19. Reviewing Problem-based Learning (PBL) together: A Case study of a PBL programme in the Faculty of Veterinary Medicine, University College Dublin

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INTRODUCTION

Problem-based Learning (PBL) is a popular approach to learning in disciplines that value the theory to practice connection. Its origins have been in disciplines such as medicine and other health sciences. In UCD, the Faculty of Veterinary Medicine has integrated problem based learning into its curriculum as one of the approaches to learning. It is used alongside other formats such as lectures, practicals and clinical experiences. It therefore uses a hybrid approach to the Problem-based Learning (Armstrong, 1991).

Since the inception of the new curriculum in 2000, the entire Veterinary Medicine curriculum has undergone an extensive review process for accreditation purposes. The Faculty of Veterinary Medicine has evaluated aspects of the PBL programme on an on-going basis using tools such as end of semester questionnaires and the approaches to study questionnaire (ASSIST) (Ryan et al, 2004). This type of quantitative study gives data on the effectiveness of Problem-based Learning. Curriculum co-ordinators/committees, in addition, need to gain more annual, fine-grained qualitative feedback on a programme's continued strengths and weaknesses. Light and Cox (2004) maintain this approach derives from a more qualitative 'anthropological' paradigm. They refer to it as the 'illuminative approach' (Light & Cox, 2004:197).

On the whole, informal and questionnaire-based feedback has indicated that the PBL programme is popular with the majority of students in the Faculty of Veterinary Medicine. Faculty staff teaching the later years of the course report that since the introduction of PBL, the students have developed better communication skills and a greater capacity to discuss, question and deal with clinical case material. It was felt that it was timely to review, with the staff and students simultaneously, the success of the programme with a new approach to capture the feedback.

The purpose of this chapter is therefore two-fold:
1) To describe the process used to gather student and staff feedback using an illuminative approach;
2) To presents some of the findings, from this process, on the PBL experience in the Faculty of Veterinary Medicine

PBL in the Faculty of Veterinary Medicine

Problem-based Learning was introduced to the Faculty of Veterinary Medicine in the academic year 1999-2000, as a pilot course organised by visiting Fulbright Scholar Dr. Phil Bushby of Mississippi State University. With the adoption of a new curriculum in the following year, PBL was established as an independent course within the Veterinary Medicine program structure. The course is run over the first two years of the five-year Veterinary curriculum. Before the start of the first case in the first year, the students are given an introductory talk to outline the

purpose of PBL: what is expected from the students and what to expect from the facilitators. Three cases are presented in each year, and each case is matched to topics being covered in concurrent courses. Each case is carried out in 3-4 sessions over a two-week period. For each case, the class of approximately 90 students is randomly divided into ten groups. Each group is assigned a staff facilitator, and at each session of the case one student of the group volunteers to act as the "scribe" (the person who will write up the lists created by the students) and one student from the group acts as the case reader.

The case is presented using 'progressive disclosure'. Each case comprises a series of one-page documents, following a narrative, normally based on a clinical scenario. The storyline is typically delivered from a second-person perspective, so that the students identify personally with the clinician. The group has to evaluate each document before receiving the next. The documents are assessed under four headings: facts, ideas, learning issues and plans (Barrows, 1989). The facts are that those facts, e.g. clinical history, specific clinical examination findings, laboratory findings etc., are particularly relevant to the case. The list of ideas generated by the students, reflect what the group members think is happening with the patient's problem(s). The learning issues should be a list of what needs to be known in order to completely understand and deal with the patient's problem(s). The plans are those actions that must be taken by the clinician, such as diagnostic/therapeutic steps, in order to progress towards completion of the case. Throughout the case, the facilitator has access to a guidebook summarising the case, listing the anticipated learning objectives, and providing an explanation of the issues as they arise in the case, allowing the facilitator to direct their questioning to encourage the students to engage in particular lines of discussion.

SOME ISSUES AND METHODS SURROUNDING GATHERING STUDENT/STAFF FEEDBACK

Gathering feedback on the success of a programme is usually described by the term 'evaluation' in the literature. This term separates it from the term 'student assessment' which is the term used to describe how students are assessed on their learning, i.e. essays, exams. There is no international agreement on the best process of programme evaluation. However, the use of questionnaires is often the most favoured technique. Standard questionnaires such as the 'course experience questionnaire' are popular internationally (Ramsden, 1992; Lucas et al, 1997). However the use of questionnaires has some criticism in the literature for their validity, i.e. the ability of the evaluation to measure what it is meant to measure (Sproule, 2000; Cosser, 1998). Other methods for gathering student feedback are course portfolios (Hutchings, 1998), focus groups (Powell & Single, 1996), nominal group techniques, student panels, on-line questionnaires (Hounsell, Tait & Day, 1997) and structured group feedback meetings (Gibbs, 1988). These methods have also some advantages and disadvantages. Moore and Kuol (2005) outline some of the research for and against the use of student evaluation. A method, of particular interests to the authors which is growing in its popularity, is structured group feedback meetings. Gibbs (1988: 69) described how structured group feedback could give those involved (staff/students) the opportunity to contribute to the feedback equally with a degree of anonymity. It also gives them time to think through their own views before being confronted with other people's. It puts extreme and minority views to the test. It gives the teacher a more neutral role and ensures that the outcome is recorded fully.

The process of gathering feedback in this method is normally carried out in class and in the following three stages:
Stage 1: Working alone, students/staff make individual responses to the question on the course/programme. Table 1 is a sample of one proforma used in the process: however other questions/statements can be used.

Figure 1: Proforma used in the 'structured group feedback meeting'

Thing about the course that I would like to see:		
Continue	**Stop**	**Start**

This approach balances the positive and negative aspects of the course, but also suggests some changes that could be made to the course, i.e. 'start'.

Stage 2: Working in groups about 4-8, students/staff record those comments that receive majority support from the group.

Stage 3: In a plenary session, the majority comments from the groups are recorded and the whole group are invited to discuss and adjust the overall picture (Gibbs, 1988).

The structured group feedback meeting removes extreme views and gives a more consolidated, reflective and action-oriented view.

Whichever methods are used for gathering student feedback, it must be remembered that student feedback as the sole method has some drawbacks. Worthington (2002) noted that variables such as grade, ethnic background, gender and age have an influence on student ratings. Students' beliefs about 'what is good teaching' can also influence their ratings. Van Rossum and Shenk (1984) describe how students can fall into two categories, i.e. those that believe the teacher should select and present the content and those that believe that the learner functions independently with the facilitation of the teacher. These belief systems can influence ratings in evaluations. In addition many evaluations, such as questionnaires, focus on teaching skills and give less emphasis to student learning (Entwistle & Tait, 1990; Saroyan & Amundsen, 2001).

Due to the emphasis on student learning and the non-traditional approach to learning in PBL, a more qualitative approach was used to gather feedback using an 'illuminative process'. In order to counteract some of the arguments around student feedback as the sole method, this approach gathered the feedback from the perspectives of both the staff and students involved in the programme.

THE PROCESS OF GATHERING STUDENT AND STAFF FEEDBACK IN THE FACULTY OF VETERINARY MEDICINE

Having established that obtaining feedback regarding PBL was a priority, the Faculty planned a morning workshop specifically for the purpose of reviewing this programme (See Figure 2). In preparation for this workshop, student representatives from each year of Veterinary Medicine were asked to formally discuss the PBL programme with their class and to bring their findings to the workshop (Table 2). Figure 2 outlines the format of the workshop and how the student feedback was integrated.

Figure 2: The framework used to obtain feedback from staff and students regarding PBL
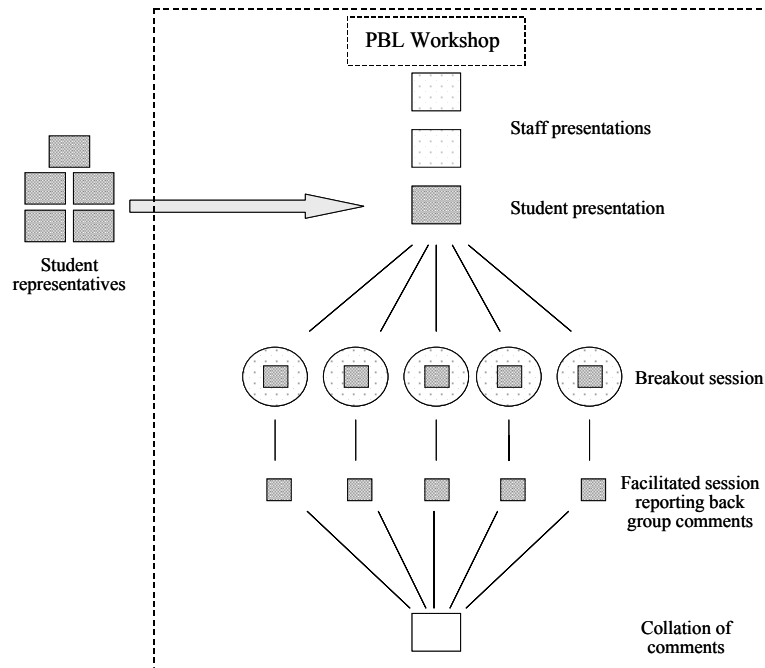
The workshop began with a brief foreword by the meeting Chairman, Dr. Michael Doherty, the Associate Dean for Teaching and Learning in the Faculty. The first presentation was delivered by Dr. Deirdre Campion, who described how PBL has evolved in the Faculty of Veterinary Medicine, and outlined the results of questionnaire-based feedback on two previous occasions. The results from both sets of feedback indicated a high level of student satisfaction with the PBL course.

Ms. Marion Ryan, of the Molecular Biology Facility, Faculty of Veterinary Medicine, UCD then spoke about her longitudinal study of the *'approaches to study'* adopted by the veterinary students. Some of the findings of this study had previously been published (Ryan et al, 2004). Although this study did not focus specifically on PBL, some interesting findings have emerged. Firstly, there was a positive and significant relationship between the rating of PBL as a teaching method and adoption of a deep learning approach by those students, although this relationship is not linear. Secondly, in terms of the skills that PBL attempts to foster, those students who considered themselves as already having the study skills that PBL intends to foster, rate PBL higher than those students who do not consider themselves as having those skills (Figure 3).

Figure 3: Histogram of mean cumulative score for study skills and helpfulness of PBL
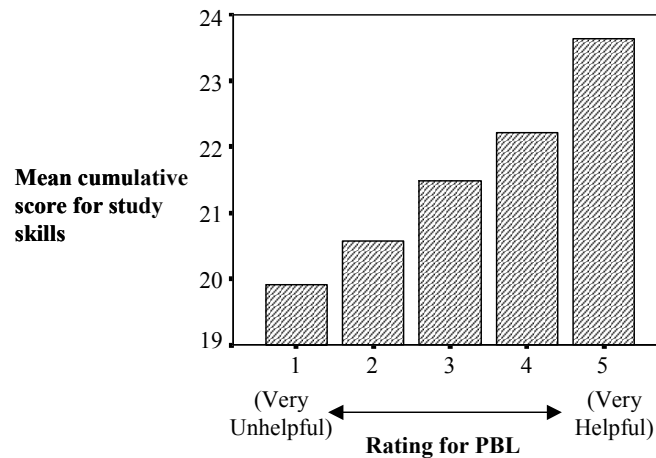
This histogram compares the cumulative score for the student's self-rated study skills to the student's response to the statement: "*how helpful you find PBL in achieving your own personal learning objectives*". The cumulative study skills score is derived from student assessment of their own (1) ability to take notes, (2) ability to use the library, (3) problem solving abilities, (4) ability to contribute to group discussions, (5) ability to work collaboratively in a group, and (6) good reading and writing skills. A high cumulative score indicated that the student strongly rated their abilities in these areas. This histogram does not necessarily imply a causative relationship.

A student representative delivered the third presentation, summarising the results of all the student feedback gathered by the five class representatives. This student-based summary is outlined in Figure 4.

Figure 4: Summary from student discussions prior to workshop

Advantage/Benefits	Disadvantages	Suggestions
Feedback overall has been generally positive	Benefit gained is very dependent on facilitator and degree of input from other group members	Clearly defined learning issues – important to look at bigger picture rather than becoming bogged down with detail – guidance from facilitator needed
Problem based approach is an integral part of Veterinary Medicine and PBL provides an introduction early in the course to clinical cases	Some learning issues very broad and often a lot of irrelevant information researched rather than concentrating on important aspects	Limit information researched e.g. half typed page per person plus 1-2 minute summary at start of session – regurgitation of long texts are of no benefit and are confusing
Excellent exercise in sourcing information and learning to use the library effectively	Learning issues often not shared out equally so some students have a much higher workload than others	Most students preferred experts/vets as facilitators as they are more focused on the clinical aspects of case – recognise not really a viable

		option but increased emphasis on diagnostic approaches, formulating differential diagnoses etc., would be welcomed
Integrates knowledge of phys-bio, anatomy, husbandry etc., into clinical situations	Library space and facilities – 80 students all looking for information on the same case	Summary of case at start and end of each session and more discussion of learning issues cases relevant to material covered in recent lectures and shorter/simpler cases in 1st year
Welcome change from lectures in 1st and 2nd year	Some aspects of cases difficult to understand especially in 1st year	
Enjoy working on real cases – holds interest/focus		
Group work and communication skills		

Following a brief coffee and informal discussion session, a version of Gibbs' structured group feedback stages was employed (Gibbs, 1988). The workshop participants were divided into five groups, with one student representative joining each group. Each group discussed the PBL programme under the headings "Continue, Stop, Start", and the points that were agreed by the group were noted on a flipchart for that group. Following approximately 45 minutes of group-based discussion in a plenary session, Dr. Geraldine O'Neill of the Centre for Teaching and Learning facilitated the submission and discussion of the points raised by the individual groups under the three headings, with the final production of a single document. Although it had not been arranged that this would happen, the student member of each group carried out the reporting for each of the groups. A summary of the points generated in the plenary session is given in Figure 5.

Figure 5: Summary of plenary session with staff and students

Continue	Stop	Start
Continue current presentation of course	Stop timetabling on Friday afternoons (students travelling to country on Fridays)	Timetable other days
Continue explaining the expectations of the students and facilitator to the students	Stop excessive photocopying of text books by students	Improve resources to support the process, i.e. library, video, blackboard materials
Continue the other formats of teaching and their alignment to PBL	Stop anecdotal stories by facilitators	Develop guidelines and further training programmes for facilitators
Continue summary of discussion at the end (1/2 minute)	Stop non-participation by facilitators	Expand the facilitator pool
Continue facilitators from various disciplines		No new material in last session
Continue to change groups		Re-examine the assessment

after a full problem (long case)		strategies
		Have student name badges to facilitate the discussion
		Have clearly developed learning issues

DISCUSSION AND CONCLUSION

The results of both the student feedback and the facilitated structured group feedback indicate a continuing high degree of satisfaction with PBL. The comments returned by the two methods may be grouped into three main themes: understanding of the role of facilitator, understanding of the PBL process, and the need for resources for PBL.

Theme 1: Role of facilitator

Comments regarding facilitation and facilitators formed the greatest proportion of the returned comments. The students clearly indicated a preference for clinical "experts", and the diversity of comments from the combined staff-student workshop indicates both a support for this view, but also disagreement with it. The topic of "expert" *vs* "non-expert" facilitators has sparked considerable debate, and disagreements, particularly in medical educational literature in recent years (Maudsley, 1999a; Hay and Katsikitis, 2001; Gilkison, 2003; Gilkison, 2004; Miflin, 2004). Albanese (2004: 920), in his editorial review of this ongoing debate, suggested that:

> perhaps the real issue is not whether tutors should be content experts, but what is the minimum content expertise and group facilitation expertise needed by tutors to be effective.

The challenge for the Faculty of Veterinary Medicine may be to establish exactly what is required of facilitators, and provide regular training and retraining of faculty staff in group facilitation skills.

Theme 2: Understanding of the PBL process

The second theme is intimately related to the first, in that some comments reflected a lack of understanding as to how PBL aims to foster independent learning, particularly with regard to the learning issues. The students would like to have the learning issues clearly laid out for them, and several staff members supported this view, encouraging the concept that there is such a thing as "irrelevant information" or even "unnecessary learning".

The two themes above to some extent pulled against the core principle of Problem-based Learning, i.e. 'giving students their learning objectives', 'facilitator telling anecdotal stories'. Neither of these objectives are in themselves a poor learning experiences but conflict at times with the student-centred principles in PBL (Barrows, 1996). The students' value of the stories from clinical staff should not be lost, but it could be used in a separate forum, i.e. in a short resource/seminar session after PBL to the whole class. It would seem to be inappropriate to lose the students' ownership and control over the learning experience that is key in the PBL process, described by Maudsley as active, iterative and self-directed (1999b:180). In addition, Diana et al (1994) emphasises students developing their own learning objectives. Continued training of facilitators may open the debate on what Murray and Savin-Baden (2000) describe as lecturers' 'pedagogical stance', i.e. the ways in which staff in higher education see themselves as

teachers. Continued provision of guidelines to students regarding the PBL process should also facilitate a greater understanding with staff and students alike.

Theme 3: The need for resources for PBL

The final theme to emerge in this process was regarding resources to support the PBL process. It is well recognised that setting up PBL in any education system requires outlay in terms of staff time, resources and materials (Johnson & Finucane, 2000). For PBL to work, it is essential that the correct facilities are available to the students to allow small-group work. These include appropriate workspaces, as well as whiteboards/flipcharts, computer access, and access to photocopying and library facilities. Staff charged with preparation of the PBL cases and organisation and delivery of the course must be provided a level of administrative support that reflects the workload. The returned comments require some investigation on the part of the Faculty of Veterinary Medicine to assess if sufficient resources are actually in place to support this important programme.

Reviewing PBL together seemed an appropriate feedback method to reflect the collaboration and student-centred approach emphasised in Problem-based Learning. The students took ownership of the feedback process and the framework used to gather feedback proved to be useful and informative. The views of staff and students were simultaneously given airspace, allowing for a refinement in the collated views. The results of feedback will help inform some changes to the PBL programme, to further staff and student education on the process and to develop learning resources.

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