A Tutorial Programme to Enhance Psychiatry Learning Processes within a PBL-Based Course

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This paper describes a tutorial programme developed at the University of Western Australia (UWA) to enhance medical students' learning processes within problem-based learning contexts. The programme encourages students to use more effective learning approaches by scaffolding the development of effective problem-solving strategies, and by reducing examination anxiety. The programme adds to a growing body of work on methods to augment problem-based teaching practices in psychiatry education.

Introduction

It has long been recognized that the practices adopted by medical educators have a significant impact on students' learning processes, and, in turn, on the knowledge, skills and attitudes with which these students graduate (e.g., Curran & Bowie, 1998). Despite this, historically, little emphasis has been placed on issues of pedagogy within psychiatry education. For example, in the introduction to their text, *Teaching psychiatry: putting theory into practice*, Gask, Coskun and Baron (2010) note that in psychiatry, "clinicians are frequently involved in training students and residents yet few have themselves been trained in pedagogy".

The past decade has seen an increase in efforts to address this issue. In particular, there is a growing emphasis within the psychiatry education literature on exploring ways to enhance students' learning *processes*,

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rather than an exclusive focus on endpoint outcomes. This suggests an increasing awareness that, to produce practitioners with the ability to apply complex knowledge efficiently within clinical settings, educators must encourage students to engage in high-quality learning processes. A particular emphasis in the medical education literature has been placed on how educators can encourage students to adopt 'deep', rather than 'surface', oriented learning approaches (e.g., Balasooriya, Toohey & Hughes, 2005; Dolmans, Wolfhagen & Ginns, 2010).

This paper first considers existing literature on students' learning approaches and on the use of problem-based learning (PBL) methods in medical education. Problems identified with the use of PBL methods are then summarized, and a tutorial programme developed by the first author at the University of Western Australia (UWA) to address these issues is described. The potential of this programme to enhance students' learning processes in PBL contexts is then considered.

Students' Learning Approaches

Biggs (1987) posed that students can adopt one of two major kinds of approaches when they are engaged in a learning task: (i) *deep* approaches, which focus on building understanding and high-level learning outcomes (e.g., problem-solving); and (ii) *surface* approaches, which focus on memorization and low-level learning outcomes (e.g., quantitative recall). In general, it has been found that tertiary-level students who adopt a deep approach to learning achieve superior outcomes to those who adopt more surface-oriented approaches (e.g., Shokri, Kadivar, Farzad & Sangari, 2007). In the context of medical education, several studies have indicated that the development of clinical reasoning skills can be enhanced through students' use of deep learning approaches (e.g., Groves, 2005; Whelan, 1988).

Ramsden (1988) summarised the key characteristics of students who adopt predominantly deep or surface learning approaches. Students who adopt deep learning approaches are characterised by their tendency to:

- focus on the meaning of learning tasks;
- relate previous and new knowledge;
- relate knowledge from different courses/units;

- relate concepts to their everyday experiences;
- relate evidence and argument in any topic;
- organise disparate content into coherent wholes; and
- be 'internally driven'.

Ramsden (1988) contrasted the above depiction with students who adopt more surface-oriented learning approaches, characterised by their tendency to:

- focus on the superficial aspects of learning tasks;
- focus on unrelated parts of learning tasks;
- memorise information for assessment;
- associate concepts without reflecting on their relationships;
- retain knowledge in a fragmented form; and
- be 'externally driven' (e.g., focus only on doing what is needed to complete required assessment tasks).

Both curriculum characteristics and assessment methods can influence the learning approaches that students choose to adopt. Researchers such as Curran and Bowie (1998) and Balasooriya et al. (2005) have identified various curriculum and teaching characteristics which encourage the use of deep or surface learning approaches. Courses which promote surface learning approaches include those which:

- have very heavy workloads, high class contact hours, or excessive course materials;
- provide limited opportunity for students to pursue topics in depth;
- provide students with limited or no choice in terms of topics and/or teaching and assessment methods;
- do not have a clear and transparent overall structure; and
- incorporate assessment tasks that reward rote learning, are anxiety provoking, or focus on independent details rather than overall structure and relationships.

In contrast, Curran and Bowie (1998) and Balasooriya et al. (2005) described courses that foster deep learning approaches as those which:

- are highly engaging and involve students in the learning process;

- provide opportunity for student-student interaction;
- are founded on a well-structured knowledge base;
- provide a safe and supportive learning climate;
- allow students to learn from mistakes;
- are relevant to practice;
- encourage students to 'learn by doing';
- have a clear and transparent overall structure;
- confront and eradicate students' misconceptions;
- include assessment methods that are well aligned with teaching methods and curriculum content;
- assess for structure rather than for isolated facts; and
- emphasise depth of knowledge over breadth.

The factors summarized by researchers such as Curran and Bowie (1998) and Balasooriya et al. (2005) are consistent with Biggs's notion of *constructive alignment* (e.g., Biggs & Tang, 2007). Based on this notion, to be effective, learning environments must have a high level of internal consistency. Two foundational assumptions underpin the notion of constructive alignment:

- *Learners must construct meaning from what they do in order to learn.* This notion underscores the importance of encouraging students to link new concepts to old, as well as linking current learning outcomes to future possibilities through reflection and abstraction.
- *Educators must align planned learning activities with intended learning outcomes.* This implies that learners must be provided with clearly specified goals for their learning and well-structured, appropriate learning activities; ongoing, formative feedback on their efforts, and end-assessment criteria that are well aligned with the intended learning outcomes.

Meyers and Nulty (2008) developed five principles to guide educators in designing learning tasks and environments to achieve constructive alignment. They proposed that all learning materials and tasks should:

- be linked clearly with 'real-world' practices;
- be constructive, sequential and interlinked;
- challenge students and promote high levels of intrinsic interest;

- align internally and with targeted learning outcomes; and
- require students to make use of progressively higher-order cognitive processes in order to succeed.

The Use of Problem-Based Learning Methods in Undergraduate Medical Education

Problem-based learning (PBL) methods were first popularized in medical education by Howard Barrows and colleagues in the 1960s (see Neville, 2009). In the decades since, PBL has been adopted by most medical schools within Australia and in other countries (e.g., Barrows, 1996; Can, Hazell & Williamson, 1996). Hmelo-Silver (2004) proposed that PBL is designed to help students to construct an extensive and flexible knowledge base; develop effective problem-solving skills; develop self-directed, lifelong learning skills; become effective collaborators; and become intrinsically motivated to learn. Barrows (1996) outlined six core characteristics of PBL learning contexts:

- a heavy emphasis is placed on student-centred learning processes;
- learning occurs mainly in small groups;
- teachers act as facilitators or guides, rather than as 'knowledge transmitters';
- problems form the basis for organized focus and the stimuli for learning;
- problems stimulate the development and use of problem-solving skills; and
- new knowledge is obtained by means of self-directed, rather than teacher-directed, learning.

In the literature, many have noted the promise of PBL to enhance students' theoretical understandings and improve their critical thinking skills (see Biley, Smith & Biley, 1999). PBL is also posed by many of its proponents to encourage more self-directed learning and the use of deep, rather than surface, learning approaches (see Groves, 2005). Despite such recommendations, the mechanisms by which PBL methods can produce these outcomes are rarely explicated. Based on the existing literature, Neville (2009) cited the following characteristics

of PBL, which might account (at least in part) for any positive effects these methods have on student learning processes and outcomes:

- knowledge is acquired in relevant contexts, which may enhance recall;
- concepts are acquired in a way that facilitates transfer to solve/view similar problems;
- acquisition over time of 'prior examples' facilitates pattern recognition;
- the emphasis placed on activating prior knowledge may facilitate processing of new information;
- knowledge is elaborated at the time of learning, which may facilitate recall; and
- learning within similar contexts may aid knowledge acquisition and subsequent application, as well as facilitating recall.

Despite its significant following, there has been widespread debate over the efficacy of PBL for enhancing student learning processes and outcomes within medical education. As noted by Newman (2004), "...Problem Based Learning has arguably been one of the most scrutinised innovations in professional education".

Early reviews on the efficacy of PBL in medical education were inconsistent in their conclusions. For example, the review published by Vernon and Blake (1993) was generally positive, indicating that "...overall, the results of our meta-analysis support the superiority of the PBL approach over more traditional methods...". In contrast, results of Albanese and Mitchell's (1993) meta-analysis of PBL studies from 1972 to 1992 indicated that:

> There is no consistent evidence that problem based learning in continuing medical education was superior to other educational strategies in increasing doctors' knowledge and performance but moderate evidence that it led to higher satisfaction... Compared with conventional instruction, PBL, as suggested by the findings, is more nurturing and enjoyable; PBL graduates perform as well, and sometimes better, on clinical examinations and faculty evaluations; and they are more likely to enter family medicine... However, PBL students in a few instances scored lower on basic sciences examinations and viewed themselves as less well prepared in the

basic sciences than were their conventionally trained counterparts. PBL graduates tended to engage in backward reasoning rather than the forward reasoning experts engage in, and there appeared to be gaps in their cognitive knowledge base that could affect practice outcomes.

Other early reviews similarly provided little evidence to support the superiority of PBL over traditional learning methods. For example, in the review report of Colliver (2000), it was noted that:

> Medical educators for the most part have been receptive to the PBL approach. It certainly seems like a more challenging, motivating and enjoyable way to learn, and students appear to agree. However, the educational superiority of PBL relative to the standard approach has been less clear... The review of the literature revealed no convincing evidence that PBL improves knowledge base and clinical performance, at least not of the magnitude that would be expected given the resources required for a PBL curriculum.

More recent syntheses of PBL have, however, been somewhat more positive. For example, based on an analysis of 13 PBL evaluations, Koh, Khoo, Wong and Koh (2008) concluded that:

> Problem-based learning during medical school has positive effects on physician competency after graduation, mainly in social and cognitive dimensions... [Eight] of 37 competencies had strong evidence in support of problem-based learning. Observed assessments had 7 competencies with strong evidence. In both groups, most of these competencies were in the social and cognitive dimensions. Only 4 competencies had moderate to strong levels of evidence in support of problem-based learning for both self-and observed assessments: coping with uncertainty (strong), appreciation of legal and ethical aspects of health care (strong), communication skills (moderate and strong respectively) and self-directed continuing learning (moderate).

Based on the prior evaluations reviewed in these papers, it is clear that whilst PBL holds promise for enhancing academic performance in some areas, its effects have been inconsistent across studies. This inconsistency has fuelled ongoing debates over the use of PBL in undergraduate medical education contexts.

Sean Hood and Elaine Chapman

Common Issues in the use of PBL Approaches

Debates over the overall efficacy of PBL for improving students' learning outcomes have prompted medical education researchers to analyse the learning *processes* that PBL encourages. Common criticisms made of PBL focus on problems with the lack of structure and alignment often associated with PBL contexts; the potential for PBL to increase students' anxiety levels; and the lack of available evidence on the impact of PBL on students' learning approaches.

Issues of Structure and Alignment

A common concern raised with respect to PBL relates to the lack of structure that characterises many PBL contexts. For example, Hendry, Lyon, Prosser and Sze (2006) argued that PBL students require some form of supplemental direct instruction to regulate their learning. Neville (2009) similarly summarized concerns that the relatively unstructured approach used in PBL to enhance students' problem-solving skills was not consistent with current understandings about working memory. The latter concerns are consistent with the findings of Sweller and colleagues, who found that active problem-solving early in the learning process is a less effective instructional strategy than studying worked examples (e.g., Sweller, 1988).

Research on students' perceptions of their learning environments has confirmed that medical students often crave a more structured approach within PBL contexts. The findings of several studies suggest that students consider misalignment with assessment processes, lack of specific feedback, and reduced structure as ongoing issues in PBL contexts. In Australia, for example, published analyses of responses to annual *Course Evaluation Questionnaires* (CEQs) in medicine have highlighted the importance of course structure and clear assessment criteria in student satisfaction. In an analysis of the 2005 CEQs from the University of Sydney, the open-ended responses provided by students included demands for "more direction as to learning expectations", "more guidance", and "clearer explanation of marking criteria" in PBL units[1].

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[1] 2010 Report from the University of Sydney's *Institute for Teaching and Learning*, http://www.itl.usyd.edu.au/aboutus/default.htm.

Effects on Anxiety and Motivation

Consistent with the findings summarised above, it has been proposed that PBL contexts may increase students' anxiety levels. In a study with undergraduate nurses, Biley et al. (1999) noted that formal assessments were particularly stressful for students in PBL contexts, because PBL often did not prepare them well for formal examinations. Students also reported a need for more direct support and structure to avoid feeling 'cut loose' in PBL courses. This finding is consistent with prior evaluations, in which PBL was reported to be more stressful than traditional learning contexts (see Berkson, 1993a; Berkson, 1993b).

PBL has also been reported under some circumstances to have a negative impact on students' intrinsic motivation levels. In one recent study, Wijnia, Loyens and Derous (2011) examined the effects of PBL versus lecture-based environments on undergraduates' study motivation. Results showed that PBL students scored higher on competence but did not differ from other students on 'autonomous' motivation. Analyses of focus group data indicated that uncertainty (e.g., in selecting the correct and sufficient literature) can be detrimental for students' motivation. Given that PBL can create uncertainty, the authors posed that it was crucial in PBL contexts to incorporate right amount of structure to avoid having a negative impact on student motivation.

Impact of PBL on Student Learning Processes

Advocates of PBL often highlight the potential of these methods to encourage students' use of deep, rather than surface, learning strategies. Reviews of the medical education literature have presented limited evidence to support this view. In their early review, for example, Albanese and Mitchell (1993) reported that students were more likely to adopt deep approaches to learning and to control their own learning in PBL-based courses. In a later review, Newman (2004) highlighted two studies in which positive effects of PBL on students' learning approaches had been found. In both of the latter studies, students reported using fewer 'undesirable' and more 'desirable' learning approaches after studying under a PBL approach.

Studies of the effects of PBL on students' learning approaches have not, however, consistently reported positive results. For example, Groves (2005) asked medical students to complete a learning strategies questionnaire at the commencement and at the end of their first academic year. Results indicated a net shift in predominant learning approach away from deep learning towards a more surface approach over the study period. Based on these results, the authors questioned prior conclusions that PBL curricula robustly fostered a deep approach to learning, suggesting that other factors (e.g., workload) may be more significant determinants of students' learning approaches.

Further to these outcomes, while most research conducted on PBL and learning processes has focused on the learning strategies that students adopt, some studies have focused on other learning process factors. Again, these studies have produced inconsistent results. For example, while it is generally assumed that PBL will encourage students to engage in more self-directed learning methods, the few studies done in this area have not provided strong evidence to support this assumption (Chakravarthi, 2010).

Augmenting PBL Approaches in Psychiatry Education: The UWA Approach

In light of concerns raised about PBL's effects on student learning processes and outcomes, various practitioners have attempted to develop and trial methods for overcoming associated problems in undergraduate medical courses (e.g., Vardi & Ciccarelli, 2008). This section of the paper summarizes a supplementary tutorial programme developed by the first author at the University of Western Australia (UWA) to address these issues. At the time of writing, PBL was used in most undergraduate medical units at UWA. The 4th-year module in which the programme was developed is the largest psychiatry training component of the UWA medical course. While the PBL approach used in the module provides students with a sound theoretical knowledge base, the approach does not focus sufficiently on developing students' clinical reasoning skills, or on preparing them for the existing 'long-case' clinical examination at the end of the module.

The overarching goal of the tutorial programme is to improve students' experiences in the psychiatry module by: (i) enhancing the development of generic problem-solving skills, providing better alignment between the module content and the module assessment methods, and increasing the clarity of goals/standards within the module; (ii) fostering students' use of the deep learning approaches identified to be essential for clinical skill development, and; (iii) reducing undue anxiety about the end-of-module examination, which interferes with higher-level learning processes. Concurrently, it aims to address some of the key concerns raised previously by students about studying exclusively under PBL.

The methods used in the programme are all based on evidence drawn from the medical education literature. The programme comprises weekly sessions which allow students to consolidate the knowledge they acquire through PBL and prepare specifically for the clinical examination. Given that psychiatry clinical examinations are highly structured, it is vital for students to use a 'template' in their presentations that is congruent with what a psychiatrist expects. The intervention is designed to achieve the above-mentioned goals by applying six evidence-based learning principles:

- explicating curriculum structure/assessment goals;
- building knowledge on previously acquired concepts;
- scaffolding application and transfer of learned material to clinical settings;
- troubleshooting common areas of difficulty;
- modelling effective higher cognitive processes, and;
- engaging active learning and collaboration.

These principles are applied in the programme as shown in Table 1. As indicated, Tutorial 1 of the programme focuses on explicating aspects of the unit structure and processes. Making these elements of the module explicit is designed to clarify the overall structure of the unit, reduce examination anxiety, and enhance students' sense of control. Based on the research summarised by Curran and Bowie (1998) and Balasooriya et al. (2005), this should, in turn, encourage the use of deep, rather than surface, learning approaches.

Table 1. Principles applied in the UWA psychiatry tutorial programme

Tutorial 1 (Explicating)	This tutorial provides an overview of the module structure and exam process; insights into the purpose of the examinations, and; how students can use their clinical experience in the placement and PBL process to facilitate their learning in that term.
Tutorial 2 (Knowledge-building)	This tutorial covers Psychiatric History in detail. This builds upon the introductory lecture that students receive on this topic, by covering the following areas: (i) how to record information from the history for examination purposes (eg: folded manila card technique); (ii) the asynchronous/chaotic nature of information retrieval in psychiatric settings; (iii) the temporal nature of headings in the history (an important yet problematic area for students); and (iv) clarifying understanding of formal psychiatric headings in the history.
Tutorial 3 (Scaffolding)	This tutorial covers the Mental State Examination (MSE), focussing on common problems and translation of existing lecture material to clinical settings. Key issues are (i) temporal sequence in MSE vs. history, (ii) clarifying technical terms used in MSE, and (iii) providing a template for MSE that is "exam-safe".
Tutorial 4 (Trouble-shooting)	This tutorial explores diagnosis and differential diagnosis. Common errors are explored (eg: giving an "episode" rather than a "disorder" label as a diagnosis) and links to the PBL course are explicitly made.
Tutorial 5 (Modelling)	This tutorial focuses on formulation (weighted summary statement). Students are taught a "grid" to formulate, which provides both structure and confidence. Students usually begin to present examples of their work by this week also (eg: a student might want to read out his/her MSE to the group). Group participation is encouraged through a "safe environment" groundrule, with any negative comments made being reframed in positive terms. A stepwise progression to the challenges of the pending clinical examination is fostered.
Tutorial 6 (Engaging)	This tutorial ties it all together, and explores issues that students have come up with in their own examination preparation. Refinement of examination technique occurs through student presentations and constructive group feedback. This is the traditional "long case" format, thus most of these skills are useful in other medical disciplines.

Tutorial 2 then builds on the understandings that students develop of taking a Psychiatric History in their lectures. Based on the research summarised by Curran and Bowie (1998) and Balasooriya et al. (2005), this tutorial provides students with ample opportunity to pursue Psychiatric History in depth; presents a well-structured knowledge base for the topic; and provides opportunity to confront and address students' misconceptions.

Tutorial 3 is designed to provide students with explicit scaffolding in tackling the Mental State Examination, while Tutorial 4 focuses on scaffolding students into the process of trouble-shooting. Tutorial 5 is then designed to target higher-level cognitive outcomes by modelling an effective approach to formulation. As noted previously, evidence suggests that PBL students require direct support to apply their knowledge to clinical settings. Based on the work reported by Curran and Bowie (1998) and Balasooriya et al. (2005), these tutorials provide students with a more structured approach to studying each of these topics; engage students more in the learning process; and encourage students to 'learn by doing'.

Tutorial 6 is designed to provide an integrated view of the unit as a whole as well as reducing anxiety about the examination and refining students' examination techniques. A further goal is to provide students with opportunity to receive constructive group feedback. As indicated by Curran and Bowie (1998) and Balasooriya et al. (2005), courses which include assessment tasks that are anxiety provoking tend to promote the use of surface learning strategies. In contrast, those in which the assessment methods are well aligned with teaching methods and curriculum content tend to promote the use of deep learning strategies. This tutorial is thus designed to address a key concern that emerges with the use of PBL (i.e., increased examination anxiety due to the lack of a transparent structure).

As a set, these tutorials have been found by the first author to address most of the issues that students have reported with respect to the use of PBL methods. Whilst no formal evaluation has yet been conducted on the programme, student feedback received thus far has been unequivocally positive. This is consistent with the findings of previous

researchers, who have pointed to the need for PBL contexts to include some form of supplemental direct instruction (e.g., Hendry et al., 2006; Vardi & Ciccarelli, 2008).

Conclusion

This paper contributes to an increasing body of work on strategies to augment PBL-based courses in psychiatry education. The programme described in this paper addresses several of the problems that arise for students and educators who work within PBL-based learning contexts. Whilst the programme described has yet to be evaluated formally, based on preliminary student feedback, the tutorial sessions have the effect of improving overall teaching quality, enhancing generic skill development, and increasing clarity of the course goals/standards. Several students have also reported that the programme has had positive effects on their use of deep learning strategies in preparing for their examinations, primarily by reducing examination-related anxiety.

Clearly, however, other aspects of courses must be considered if psychiatry educators wish to achieve the 'constructive alignment' described by Biggs and his colleagues. First, while the programme described in this paper provides a 'bridge' between PBL processes and formal examination tasks, some analysis of the alignment between course assessment methods and PBL tasks should be conducted routinely. The effects of different assessment methods on student learning processes are now well documented (e.g., Prosser & Trigwell, 1999). To achieve alignment within PBL-based psychiatry courses, the criteria used in grading students' performances must not reward learners for taking a surface-oriented approach to their learning. Amongst other criteria, the performance assessment at the end of a PBL unit should be based explicitly on students' ability to: (i) extract meaning and appropriate generalizations from learning tasks; (ii) make connections between these tasks; (iii) apply general principles presented to them; (iv) analyse material in a systematic way; and (v) reflect upon various aspects of their own performance.

Students' learning development and engagement must also be supported through the use of effective PBL tasks. In particular, the problems used in PBL should be sufficiently challenging to engage

students for sustained periods. Hung (2008) applied the principles espoused by Biggs and colleagues to provide a systematic conceptual framework for guiding the design of effective PBL tasks. Hung's approach is based on a 9-step problem design process. Initial steps involve analysing learning goals, content and contexts to aid in problem selection. Further steps are then taken to ensure that the problems meet the requirements identified in the analyses. The final two steps are associated with a reflection component. The use of this model, alongside the tutorial programme proposed in this paper, may further enhance the efficacy of PBL in psychiatry education settings.

At a broader level, the current paper adds to a growing body of literature on the quality of methods used within psychiatry education. The practices adopted by psychiatry educators will not only influence the learning approaches that students adopt; these have also been shown to have a significant impact on recruitment to the profession. As noted by Dogra, Edwards, Karim and Cavendish (2008), "recruitment into psychiatry is correlated with the quality of undergraduate medical school teaching programmes and with a commitment of major resources to teaching students... There is an extensive literature related to attitudes towards psychiatry but less on the learning and teaching of psychiatry." A continued focus on quality in psychiatry education is critical, therefore, both for the individual students we educate, and for the future of the profession as a whole.

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