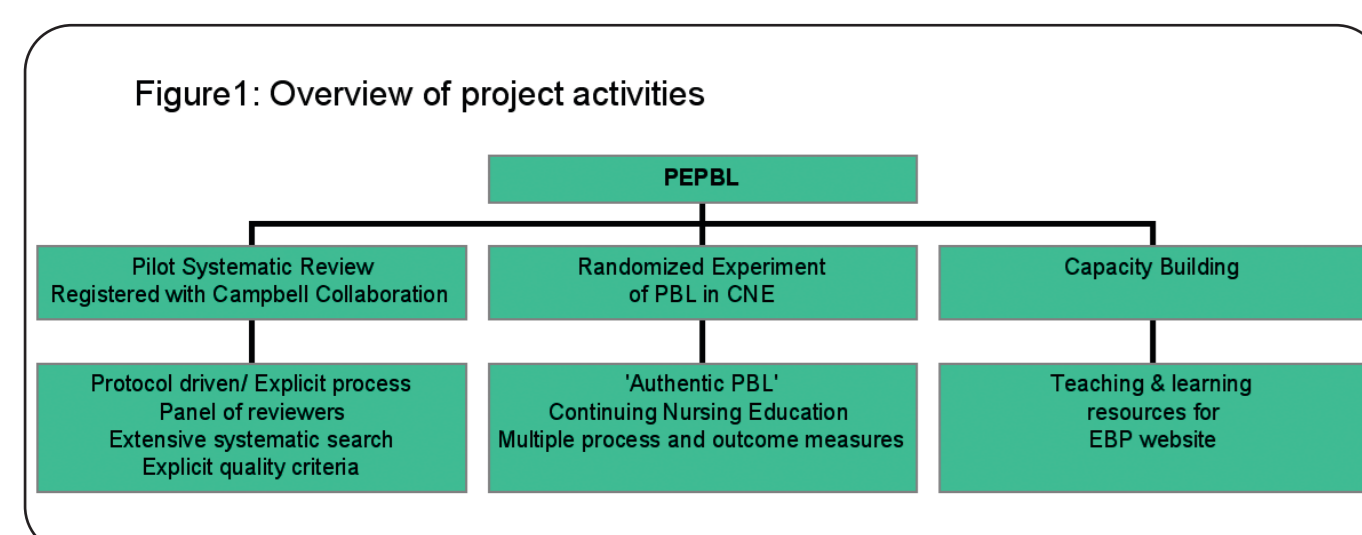


The effectiveness of problem based-learning (PEPBL)

Career development associate: Mark Newman

Aims:

- To contribute to the evaluation of the effectiveness of Problem Based Learning in higher education



Significance:

Problem Based Learning (PBL) has been adopted around the world as a philosophy and method for teaching and learning in professional education in particular. Advocates of the approach have made many claims for its success. Despite the apparent widespread use of this approach and the plethora of published papers on PBL there are numerous basic questions about the approach that remain controversial. At a fundamental level there is no universal agreement about what PBL actually is. Similarly there is little agreement about what the specific outcomes of PBL are or how they should be measured. In recent years the advantages that are claimed for PBL have become part of the generally articulated outcomes for education at all levels and it is therefore important to explore rigorously what kinds of PBL produce what kinds of outcomes for which students in which contexts.

Timescales:

The project commenced in Early 2000 and begun reporting data in late 2002. The final report of the systematic review is now available and the report of the primary study will be available from early July 2003.

Partnerships:

The project involves higher education teachers in all aspects of its design and operation.

The project has a website and has developed an international e-mailing network with over 1000 members.

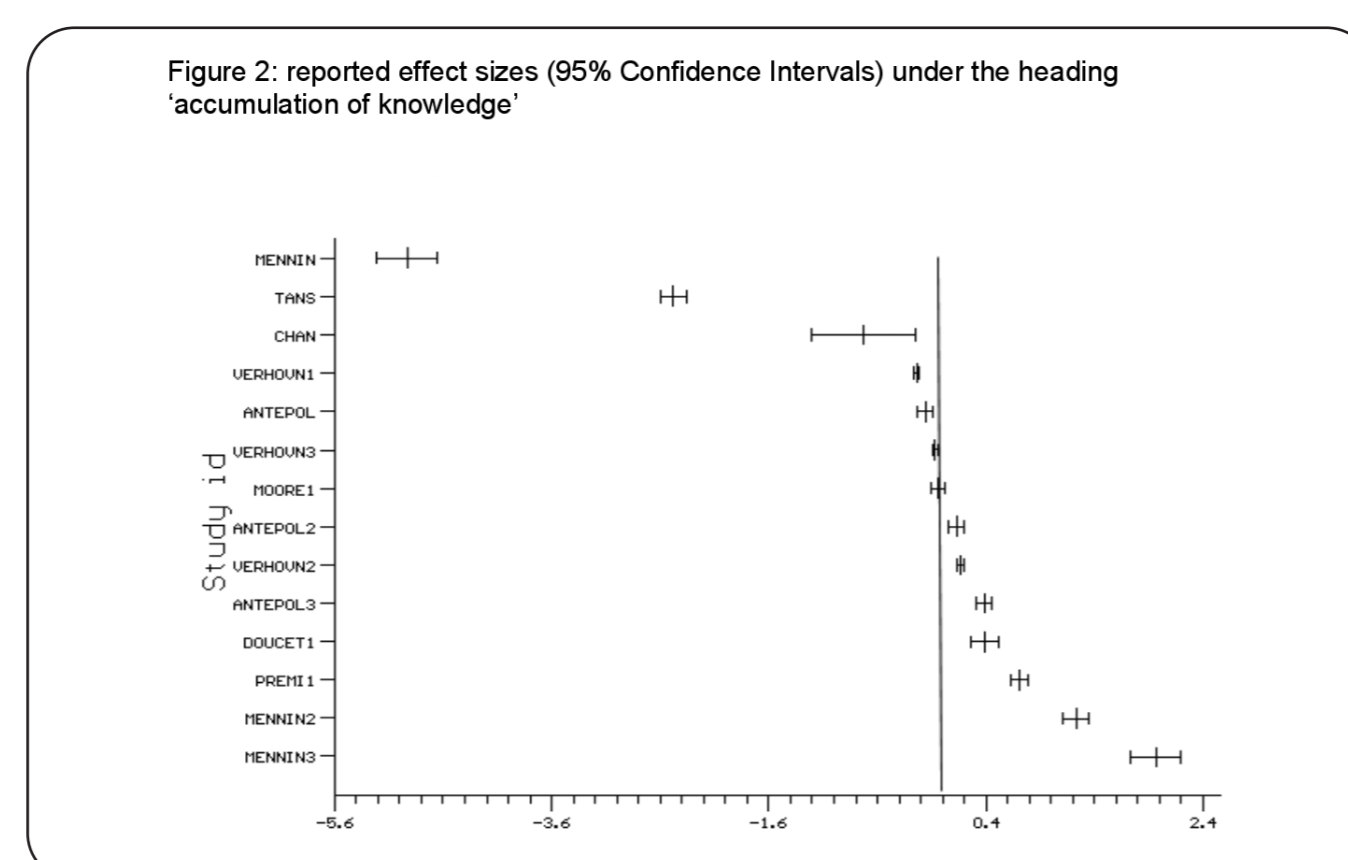
A one day workshop on research and evaluation in Problem Based Learning organized as part of the project attracted more than 70 delegates from four different countries.

Summary of results from the systematic review:

91 citations were identified from five existing reviews. Of these 15 were adjudged to meet the Review inclusion criteria. Of the 15 only 12 reported extractable data. The included studies reported a range of effects that were grouped under headings discussed below. Not all of the effects reported in the included studies were included in the pilot review, only those which met the quality criteria.

The studies all reported on PBL used in higher education programmes for health professional education at both pre- and post- registration levels. The majority of students were in medicine and the majority of these studies reported on pre-registration medical education.

The effects reported were grouped under the headings 'improvement on practice', 'approaches to learning', 'satisfaction with the learning environment' and 'accumulation of knowledge'. As an example figure 2 illustrates the reported effect sizes under the heading 'accumulation of knowledge'



Reported effect sizes ranged from $d = -4.9$ to $d = 2.0$. A pilot meta-analysis produced a mean effect size of $d = -0.3$ but the 95% confidence interval did not exclude a positive effect.

Summary of primary study and some examples of results:

Sample: 1 year part time programme at level 3 (3rd year undergraduate). 67 qualified nurses enrolled from 5 north London Hospitals.

Key differences between the experimental (PBL) and control (SGL) curricula:

'Authentic PBL'

- Goals/ activities determined by students within curriculum framework
- Focus on cognitive skills
- Triggers precede learning
- Realistic clinical problems
- Use of small groups,
- student- student interaction
- peer – regulation
- Teacher as facilitator
- Little tutor participation

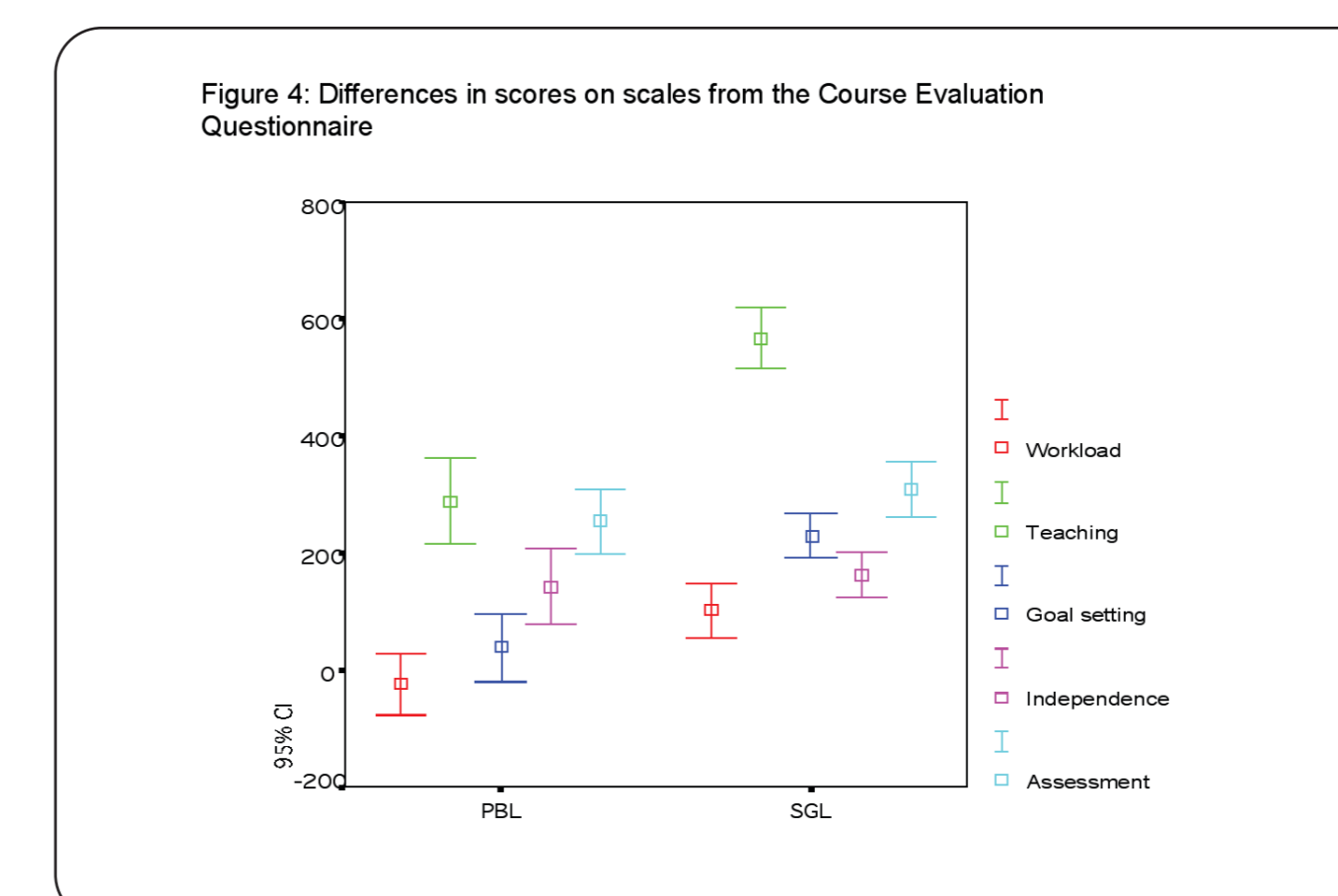
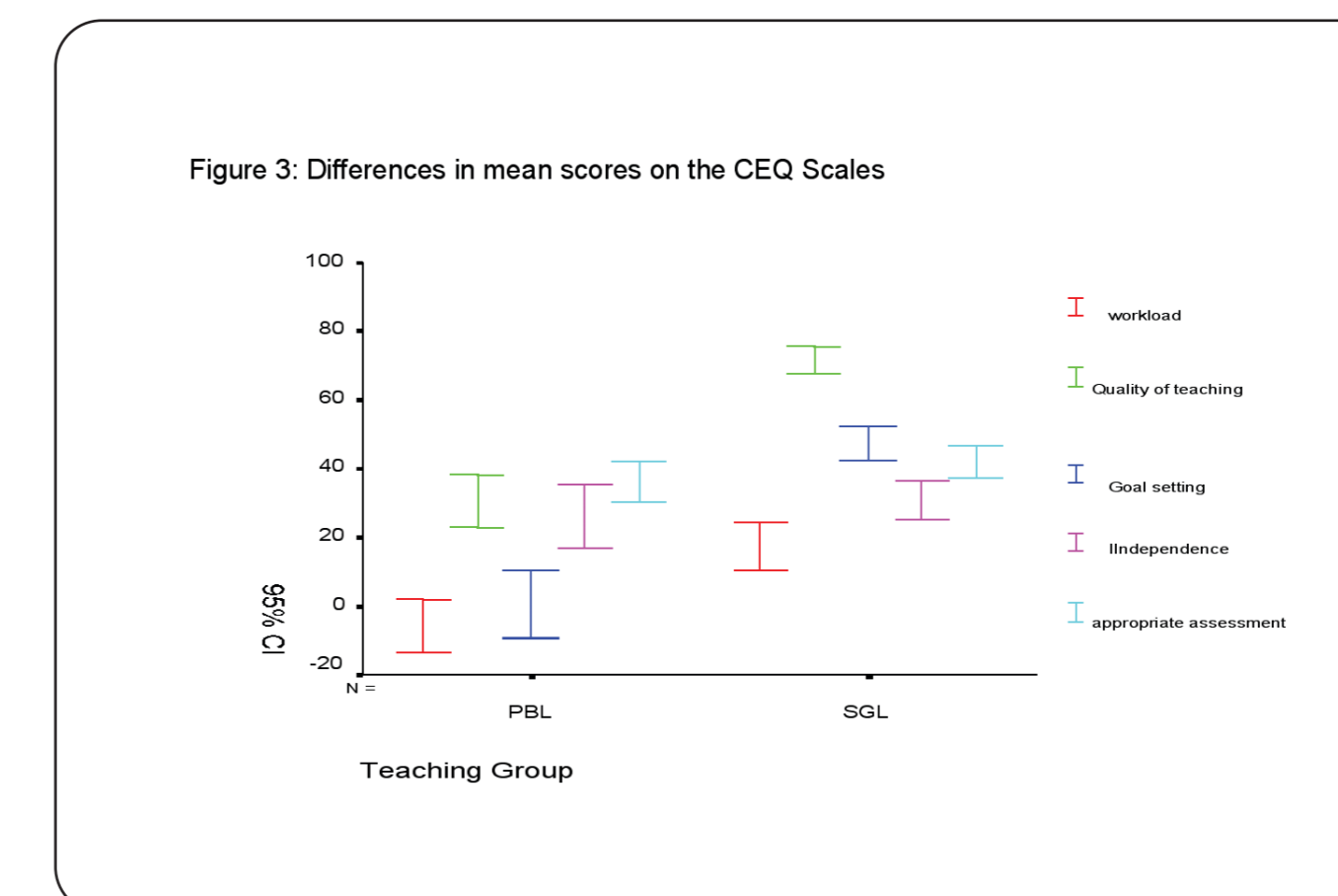
Instructor-centred SGL

- Goals/activities determined by instructor
- Emphasis on content/ knowledge
- Instructor - student interaction
- Instructor corrects, criticises or reject erroneous or irrelevant student contributions
- Much Instructor participation
- Instructor evaluates

Outcomes assessed:

The following have been assessed: attainment, satisfaction, self-directed learning ability and performance in practice.

For example 'student satisfaction' was measured using a basket of indicators, one of which was the Course Evaluation Questionnaire (CEQ). On all of the scales the students in the experimental curriculum rated their experience lower than students in the control curriculum. This pattern was evident in all of the satisfaction indicators used.



Research team:

Primary Study

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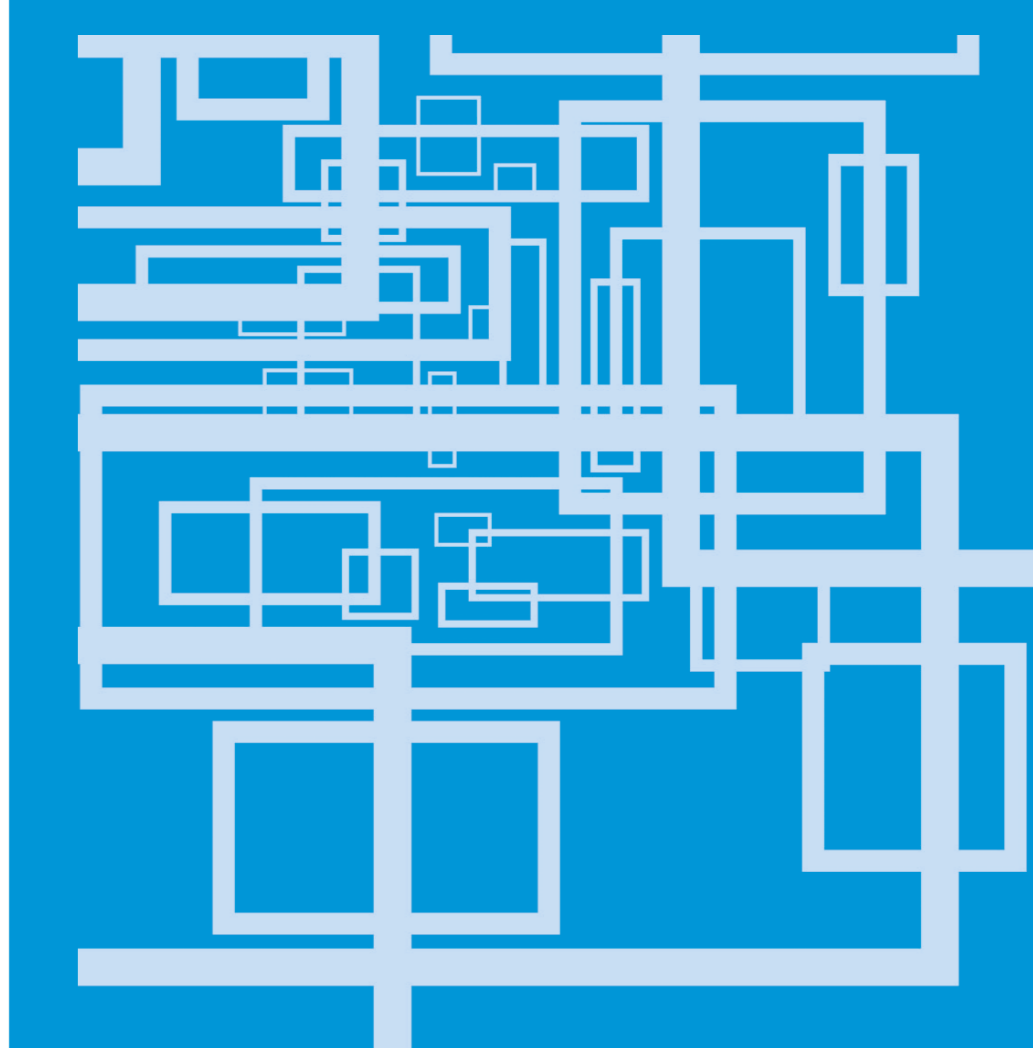
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Project websites:
<http://www.hebes.mdx.ac.uk/teaching/Research/PEPBL/index.htm>
<http://www.mdx.ac.uk/www/rctsh/ebp/main.htm>

Teaching and Learning Research Programme



TLRP involves over 30 research teams with contributions from England, Northern Ireland, Scotland and Wales. Work began in 2000 and will continue to 2008/9.

Learning: TLRP's overarching aim is to improve outcomes for learners of all ages in teaching and learning contexts across the UK.

Outcomes: TLRP studies a broad range of learning outcomes, including the acquisition of skill, understanding, knowledge and qualifications and the development of attitudes, values and identities relevant to a learning society.

Lifecourse: TLRP supports projects and related activities at many ages and stages in education, training and lifelong learning.

Enrichment: TLRP commits to user engagement at all stages of research. It promotes research across disciplines, methodologies and sectors, and supports national and international co-operation.

Expertise: TLRP works to enhance capacity for all forms of research on teaching and learning, and for research-informed policy and practice.

Improvement: TLRP develops the knowledge base on teaching and learning and policy and practice in the UK.

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