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**Abstract:** Problem-based learning (PBL) is a pedagogical approach to professional training that emphasises the development of clinical reasoning skills and self-directed learning. In contrast to more traditional lecture-based approaches which focus upon the linear acquisition of course content, PBL is undertaken in the context of actual case presentations. Although PBL has been adopted widely in the professional training of medical practitioners and nurses, it is only just beginning to be employed in the professional education of psychologists. This paper examines the nature and benefits of PBL for education in clinical and forensic psychology by outlining its implementation and development at Charles Sturt University (CSU), located in a rural area of Australia. Although a full and independent evaluation of PBL for education in clinical or forensic psychology is yet to be undertaken, this paper argues that PBL can make a significant contribution to professional training in psychology.

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Professional education of psychologists using online problem-based learning (PBL) methods: The experience at Charles Sturt University

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Problem-based learning
Problem-based learning (PBL) is a pedagogical approach to professional training that emphasises the development of clinical reasoning skills and self-directed learning. In contrast to more traditional lecture-based approaches which focus upon the linear acquisition of course content, PBL is undertaken in the context of actual case presentations. Although PBL has been adopted widely in the professional training of medical practitioners and nurses, it is only just beginning to be employed in the professional education of psychologists. This paper examines the nature and benefits of PBL for education in clinical psychology by outlining its implementation and development at a university located in a rural area of Australia. Although a full and independent evaluation of PBL for education in clinical psychology is yet to be undertaken, evidence is presented of its effectiveness in professional training contexts.
PROFESSIONAL EDUCATION OF PSYCHOLOGISTS USING ONLINE PROBLEM-BASED LEARNING (PBL) METHODS: THE EXPERIENCE AT CHARLES STURT UNIVERSITY

In 2000 Charles Sturt University (CSU) modified the structure of its clinical and forensic postgraduate psychology programs to a problem-based learning (PBL) structure. The modification was as an online PBL program incorporating online cases and forums, additional online resources, together with face-to-face lectures, practical/tutorial exercises and in-vivo assessments conducted at residential schools, as well as written assessments and supervised professional placements. The focus of this paper is upon the PBL approach to professional education in Psychology. As there is considerable variation in the way in which PBL is used in the teaching and learning literature, we first describe this as applied in the CSU programs. Secondly, we examine literature on the effectiveness of such a pedagogy for professional education, particularly as applied to clinical psychology. Thirdly we examine limitations of PBL, and suggest the ways in which these were addressed in the design of PBL at CSU. Throughout this paper we consider the benefits and contributions of adopting a PBL approach in the training of professional psychologists.

The professional psychology courses offered at Charles Sturt University

The Master of Psychology at Charles Sturt University was first offered in 1995. It was designed as a part-time degree, offered by Distance Education only. The rationale for the distance education offering was to enable psychologists working in rural areas across Australia to complete a post-graduate professional qualification in clinical or forensic psychology. In this offering, students were required to complete 80 hours of face-to-face
teaching per year in each of the four years of the part-time course by attending compulsory residential schools held on the Bathurst campus. In between residential schools, students were required to work through print content (study guides and supplied readings) that were designed basically as didactic materials providing students with the 'information' of the curriculum. In addition students were required to complete 1000 hours of practicum in the field, and undertake and report a piece of clinical or forensic relevant research.

The degree was radically restructured for commencement in 2000 into the current online PBL program. The thirteen semester-based subjects were reorganised into seven full-year subjects of various weightings in terms of credit points. As a result all subjects were re-designed and re-written as online case-based PBL subjects. The course was still offered only in part-time mode, and offered only via distance education with all of the other components of the course remaining (i.e., attendance at compulsory residential schools, provision of study guides and supplied readings, field placement requirements, and completion of a research project and report). In this re-design the student background, specifically their skills in clinical reasoning (Boud, 1985) were taken into consideration.

The students enrolled in the Master of Psychology course at Charles Sturt University are currently required to be fully registered as a Psychologist in the State or Territory within which they reside and practice prior to their commencement in the course. The vast majority are employed full-time in positions that involve the provision of psychological services. Within these stipulations the amount and breadth of experience students have varies, with some students only becoming fully registered within the last six months or so, while others have been registered for ten years or more. Some students have worked exclusively with children and families, whereas others have had only adults as
clients. Some have experienced multiple work settings (such as public health, private practice, and disability or corrective services and juvenile justice) whereas others have worked in only one of these settings. The fact that all students have been employed as psychologists, and usually have a reasonable amount of clinical or forensic experience, means that they can also contribute a great deal to each others’ learning. This was a significant factor in deciding to move to a PBL approach. Throughout the course students are encouraged to share their knowledge and professional experience to maximise the learning experience for the whole class. Of course this is monitored by the professional staff, and perceived misinformation is promptly and sensitively corrected. Furthermore, students are encouraged to develop professional networking with each other from the first residential school at the start of the course. Students are encouraged to pool tangible resources (such as preferred case formulation formats, monitoring forms, relaxation scripts, useful metaphors, and so on.

PBL and its implementation in the CSU Program

In comparison to other pedagogical approaches, problem-based learning has been recently developed and promoted as an effective approach for professional training (Savin-Baden & Major, 2004). It had been popularised by Barrows and Tamblyn (1980) who viewed “problem based learning” (PBL) as being different from problem solving learning in which students solved problems set by the lecturer. In PBL students solved real life problems. Specifically, in PBL Barrow and Tamblyn focused upon the actual reasoning and problem-solving abilities of medical students at McMaster Medical School, Canada, and developed PBL based on problem scenarios that reflected ‘complex, real world situations’ to assist students to not only acquire the knowledge base from which the
reasoning process could proceed, but also upon the acquisition of reasoning skills *per se* (Savin-Baden & Major, 2004). There are two assumptions of PBL. The first is that learning through a real problem situation is more effective than rote learning a body of knowledge. This assumption is based on research that has found that even problem-solving learning, when de-coupled from the context in which it occurred, does not necessarily result in generalisation to actual clinical case work in post-training settings (Savin-Baden, 2000). The second assumption is and that for medical students the treatment of patients is essentially a problem solving skill (Savin-Baden, 2000).

The design of the curricula at CSU required more than repackaging the thirteen subjects into seven year long subjects. It required a re-design with problem scenarios central to student learning. The important educational objectives that enable PBL to reflect complex real-world scenarios are, according to Burrows (1986), (1) the structuring of knowledge for use in clinical contexts, (2) the development of an effective clinical reasoning process, (3) the development of effective self-directed learning skills, and (4) increased motivation for learning. The real world aspect of PBL means that it has been used in teaching a variety of professional training areas since the 1960s, but has been applied predominantly within the medical and other sciences (Savin-Baden, 2000; Savin-Baden & Major, 2004).

Problem based learning is argued to allow students to direct their own learning as they explore complex but realistic scenarios. Azer (2008) described the role of the student in PBL as including, (a) learning to apply knowledge to real-life situations, (b) producing information by asking questions and researching for answers, (c) accessing resources that are self located or located through collaboration in a PBL team situation and, thus, (d)
developing abilities for critical analysis. Specifically, students work in small groups to examine a problem situation and, through this exploration, locate the gaps in their knowledge and skills in order to decide what information they need to acquire in order to resolve or manage the situation. A PBL approach, however, does not exclude the use of lectures (and these are still a major component of residential schools in the CSU model). In the online environment lectures complement the on-line presented problem-based tasks rather than being the major channel for the transmission of subject-based knowledge. Thus, a critical feature of PBL is the use of problems, predominantly presented within case material, as the central pedagogical strategy to encourage students to seek solutions and the knowledge required to solve the problem.

The model of PBL adopted by CSU is a case-based approach, one of many approaches to PBL identified in a taxonomy developed by Barrows (1986; see also Savin-Badin, 2000). In this approach hypothetical (although derived from real) cases are presented to students in an on-line environment (currently CSU Interact, a Saiki platform). Case information is “unfolded” in a series of mini-vignettes in which both critical and irrelevant exposures and disclosures are presented. The cases unfold in complexity as students progress through the material. In early sessions, critical information is not revealed. Thus with each step in the case the student is required to synthesise information already revealed, to infer its significance, to formulate a hypothesis (moving from initially crude to refined), and to seek confirming or disconfirming information. At one level this will be information intrinsic to the case itself (e.g., assessing for additional symptoms for a hypothesized diagnosis, or evidence of treatment adherence), or information about more content specific domains (e.g., what is the reliability and validity of diagnoses of
externalizing problems in children). Thus students simultaneously explore the curriculum in a guided and structured way, and explore the case in a manner similar to “real-world” case work.

Advantages of this approach are that it allows students to explore diagnosis, treatment planning and outcome evaluation in a realistic and elaborated pedagogical approach. The pedagogy is “realistic” in that the cases are based upon real case material (although heavily disguised), and are contextualized in actual clinical settings. Furthermore, the cases are “unfolded” in such a way that is consistent with the ambiguity, uncertainty and conflictual nature of actual clinical disclosures and observations (Kim et al., 2006). The pedagogy is “elaborated” in that the case material provides a springboard from which students become active learners, seeking to explore areas of ignorance, uncertainty and doubt. This latter is an important mechanism by which the course curriculum is covered.

The effectiveness of PBL in professional training

Problem-based learning has been most frequently applied in the training of medical practitioners, and it is in this training domain that the evaluation of PBL has primarily been undertaken. For example, Schmidt, Vermeulen and van der Molen (2006) surveyed graduates of two medical schools in the Netherlands, one of which employed a PBL approach to training, the other employing a more conventional training model. Respondents were asked to rate themselves on 18 professionally relevant skills, as well as to rate the quality of their training compared to that which they believed other graduates had received. The authors analysed responses in terms of four indices; interpersonal competencies (interpersonal skills, team collaboration, leadership), cognitive competencies related to PBL goals (problem solving, information seeking and self-directed learning), academic
competencies (research activities and knowledge dissemination), and task-related competencies (productivity, planning skills, efficiency). Graduates of the PBL program rated themselves to be higher (at moderate to large effect sizes) in the areas of interpersonal and cognitive competencies, and although higher than graduates of conventional programs, at only a small effect size for academic and task-related competencies. This finding that PBL approaches are superior in facilitating problem-solving and collaborative skills supports at least one of the purported strengths of a PBL approach to professional training (Savin-Baden & Major, 2004). Furthermore, Tiwari, Lai, So and Yuen (2006) used a standardised measure of critical thinking (the California Critical Thinking Disposition Inventory [CCTDI]) to examine the effect of PBL approaches on the development of critical thinking skills of nursing students in Hong Kong. Again, students of a PBL approach were compared to students taught via a conventional “lecture-based” program. The results again indicated a benefit of the PBL approach in fostering problem solving and critical thinking amongst students, in this case measured at different stages throughout the training programs, as well as at completion and at a two year follow-up. The authors of this evaluation argued that the critical component of PBL that facilitated problem solving and critical thinking was that PBL encouraged students “…to analyse problems through the process of initiating and developing appropriate investigations. Prompted by the need to synthesise and test newly acquired knowledge, they adopted a critical and objective approach to scrutinising the relevance of the information to the problem” (P.40).

In addition to specific evaluations, several meta-analytic studies have reported finding the PBL format to be superior to other education approaches (e.g., Albanese & Mitchell, 1993; Dochy, Segers, Van den Bossche, & Gijbels, 2003; Vernon & Blake,
in summary, the findings from educational outcome evaluation studies are that PBL is superior, not in the theoretical knowledge that it provides, but in the meta-cognitive skills that it provides to students. Specifically, PBL trains clinicians in clinical problem solving skills, reflective practice, and collaboration. Of equal significance is the fact that although studies have not found an advantage for PBL in terms of content knowledge acquisition, at the same time they have not highlighted a deficit in declarative knowledge resulting from a PBL approach to professional training. The means by which the facilitative effects of PBL approaches on professional meta-cognitive skills occur is yet to be elaborated. A recent review by Svinicki (2007) calls for research to now go beyond the question of “does PBL work?” and proceed to the next stage of analysis by investigating how and why it works. The same injunction was made some years earlier by Hmelo-Silver (2004), who noted that there are many published reports detailing innovative applications of PBL in a wide variety of settings, and involving a wide variety of professions other than medicine (e.g., Dahlgren & Dahlgren, 2002; Ram, 1999). She notes, however, that there is a relative paucity of empirical evidence on what students are acquiring through PBL and, in particular, how they are acquiring it.

The current paper is not able to address this question, other than to suggest that PBL approaches focus as much on the way that students learn as they do upon what is to be learned, and thus instil in students a need to monitor and evaluate all information related to professional practice. In short, PBL teaches critical thinking and problem solving, as much as it does professional knowledge and skills. As noted by Huey (2001), clinical psychologists, along with most other health professionals, are primarily clinical problem-solvers. From their first contact with a client, they need to be able to make sense of a
complex set of presenting problems in order to develop a tentative case formulation. Huey (2001) argues that an important goal in training clinical psychologists is to develop and facilitate effective clinical reasoning. In other words, future clinical psychologists need to be taught how, rather than what, to think about complex psychopathology. He therefore argues that clinical psychology training “should aim to provide information on and facilitate skills in problem-solving” (p. 12). Specifically Huey (2001, p. 13) proposed that the aims of PBL could be summarised as (1) better acquisition and integration of scientific and clinical knowledge, (2) improved clinical reasoning and other skills, and (3) more effective lifelong learning skills. Empirical evidence appears to support the latter two proposals, but is yet to confirm the first. Despite this, Huey proposed that the key mechanism underlying the effectiveness of PBL is that it instils in students a process of inductive reasoning such that students must infer a generalised conclusion from an initial problem statement. This conclusion is argued to be equivalent to a hypothesis, which can then be tested as more data is collected. Thus the student is engaging in hypothetico-deductive reasoning as they work through the didactic case material that is in effect the implementation of a scientist-practitioner approach to coursework problems, and thus the foundation for subsequent professional practice. In the CSU program, to address the criticism that PBL was not as strong in teaching theoretical knowledge, a theoretical based examination is held in every subject.

Curriculum Development

The development of the online problem-based learning methodology for the Master of Psychology course was encouraged and supported by the Centre for Education, Learning, and Teaching (CELT) at CSU. Educational designers worked closely with
academic staff to develop the format for the materials. This collaboration between academic staff, educational designers, as well as coordinators of the University’s on-line learning environment, was a critical part of the early development of the PBL initiative. The planning process involved individuals and groups deconstructing and reconstructing the curriculum from a linear “lecture based” model to a vertically integrated “case-based PBL structure”. Although the aims and goals of the course did not change, these had to be operationalised in a radically different way. In effect, the 13 subjects of the course were reconstructed into major themes (or “megasubjects”). The themes were:

1. adult mental health (which included assessment, diagnosis and clinical interventions with adults, as well as interventions with adults in forensic settings)
2. problems that emerge during childhood and adolescence (which included assessment, diagnosis and clinical interventions with children, as well as adults with a developmental disability, or children and adolescents in a juvenile justice context),
3. biological based problems and interventions (including neuropsychological assessment and interventions, rehabilitation programs, psychopharmacology), and
4. clinical and forensic practice areas (including individual and community health interventions, cultural issues, general clinical or forensic practice, supervision and practitioner contributions to professional knowledge and practice).

Course subjects covering research methods and the research dissertation were not restructured into a PBL approach, even though such a revision would be possible because of the essentially research focus of PBL. The determination of the “major themes” was driven by the perceived ability of the proposed themes to enable the development of subjects that addressed clinical/forensic competencies (skills) while at the same time
addressing knowledge requirements. A matrix approach of course mapping was developed to ensure that all essential curriculum components were addressed through putative cases in a PBL approach. This was undertaken first at a course level, to ensure that all curriculum components (syllabus) were covered in the topic areas, and then within the topic areas (megasubjects) to ensure that all curriculum components allocated to that area (megasubject) were covered within the cases. For ease of explication, we will present here the first year “megasubject” PSY531 Adult Mental Health. It should be stated that this subject is taught in conjunction with introductory subjects in clinical or forensic psychology, which orient students to the assumptions and goals over the course of the clinical or forensic courses respectively.

In the development of the first year Adult Mental Health subject (PSY531) the initial task was to identify the knowledge and competencies that should be developed within this subject. Competency areas identified included (but were not restricted to): Research skills (identifying and obtaining relevant theoretical and empirical literature); Assessment (clinical interview and use of standardised and non-standardised assessment methods); Case formulation; Treatment planning; Treatment implementation; Treatment evaluation; and Professional written communication. Other critical issues to be covered within the subject included: Ethics and professional behaviour; Legal issues, relevant legislation, and legal obligations; The scientist-practitioner approach to practice; Collaborative practice with other professionals; Self-awareness and self-care; and Transtheoretical approaches to psychological therapy. These competency elements can be considered to be the column elements of a curriculum grid. In a series of meetings the seven clinically or forensically qualified academic staff involved in the subject considered
how these elements might be developed across the span of the subject from an initial case to the final case. That is, no one element was considered to belong to a particular case, rather, all elements were viewed as developing across all the cases presented in the subject. This does not mean to imply that some of these elements were not seen to require a greater focus in one or more cases, and a lesser focus in others. Consequently the matrix was further developed such that the row elements were seen to be the case materials. All staff ultimately developed and wrote a complete case which was to be delivered online in which initial cases assumed only preliminary skills on the part of the students. The ordering of the cases across the year-long subject represented a progression in the presentation of professional competencies. Initially seven cases were employed, but this was found to be too demanding for students and the subject now contains six cases.

The academic staff drew on their own clinical experience and wrote the cases from the perspective of the therapist involved. Six types of problem area were agreed upon and then chosen by staff members for case development. Problem areas agreed upon for coverage in single cases for the Adult Mental Health subject were: Anxiety disorders; Alcohol and other drug abuse; Mood disorders; Psychotic disorders; Impulse-control disorders; and Personality Disorders. Other problem areas such as relationship problems, sexual dysfunction, bereavement, sleep disorders, and pain disorders are covered in other subjects are offered later in the course, as are cases related to other demographic groups (e.g., children, adolescents, the aged, etc) and other populations (forensic, brain damaged, developmentally disabled, etc).

Pragmatics of subject delivery
Problem-based learning can be a challenge to teaching staff, who need to re-assess how they conceive their teaching goals and methods in adopting a greater facilitative role, but can be just as much of a paradigm shift for students, who need to become more active in their learning strategies. For this reason, the CSU professional postgraduate programs familiarise students with the PBL approach in a supportive face-to-face environment. The course commences with five days of residential school conducted on the Bathurst campus. Much of the first two days of the residential school involves introducing the students to the online format for their subjects. This includes commencement of a PBL case presented on the online environment. In order to facilitate the process, students are provided with a hard copy of their online case (as well as the web-presented interactive material), and the group proceeds to work through the content face-to-face with the academic staff, with frequent switching to the online material. The group’s attention is gradually transferred fully to the online version of the case, and they receive instruction in how to engage in similar discussion and interaction via the relevant online case forum. This first case, therefore, is commenced with in-vivo tutorial discussion being presented in parallel with online forum-based discussion. A number of staff, including the department’s Educational Designer, are on hand to assist students individually as necessary. Students are then required to work collaboratively and to post responses on the online forum to identified case questions before the commencement of class the next morning. This process ensures that students are familiar with PBL studying and the online case-based learning method before leaving the residential school and returning to their respective locations across Australia. It also ensures that students are provided with a transition from the more
conventional teaching and learning methods with which they are familiar, to the PBL approach.

As outlined above, in their first year of part-time enrolment, students work through six cases presented online via a PBL approach. The cases progress from the point of first contact to the termination of therapy, and in some cases, also to follow-up appointments. While each case focuses on a specific presentation or diagnosis, working through each case requires familiarisation with similar presentations through the process of differential diagnosis, thus enabling a broadening of the descriptive psychopathology that can be covered with each case. In the online case based material, fundamental information is presented through a realistic clinical scenario that places students in the position of an observer in early cases (or a clinician in subsequent cases) as the case unfolds. They are brought in to be an active participant in the case through targeted questions. At regular intervals throughout the online case material that is presented online, questions are posed for the student to consider. The majority of these questions are either personal reflective questions, where the student is encouraged to note down their responses in an electronic or hand-written journal, or problems that require the student to determine the knowledge they need to obtain in order to resolve the problem, and then to seek out that knowledge. In some cases the question posed is subsequently accompanied by a link (always labelled “The therapist comments”) where the clinician (teaching staff) offers guidance about how to approach the question. Of course students are encouraged to consider their own response before consulting the therapist’s comments. The therapist’s comments are not intended to be the “right answer” to the question posed, but an example of how the therapist of the actual case material could have resolved an issue or addressed a problem in that particular
situation. Frequently students are asked to suggest alternative solutions. The questions vary, but they are rarely of a type that has a “right or wrong” answer. The student is encouraged to use their own judgement and develop their critical thinking skills. Finally, each case also has three or four questions where posting a response to the case forum by a due date is compulsory. Overall, students must respond to a minimum of 80% of these compulsory questions to be eligible for final assessment in the subject. Frequently these questions consist of multiple parts and may require students to work in smaller groups to formulate a group response. The compulsory forum questions usually require independent work in the form of background reading and research in relation to a particular clinical issue.

Each case is set in a particular practice context, such as an independent private practice, a general medical practice, a public psychiatric hospital, or a community health centre. Issues relevant to these work contexts are raised as part of the case material. Finally, each online case is also accompanied by a set of relevant readings. These readings vary in nature. Some are review articles or book chapters on relevant interventions, others are research publications, and others discuss the relevant theoretical literature. Students are expected to read beyond these supplied articles, and share the source of any useful finds with their classmates.

Limitations and Boundaries

Problem-based learning is an approach that emphasises exploration and student-driven learning. Professional training, on the other hand, has goals and objectives that are determined by community needs, as interpreted by professional and accrediting bodies (such as the Australian Psychology Accreditation Council), with an emphasis upon
demonstrable skills and knowledge. This necessarily results in a tension between a pedagogy that has an emphasis on process, and course objectives that emphasise specified outcomes in terms of knowledge content and skills. The professional education programs at Charles Sturt University have moved some way towards resolving this tension, but cannot present itself as having achieved this by implementing a full PBL model of professional education. At best the programs at CSU offer a blended learning model that incorporates a mix of pedagogical approaches. While PBL is used almost exclusively within the on-line environment, lecture-based classes are still an important feature of residential schools, as well as practica contributing an additional, if not even more important, learning component. The problem we at CSU have faced is how to combine these different facets into an integrated learning experience. Informal feedback from students, and more formal University teaching evaluations, indicate that students appreciate the mix of methodologies, and find the PBL approach both challenging and satisfying. A more targeted evaluation of PBL in professional education in Psychology, however, is yet to be undertaken, and will be an important next step in the development and evaluation of the programs offered by CSU.
References


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