"DEMOCRACY BEGINS IN CONVERSATION": THE PHENOMENOLOGY OF PROBLEM-BASED LEARNING AND LEGAL EDUCATION

*PAUL MAHARG**

INTRODUCTION

Learning is complex for any number of reasons. One of these is that it doesn't take place in a laboratory: it happens in real places, within and between real people, and as a consequence it takes place in multi-factorial environments. At every stage of learning in Higher Education (HE), from student choice of institution and pro-gramme,[1] to the transfer of learning from theory to practice,[2] to a single institution's or a teacher's evaluation of teaching and learning,[3] there are many causal factors that affect educational process and outcome. The complexities and variables created by the interaction of such multiple factors, well known in the field of education, make learning a highly complex phenomenon to analyse and understand.

It is complex also because the conceptual and analytical tools that we need to use in legal education are developed in disciplines other than legal education. Indeed it could be said of education itself that it is inherently an interdisciplinary discipline, because it is not possible to analyse many aspects of educational experience without straying into or borrowing from another disciplinary domain – educational psychology for instance, or communications theory, or economics or the sociology of educational practices.

In this article I argue that the phenomenological complexity, the lived experiences of educational practices in legal education is a research field that we still need to investigate and explore in much more detail. Such an exploration will not be theoretical only, but will fuse theory with an understanding of context and practice. In this, I take a Deweyan and Pragmatist view of education, holding that any theory of knowledge is also, fundamentally, a theory of inquiry. It is not possible therefore to separate educational theory from educational practice. Just as there can be no complete and absolutely correct map of the planet, so what we map in education will be contingent, local and purposive – and in this lies its explanatory and predictive power for us as educators. The process holds larger significances, too, and is important for the development of legal education as a juristic as well as a heuristic activity. The conversations about theory in practice and practice deriving from theory are essential to the development of democratic legal education, and legal education for democracy, as we shall see.

To investigate how the phenomenology of educational practices can be further developed in legal education, I shall take Problem-Based Learning (PBL) as a case study. PBL is a useful field for a number of reasons. First, it is derived from another discipline, namely medical education, and is therefore an interesting study in interdisciplinarity. Second, it has generated over half a century of substantial literature

[1] Briggs S, 'An Exploratory Study of the Factors Influencing Undergraduate Student Choice: The Case of Higher Education in Scotland' (2006) 31 Studies in Higher Education 705.

[2] Ferguson KE and Jinks AM, 'Integrating What Is Taught with What Is Practised in the Nursing Curriculum: A Multi-Dimensional Model' (1994) 20 Journal of Advanced Nursing 687.

[3] Lechner S, 'Evaluation of Teaching and Learning Strategies' (2001) 6 Medical Education online <http://www.med-ed-online.net/index.php/meo/article/viewFile/4529/4709> accessed 25 January 2015.

describing and analysing both theory and practice. Third, it is to date little used in common law jurisdictions. Fourth, and perhaps most valuable, the adaptation of the heuristic for legal education changes the nature of that education; and the nature and extent of those changes are the focus of the case study.

In the argument that follows, we shall start with a general description of PBL and its origins in the Health Sciences, followed by a summary of the educational advantages and disadvantages of adopting PBL as an educational method, a summary of the brief literature examining the specific application of the method in Law, and a brief overview of the literature on PBL in Law and technology. I shall argue that Law requires the development of a distinctive evaluative approach to PBL, one befitting its role as a Social Science or Arts domain rather than Science; and that the guiding principles of this are available in part within the medical educational literature, but also within the fields of phenomenographical and phenomenological inquiry. Since PBL is interdisciplinary, the case study is too. It involves aspects of literature review, and therefore a general description of the methodology is stated in the footnote below.[4]

GENERAL DESCRIPTION OF PBL

There have been many varieties of problem-based and solution-based approaches to learning, but PBL is generally acknowledged to have formed as a distinct curriculum framework in medical education at McMaster University, Canada, in the late 1960s.[5] It grew from a dissatisfaction with the then current modes of learning and teaching medicine, and the attempt to undertake radical educational change. Since then, it has been employed in a variety of disciplines — in Architecture, Education, Management, Physics and Nursing, for example.[6] There are varieties of PBL, and varieties of definition and description. Barrows' six core characteristics, though, are generally cited as a classic definition:

1. Learning is student-centred;
2. Learning occurs in small student groups;
3. A tutor is present as a facilitator or guide;

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[4] My review of the literatures draws from the disciplines of Medicine, Engineering, Business and of course Law. It takes account of meta-reviews and systematic reviews in these disciplines, and extends from 1980–2013. Discipline-specific databases were searched (eg Medline) and with the same keywords across disciplines. The initial pass revealed over 400 items, later reduced to 211, which we recorded in a private Zotero Group Library, and which is available should readers wish to consult it (please contact the author at paul.maharg@anu.edu.au). In itself this article is not a systematic review of PBL, which is a considerable review activity, particularly in a discipline where the historical work is considerable, such as medical education. It focuses on the subject of the advantages and disadvantages of PBL as a heuristic, and I focus particularly on the effects that PBL has on knowledge acquisition, on skills development, and on student development. I would claim for it that the article, starts from the review of the literatures on this topic, then develops argument stemming from the literature review.

[5] Albanese MA and Mitchell S, 'Problem-Based Learning: A Review of Literature on Its Outcomes and Implementation Issues' (*LWW*) <http://journals.lww.com/academicmedicine/Fulltext/1993/01000/Problem_based_Learning__A_Review_of_Literature_on.20.aspx> accessed 18 February 2014; Vernon D and Blake R, 'Does Problem-Based Learning Work? A Meta-Analysis of Evaluative Research' (*LWW*) <http://journals.lww.com/academicmedicine/Fulltext/1993/07000/Does_problem_based_learning_work__A_meta_analysis.15.aspx> accessed 18 February 2014.

[6] Maitland B, 'Problem-Based Learning for Architecture and Construction Management' in David Boud and G Feletti (eds), *The Challenge of Problem-Based Learning* (Kogan Page 1997); Curtis Dickinson A, 'Sammamish Year 3: Teaching, Leadership, and School Change' (*Edutopia*) <http://www.edutopia.org/blog/sammamish-pbl-teaching-leadership-change-adrienne-curtis-dickinson> accessed 26 January 2015; Smith GF, 'Problem-Based Learning: Can It Improve Managerial Thinking?' (2005) 29 Journal of Management Education 357 <http://jme.sagepub.com/content/29/2/357> accessed 9 February 2015; Williams B, 'Introductory Physics: A Problem-Based Model' in BJ Duch, SE Groh and DE Allen (eds), *The Power of Problem-Based Learning: A Practical 'How To' for Teaching Courses in Any Discipline* (Stylus 2001); Williams SM and Beattie HJ, 'Problem Based Learning in the Clinical Setting – A Systematic Review' (2008) 28 Nurse Education Today 146.

4. Authentic problems are presented at the beginning of the learning sequence, before any preparation or study has occurred;
5. The problems encountered are tools to achieve the required knowledge and the problem-solving skills necessary to solve the problems;
6. New information is acquired through self-directed learning.[7]

Boud describes its nature in eight characteristics – it is:

1. An acknowledgement of experience of learners.
2. An emphasis on students taking responsibility for and control of their own learning.
3. Interdisciplinary boundary-crossing.
4. 1The fusion of theory and practice.
5. A focus on processes, not merely the products, of knowledge acquisition.
6. Change in tutor role from instructor or tutor to facilitator.
7. Change in focus from tutor / lecturer assessment of learning outcomes to student self-assessment and peer-assessment.
8. A focus on communication and interpersonal skills.[8]

In more detail on the learning method, Moust *et al* describe the "Seven Jump"' stages of PBL at Maastricht as instructions to students:

Table 1. Steps involved in PBL

1. Clarify unclear phrases and concepts in the description of the problem.
2. Define the problem; which means: Describe exactly which phenomena have to be explained or understood.
3. Brainstorm: Using your prior knowledge and common sense, try to produce as many different explanations as possible.
4. Elaborate on the proposed explanations: try to construct a detailed coherent personal "theory" of the processes underlying the phenomena.
5. Formulate learning issues for self-directed learning.
6. Try to fill gaps in your knowledge through self-study.
7. Share your findings in the group and try to integrate the acquired knowledge in a suitable explanation for the phenomena. Check whether you know enough. Evaluate the process of knowledge acquisition.[9]

They summarise and acknowledge many other commentators when they write:

> PBL seems to be a coherent educational approach. The various underlying principles and factors seem to be influencing each other in subtle and expected ways. Barrows . . . one of the early contributors to the development of PBL, stresses the importance of PBL as a coherent educational approach and warns that changes in one element can seriously damage other elements in the "house" of PBL.[10]

In the article they note the effects of changes to the method due to inadequate staff-student ratios (larger PBL groups, leading to loss of student engagement); and changes due to exaggerated fears of staff members that subject matter was not

[7] Dochy F and others, 'Effects of Problem-Based Learning: A Meta-Analysis' (2003) 13 Learning and Instruction 533.
[8] Boud DJ and Higher Education Research and Development Society of Australasia, *Problem-Based Learning in Education for the Professions* (HERDSA 1985).
[9] Moust JHC, van Berkel HJM and Schmidt HG, 'Signs of Erosion: Reflections on Three Decades of Problem-Based Learning at Maastricht University' (2005) 50 Higher Education 665.
[10] *Ibid.*

sufficiently covered ("pointing" to resources, thus drastically reducing student agency and abilities to become independent learners). They also suggest ways in which, after a period of time using PBL, the method may be revitalized, *eg* building learning communities, informing students about the educational basis for PBL, helping students to become self-directed learners, offering students more variety in educational formats within the PBL environment, developing computer-supported environments, and adopting new forms of assessment.

Academic staff new to the PBL approach sometimes understand it as a version of project work. Kwan cites Chin and Chia's useful comparative table on the subject, showing the differences between the two educational approaches:

Table 8.1 Differences between PBL Project and Typical Project Work (Chin and Chia, 2004)

PBL project work	Typical project work
• Problems are identified by students themselves, and inspired by real-life experiences.	• Problems are identified by students or given by the teacher. Sometimes, problems are contrived.
• Problems are ill structured, with sub-problems embedded in a multifaceted, overarching problem statement that presents a scenario.	• Problems may be well defined if given by teacher. • The problem is usually encapsulated in a clear and focused investigative question or topic at the outset.
• Questions emerge along the way.	• No role-playing is usually involved. If the problem is given, students may feel detached from it, and see their role as merely fulfilling the requirements of a task set by the teacher.
• Students role-play a character in the problem statement with whom they can identify.	
• Students are required to generate questions and identify learning issues (based on the problem statement) which then act as springboards for their inquiry and learning.	• Students are usually not explicitly required to pose questions and identify learning issues. However, questions may arise incidentally during the course of the investigation.
• Because students are required to offer a solution to a multifaceted, ill-defined problem, they are unable to use "copy-and-paste" strategies in the written report.	• Some projects allow descriptive reporting on specific topics. This may lead students to resort to "copy-and-paste" strategies in the written report.

Table 2: Differences between PBL project and typical project work.[11]

Finally, and more generally, Savin-Badin and Major perceptively point out that PBL is less a set of curriculum changes and more in the way of a collection of general characteristics, which they group under three headings:

1. *Curriculum* organised around problems rather than disciplines; an integrated curriculum and an emphasis on cognitive skills.
2. *Conditions* that facilitate PBL such as small groups, resource-based learning and active learning.
3. *Outcomes* that are facilitated by PBL such as development of skills and motivation, and development of life-long learning.[12]

EVALUATION: WE FIND WHAT WE LOOK FOR

It should be said at the outset that the literature on PBL is dominated by analysis from Medicine and Health domains. The form of the literature is thus that of medical

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[11] Chin C and Chia L-G, 'Implementing Project Work in Biology through Problem-Based Learning' (2004) 38 Journal of Biological Education (Society of Biology) 69; Kwan A, 'Problem-Based Learning' in Malcolm Tight and others (eds), *The Routledge International Handbook of Higher Education* (Routledge 2012).

[12] Baden MS and Major CH, *Foundations of Problem Based Learning* (Open University Press 2004).

science, with scientific, highly statistical reporting of learning outcomes and experiences, and the development of both meta-reviews and systematic reviews on a wide range of PBL issues. This has helped PBL to become one of the most heavily-analysed pedagogies in any discipline in Higher Education. Some of the recent literature has criticised the quality of meta- and systematic review, but it should be admitted from the perspective of legal education that nothing remotely comparable to this body of literature has been developed for any pedagogy in Law.[13] As a result we have a large number of studies to draw upon, often different in results, sometimes conflicting directly, particularly on comparative surveys. There are general patterns that can be discerned, however, and in this brief survey of the literature we shall focus on them. In the following subsections we shall focus on the effects that PBL has on knowledge acquisition, on skills development, and on student development generally across a variety of disciplines.

Knowledge and Skills Acquisition

McParland *et al* noted that on assessment of knowledge acquisition, students on a PBL curriculum achieved higher examination scores (clinical and knowledge-based) than students on a conventional curriculum [14]. In their controlled experimental/control analysis of an ethics course taken by senior nursing students (N=142), PBL curriculum *versus* conventional lecture-based methods, Lin *et al* noted that there was a statistically significant difference between the ethical discrimination scores of the two groups in favour of the experimental group (P<0.05). There were also significant differences in satisfaction with self-motivated learning and critical thinking between the two groups. Lin *et al* noted that PBL appeared to be useful particularly *in situ*ations where there were personnel and resource constraints.[15]

In a study that tracked students in comparative PBL and conventional medical education programmes over a decade through assessments, Hoffman *et al* noted performance of the PBL cohort as follows:

> The PBL curricular changes implemented with the graduating class of 1997 resulted in higher performances on USMLEs [US Medical Licensing Examination] and improved evaluations from residency program directors. These changes better prepare graduates with knowledge and skills needed to practice within a complex health care system. Outcomes reported here support the investment of financial and human resources in our PBL curriculum.[16]

Against this, we should note the findings of Hartling *et al* who conducted a systematic review of PBL, analysing the findings of 30 studies where the most common evaluative outcome was knowledge acquisition:

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[13] Nor should it be assumed that medical education has developed its literature because its methodology is based in science, where systematic review is a common feature of the research landscape; whereas legal research has a different methodological and research basis, anchored as it is in the social sciences. It is also stems, as the Legal Education and Training Report argues, from a historical uninterest by legal academics in organising the body of research pertaining to legal education.

[14] McParland M, Noble LM and Livingston G, 'The Effectiveness of Problem-Based Learning Compared to Traditional Teaching in Undergraduate Psychiatry' (2004) 38 Medical Education 859.

[15] Chiou-Fen Lin and others, 'A Comparison of Problem-Based Learning and Conventional Teaching in Nursing Ethics Education' (2010) 17 Nursing Ethics 373.

[16] Hoffman K and others, 'Problem-Based Learning Outcomes: Ten Years of Experience at the University of Missouri—Columbia School of Medicine' (2006) 81 Academic Medicine 617.

> Twenty-two years of research shows that PBL does not impact knowledge acquisition; evidence for other outcomes does not provide unequivocal support for enhanced learning.[17]

In 1993 two studies appeared with partially-conflicting results on knowledge acquisition by PBL students, but both fairly negative. Investigating the effects of PBL generally on medical graduates, Albanese and Mitchell found that students regarded PBL as more supportive and enjoyable than conventional transmissive approaches; that PBL graduates performed at least as well and sometimes better on clinical examinations, but they performed lower on basic science examinations and thought they were less well prepared in basic science compared to students who had encountered conventional instruction.[18] By contrast, when Vernon and Blake synthesised all research from 1972–1992 that compared PBL with conventional instruction they found no statistical significance in the scores of PBL students compared to the conventional cohort on the National Board of Medical Examiners (NBME) Step 1 assessment.[19] Colliver came to broadly the same conclusions in his review but went further, coming down against PBL on grounds of its cost for so little apparent benefit.[20]

Analysis, methodology and the results, however, were becoming more sophisticated so that methodology itself, what was measured and how it was measured, became a focus for concern. The methodology by which a curriculum approach is evaluated clearly affects the outcome. If an evaluation framework assesses a curriculum for types of skills or categories of knowledge that are not the purpose of the curriculum design, then clearly there is mis-alignment of evaluation to curriculum aims and student learning outcomes. The question then arose – were researchers testing for the wrong outcomes? Given the claims that PBL makes to be a radical form of curricular intervention, were there educational achievements that were being missed by more conventional forms of educational research analysis?[21] If this were so, how might a new research approach be designed and applied – and what might be the results?

These were the questions asked by Filip Dochy and his colleagues at Maastricht University. A meta-analysis by Dochy *et al* addressed the effects of PBL on knowledge acquisition and skills, on an inclusion list of 43 articles. They proved a robust positive effect on skills and noted the effect of the 1993 studies on the literature. Viewing them in context (that is to say, accounting for PBL effects such as expertise levels of students, variation in effect sizes, *etc*) they declared the earlier 1993 results to be non-robust. Their results showed that the differences in knowledge acquisition between first and second year students on PBL and conventional programmes disappeared later. A significant finding of their study was related to knowledge retention: students in PBL gained slightly less knowledge, but remembered more of the acquired knowledge.[22]

This last point is interestingly connected to the form of education that lies at the heart of PBL, and which sets out, transparently, to evaluate students' problem-solving

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[17] Hartling L and others, 'Problem-Based Learning in Pre-Clinical Medical Education: 22 Years of Outcome Research.' (2010) 32 Medical Teacher 28. The researchers also noted that
   "[w]ork is needed to determine the most appropriate outcome measures to capture and quantify the effects of PBL. General conclusions are limited by methodological weaknesses and heterogeneity across studies. The critical appraisal of previous studies, conducted as part of this review, provides direction for future research in this area".

[18] Albanese and Mitchell (n 5).

[19] Vernon and Blake (n 5).

[20] Colliver JA, 'Effectiveness of Problem-Based Learning Curricula: Research and Theory' (2000) 75 Academic Medicine 259.

[21] A number of studies claim the radical difference that PBL makes. See, for instance, Moore GT and others, 'The Influence of the New Pathway Curriculum on Harvard Medic...: Academic Medicine' (1994) 69 Academic Medicine 931; Trappler B, 'Integrated Problem-Based Learning in the Neuroscience Curriculum – the SUNY Downstate Experience' (2006) 6 BMC Medical Education 47. Others, as we have seen, remained sceptical.

[22] Dochy and others (n 7).

skills in an authentic assessment environment. Students therefore have to transfer acquired knowledge and skills to demonstrate understanding of contextual factors on problem analysis as well as on problem solving itself; and to do this will call upon learned processes and procedures that contextualise knowledge items. PBL test design thus frequently asks learners not for their recall of isolated items or for isolated and contained units of reasoning (as might appear, *eg*, on multiple choice question lists), but for the repeated integration of relevant ideas and concepts (hence the gain in retention), and the further exploration of them. Integrative assessment, in other words, is the aim;[23] and it is an aim that can be significantly different from conventional knowledge examination precisely because the integration is more sophisticated and more explorative.[24] Moreover, in PBL students are focused on patterns of engagement with knowledge objects, and therefore "a sufficient level of domain-specific knowledge is a determinant of productive problem solving".[25] For Dochy and his colleagues such profiles became "the basic determinants of academic achievement" and an important element in a new theoretical framework to describe the process of PBL.[26]

In Law, this is a significant positive advantage, where knowledge of principles and the evidential detail for those principles is required, together with the procedural skills of argumentation or legal reasoning. But what counts as sufficiency, and how can knowledge acquisition be measured in this context, either by individual or group in a PBL curriculum? Dochy developed what he termed "knowledge profiles" – "a plotting as a graph of raw or standardized scores of a group or individual on certain parameters",[27] which could be used to show development within the PBL environment. What are knowledge profiles, how are they formed and how can they be used? To understand a knowledge profile, one must understand the centrality of prior knowledge and skills to the formation of new knowledge and skill. As Dochy describes it in a review of the educational literature on prior knowledge, "learning can be viewed as a successive transition between knowledge states".[28] A profile is therefore a snapshot assessment of the state of prior knowledge attained by a student at any particular point in the transition.

This was further developed by others. In a perceptive and more positive study in 2005 Gijbels *et al* conducted a meta-review of the influence of assessment on the reported effects of PBL. They began by noting the long history of PBL, from Dewey in the early twentieth century, through Piaget, Bruner to Ausubel and others. They defined three levels of the knowledge structure, namely understanding of concepts, understanding of the principles that link concepts, and linking of concepts and principles to conditions and procedures for application. They then applied this to a meta-review of 40 studies. They found that

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[23] Segers M, Dochy F and De Corte E, 'Assessment Practices and Students Knowledge Profiles in a Problem-Based Curriculum' (1999) 2 Learning Environments Research 191.

[24] Schmidt *et al* point out, similarly, how important is the activation of prior knowledge in small-group settings; and PBL works, in their view, because it provides the context for students to elaborate their own knowledge, which in turn facilitates the comprehension of new data related to the problem. Schmidt HG, Rotgans JI and Yew EH, 'The Process of Problem-Based Learning: What Works and Why' (2011) 45 Medical Education 792.

[25] Gijbels D and others, 'Effects of Problem-Based Learning: A Meta-Analysis from the Angle of Assessment' (2005) 75 Review of Educational Research 27. It has of course been established that under conventional assessment of knowledge, domain-specific prior knowledge facilitates student learning – see Thompson RA and Zamboanga BL, 'Academic Aptitude and Prior Knowledge as Predictors of Student Achievement in Introduction to Psychology.' (2004) 96 Journal of Educational Psychology 778.

[26] *Ibid.*

[27] Dochy FJRC, *Assessment of Prior Knowledge as a Determinant for Future Learning: The Use of Prior Knowledge State Tests and Knowledge Profiles* (Lemma BV 1992) <http://library.wur.nl/WebQuery/clc/369046/>.

[28] Dochy FJRC and Alexander PA, 'Mapping Prior Knowledge: A Framework for Discussion among Researchers' (1995) 10 European Journal of Psychology of Education 225, p 226.

in general, the effect of PBL differs according to the levels of the knowledge structure being measured. PBL had the most positive effects when the focal constructs being assessed were at the level of understanding the principles that link concepts, the second level of the knowledge structure.[29]

The results of their meta-analysis suggested that the implications of the types of assessment used to measure knowledge acquisition need to be taken into account more than they have been in review studies, particularly in the early studies.

In those early studies, as Dochy and Gijbels point out, the evaluation of PBL's effects had been limited and biased by the use of conventional assessment of knowledge that assumed only conventional knowledge acquisition. In addition, comparison of multiple medical schools does not necessarily take into account variations in the type of conventional instruction offered, or indeed the type of PBL that was designed and implemented. This point was also made by the authors of a study of a single medical school, namely Maastricht University Medical School. Schmidt *et al* summarized the effects of the University's well-established medical school PBL curriculum against their counterparts educated in conventional curricula (using in total 270 comparisons). The study also analysed skills acquisition alongside knowledge acquisition, rather than as a separate component. As well as knowledge acquisition, therefore, they analysed diagnostic competence, interpersonal and other general professional competences and practical medical skills – as they say in their abstract,

> [t]he results suggest that students and graduates from the particular curriculum perform much better in the area of interpersonal skills, and with regard to practical medical skills. In addition, they consistently rate the quality of the curriculum as higher. Moreover, fewer students drop out, and those surviving need less time to graduate. Differences with respect to medical knowledge and diagnostic reasoning were on average positive but small. These outcomes are at variance with expectations voiced in recent contributions to the literature. They demonstrate that constructivist curricula can have positive effects on learning even if they deemphasize direct instruction.[30]

On knowledge acquisition, Schmidt *et al* noted what many others observed: that PBL students better integrate their knowledge, which resulted in more accurate reasoning; that in the clinical case recall (a measure of expertise) and processing speed (a sign of better understanding) they were superior to the conventionally-educated cohorts.[31] In skills acquisition, PBL students demonstrated much better interpersonal skills, and knowledge about skills (a variable closely related to skilled performance).[32] Student and expert perceptions of the quality of PBL education were higher than the results for the conventionally-educated cohorts, with students commenting positively in particular on their practices in independent study and critical thinking. In passing, Schmidt *et al* also noted that PBL schools graduate students faster and in larger numbers and retain students better[33] – a positive and sizeable effect, as they note, given that graduation figures for medical school are already high. The authors point to the form of PBL as the cause of this success: in particular the role of problems and the facilitator, the effects of self-directed learning and of small-group learning.[34] Their argument is an explicit counter to the research of Kirschner *et al*, matching their article point for

[29] Gijbels and others (n 25).

[30] Schmidt HG and others, 'Constructivist, Problem-Based Learning Does Work: A Meta-Analysis of Curricular Comparisons Involving a Single Medical School' (2009) 44 Educational Psychologist 227.

[31] *Ibid.*

[32] Schmidt *et al* n 30, p 236.

[33] *Ibid*, p 237.

[34] *Ibid*, pp 238–40.

point. [35] A comparative reading of the two articles is instructive not just for the striking differences in educational approach to PBL, but as an illustration of the crucial importance of knowing what one measures and why in education.

Koh *et al* give a perceptive summary of key studies in their systematic review, where the control group is conventional instruction and the experimental group is PBL. Their findings broadly support the findings of Schmidt and others, and Dochy and Gijbels.[36]

Several studies have extended analysis of knowledge acquisition beyond HE programmes into the workplace. Kaufman and Mann compared medical student performance in PBL and conventional curricula on basic science knowledge through two pre-clinical years, Parts I and II of the Medical Council of Canada Qualifying Examination, the latter written after 17 months of postgraduate education. They concluded:

> the performance of PBL and conventional classes is equivalent after medical school, and during postgraduate education, and [. . .] knowledge differences found in the first PBL class after two preclinical years have disappeared at the end of fourth year. Basic science knowledge may continue to grow throughout the clinical experience.[37]

The last point was confirmed in Schmidt *et al* where, in a similar comparison, the researchers found positive effects: PBL "not only affects the typical PBL-related competencies in the interpersonal and cognitive domains, but also the more general work-related skills that are deemed important for success in professional practice". [38]

On the issue of the effect of PBL on work-related skills Tamblyn *et al* conducted an interesting study of transition from a conventional curriculum to a community-oriented PBL curriculum. Tracking 751 doctors from four graduation cohorts, three before the transition to PBL and one after, the researchers found a statistically significant improvement in mammography screening rates and continuity of care compared with graduates of the conventional medical curriculum. Indicators of diagnostic and management performance did not show the hypothesised decline. PBL graduates showed a significant fourfold increase in disease-specific prescribing rates compared with prescribing for symptom relief after the transition. The researchers concluded that transition to a community oriented PBL curriculum was associated with significant improvements in preventive care and continuity of care and an improvement in indicators of diagnostic performance.[39]

Summary: Phenomenology and the Evaluation of PBL

What can we draw from this brief account of the literature on knowledge and skills in PBL? On skilled performance both during the period of HE study and after, PBL seems to improve student and novice skills more effectively than conventional instruction regimes. On knowledge acquisition the picture is more complex because of the nature of knowledge learned via conventional instruction as opposed to the structure of knowledge learned via PBL. As we should expect, the form of the educational intervention affects what is learned: what students learned in conventional

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[35] Kirschner PA, Sweller J and Clark RE, 'Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching' (2006) 41 Educational Psychologist 75.

[36] These findings, highly detailed and meticulously described, are available at Appendix 3, http://www.cmaj.ca/content/178/1/34/rel-suppl/98e5ad3ce6430528/suppl/DC2.

[37] Kaufman DM and Mann KV, 'Achievement of Students in a Conventional and Problem-Based Learning (PBL) Curriculum' (1999) 4 Advances in Health Sciences Education 245.

[38] Schmidt and others (n 30).

[39] Tamblyn R and others, 'Effect of a Community Oriented Problem Based Learning Curriculum on Quality of Primary Care Delivered by Graduates: Historical Cohort Comparison Study' (2005) 331 BMJ (Clinical research ed.) 1002.

medical instruction differed significantly from what students learned in PBL. If we accept that, then we need to come to agreement that the forms of integrated skills and knowledge learned and practised by PBL students and novices require different types of evaluation processes and instruments. It also requires a broader view of the evaluative framework, one that includes phenomenological and phenomenographic approaches as well as theories of extended cognition.[40]

Let me offer some examples of what I mean. In their classic phenomenographical study of learning Entwistle and Marton construct the metaphor of a knowledge object that describes "aspects of memory processes and understanding which [are] not reductionist".[41] As Entwistle and Marton describe it, a knowledge object for students is a form of understanding legitimated within a particular disciplinary domain. It is, they say, "a way of making sense of personal experiences of learning and studying", where:

> The nature of the knowledge object formed will depend crucially on the range of material incorporated, the effort put into thinking about that material, and the frameworks within which the knowledge object is developed.[42]

What is interesting about this is that, despite their use of the word "object" in their definition Entwistle and Marton do not define a knowledge object as an object at all. Instead it is made up of a number of mental and social processes. According to them there are four characteristics of knowledge objects:

1. A student's awareness of a closely-integrated body of knowledge.
2. The quasi-sensory representation of this corpus.
3. A movement from unfocused and episodic remembering to much more detailed and coherent knowing.
4. Structure of the knowledge object itself.

There are a number of key questions raised by this research. The characteristics above include those of "awareness", "representation", "movement" and "structure", which are odd if applied to objects, even metaphoric objects. Is the knowledge object really an object, that is, a tool with which one learns; or is the object itself a process, a way of grappling with knowledge that one must learn? Entwistle and Marton's study is actually part of a tradition that sees the context of learning as profoundly affecting what is learned and how it is learned. John Dewey, for instance expressed a similar notion in his concept of "idea artefacts". [43] This concept parallels other approaches to learning and the structure of knowledge. Berardi-Coletta *et al*, for instance, conducted studies on the role of metacognition in problem-solving, and concluded that "process-oriented [*ie* metacognitive] participants consistently form[ed] more sophisticated problem representations and develop[ed] more complex strategies".[44] For them, the process

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[40] See for example Clark A and Chalmers DJ, 'The Extended Mind' (1998) 58 Analysis 7, more of which below. In this section I summarise and extend work in Maharg and Priddle – see Maharg P, *Transforming Legal Education: Learning and Teaching the Law in the Early Twenty-First Century* (Ashgate Publishing, Ltd 2007); Priddle J and others, 'Simshare: Final Report' <http://www.academia.edu/3030697/Dr_Julian_Priddle>.

[41] See Entwistle N and Entwistle D, 'Preparing for Examinations: The Interplay of Memorising and Understanding, and the Development of Knowledge Objects' (2003) 22 Higher Education Research & Development 19; Entwistle N and Marton F, 'Knowledge Objects: Understandings Constituted through Intensive Academic Study' (1994) 64 British Journal of Educational Psychology 161. In the former article the linkage of forms of intention (deep, surface) to specific studying processes is made overt.

[42] *Ibid*, pp 174–5.

[43] Dewey, J, *The Later Works of John Dewey, Volume 16, 1925–53: 1949–1952, Essays, Typescripts, and Knowing and the Known (Collected Works of John Dewey)*. Edited by Jo Ann Boydston (Southern Illinois University Press), p326–7; 330.

[44] Berardi-Coletta B and others, 'Metacognition and Problem Solving: A Process-Oriented Approach.' (1995) 21 Journal of Experimental Psychology: Learning, Memory, and Cognition 205, p207.

of verbalisation was not the source of better problem-solving: the source was the metacognitive processing involved in the effort to produce explanations.

There are a number of strong parallels between the phenomenographical approach to knowledge objects and the constructionist approaches to learning – Sherry Turkle's concept of ''evocative objects'' that we think with is a good example of this.[45] Indeed it might be argued that learning knowledge is neither an object nor a process, but more of a performance, such as in the theatre or in a concert hall, where there is are scripts that guide performance, but the performance itself is the reason for the script's existence. The same applies to reading as performance, for example one's reading of a poem or a novel that, multi-layered and complex, cannot be fully represented in any way other than the experience of reading, all other interpretive embodiments of the art work being fragmentary only.

Theories of extensive cognition, or the Extended Mind Hypothesis, take this a stage further, and extend cognitive processing into the environment surrounding the human body. For Clark, for instance, cognition ''leaks out into body and world'': thinking itself is distributed in our social and personal environment.[46] Clark gives the example of Susan Goldin-Meadow's work on gesture and thinking. Gesture is not merely the result of thinking: for her, gesture functions ''*as part of the actual process of thinking*''.[47] As Clark summarises her work,

> [t]he physical act of gesturing, . . . plays an active (not merely expressive) role in learning, reasoning, and cognitive change by providing an alternative (analog, motoric, visuo-spatial) representational format.[48]

The same, Clark argues, extends to other representational formats in the world: paper, pens, pixels. On the subject of writing, he argues:

> [t]he paper provides a medium in which, this time via some kind of coupled neural-scribbling-reading unfolding, we are enabled to explore ways of thinking that might otherwise be unavailable to us.[49]

What is true of the microcosm of the individual gesture, the knowledge object, the worked-out thought on paper, is true also of the macrocosm of the PBL curriculum. A curriculum, too, is a tool for and of thinking. It is a representational format that profoundly affects what is learned and how, and contains within its structures and spaces distributed thinking. The phenomenology of that construct is something that we have yet to explore in sufficient depth in legal education, and particularly as regards PBL. The evaluation of PBL and the law curriculum, too, has yet to be properly explored; and the following section begins that process.

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[45] Turkle's work on evocative objects stemmed from her work with students at MIT, where she asked them to write on an object encountered during their childhood or adolescence that influenced their path into science. As Harman puts it, these objects have ''autonomy, richness and depth'', and in this sense they are closely aligned with the objects/processes that Entwistle and Marton describe and analyze (Harman G, 'Zeroing in on Evocative Objects' (2008) 31 Human Studies 443, p 455). See also Ackermann E, 'Constructing Knowledge and Transforming the World' in M Tokoro and L Steels (eds), *A Learning Zone of One's Own: Sharing Representations and Flow in Collaborative Learning Environments* (IOS Press 2004).

[46] Clark A, *Supersizing the Mind: Embodiment, Action, and Cognitive Extension* (Oxford University Press 2008), xxviii.

[47] Clark A, 'Curing Cognitive Hiccups: A Defense of the Extended Mind' (2007) 104 The Journal of Philosophy 163, p 176.

[48] *Ibid*, p 178.

[49] *Ibid*, p 179.

PBL AND LAW

Law school use of PBL
A number of law schools use the methodology, either as a whole-curriculum approach or part-curriculum (*ie* individual modules or syllabi). At the time of writing (January 2015) a representative sample would appear to be as follows: in the Netherlands, the University of Maastricht and Erasmus University (Rotterdam);[50] in Sweden, the University of Uppsala and the University of Umea;[51] in Colombia the University of Los Andes;[52] in Australia RMIT University;[53] and in the UK, Nottingham Trent University and the University of York.[54]

Literature on PBL in Law Schools
The PBL programme at the Law School of the University of Maastricht has been the focus on considerable research, more than any other law school. Driessen and Van der Vleuten report on successes at Maastricht on assessment of learning – block tests, portfolios, formative computer-based tests. In particular,

> the assessment program enhanced skills and changed attitudes that had been opposed to the ideals of life-long and problem-based learning. Empirical data on the quality of the new assessment system reveals that we went a step forward in matching problem-based learning with student assessment.[55]

In an interesting study Moust *et al* point to the need to revitalize the PBL curriculum after a period of time. [56] Moust, who has been involved with the Dutch law programme since 1985, summarised the Maastricht approach and its achievement, showing how

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[50] Maastricht's is one of the oldest PBL Law programmes, and the most thoroughly documented to date. Law is only one programme employing PBL amongst many at the university: starting with a medical school, it was then adopted by Health Sciences, Law, Economics, Psychology and the Liberal Arts, and involves around 12,000 students, 2,500 staff and approximately nine curricula. Almost the entire institution uses the method – see http://bit.ly/1BrP14w which includes a helpful introductory video emphasising PBL key points, including small groups, active learning, facilitation, collaboration, and the like. The descriptive and analytical literature is extensive, and summarised below. For information on Law PBL at Erasmus University, see http://bit.ly/1 DaCoLb. At least one Masters programme there (in Public International Law) is moving to PBL – see http://bit.ly/1xYXnwR

[51] In the University of Uppsala, the Juridiska fakulteten hosts the PBL undergraduate programme – see http://bit.ly/1zOV98O. The programme appears to be loosely based upon both PBL and case-based approaches. In the Department of Law at UMEA there appears to be no general curriculum statement, but a number of staff state that they teach using PBL. See http://bit.ly/1C7rTLr; see also Boström V and others, *Developing Legal Education: The Lao Context and a Swedish Approach to Problem-Based Learning* (Juridiska institutionen, Umeå universitet, Umeå 2006).

[52] See http://bit.ly/1z2aJLp Most of the work on PBL implementation in the law school seems to have been led and documented by the Director of the Teaching & Learning Centre, Juny Montoya Vargas. See Montoya Vargas J, 'Problem-Based Learning at LASOL: A Case' <http://web.stanford.edu/dept/law/lelac/Montoya.pdf> accessed 9 February 2015; Perez-Hurtado LF and Montoya Vargas J, 'Teaching Values through Pedagogical Practice in Legal Education' (2011) 2 Web Journal of Current Legal Issues <http://www.bailii.org/uk/other/journals/WebJCLI/2011/issue2/perez2.html> accessed 9 February 2015.

[53] In Australia the University of Newcastle was an early adopter. See Macfarlane J and Manwaring J, 'Using Problem-Based Learning to Teach First Year Contracts' (1998) 16 Journal of Professional Legal Education 271. For information on PBL at RMIT, see Douglas K and Ruyters M, 'Going to the Movies: Legal Education, Problem Based Learning and Public Policy' in Michael Adams, David Barker and Katherine Poludniewski (eds), *Law and Public Policy: Taming the Unruly Horse?* (ALTA 2007) <http://www.alta.edu.au/resources/PDFs/Published%20Conference%20Papers%202006%20and%202007/2007%20Papers/2007%20DOUGLAS%20K,%20RUYTERS%20 M_Going%20to%20the%20 Movies_Final.pdf> accessed 9 February 2015.

[54] See http://bit.ly/1CIUvd0 and especially http://bit.ly/1uvEP67. York designed a full qualifying undergraduate curriculum in Law, and has given outlines of its approaches to facilitation, teaching, learning and structure at UKCLE events. Very little has been published on the programme. For a general introduction see http://bit.ly/1yW5Oxk. For information on how learning takes place within the problem process, see http://bit.ly/1H0RHff. For information on teaching, learning and particularly assessment on the programme, see http://slidesha.re/1yJrJr8.

[55] Driessen E and Van Der Vleuten C, 'Matching Student Assessment to Problem-Based Learning: Lessons from Experience in a Law Faculty' (2000) 22 Studies in Continuing Education 235.

[56] Moust, Berkel and Schmidt (n 9).

students' general problem-solving skills are enhanced, as well as their "growing content-specific knowledge".[57]

While this article demonstrates how students adapt and grow within the PBL learning ecology, Moust and Nuy examine PBL from a staff perspective, analysing some of the reasons why PBL is problematic for staff to implement. These include the shifts that are required in syllabus construction and in assessment practices [58].

Maria Tzannes outlines some of the benefits of PBL to Australian Law curricula, which include benefits to society, to law schools (movement away from "coverage" in the curriculum and time given to knowledge "which is easily forgotten if not used frequently or which can change through legislative amendment") and to the professional development of students. Tzannes also summarises well the obstacles to PBL development in Law in Australia, and it is worthwhile summarising her list of 17 obstacles, and placing beside them some strategies that may overcome them.[59]

	Obstacle	Possible strategies
1	Staff misunderstand the nature of PBL and assume it relates to hypotheticals	Comprehensive structured induction of new staff re facilitation; long lead time and re-orientation of new staff and training of new staff. Sufficient funds should be allocated for course development and ongoing development (MT)
2	A sense of negativity develops then, about new forms of teaching and learning	Staff need to be informed about the need for change and the prospective outcomes of that change process. They need to develop a sense of ownership of the new curriculum (MT) Course developers should seek political allies within and outside the organisation to support the changes (MT)
3	No need to be innovative in HE since profitability is not usually at stake	Local conditions of profitability often prevail, and a new programme can be an opportunity for new financial strategies
4	PBL is seen to be resource-intensive because it involves small-group teaching	Good design mitigates resource costs. Small-group teaching need not imply high-cost – it depends on the context of the small-group teaching, *eg* other activities staff and students are involved in (PM)
5	Assessment of performance is difficult when students work in teams	As in medical education, there are plenty of design solutions to this, where teamwork and individual work can be assessment, in tandem, in isolation, or as a combination of the two (PM)
6	PBL is seen to be time-consuming, difficult to administer, labour-intensive	As with all experiential learning design and resources, there is a spike at the start for design staff; and thereafter their workload tends to decrease (PM)

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[57] Moust JHC, 'The Problem-based Education Approach at the Maastricht Law School' (1998) 32 The Law Teacher 5.

[58] Moust JC and Nuy HJ, 'Preparing Teachers for a Problem-Based, Student-Centered Law Course' (1987) 5 Journal of Professional Legal Education 16.

[59] I have tabulated one obstacle and possible response against each other for easier reading. All obstacles are those identified by Tzannes. She does not suggest exact strategies to cope with all these obstacles. Where she does so, the strategies she advises are identified by the letters "MT" in brackets. Those tagged with "PM" in brackets are my own counterarguments.

	Obstacle	Possible strategies
7	Institutionalised practices militate against the implementation of PBL, notwithstanding permission from senior management	PBL goes beyond mere curriculum tinkering – its effects can be far-reaching since it changes how the work of teaching is conducted (MT)
8	Teachers have difficulty moving from a didactic style of teaching	PBL facilitators can be used to teach (and need training for this role). Staff require training in designing resources for PBL. (PM)
9	Course coverage or depth is perceived to be sacrificed	Different things are known; knowledge is retained better on PBL; knowledge and skills are better combined (PM)
10	Students ask questions of the integrated materials, and beyond them – staff feel they don't know the subject material well enough to teach	Preparation in collaborative teams by academic design staff; preparation of materials for facilitators, and induction and training for facilitators as well as design staff (PM)
11	PBL challenges teaching staff on how we come to know things, the status of knowledge and who / where is the repository of knowledge	Curriculum development and change is not merely logical or rational but also an emotional and political process. Knowledge itself needs to be challenged (MT)
12	Teachers feel academic expertise is devalued because teacher-centred formats are de-centred	Not always, but certainly possible. This can be mitigated by inducting staff into new roles – teacher as designer, *eg*. (PM)
13	Teaching staff are uneasy because PBL appears to empower students and disempowers staff	PBL also engages students and it is engagement that empowers students, and thus draws in staff. (PM)
14	Inter-course integration is seen as problematic	Collaboration between staff should start early and with consensus between designstaff (PM)
15	In curricula where there are divisions between PBL and conventional approaches, problems may arise because of the incompatibility of the approaches, with students resenting the independence required of them in PBL	The empowerment of students in groups is a powerful agent for change which may lead to support for PBL; but which in any case requires skilful planning and handling (MT)
16	Confusion over the role that students play in student-centred PBL, especially school-leavers	Induction and information is required at every stage. PBL may well be better-suited to more mature students (PM)

In her analysis of PBL in legal curricula in New Zealand, Mackinnon proposes, on a general review of the literature from other disciplines, that PBL promotes the following conceptual elements:

1. Contextualization
2. Interdisciplinarity
3. Integration of prior personal and/or professional knowledge
4. Collaboration
5. Enquiry skills
6. Reflection and transition

7. Self-directed learning and self-assessment
8. Praxis[60]

In spite of this, her research into the "dominant stakeholder analysis" suggested that PBL was unlikely to be strongly "championed by any of the main stakeholder groups in New Zealand, despite evidence that its characteristics have benefits for all of them" because of three factors: "it is misunderstood; it is resource intensive; it is a break with tradition".[61]

The first and third points are undeniable. The second is more controversial. Finucane *et al*, analysing a new medical curriculum in the University of Limerick based upon a model developed by Flinders University, is one of the few articles in the literature to cost a PBL programme closely within a single institution .[62] The implication in the article is that, for the benefits that accrue from PBL, the method is seen as being good value. Mackinnon ends by arguing vigorously against those who have seen the application of PBL to Law as merely the "professionalization" of Law's intellectual superstructure. Dismissing Drinan's description of PBL as "shallow pragmatism", she summarises the role that PBL can play in legal education in words that indicate how PBL can go beyond direct professional preparation:

> Problem Based Learning approaches require reflexive participants; those who are sufficiently conceptually literate to read and critique key aspects of the social order and to understand their own and others' status and role in it (including understanding any conflict between the personal "self'" and the professional "self"). Reflexivity contributes to humanist as well as to legal solutions to complex human problems and is essential to professional citizenship participation in the globalising market and society at a time of transition from a work society to a risk society.[63]

Her broad view of the benefits of PBL is of a piece with the analyses of the achievement of the Maastricht University Law School, which shows no narrowing of the curriculum.

Grimes concurs with Mackinnon on this and many other points in his descriptions of PBL at York University Law School.[64] He describes the PBL LLB curriculum at York in positive terms, though there is little analysis of empirical data. He acknowledges that "more research [in Law] is needed to obtain conclusive evidence of the impact that PBL and role play has on learning, and to give a deeper insight into the cognitive and emotional effects of small group learning overall".[65]

Shirley Lung gives a useful overview of PBL in Law in the US, opposing the problem method to the more conventional signature pedagogy of the case method. In her summary of the literature she makes it clear that the power of the problem method lies in the way that PBL fosters procedural knowledge, where the case method privileges

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[60] Mackinnon JJ, 'Problem Based Learning and New Zealand Legal Education' (2006) 3 Web Journal of Current Legal Issues <http://www.bailii.org/uk/other/journals/WebJCLI/2006/issue3/mackinnon3.html> accessed 9 February 2015.

[61] *Ibid.*

[62] Finucane P, Shannon W and McGrath D, 'The Financial Costs of Delivering Problem-Based Learning in a New, Graduate-Entry Medical Programme' (2009) 43 Medical Education 594.

[63] Mackinnon (n 60).

[64] See Grimes R, 'Delivering Legal Education through an Integrated Problem-Based Learning Model – the Nuts and Bolts' (2014) 21 International Journal of Clinical Legal Education <http://www.northumbriajournals.co.uk/index.php/ijcle/article/view/388> accessed 8 February 2015.

[65] Grimes R, 'Faking It and Making It? Using Simulation with Problem-Based Learning' in Caroline Strevens, Richard Grimes and Edward Phillips (eds), *Faking It and Making It? Using Simulation with Problem-Based Learning* (Ashgate Publishing, Ltd 2014), 191. 1.

declarative knowledge.[66] When students develop procedural knowledge they elaborate schemas and scripts around items of declarative knowledge and in doing so engage in self-directive learning. As Lung puts it, "the key to expert problem-solving lies in how knowledge is organized, not the quantity of declarative knowledge acquired".[67] In more detail, she describes the process of acquiring procedural knowledge as follows:

> This includes grappling with the structure of rules and their interrelationships as well as learning to recognize "multiple uses of a single rule or how a single rule operates under different circumstances". Equally significant, students are confronted with sorting out the categorizations, characterizations, paths, and choices that arise at each stage of an analysis.[68]

What Lung describes well here is the process by which, in PBL, students begin to learn legal reasoning. Lung does not pursue the point, but it could perhaps be argued that in PBL what students learn is a *different form of legal reasoning* to that which they learn *via* more conventional educational methods. In saying this I am not making the claim that PBL alters the fundamental *grundnorm* of legal reasoning. As Ian McLean has pointed out, and many since, this is a highly complex issue, and cannot be claimed or proven here.[69] However it is undeniable that a form of legal education affects what is learned of legal reasoning, and how it is learned.

Lung's article is also useful because she goes on to identify problems with PBL in legal education – problems of vicarious learning and transfer of learning in particular – and describes these perceptively and in depth. Her solutions include guiding students toward what she calls, in a resonant phrase, "deep problem structures" (to which we will return in the Conclusion); and learning through "metacognitive strategies" by "internalizing habits of self-questioning" and use of visualizations.[70] She also advocates use of "information processing scripts" that enable students to apply law to facts in a series of "decision points" and which would thus "list or describe each sequential step in the thinking process".[71] As she points out, the uses of such a script are rich – students could collaborate in forming them, or a student could lead the PBL group through the formation of the script; or a group could be asked to develop one. It could be used for formative or summative assessment.[72]

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[66] Lung S, 'Problem Method: No Simple Solution, The' (2008) 45 Willamette Law Review 723. Lung cites Krieger on this: Krieger SH, 'Domain Knowledge and the Teaching of Creative Legal Problem Solving' (2004) 11 Clinical Law Review 149, at 165–66.

[67] Lung (n 66), pp 737–8.

[68] Lung (n 66), p 738, quoting a student, Allie Robbins, in a memo to Lung, on file with Lung. It is worth quoting Lung's contextual comment here: "Robbins, one of my students, has explained that reading cases, taking notes on cases while reading and during class, and outlining often left her piecing together crucial information about the rules and their application right before exams. The memo offered Robbins' perspective on how problem-based learning can be an effective methodology for helping students learn to apply rules." (Lung (n.66), footnote 81, pp 736–7.) The student comment reveals how PBL can facilitate procedural thinking when learning complex legal rules.

[69] Arguing for continuity between medieval and Renaissance texts, McLean points out with regard to the way that interpretive rules grew up around the glossatorial readings of the *Corpus Iuris Civilis,* "conservative forces were at work to preserve technical vocabulary and the terms of debate from change; and that the realm of law and legal interpretation operated as a coherent and recognizable practice". Maclean I, *Interpretation and Meaning in the Renaissance* (Cambridge University Press 1992), 139–40, cited in Maharg (n 37).

[70] Lung (n 66), p748.

[71] Lung (n 66), p755.

[72] Lung (n 66), p756–7.

CONCLUSION

As we have seen, the debates regarding the efficacy of PBL as a curriculum approach at first focused on testing students on declarative knowledge and skills, and compared this with student performance in conventional programmes. This has shifted now, and from it has emerged debates about how we evaluate what students learn within PBL programmes. The evidence we have to date is that students learn differently, and they learn different procedural skills on PBL programmes.

More important for our purposes here, we have seen that in the process of re-thinking evaluation, researchers such as Dochy, Gijbels and colleagues have had to re-design evaluation instruments – Dochy's "knowledge profiles", Schmidt's micro-analytical measurement approach are examples.[73] Their work has shaped the direction of evaluative studies in PBL, while remaining within the field of medical educational research.

By contrast with medical education, legal education has only really begun to analyse the effects that PBL has upon legal learning. We need much more analysis along the lines that has been developed for medical education. We need to learn the lessons of designing sensitive evaluation tools, such as those of Dochy and Schmidt.

We also need to design approaches that are sensitive to our discipline, and the requirements of students, universities, regulators and the profession. We require evaluative instruments that can give us insight into how best to help students understand, in Lung's words, "deep problem structures", the nature of conflict, how disputes arise and can be resolved (by extra-legal as well as legal means). Throughout, I have argued that phenomenological and phenomenographic approaches would give us instruments by which to understand how learning comes about, its quality and effectiveness in PBL law programmes.

Indeed they already exist in the research literatures. Phenomenography is a well-established approach in Education, with its research methods.[74] As I pointed out in *Transforming Legal Education*, collaborative and discursive constructions of tasks, so important for professionals and experts, are essential for students as the only alternatives to individualized, competitive mastery of legal knowledge which, for most students most of the time, still represents their predominant experiences of legal education. PBL is a social, collaborative curriculum design: we need tools that investigate the social collaboration that takes place at the micro-level. We could, for instance, look to the work of Edwards on community, practice and participation.[75] Or we could use the extensive research work on conversation analysis, dialogue and learning by Neil Mercer and colleagues.[76] These instances, and many more, show us the richness of evaluative tools that we can bring to bear on the phenomenological task of understanding how and why PBL works in legal education, how we can design it better, and how our students can benefit from it. Nor is this understanding technical merely: it goes to the heart of our understanding of educational dialogue, around which

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[73] Micro-analytical measurements evaluated the extent to which students' "situational interest" was engaged during PBL. They found that "situational interest predicted students' academic achievement with considerable accuracy, demonstrating that it drives learning". Rotgans JI and Schmidt HG, 'Situational Interest and Academic Achievement in the Active-Learning Classroom' (2011) 21 Learning and Instruction 58, p 65.

[74] See for instance Kinnunen P and Simon B, 'Phenomenography and Grounded Theory as Research Methods in Computing Education Research Field' (2012) 22 Computer Science Education 199; Stenfors-Hayes T, Hult H and Dahlgren MA, 'A Phenomenographic Approach to Research in Medical Education' (2013) 47 Medical Education 261.

[75] Edwards A, 'Let's Get beyond Community and Practice: The Many Meanings of Learning by Participating' (2005) 16 Curriculum Journal 49.

[76] Mercer N, *The Guided Construction of Knowledge: Talk Among Teachers and Learners* (Multilingual Matters Ltd 1995); *Words and Minds: How We Use Language to Think Together* (First edition, Routledge 2000).

PBL is based. Indeed it is not too much to claim that it contributes to the wider circles of ethical and democratic encounter in our educational institutions. As Dewey said, "Democracy begins in conversation".[77] The quality of that conversation has significant consequences, for it affects all the actions that flow from it, both within Higher Education and beyond.

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[77] According to Steven Fesmire, Dewey said the words at his 90th birthday party; and they characterise much of his approach to both democratic debate and education. Fesmire S, *Dewey* (1st edn, Routledge 2014), p 179.