Teaching Methods to Complement Competencies in Reducing the “Junkyard” Curriculum in Clinical Psychology

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This article aims to identify the most efficient ways to teach and learn the professional competencies required in clinical psychology. There are a wide variety of influences on clinical psychology curricula that leads to a lack of coherence in aims and methods. When clinical psychology trainees come face-to-face with their first client, they are challenged to integrate their existing declarative knowledge and apply nascent procedural skills. How can clinical programmes better prepare students for these challenges? Because problem-based learning has been widely applied in medical education it is the starting point in answering this question. Systematic literature searches and a narrative literature review were undertaken to identify teaching methods. Little published research reports randomised controlled evaluations of teaching methods in health professions. Much literature presented opinions about teaching methods. Whole-of-programme evaluations of problem-based learning in medical education were retrieved and directed learning or direct instruction techniques were examined in teaching more specific knowledge. Little research was of direct relevance to clinical psychology training. More research is needed into both the efficacy of clinical psychology training and into the specific barriers that trainee clinical psychologists face. In the absence of good quality research, suggestions for teaching methods are provided.

Key words: Clinical psychology training; direct instruction; problem-based learning; teaching methods.

What is already known on this topic
1 There is a broad literature on teaching methods but little specifically about teaching clinical psychology.
2 Problem Based Learning is a popular teaching method in medical education.
3 Multiple influences on curriculum may make it hard to teach and learn in clinical psychology programs.

What this paper adds
1 Reviews literature on teaching methods in clinical psychology and other health professions.
2 Contrasts constructivist educational methods such as Problem Based Learning with Instructivist methods such as Cognitive Load Theory to raise issues in how to teach clinical psychology.
3 Suggestions for teaching methods and areas requiring further research.

Designing and implementing effective curricula in the professional applied disciplines is difficult in part because of the many extrinsic drivers of such curricula. In clinical psychology, external agencies such as registration boards, peak bodies and governments may drive training demands. In addition factors internal to training programmes such as traditions and widely-held beliefs also influence training (Helmes & Pachana, 2006); as do particular national practices that remain highly influential, such as implicit models of training (Helmes & Wilmoth, 2002). The result of such pressures on professional curricula can be a piecemeal approach to training. Educators speak of a “junkyard curriculum,” which is “littered with reforms . . . and assorted legacies” but lacks cohesion (Reardon & Ramaley, 1996). Students often pay a heavy price for operating in such an environment, and are described by Reardon and Ramaley (1996) as having to “scrounge around the yard . . . picking and choosing from among the rubble in accordance with minimal house rules” (p. 517).

This article considers educational strategies that may help the integration of diverse material to make it easier to learn from, easier to teach in, and thus enable increases in the number of graduates in the context of limited additional resources. Other articles in this special issue argue for the reorganisation of the curriculum around competencies with an associated increase in the cohesion of the curriculum. The focus in this article is on alignment of content with teaching and learning methods to achieve the learning objectives, in this case professional competencies (Biggs, 2003).

Different teaching and learning strategies may aid integration of otherwise disparate information and produce better outcomes when student capacity for analysis and synthesis is measured, rather than simple knowledge content (Gijbels, Dochy, Van den...
Bosche, & Segers, 2005; Stedmon, Wood, Curle, & Haslam, 2005). Problem-based learning (PBL) is perhaps the most widely known alternative to traditional lecture/seminar-based education for health professionals (Savery, 2006). In addition, Kaufman (2003) identifies Adult Learning Theory, Self-Directed Learning, Self-Efficacy, Constructivism, and Reflective Practice as useful theoretical approaches in medical education. Experiential Learning Theory (Kolb, 1984) is another approach that has also been influential in education. Nevertheless, despite a long history, it needs to be noted that none of these approaches is supported by a body of empirical literature based on randomised, controlled trials. Without explicitly addressing relevant techniques, clinical psychology trainees are left to use ad hoc strategies to integrate practice information when they begin to assess and treat clients under supervision. We seek educational strategies to achieve more integrative learning earlier in the program and in a more reflective and considered way.

Without prompting the remainder of the article it is clear that a didactic lecture is unlikely to be the optimal teaching method (Schwartz, 2004). That said, few Clinical Psychology programs would rely exclusively on didactic lectures. If any doubt remains, Biggs (2003) reviews research that indicates unsupervised reading is at least as effective as a didactic lecture.

An information processing perspective (Bennett-Levy, 2006; O’Byrne, Clark, & Malakuti, 1997) provides the background for this review. Here expertise is described in terms of a declarative knowledge system (or conscious information), a procedural knowledge system, and a reflective system. Initially, novice clinical psychologists acquire declarative knowledge and as training progresses, this populates their procedural system. As they further develop, reflection strengthens their procedural system. In addition to reflection other processes such as observation, rehearsal, practice, and feedback may play a role in procedural learning. Bennett-Levy’s (2006) model has similarities with Stoltenberg’s (2005) developmental accounts of clinical supervision in that it captures different cognitive, behavioural, and emotional needs of trainees over time, such as their need for facts early on, moving up to meta-cognitive capacity as expertise develops. Bennett-Levy’s (2006) model appears to imply a linear acquisition of skill. O’Byrne et al. (1997) provide a similar information processing account that is non-linear, so that novices may need to unlearn or replace existing procedural knowledge. For example, many trainees learn active listening skills before they come to clinical training—during clinical training they need to retain reflective listening but also develop the ability to guide a clinical interaction rather than allowing the client to wander around in confusion. McGuirk and Burke (2002) describe three major elements in information processing required for new learning.

“The first is prior knowledge activation: pre-existing knowledge is used to understand and structure new information, and the kind of structure in which it is available in long-term memory determines how new information is understood and in turn what is learned.

The second element is encoding specificity: future retrieval of information is promoted when retrieval cues are coded together with the information.

The third element is elaboration: elaboration of knowledge occurs through answering questions, taking notes, writing summaries, and teaching others, which facilitates understanding, processing, storing and retrieving information.” (McGuckin & Burke, 2002, p. 349)

These perspectives have the promise of specific predictions about teaching methods and skill acquisition that when tested could lead to advances in training.

Clinical Psychology Training in Australia

Clinical psychology programmes are typically made up of coursework, clinical placement and research with approximately equal weight. Training in the science of psychology has been undertaken in an undergraduate degree and typically only those with the highest marks (among other selection criteria) are selected for entry into post-graduate clinical psychology training. Such selection processes mean clinical psychology trainees are experienced in learning thorough traditional lecture/seminar methods and have skills in searching retrieval and appraisal of literature. Most programmes will aspire to a scientist practitioner model of training. Implicit models of training (Helmes & Wilmoth, 2002) are probably a combination of behavioural and cognitive components from the dominant model of therapy training and the “see one, do one” model with a residual default to didactic lecture. Selecting an explicit model of training to align with assessments and learning objectives could lead to a more coherent programme that is easier to learn from and easier to teach.

Advances in information technology have led to a shift in the context of clinical psychology training and practice. While previously access to specialist knowledge was restricted, information technology means that the reverse is now the case—specialist information is so readily available as to swamp the practitioner. Our own work adapting critical appraisal techniques from evidence-based medicine to clinical psychology may lead to changes in how clinical psychologists keep up to date (Baillie & Peters, 2005, in press). It is clear that clinical psychology programmes need to teach strategies to keep up to date and to sustain lifelong learning.

Scott, Pachana, and Sofronoff (2011) report a survey of first year students in the 35 clinical psychology programmes across Australia. Two questions are relevant here: the use and perceived effectiveness of different teaching methods (see figures 4 and 5 of Scott et al., 2011). It is clear from these responses that a variety of teaching methods are used. Students rated “case examples,” “demonstrations/modelling,” “lecturer used their own (clinical) work as an example,” and “interactive workshops” as the most effective. Teaching methods that were rated least effective were “didactic lectures,” “reading lists,” and “student presentations.” As in literature we review below, students’ ratings indicate that they believe more interactive teaching methods are more effective than didactic lectures. However, as Scott et al. (2011) did not ask about the frequency of use, we have no information about how commonly didactic lectures were used compared with more interactive or demonstrative methods. Bennett-Levy, McManus, Westling, and Fennell
There are few randomised controlled trials and some authors have questioned the appropriateness of these methods in education (Dolmans, 2003; Farrow & Norman, 2003). On the one hand, existing training programmes are based on very little empirical evidence of effectiveness, so perhaps innovations only need exceed that very limited standard before they have a relatively stronger evidence base. On the other hand, there are considerable financial and personal resources expended on clinical training and the public places great faith in the profession to deal with sensitive personal issues and provide quality health services. There is a need for educational techniques based on the best available current evidence for use now, and a need to improve the methodological quality of research on teaching methods, for the future. Without randomised controlled trials there is a severe risk of the adoption of less than optimal or even ineffective teaching procedures.

Whole-of-programme comparisons are costly and difficult to undertake in a way that ensures that the intended innovations are consistently and reliably delivered. Thus, it is relatively unlikely that randomised controlled trials have or will be conducted of whole-of-programme changes in clinical psychology to PBL or any other educational technique. A more practical alternative are more circumscribed randomised controlled trials of smaller changes to teaching methods evaluated on proximal outcomes such as the acquisition of targeted competencies.

In addition to disagreement about optimal design, there are differences in the outcome measures reported. Self-assessed learning is the dominant outcome measure reported in the literature (Colliver, 2000). However, learners may not yet know what it is that they need to know. Given our focus on competencies in other aspects of this project, we sought studies reporting independent assessment of competencies. Some educational techniques may not improve learning directly but do so by first improving motivation for learning.

The cost-effectiveness of any innovation is crucial. Voudouris and Mrowinski (2010) recently estimated that there was a shortfall of $8,000 per student in funding for clinical psychology training at Australian universities. Thus, pressure is often on directors of clinical training to reduce costs or produce more graduates for the same cost. In the current context, it is unlikely that the funds to support a whole-of-programme change would be available unless there was very strong evidence to support such a shift.

(2009) report similar results from a survey asking experienced Cognitive Behavioural Therapy (CBT) practitioners about training methods.

What is wrong with current clinical psychology training? Scott et al.’s (2011) survey of students confirms our experience—that trainees are experiencing high levels of stress. Our suspicion is that this is due to high and conflicting demands. Indeed, there is little systematic literature about the challenges trainee clinical psychologists face, pointing to a clear need for more research and monitoring. Techniques such as Cognitive Task Analysis (R. E. Clark & Estes, 1996; Jonassen, Tessmer, & Hannum, 1999) may help to target teaching techniques and educational support towards the more difficult aspects. Beyond the self-report of trainees and the anecdotal experience and recollections of experts we have little information about the cognitive processes going on in the minds of novice clinical psychologists.

**Aim of this Review**

For the purposes of this review, we will focus on educational strategies to support integration of existing knowledge as intern clinical psychologists assess and treat their first client under supervision. In many programmes, this occurs at around the middle of the first year of clinical training. Thus, the question for this review is: can educational techniques assist in the integration of knowledge when intern clinical psychologists begin to see clients under supervision? Pachana, Sofronoff, Scott, and Helmes (2011) review literature on the competencies of clinical psychologists and their assessment. The task of this article is to examine teaching and learning strategies that align with those competencies. O’Donovan, Halford, and Walters (2011) consider clinical supervision in more depth, so, while it is a key learning technique in clinical psychology programs, it is not covered further in this article. Among many educational theories, PBL and Cognitive Load Theory (CLT) have received much attention in the past few years and were the starting point for our searches. The literature on teaching or pedagogical methods is vast so this article provides a selective review focusing on PBL and CLT. PBL was chosen as an example of a constructivist approach to education and because of its prominence in medical education. In contrast, CLT is a contrasting instructivist approach that has received recent attention.

**Review Methods**

We searched MEDLINE, PsycINFO and Google for literature using increasingly broader terms. We began with a narrow focus on clinical psychology and progressed to psychiatry, allied health disciplines, procedural specialties of medicine, and ended in undergraduate psychology and medical education. Retrieved articles were scanned for relevant references. We worked forward from key articles on PBL in clinical psychology (Huey, 2001; Kiernan, Murrell, & Relf, 2008; Stedmon et al., 2005) using citation indices to scan and retrieve articles that cited these works.

There is disagreement in the literature about the optimal methods for evaluating educational techniques and approaches. There are few randomised controlled trials and some authors have questioned the appropriateness of these methods in education (Dolmans, 2003; Farrow & Norman, 2003). On the one hand, existing training programmes are based on very little empirical evidence of effectiveness, so perhaps innovations only need exceed that very limited standard before they have a relatively stronger evidence base. On the other hand, there are considerable financial and personal resources expended on clinical training and the public places great faith in the profession to deal with sensitive personal issues and provide quality health services. There is a need for educational techniques based on the best available current evidence for use now, and a need to improve the methodological quality of research on teaching methods, for the future. Without randomised controlled trials there is a severe risk of the adoption of less than optimal or even ineffective teaching procedures.

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PBL describes a constructivist educational method that originated in the undergraduate medical programme at McMaster University in Canada in 1969 (Neville, 2008). One definition of “classical” PBL as seven steps was provided by Schmidt (1983):

1. **Case presentation:** The PBL case is presented and unknown terms are explained.
2. **Problem definition:** The group defines the fundamental issue.
3. **Brainstorming:** The students collect ideas.
4. **Formation of hypothesis:** The results of the brainstorming are formed into a working hypothesis.
5. **Defining educational objectives:** The students define a detailed agenda to “gain more profound knowledge of the processes forming the crux of the problem” (Schmidt, 1983).
6. Self-study: The students acquire the necessary knowledge by themselves.

7. Synthesis: The results are presented within the group and the case is revisited based on the insights achieved.

The work is done in small groups facilitated by a tutor with expertise in facilitation but not necessarily content knowledge. Proponents argue that PBL better prepares graduates for lifelong learning, an issue we return to later in the article.

While PBL was initially developed without reference to pedagogical theories (Colliver, 2000), it is now commonly grouped within the constructivist theories. These approaches to education see learning as essentially emerging from social interaction. Of course, as in psychotherapy, many will take an eclectic approach to teaching, and, as in psychotherapy, this may reduce the coherence of the approach. One choice is a total PBL programme or to use PBL methods in combination with other approaches. Some programmes that combine PBL and other methods have been evaluated (Moeller, Spitzer, & Spreckelsen, 2010).

There is little empirical evidence about the effectiveness of PBL in developing core competencies in post-graduate psychology programmes, despite some evidence that students prefer this style of teaching. An opinion piece by Huey (2001) argues that PBL methods should be particularly useful for training mental health clinicians because PBL teaches inductive clinical reasoning in the context of complex and poorly delineated problems. It teaches “how to, rather than what to, think about complex psychopathology” (p. 11). Kiernan et al. (2008) describe the experience at Charles Sturt University in Australia where an on-line PBL/mixed lecture/seminar-based course has been introduced to train clinical and forensic psychologists. As yet no formal evaluation has been reported of this course.

In a small US study, Hays and Vincent (2004) measured 40 post-graduate psychology students’ opinions of their new PBL-based courses compared with lecture/seminar courses in three subject areas. They found very strong support for the PBL format for five of the six key elements: “promoting interactions between student and faculty,” “developing critical thinking skills,” “allowing students to grasp concepts,” “developing research skills,” and “developing oral presentation skills.” They rated the sixth element, “workload” higher in PBL. All 40 students thought the PBL-based course should be introduced in preference to lecture/seminar classes and that the PBL course covered the material as well as lecture/seminar classes. However, there was no control group and no formal statistical testing was carried out on the data. As will be seen, these findings are similar to those found in other professions: Students tend to prefer PBL over lecture/seminar lectures. In the absence of research about PBL in clinical psychology, we turn to evidence about PBL from other disciplines, first looking for post-graduate training and procedural specialties.

McGuirk and Burke (2002) reviewed literature to establish the best evidence medical education in psychiatry. While they found no trials of PBL in psychiatry they were generally positive about its possible effects. Thirunavukarasu and Thirunavukarasu (2009) reached similar conclusions. McParland, Noble, and Livingston (2004) found better performance in an 8-week psychiatry module by a PBL-trained cohort compared with the lecture/seminar-trained cohort from the previous year. The PBL-trained group performed significantly better in post-course written and viva knowledge examinations. Contrary to predictions, they found no differences in attitudes towards psychiatry, nor in learning style. However, these results might be due to a partial implementation of PBL. Instead of presenting the clinical scenario first in a small group format, content experts briefed the cohort and then scenarios were presented. The effect of presenting resources before or after the clinical question is posed is an example of research questions that may be addressed in small experimental studies.

PBL has received some limited evaluation in physiotherapy and other health areas apart from the training of medical doctors. There have been some opinion pieces, most of which appear to favour the notion of introducing PBL to allied health domains (Dahlgren & Dahlgren, 2002; Morris, 2003; Reynolds, 1997; Solomon, 2005). Some research has been carried out in occupational therapy and physiotherapy, but none is of a standard to make objective comparisons between PBL and lecture/seminar teaching methods (Hammel et al., 1999; Kamwendo & Torquist, 2001; McCannon, Robertson, Caldwell, Juwah, & Elfessi, 2004; Scaffa & Wooster, 2004; Schaber, 2005; Velde, Wittman, & Vos, 2006).

Severtiens and Schmidt (2009) compared first year psychology students from three different schools employing PBL, lecture/seminar, and mixed PBL/lecture/seminar curricula. They compared the students on formal and informal social and academic integration (self-rating) as well as performance during their courses (credit points obtained after a 1-year study). It was anticipated that the group cooperative nature of PBL would improve both academic and social integration of students compared with lecture-based courses. This study found the PBL based course had superior outcomes for accumulation of credit points in the first year, and for three of the four measures of integration. Inclusion in the study was voluntary and only one third of students in the year studied agreed to participate. This, and sampling from three different institutions, make it difficult to draw clear conclusions regarding the usefulness of PBL in undergraduate university psychology courses. Clearly further research is needed.

Smits, Verbeek, and de Buissonjé (2002) reviewed original studies on post-graduate medical students, arguing that PBL may be more effective with post-graduate students. They searched for controlled studies comparing PBL with “other” or “no” teaching. To be considered for inclusion in the review, the educational intervention needed to approximate classic definitions of PBL (see above). Next, studies were assessed for quality on five criteria: randomisation to treatment and control groups, adequacy of follow-up, intention-to-treat analysis, participants and observers blinded (all scored zero on this criterion), and similarity of the groups at the start. One study that was rated as “high quality,” Doucet, Purdy, Kaufman, and Langille (1998), used participant self-selection for group allocation; lost almost half of the participants to follow-up; and reported large differences between treatment and control groups in course content unrelated to the intervention. In three of the poor quality studies, the comparison was PBL versus no teaching. Smits et al. (2002) concluded that there were favourable findings for PBL over lecture/seminar teaching in participants’ knowledge, performance, and satisfaction, but there was no information about
patient health outcomes. Consequently, the evidence was not sufficient to favour PBL over other teaching styles.

Finally, we consider recent reviews of PBL in undergraduate medical education. Colliver (2000) analysed the effectiveness of PBL in terms of knowledge acquisition and clinical performance, and related findings to underlying educational theory. Studies that measured these effects in undergraduate training where PBL was used and where outcomes were assessed at the end of training were considered. First, he analysed three reviews of the effectiveness of PBL published in 1993 (Albanese & Mitchell, 1993; Berkson, 1993; Vernon & Blake, 1993) and then searched for studies from 1992 to 1998 where PBL formed the core of the curriculum for the “intervention” group. From the three 1993 reviews, he concluded that despite their different approaches to analysis of the research, “a common picture emerges, showing little or no effect on student achievement” (p. 261) and “the three reviews show no convincing evidence for the effectiveness of PBL in fostering the acquisition of basic knowledge and clinical skills; the effects are small at best and easily accounted for by pre-existing differences” (p. 261).

Colliver (2000) found eight new studies (published 1992–1998) comparing PBL with other curricula “tracks”—three of which were randomised and five not. No formal meta-analysis was presented because of the small number of randomised studies. He showed that findings relating to relative efficacy of PBL training in two of the randomised studies were confounded and in the third study, which was not strictly randomised, the positive effect for PBL (diagnostic ability) accounted for only 1–2% of the variance in student outcomes. For the non-randomised studies Colliver argued that different skills and experiences on entry and in course content explained any differences found. Overall he found no evidence of improved knowledge or clinical performance and questioned the validity of the underlying educational theories.

Newman et al. (2003) report a Cochrane review of the evidence regarding the effectiveness of PBL compared with non-PBL learning strategies. The review included 12 studies of suitable quality and that provided useful data. They were able to justify a meta-analysis on a broad-based “accumulation of knowledge” variable that had non-significant negative findings for PBL. They concluded that “the limited high quality evidence available from existing reviews does not provide robust evidence about the effectiveness of different kinds of PBL in different contexts with different student groups” (p. 7), and pointed to ways of improving the quality of research in the area of education interventions such as PBL. They concluded that studies purporting to compare PBL with other teaching interventions do not specify clearly enough what constitutes the experimental and control conditions and that journal reviewers and editors should follow specific guidelines for a higher standard of research in this area.

Koh, Khoo, Wong, and Koh (2008) recently reviewed 13 controlled studies of the efficacy of PBL during medical school on competencies after graduation. Studies were selected if they used PBL as a teaching method in medical school, included assessment made after graduation, included a control group from a lecture/seminar curriculum (not necessarily randomised); and the PBL curriculum involved no other differences than use of PBL. Seven studies were rated highly (Hoffman, Hosokawa, Blake, Headrick, & Johnson, 2006; Jones, McArdle, & O’Neill, 2002; Mennin, Kalishman, Friedman, Pathak, & Snyder, 1996; Peters, Greenberger-Rosovsky, Crowder, Block, & Moore, 2000; Rolle, Andren, Pearson, Hensley, & Gordon, 1995; Tamblyn et al., 2005; Watmough, Ryland, Taylor, & Garden, 2006a; Watmough, Taylor, & Garden, 2006b). The two Watmough papers were considered as one study. Koh et al. (2008) concluded that these studies demonstrate adequate empirical support for the use of PBL as a teaching method over lecture/seminar methods. However, closer examination of the seven studies reveals that they were all limited by either use of student self-ratings alone (Mennin et al., 1996; Peters et al., 2000), non-random group assignment (Hoffman et al., 2006; Rolle et al., 1995), or significant changes in course content apart from method of teaching (Hoffman et al., 2006; Jones et al., 2002; Tamblyn et al. 2005; Watmough et al., 2006a, b).

It should be noted that many of the trials discussed in this section consistently alter more than one variable (e.g., teaching method and programme novelty) between intervention and control groups so we cannot safely determine causal factors. It is likely that an interesting, well-structured, lecture will be superior to a chaotic PBL-based session in which students have little knowledge of the relevant questions, why they are being asked those questions, or what the purpose is of the exercise. At the other extreme, it is likely that an excruciatingly boring, poorly organised, largely unintelligible lecture will result in poorer learning outcomes than a well-organised, motivating PBL session in which students are clear concerning the purpose and procedures. It is possible to run good quality randomised trials relevant to the concerns of this article and such trials have been run (see below).

**What are the Specific Benefits of PBL?**

Can PBL strategies encourage lifelong learning? Norman, Wenghofer, and Klass (2008) compared graduates from a PBL-based course at McMaster University with graduates from lecture/seminar courses at other Canadian Universities who had graduated between 1972 and 1991. They identified 1,166 doctors who had been reviewed several years after graduation on a standard competence scale—108 of whom were McMaster graduates. They found no differences between assessed competence of the McMaster (PBL-taught) graduates and graduates from lecture/seminar courses. Students in post-graduate programmes may have developed self directed learning skills during their earlier university training so the lack of differences may not be surprising. Graduates may leave university and enter an environment that is not openly hostile to continued learning but provides few incentives to do so. Thus PBL alone does not ensure lifelong learning.

Another advantage thought to be encouraged by the PBL teaching method is improving critical thinking skills in students. This issue was addressed in a recent review of studies on undergraduate nurses by Yuan, Williams, and Fan (2008). Although the research is sparse in this area, the studies that were identified by the authors showed no particular advantage of PBL-based programmes over lecture/seminar programmes in improving critical thinking skills in nurses.
Implementation and Ongoing Costs of PBL

The issue of the costs of implementation of a new PBL-based curriculum has been alluded to by various reviewers. However, no recent study was found that could make adequate comparisons between costs of lecture/seminar and PBL-based curricula. Two of the reviews from 1993 (Albanese & Mitchell, 1993; Aldred, Aldred, Walsh, & Dick, 1997; Berkson, 1993) referred to relative costs, but came up with very different estimates. Issues such as: type of PBL used (whether it is a mixed or pure version); level of education/expertise of tutors; physical and media resources (e.g., pressure on the main library and space within the faculty); and size of the tutorial groups, all need to be considered in estimating costs. It is clear that a programme-wide switch to PBL requires a substantial investment in curriculum development, changes to facilities to support small group interaction, changes in staffing, and changes in student workload. In the context of already high student workloads, limited staffing and teaching facilities, and funding shortages for clinical psychology training (Voudouris & Mrowinski, 2010), it is unlikely that programme-wide PBL implementations are feasible. A more circumscribed experimental approach evaluating the effect of specific teaching strategies on specific competencies is likely to be a more practical curriculum innovation than a programme-wide change.

Concluding Remarks about PBL

This review of the literature has demonstrated that students prefer to be taught in the PBL-based small group situation rather than in large group didactic lectures, and believe they have better outcomes from this type of training. Research on the effectiveness of PBL using more objective criteria, however, shows few potential differences in short- and long-term outcomes for the individual. We found no disassembly trials designed to identify specific components of PBL that may be more effective than others. For example, is it more or less efficient to provide resource material before or after the presentation of the case material? What are the differences between expert delivered resource materials and resources provided by peers based on their prior learning? One of the benefits of PBL has been to stimulate the review of lecture/seminar teaching and incorporation of modules of learning such as communication, problem-solving, critical thinking, and research skills that were previously de-emphasised or ignored. Such skills are clearly also important for all students in training to be health professionals; but whether skills can be achieved more effectively with PBL-based, rather than more direct teaching, is not clear.

For programme coordinators who are convinced by the evidence supporting a whole programme shift to PBL and are able to muster the resources to change to, and maintain a PBL-focused programme, there are excellent resources available from the Universities of Exeter and Plymouth programmes (Stedmon et al., 2005) and the experience from Charles Sturt University (Kiernan et al., 2008). Savin-Baden (2003) provides useful accounts of the difficulties staff face in moving from lecture/seminar content expertise teaching roles to facilitating PBL and gives resources to support this transition. Schwartz (2000) provides an undergraduate abnormal psychology text that uses a discovery approach.

CLT and Explicit Instruction

In contrast to PBL, CLT is an instructional theory that attempts to match educational strategies to our understanding of human cognitive architecture (R. C. Clark, Nguyen, & Sweller, 2006; Sweller, van Merrienboer, & Paas, 1998). The theory takes an evolutionary perspective of human cognitive architecture. It assumes that knowledge acquired by humans can be divided into biologically primary knowledge that we have specifically evolved to acquire (e.g., listening, speaking, recognising faces) and biologically secondary knowledge that we require for cultural reasons but have not specifically evolved to acquire (Geary, 2007, 2008, in press). Educational institutions are concerned solely with secondary knowledge and much knowledge associated with clinical psychology provides an example of secondary knowledge. (Communication skills and ability to express empathy are examples of aspects of clinical psychology training that probably involve primary biological knowledge, but we will leave discussion of these points to others.) While primary knowledge can be acquired effortlessly and unconsciously without explicit instruction, secondary knowledge requires conscious effort and is best acquired by explicit instruction.

While secondary knowledge depends on primary knowledge, there are cognitive structures and a cognitive architecture that deal with secondary knowledge. There are many ways of describing that architecture (Sweller, 2003), but in this article we will use a natural information processing system (Sweller & Sweller, 2006) that assumes an analogy between evolution by natural selection and human architecture. That system can be described by five basic principles.

1. The information store principle that assumes natural information processing systems require a very large store of information that in the case of human cognition consists of long-term memory.
2. The borrowing and reconstruing principle that indicates the majority of information held in long-term memory is acquired from other people.
3. The randomness as genesis principle that suggests that novel information is generated during problem solving by a random generation and test process.
4. The narrow limits of change principle indicating that in order to prevent combinatorial explosions during random generation and test, only very limited amounts of novel information can be processed resulting in a limited-capacity, limited-duration working memory.
5. The environment organising and linking principle indicating that the limitations of working memory disappear when dealing with organised information stored in long-term memory, allowing the contents of long-term memory to direct action.

These principles suggest that the purpose of instruction is to alter the contents of long-term memory. If nothing has changed in long-term memory, nothing has been learned.

CLT has been used to generate a large number of instructional effects (Sweller, 2010). For present purposes, the most important of those effects is the worked examples effect. This effect
occurs when learners presented a series of problems to solve, learn less than learners presented the same problems along with their worked solutions. Problem solving places its emphasis on the randomness as genesis principle. That is appropriate if knowledge is unavailable from other sources but can generate a large working memory load that interferes with learning. Worked examples place their emphasis on the borrowing and reorganising principle. That is appropriate when knowledge from others is available because it greatly reduces extraneous working memory load. Based on this architecture, PBL, with its emphasis on problem solving, is likely to delay learning. The worked example effect is based on randomised controlled studies altering one variable at a time.

Kirschner, Sweller, and Clark (2006) argued that undertaking complex discovery may interfere with learning. Demonstrating how to solve a problem may be a more efficient way of teaching and learning. The critique of PBL from CLT has led to a broader debate between constructivists and those who argue that direct instruction is more efficient (see Tobias & Duffy, 2009 for a book length treatment of the issues).

Kirschner et al.’s (2006) critique of minimal guidance in PBL also orients us to how we present new information to trainees and what methods and guidance we can employ to support their learning. Do we present new information to trainees in the form of cases because of ecological validity and opportunities for transfer of learning to clinical work? Or does the complexity of the case overwhelm the working memory of the new trainee? PBL has a number of useful ideas for structuring and grading of problems and in the idea of scaffolding.

Like in building works, educational scaffolding is strong and supportive at early stages of learning and is withdrawn as the learner attains more experience and independence. Critics have argued that there is little detail to assist the teacher to implement scaffolding (R. E. Clark, 2009). Perhaps an alternative is that increasing abstraction of task or competency may benefit from educational support of the same intensity but different focus?

O’Byrne et al. (1997) used evidence from cognitive psychology about the development of expertise to make suggestions for education in counselling psychology. They suggested ways to explicitly teach some of the lifelong learning and problem solving skills that are proposed to emerge from constructivist education. Their seven recommendations are:
1. teach the declarative knowledge that will help novices to handle novel problems as they become experts;
2. teach problem solving procedures;
3. training should support the development of both knowledge and motivation;
4. arrange internship experiences for the systematic practice of productions;
5. define instructional activities that develop advanced expertise;
6. select an adequate context for training; and
7. sequence training as it is performed (O’Byrne et al., 1997, pp. 329–331).

We found no research that examined the effectiveness of these recommendations in the education of counselling psychologists. In conclusion, CLT is based upon research findings from cognitive psychology and provides some specific suggestions for how to teach clinical psychology and some clear indications for further research from which to build better teaching. However, we could find no randomised controlled trials or any other form of evaluation of its application in Clinical Psychology or in the training of any other health profession. Clinical academics with a background in learning and cognition may find the evidence base for CLT more familiar than constructivist approaches. Research into the specific difficulties and challenges trainee clinical psychologists face through techniques such as cognitive task analysis may provide information upon which to better teach clinical psychology.

Other Educational Theories

In addition to PBL and cognitive load approaches to education, Kaufman (2003) identifies Adult Learning Theory (Knowles, Holton, & Swanson, 2005), Self Directed Learning (Candy, 1991), Self Efficacy (Bandura, 1986), and Reflective Practice (Schoin, 1987) as educational theories that may inform medical education. This list could also be expanded to include others such as Experiential Learning Theory (Kolb, 1984). We found no randomised controlled trials of whole program-level implementations of these theories in the training of health professionals. However, each contributes specific teaching and learning strategies that may be of interest in the revision of clinical psychology curricula. The interested reader is directed to the primary sources, but the following may provide a sample.

Adult Learning Theory (Knowles et al., 2005) provides ideas about how mature learners are motivated. Kaufman (2003) summarises seven principles: “(1) Establish an effective learning climate, where learners feel safe and comfortable expressing themselves, (2) Involve learners in mutual planning of relevant methods and curricular content, (3) Involve learners in diagnosing their own needs—this will help to trigger internal motivation, (4) Encourage learners to formulate their own learning objectives—this gives them more control of their learning, (5) Encourage learners to identify resources and devise strategies for using the resources to achieve their objectives, (6) Support learners in carrying out their learning plans, and (7) Involve learners in evaluating their own learning—this can develop their skills of critical reflection.” Like McCuickin and Burke (2002), we found no research that specifically examines methods derived from Adult Learning Theory in the education of health professionals. However, its emphasis on motivation to learn seems to be useful. It is clear that while trainees may not have the experience to know what they need to know, their beliefs about what they need to know are likely to influence their motivation to learn. Where these beliefs diverge from the priorities of professional accreditation or experts it may be appropriate to directly address the discrepancy.

Clinical psychology training should not only equip graduates with the skills and competencies to practice upon graduation but also teach how to maintain knowledge and competencies at a professional level over a career. Candy’s (1991) work may be useful in suggesting that skills to support self-directed learning should be explicitly taught. While it seems likely that explicitly teaching skills in areas such as critical appraisal of literature is likely to improve clinical practice, there is little empirical...
evidence to support this supposition (Baillie & Peters, in press; Parkes, Hyde, Deeks, & Milne, 2001).

Bandura’s (1986) work on social-cognitive theory is so widely known in psychology it probably forms part of the implicit theories that underlie current clinical psychology curricula. Nevertheless, a reminder of the importance of learning by modelling and of the role of self efficacy beliefs in the acquisition of skills is worthwhile. The emphasis on modelling is consistent with the emphasis on worked examples in CLT and the borrowing and reorganising principle described above.

Reflection has a strong role in the development and maintenance of clinical competencies in Bennett-Levy’s (2006) model of clinical skills. Experience and feedback from clinical practice is thought to crystallise into declarative knowledge through reflection in more experienced clinicians. Explicit teaching in methods to maintain reflection through supervision and peer review as well as self reflection could also be considered. However, the complexities of clinical practice make much feedback ambiguous and so attributions about the link between client outcomes and therapist behaviour are fertile ground for assumptions and cognitive biases (Hershberger, Markert, Part, Cohen, & Finger, 1996). It should be noted that making people aware of their cognitive biases has only a small effect on the subsequent impact of those biases (Klein, 2005). From this perspective it is easy to see why expert opinion honed through untargeted reflection on ambiguous feedback may diverge from careful empirical research. These cautions aside, Schön’s (1987) work provides a source of teaching strategies to promote reflection.

Experiential Learning Theory (Kolb, 1984) proposes that learning proceeds in order through four stages termed: concrete experience, reflective observation, abstract conceptualisation, and active experimentation. People differ in their learning style and hence may begin at the stage that corresponds to their style but they proceed in order from that stage. This approach has similarities with Bennett-Levy’s (2006) model but diverges in allowing differences in preferred learning style. In addition to more theoretical work reviewed above we found literature offering practical steps without an explicit base in theory or empirical evidence. Despite these clear limitations, Grantcharov and Reznick (2008) provide guidance in the teaching of procedural surgical skills that appears to have face validity because of their concrete focus on specific skills. Their starting point is the inadequacy of the “see one, do one” approach. First, they propose a specific “pre-patient curriculum” in which trainees acquire background knowledge of the theory and target skills, learn any basic or component skills, and then work in simulated environments until they reach a level of competence. After successful demonstration of competence in simulated environments, the trainee then moves to clinical settings and begins with practice of parts of procedures before being able to undertake complete procedures under supervision. Scott et al. (2011) report that many Australian Clinical Psychology programs were reported to use role plays for teaching—Grantcharov and Reznick (2008) may provide impetus to grade and structure these and other simulations to ensure a level of competence and confidence before beginning to work with clients under supervision. Such an approach would be amenable to an experimental study of effects on learning outcomes compared with existing role play methods.

Conclusion

To move forward we need better understanding through more specific evidence of the challenges students face when learning in Clinical Psychology programmes so as to better target teaching resources. Focusing programmes on competencies gives clear operationalised goals for Clinical Psychology programmes that can be assessed. Pre- to post-changes in competencies can then be examined to allow some examination of teaching and learning strategies. It may be that different competencies align with different teaching methods (Bennett-Levy et al., 2009) but our current state of knowledge is insufficient for questions of this specificity. Techniques such as Cognitive Task Analysis are likely to assist in better understanding how to better train people to perform the tasks of clinical psychology.

To address the shortage of empirical research we recommend discreet experimental manipulations of teaching methods based on specific predictions from developmental (e.g., Stoltenberg, 2005) and information processing (Bennett-Levy, 2006) models of skill acquisition in producing gains in targeted competencies. This style of more focused experimental work may be more practical than whole programme comparisons and thus contribute to knowledge about teaching methods in an incremental fashion.

We focus on issues when seeing the first client, but there are other areas of clinical programmes that require careful analysis of the competencies being taught, the methods used to teach them, and the cognitive challenges this presents the trainee. End-of-programme maintenance of self-care, or professional skills and integration of research into practice are examples of possibilities.

In the meantime a number of strategies based on common sense and speculation may be beneficial

• Make an explicit map of the desired competencies, the teaching and learning strategies employed and the outcomes to be assessed.
• Allow the student to set the pace of learning and be aware that a high cognitive load can impede learning.
• Consider how the student can generalise competencies from the learning environment to the context of application and reduce any barriers.
• Provide clear unambiguous demonstrations of key skills and competencies.
• Provide opportunities to practice key skills and competencies and receive constructive and corrective feedback.
• Consider the specificity and abstraction of the competencies and teaching strategies within the development of the intern from raw novice to graduate.
• Plan for increasing abstraction of competencies and skills and reflection on practice as the student progresses through training.
• Consider whether to explicitly teach more abstract skills such as problem solving, self reflection, and lifelong learning, or to arrange case materials to ensure these skills emerge from discovery-based learning.

The clear limitations of this review are the lack of research specifically evaluating the teaching of clinical psychology. In contrast, there is a broad and diverse literature on teaching methods from which this review selectively draws. We focused
on PBL as a popular constructivist method and contrast that with recently developments in CLT as an example of instructivist approaches. We have relied on the reviews of others rather than presenting the results of primary studies. Thus, this review may have missed primary research that is relevant or may not have considered teaching methods that may turn out to be successful.

References


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