physical and mental well-being.

Consider a Phased Introduction to PBL

From our experience, the first 5–6 weeks of the new academic year are the most stressful, not only because of learners' psychological and social transition but also in terms of adapting to new ways of learning. At BU, like at many other universities, our challenge is dealing with increasingly diverse cohorts, not only culturally but also in terms of their prior educational and vocational experiences. For us, academic diversity includes the fact that up to one-third of each new cohort has not studied Biology and approximately 20% of the intake comprises graduates who are mostly health care professionals (e.g. nurses, physiotherapists, pharmacists) and who are generally still professionally employed. Gathering feedback during the first few weeks has informed us of the extra effort and time required by the non-Biology students to address deficiencies in foundational biological concepts, i.e. learning a suite of new medical science terminology in addition to researching the learning issues (LIs) generated in the PBL tutorial. In circumstances of such educational learner diversity, we would argue that rather than immerse learners in PBL at the outset, a more prudent approach might be a phased introduction using other educational approaches. One such approach in the first few weeks that would allow learners to become familiar with group work as well take responsibility for their learning is team-based learning (TBL) [4, 20, 21]. The summative Individual Readiness Assurance Test (IRAT) followed by the Group Readiness Assurance Test (GRAT) in TBL ensures that all learners will individually and in a group have understood and applied the expected foundational biomedical and social sciences. The IRAT also allows educators to identify learners who may require early academic support.

Schedule a Bonding Session for Each PBL Group Prior to the First PBL Tutorial

Before engaging with their first PBL case, we suggest allocating time to allow group members to get to know each other and their PBL facilitator as well as discuss the expectations of learning in a PBL programme. At BU, 2 hours are assigned at the start of the PBL tutorial to a session entitled "*Bonding: Getting to know each other*" on the first day of Semester 1. During this session, the Facilitator engages students in the following activities:

- An ice-breaking exercise, such as asking each group member to depict him or herself in a drawing and then explain the drawing to the other group members
- Identifying and discussing each learner's short- and longer term goals (1 year is considered short-term while 5–10 years is considered medium to long-term)
- Ensuring that each group member has read the PBL Guide and understands BU's eight PBL steps
- Discussing the responsibilities of the various assigned roles in PBL. Each week, the following roles are assigned: Chair, Scribe, Recorder, Reflector, Learning Issues (LI) Tracker and two Resource Persons. The role of the Facilitator is also discussed [22]
- Establishing ground rules, including *What if….?* scenarios for each rule. Examples might include: *What if a group member is disruptive? What if the group thinks the facilitator is interfering too much?* and,
- Asking each group member to select another member as his/her 'critical friend' [23], i.e. a peer who is a familiar face and who can potentially provide support and advice.

Suggest That Each Student in the PBL Group Identifies a 'Critical Friend'

Setting up a formal mentoring programme is resource-intensive as it usually involves busy academics or senior student cohorts whose timetables may not coincide with that of the new learners. In the multicultural South African setting, McLean and colleagues [24] found that the initial PBL group to which learners are assigned at the start of their medical studies is a powerful socialising environment. As most members of the group will be new to university and PBL, we should capitalise on their mutual unease. During the BU 'bonding' session on the first day of the new semester, individual group members are asked to think about whom in the group they might like as their 'critical friend'. This individual will then be their first line of support should they feel homesick or need advice. The critical friend is also expected to provide regular feedback. These 'friendships' are formalised in Week 2.

Schedule a One-on-one Session for Each Student With The PBL Facilitator Early in the Semester

It is imperative to monitor individual student's transition to university and to PBL. At BU, from about Week 3, PBL facilitators meet with each learner in his/her group for about 15 min to check how the student is adapting and coping with

the new social and academic environment. Towards the end of the semester, a second one-on-one involving self-, peer and facilitator feedback is scheduled. This second meeting is more about how the student is adapting to PBL. The feedback covers professional behaviour, group work and cognitive processes.

Garner Feedback on Learners' Early Experiences

Since the first few weeks of the start of a young student's studies might be an emotional transition, we advise gathering information as early as possible about how individual learners and the cohort as a whole are experiencing the curriculum. At BU, this is undertaken in three ways:

1. *'Flagging' students:* With the PBL Facilitator in an ideal position to monitor each of the seven or eight learners in his or her group, facilitators are provided with a 'flagging' form to complete and return to the Academic Lead for PBL should any issues be identified.
2. *One-on-one meeting with their Facilitator:* As described in the section above, the PBL Facilitator engages in an informal one-on-one meeting with individual students from about Week 3 to ensure that each student is settled, e.g. in terms of accommodation, being away from home and eating properly, etc.
3. *Online feedback to the Faculty:* At the end of Case 4 (1 month completed in the first 14-week semester), Case 8 (2 months) and Case 12 (end of semester), under the guidance of the PBL Facilitator, the Reflector leads his or her Group through Step 8 of the BU eight-step PBL process. As a Group, members provide online feedback on their experiences to date in terms of the highlights of studying Medicine at BU, difficulties they may have encountered and how they have dealt with them as well as any other aspects of the programme where they believe the Faculty can assist.

Stay True to the PBL Philosophy

It is important to stay true to the PBL philosophy as the skills developed are no less important than they were when PBL was designed in the 1960s. Staying true involves having trained facilitators who ensure that the PBL process is followed.

Ensure PBL Facilitators are Well-Trained

PBL facilitators are key to ensuring that learners develop the required skills during their learning [25]. Much of the soft scaffolding during the PBL tutorial thus depends on the skills of the PBL facilitator. As process experts (vs. content experts), we expect our PBL facilitators to be *cognitively congruent* (knowing when to ask the right questions) as well as *socially congruent* (being aware of each student's prior experience and knowledge) [22]. This requires initial training, weekly briefings and ongoing monitoring. Facilitators are also expected to role model professionalism in terms of how they dress, the sorts of questions they ask (Socratic) and how they respond to challenging situations [25].

Make Sure That the PBL Process is Followed

The steps in the PBL process are important for two reasons. First, the process mirrors the hypothetico-deductive reasoning required by newly graduated doctors and secondly, each step has educational underpinnings that develop a range of skills to assist learners to become self-directed. Learning is compromised if the PBL process is 'eroded', which happens when learners and/or facilitators omit steps or do not fully engage in some of the steps [26]. The PBL process can thus be considered a hard scaffold. Each step during the Case Opening and the Case Wrap-up has a purpose. Most notably, the main objective of the Case Opening is for learners to use their prior knowledge and experience to brainstorm and hypothesise what might be going on with the patient or patients. Hypothesising requires providing an explanation or mechanism, allowing learners to identify what they know and what they do not know. They can then develop LIs to research during the week. In BU's hybrid PBL programme, we support learning by providing large group resource sessions, practicals, workshops and forums. The main purpose of the Case Wrap-up is for all learners, after a period of self-study, to fully explain what is happening to the patient so that each student can check his/her understanding. At BU, we have expanded the Maastricht seven-jump process [22] to an eight-step process. The final step (Step 8) is for reflection (and sometimes online feedback) about the Group's progress. We provide Reflector resources on the curriculum management system, including a 6-week PBL group check and SWOT analysis as well a checklist for providing feedback on some of the roles in PBL. This group check uses a validated inventory which each group completes (overseen by the Reflector) to check which areas of group work (e.g. feedback, participation, etc.) might require attention.

Develop Learners' Ability to Self-Assess and Their Self-Directed Learning Skills

Not commonly acknowledged in the literature is that self-directed learning (SDL) is an outcome of PBL, rather than our expectation of learners when they first engage with the approach. This is particularly relevant in undergraduate

medical programmes, as learners will generally be entering university with teacher-centred educational experiences. Knowles' description (p. 18) of SDL as "*a process in which individuals take the initiative, with or without the help from others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources, choosing and implementing appropriate learning strategies, and evaluating learning outcomes*" [27] reflects the need for a range of skills to be developed, which include self-assessment, reflection, critical thinking and information searching. For Hmelo-Silver [6], metacognition, the process of thinking about thinking, is key to this process. In an undergraduate programme, learners therefore require considerable guidance to develop these skills. They should also have ongoing opportunity to practice and hone these skills.

Identifying one's learning needs requires an ability to self-assess to identify one's deficiencies. After some 20 years of experience and research with learners in several undergraduate PBL medical programmes, the most frequently asked question remains: *How much do I need to know?* While the response is usually something along the lines of "*as much as you need to know to explain what is going on with your patient in the PBL case*", we need to acknowledge that for any learner new to PBL, particularly 17 or 18-year-olds who enter university from a more teacher-centred paradigm, there will be uncertainty about the depth and breadth required to meet the advertised Learning Outcomes (LOs), which contribute to the assessment blueprint. With the need to defend how we pass and fail learners to a range of stakeholders, assessment will always drive learning. Thus, to assist learners to become more comfortable with knowing how much is required or expected, LOs need to be clearly articulated at each stage [28]. At the same time, the spiral of learning must be made explicit to encourage learners to study beyond the minimum requirements for the forthcoming assessment.

Begin Developing Learners' Reflective Skills as a Prelude to Self-Assessment and Continuous Improvement

Reflection is an important skill as it allows a learner to make a personal judgement about what he or she knows and does not know and then to address identified deficiencies. Hoffman and colleagues have recently provided the first evidence of the link between medical students' lack of reflective skills and unprofessional behaviour [29]. In addition to the reflective activities offered in BU's Health Advocate and Professionalism Theme, we assist students with their reflective development in two ways. First, we have created a Reflector role in PBL to oversee Step 8 (Reflection and Feedback). Development of reflective skills happens over the first few weeks of their engagement in PBL in Semester 1. With the aid of worksheets, during Step 8 in the Case 1 Wrap-up, facilitators guide their groups on how to provide feedback on the group process. During the wrap-up of Case 2, individual learners engage in self-assessment during Step 8 and finally, for Case 3, each student provides verbal feedback to one of his/her peers.

Create an LI (Learning Issue) Tracker Role to Ensure That the Expected Learning Outcomes are Achieved

As part of developing a sense of responsibility to a group and to encourage the development of different skills, we introduced the LI Tracker role in PBL. During each Case Opening, the LI Tracker is responsible for:

- Assisting the Group to develop LIs based on what the group does not know during and at the end of the Case Opening
- Ensuring that LIs are patient-focused (i.e. LI includes the patient's name)
- Ensuring that LIs are appropriately phrased and prioritised
- Mapping the Group's LIs to the Faculty-generated Case (week), Semester and Year LOs. Semester and Year LOs are released at the start of each semester. Faculty Case LOs are released at the end of the PBL Case Opening. The LI Tracker adds the Case LIs to a communal Semester and Year LO electronic file on the learning management system so that learners in each PBL group can monitor coverage of their LOs. This process contributes to curriculum mapping and assessment blueprinting and also encourages a competency-based philosophy. During the Case Wrap-up, the LI Tracker ensures that the LIs are available on the whiteboard. As the discussion proceeds, with students using what they learnt during the week to fully explain what might be happening to the patient, the LI Tracker checks the LIs as they are discussed. At the end of the Case Wrap-up, he/she can then confirm with the Group all the LIs have been duly addressed and mapped correctly.

Ensure That LIs are appropriately Phrased and Prioritised

As outlined above, the LI Tracker is responsible for ensuring that the Group develops patient-focussed LIs written such that they define the breadth and depth of what is expected as well as the time needed to be spent. This is accomplished in two ways: (1) through the use of command terms, and (2) by prioritising LIs. Three asterisks (***) means of a major LI while one asterisk (*) indicates that this is a minor LI and so learners should not spend too much time researching it.

Command terms, action words or instructional verbs define what learners need to be able to do [30]. Including the appropriate command term in the LIs generated during PBL helps learners define the scope (breadth and depth) of their

independent research. In a Week 2 Skills workshop, PBL groups and their facilitators are made aware of 'command terms' that align with Bloom's hierarchy ([31], Table 1). They are tasked with rewriting the LIs they had generated during the Case Opening 2 days earlier. As it is important for academics and learners to have the same understanding, all groups and their PBL facilitators are provided with a summary of the most commonly used command terms and their definitions.

Provide a List of Recommended Textbooks and Ensure That PBL Facilitators Guide Learners to the Texts

We believe that we are not alone in initially providing learners with a standard set of textbooks. While some might criticise this as being too directive, we argue that providing *first year* medical students with a set of recommended texts is a useful scaffold for those new to PBL. Wijinia and colleagues found that allowing students to choose resources from a predetermined list enhanced their perceived feelings of competence without interfering with their acquisition of knowledge [32]. If possible, e-books should be provided as today's learners have grown up using technology [33] and so presumably will be more likely to access online books than they would hard copies. At Step 5 of the BU eight-step PBL process, the stage at which learners ensure that their LIs are appropriately constructed and prioritised, PBL facilitators check that all group members know where to find information to address their LIs. This is an active discussion that continues each week until the Facilitator and group members are satisfied that they are using appropriate resources.

Encourage Learners to Prepare for Supplementary Sessions by Providing Session Guidelines

Every scheduled large group resource session (often a lecture), practical, workshop or forum to supplement learning in BU's hybrid PBL programme has an associated Session Guideline. Using the online curriculum management system, learners access the timetable with hyperlinked Guidelines. Session Guidelines ask learners three questions:

- *Why should I attend?* (synopsis of the session and its relevance included),
- *How should I prepare for the session?* (pre-readings; podcasts provided), and,
- *What do I need to bring to the session?* (to ensure engagement and participation).

One of the authors (MM) has personal experience in terms of her Histology 'teaching' that this system works. As an educator subscribing to the philosophy of active, learner-centred education, how students engage with the Histology content (integrated in PBL cases) in the first few weeks of Semester 1 and in Semester 2 has been 'flipped' [34]. In 'flipping' Histology, what had previously been lectures were recorded as Voice-over PowerPoints (VOPPs) and released with the other resources required for the week at the end of the PBL Case Opening. The Session Guideline informs students of the need to watch a VOPP, read short sections from two e-books and also directs them to recommended websites. The scheduled face-to-face session have become interactive quizzes in which groups of 2–3 students discuss the question before using keypads to submit their responses. Any difficulties or misconceptions can be addressed immediately. Later in the week, learners consolidate their understanding during the Histology microscopy practical and the clinical case sessions. The feedback and the assessment results suggest that first year students have largely embraced taking responsibility for their learning, appreciating the multimodal approach to engaging with various resources.

Progressively Develop Critical Thinking and Reasoning Skills

Critical analysis and inquiry, important skills in clinical practice, underpin the PBL process [35]. Although PBL requires learners to think critically, in an undergraduate programme, we believe that we need to be proactive in developing their skills. Additional sessions have been incorporated for learners to appreciate different ways of thinking and solving problems as a prelude to clinical reasoning.

Table 1 Examples of command terms utilised by learners to define the level of thinking (Bloom's taxonomy [31]) required for developing LIs

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
List	Summarise	Solve	Present	Design	Evaluate
Label	Document	Illustrate	Deduce	Formulate	Analyse
Identify	Interpret	Calculate	Review	Synthesise	Estimate
Show	Describe	Outline	Distinguish	Explore	Explain
Define	Classify	Interpret	Reflect	Discuss	Infer
State	Recognise	Relate	Derive	Prove	Suggest
Recall	Demonstrate	Apply	Account for	Compare	Examine

Develop Critical Thinking Activities That are Interactive, Engaging and Fun

As developing critical thinking skills requires active participation and engagement, sessions need to be interactive and engaging but also fun. Activities such as de Bono's Six Thinking Hats [36] which involves students bringing different coloured hats or rolling a dice to appreciate the concept of 'chance' in genetics *forces* them to see different perspectives when analysing problems or scenarios. We believe that providing learners with opportunities to argue different perspectives or viewpoints is important when engaging with patients and other health care professionals. Such viewpoints are likely to vary around social, psychological and perhaps environmental issues, for which there might be more than one solution or perhaps no solution. Referred to as civic competency, the ability to make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world [37], is an important competency if we are to graduate socially responsible medical students.

Foster Students' Inductive and Deductive Reasoning Skills

Other useful activities include groups engaging with concepts such as inference, deduction, assumptions, descriptions and explanations. PBL facilitators then encourage students to apply what they have learnt in these skills sessions as they work through their PBL 'patient' presentations.

Develop Students' Ability to Generate and Critique a Hypothesis

A hypothesis involves proposing an explanation based upon limited evidence as a starting point for further investigation. In generating a hypothesis, learners draw on their prior knowledge and experience to explain the rationale, generally by constructing a map on the whiteboard. This is emphasised in Step 1 of the PBL process, generally in response to the first trigger which should be open-ended, allowing for extensive brainstorming. Under the guidance of their facilitators, students learn to develop confidence in articulating their reasoning as well as communicating their thinking to their peers.

Feedback From Students

As indicated earlier, some of the scaffolds and process that have been put in place over the past 3 years have been in response to feedback from students in the first few years of the implementation of the renewed curriculum and from facilitators who are at the coalface of learning. At BU, student feedback from their experiences each semester in an integrated PBL curriculum is gathered as part of the PBL process. During Step 8, the Reflector engages the group in reflecting on their learning and the group process during the semester. This online qualitative feedback is a barometer of the general well-being of the cohort and if it is undertaken early in the semester, it allows almost immediate remediation should this be required (unlike the standard evaluation at the end of the

Table 2 Qualitative feedback provided by first year Bond University medical students in a guided, hybrid PBL programme

2015 Semester 1 Week 4	• The structure of PBL, and learning based on cases is new and exciting. Many of us are straight out of high school and have not experienced this before … did take a couple of weeks to get used to. • Lots of support with the guided PBL to ensure we can do it well. It's great that we have a diverse group of people in each PBL as that can add layers to our knowledge. • Like the social dynamic of our PBL group. We get work done, but can also have a space to discuss issue that pique our interest. This is important as young medical professionals that we have an area and time to reflect on our troubles, experiences and thoughts.
2016 Semester 1 Week 4	• PBL is a really great for interaction and developing a depth of knowledge. The way you learn best is by teaching others and PBL definitely helps with that. We can function well as individuals but also learn well as a group. Rather than just writing notes, we get to interact with each other and learn points that others may have found that we didn't. • As a PBL group, we have all enjoyed the small group learning we have undertaken along with the support from professors and students in higher years. This has been a more engaging way to learn in comparison with large group lectures that could be repetitive or unhelpful. • Guided learning approach (in comparison with other universities). More personal connection with lecturers and facilitators—positive collaborative learning—PBL is a really good way to bond + study + learn.

semester). This is particularly important in Year 1, when the majority of learners are new to university and to PBL. Table 2 provides examples of Semester 1 feedback relating to learners' positive experiences of small group learning in the PBL environment.

Closing Statements

When implementing PBL in an undergraduate programme, educators need to provide learners with support as they transition to university and to new ways of learning. Implementing a range of hard (e.g. ensuring the PBL process is followed) and soft (e.g. PBL facilitator skills; one-on-one meeting with their PBL facilitator) scaffolds will assist learners to develop the skills required for self-direction. It should also be acknowledged that like their future patients and clients, learners have 'human' needs such as a sense of belonging and feeling safe. We believe that we have provided a convincing case, comprising specific as well as general recommendations that educators can implement individually or collectively to provide increasingly diverse learners with the academic and psychosocial support they require in terms of their educational and emotional needs as they transition to university and to PBL. With medical students being particularly prone to stress and mental health issues [19], we owe it to our learners to ensure that the time they spend at medical school not only develops their cognitive and psychomotor competencies but also addresses their affective needs so that they can become self-actualising individuals. The small PBL group overseen by a cognitively and socially congruent facilitator has the potential to meet many of these requirements. To do so, however, we believe that we must remain true to the PBL philosophy.

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Compliance with Ethical Standards

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