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*Introductory accounting: achieving  
relevance, interest and understanding*

## **A brief introduction to problem-based learning**

What is problem-based learning? The best response to this is to refer you to a website – that set up by Maggi Savin-Baden, of Coventry University.

Follow this link... but please return to this page once you have read Maggi's perspective!

<http://www.heacademy.ac.uk/709.htm>

You will see that Maggi sets out the difference between problem-solving learning – which I think adequately describes much of what goes on in the teaching of introductory accounting.... and problem-based learning (PBL) which is a rather more challenging approach to learning.

You can follow the links in Maggi's website to explore PBL further. But can PBL be applicable on an introductory course, where students appear to be less motivated and where you have large student groups? Yes! You might wish to use PBL for a limited amount of time on the course, just one or two weeks, in an adapted form. It will enliven the course and allow students to follow their own noses instead of yours!

Graham Clayton of Plymouth University kindly ran a PBL workshop for the introductory accounting network in May 2003. In the paper included below, he sets out the background to PBL and illustrates how it might be used in practice.

**Problem Based Learning:  
A Would-be Practitioner's Guide**

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**University of Plymouth Business School  
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*"Tell me and I shall forget.  
Show me and I may remember.  
Involve me and I shall understand."*

*Chinese proverb*

### Summary

The aim of this article is to introduce the uninitiated to Problem Based Learning (PBL). PBL is well-supported by learning theory and we shall discuss the relationship between learning theories and PBL. In terms of schools of learning PBL resides within the humanist tradition.

The key tenet of PBL is the belief that students learn better when they are activated and motivated. Learning is facilitated if students are able to use prior knowledge when getting to grips with a problem or problem statement.

The heart of the article is a verbatim walk through a typical PBL class. Our objective here is to give the reader some insight into what happens when students learn via PBL.

To conclude the article some student evaluation of the PBL approach is included and it is clear that the feedback is, in general, positive.

### **1. An introduction**

The roots of PBL are in the United States of the 1950's. Far-sighted teachers responded to the disenchantment that existed, in both the tutor and the tutee, with respect to the then conventional educational delivery systems.

These roots are embedded in fertile soil. Section 2 establishes that PBL is well supported by accepted learning theory. Furthermore it is evident that PBL resides within a distinctly humanistic setting.

In section 3, the heart of the article, we take the reader on a verbatim walk through a typical PBL session. Here, a second year group of accounting degree students grapple with an auditing problem.

Section 4 presents some student evaluation of their experience of participating in an auditing course delivered via PBL.

Section 5 offers some concluding thoughts on the role of the module leader in the PBL learning environment. Clearly the roles of the tutees and of the tutor are radically different from those performed in a more conventional lecture-based delivery setting. Importantly students are, on the basis of the evidence in Section 4, seen to be very supportive of this PBL initiative.

## 2. Learning models & learning theory

As professionals working in education we continually reflect on a number of fundamental questions. Chief amongst these are the following:

- How does learning take place?
- What is it that we would wish our students to learn?
- How can we create an environment in which students become more efficient and more effective learners?

Learning models provide us with some guidance as to how learning takes place. Griffey and Kelleher (1995) provide a historical overview of approaches to the genesis of learning. We do not, even cannot, know how learning actually takes place. Competing learning theories exist but there is no one universally accepted learning paradigm.

Four schools of learning theory are identified by Griffey and Kelleher (1995). These four are the cognitive school, the behavioural school, the social responsibility school and the humanist school.

The cognitive approach requires that instruction takes place. The empty vessel is filled by the teacher. Instruction is necessary and builds understanding using the building bricks called facts. The behavioural approach focuses on rewards and punishments. Education is thus concerned with behaviour modification, The clay is moulded by the potter. The dog is trained by the trainer. Here the teacher orchestrates the process of learning. The social responsibility approach portrays the teacher as the role model and learning requires that the student becomes more like the teacher. So the teacher attempts to replicate himself/herself. The humane school recognises the implicit worth of the student and the teacher turns facilitator. There is thus a greater emphasis on the student being at the core of the learning activity. Problem Based Learning (PBL) resides within this humanist tradition.

So, PBL developed in the 1950's in medical education and other health-related disciplines which had a professional orientation. Today, as well as in the United States, the PBL approach is also used widely in Australia and mainland-Europe.

PBL-based approaches were implemented because of a dissatisfaction with an over-reliance on factual content and memorisation. Courses were becoming more and more discipline-based and, as such, lacked integration between individual sub-disciplines. In the medical context the trainee doctors knew more about the 26 bones in each foot without being able to diagnose the medical problem. Some felt that medical courses were in danger of producing 'idiots savant' with medical qualifications. Students were being packed with data but not with information or understanding.

Barrows and Tamblyn (1980) noted that although some students had a thorough grasp of medical facts they were unable to apply these to a patient's particular problems. Students who had passed through "excellent, detailed" courses were unable to use what knowledge they had. Once students had graduated they would be required to update their knowledge but students were generally ill-prepared for such activity.

PBL gained acceptance as disillusion with mass lectures rose. The lecture may often merely attempt to shovel facts into the passive receptor. Such a mode of delivery tends to leave students unable to make use of the knowledge gained in this way.

Empirical research from the teaching of physics and economics has found evidence of students' inability to use scientific knowledge in the solving of problems. Indeed, it has been found in traditional systems of learning that students tend to fall back on naive knowledge in the analysis of these problems. Economics students fail to think *qua* economist and revert to non-economic forms of analysis.

PBL, it is argued, can overcome this via the activation and elaboration of the students' Prior Knowledge (PK). Proponents of the value of PK argue that it focuses the learning effort and facilitates the learning of new concepts. Note that it is the knowledge which the student brings with him/her that is used to engender learning. The student is not an empty vessel according to practitioners of PBL. Learning proceeds in a LEGO-like fashion as new knowledge attaches itself to old knowledge. In this way knowledge can expand and complex structures can be created.

PBL begins with a problem not with knowledge. Knowledge is gained by way of the solution to the problem. Analysis of problems is used as the primary instrument for the acquisition and application of knowledge. Consequently, independent lifelong learning skills are acquired by students as the PBL system places activity and responsibility directly on to them. This makes PBL student-centred and self-directed. Small group activity is the main instructional activity. Other activities take place- skills workshops and lectures for example, but these activities buttress the small group activity.

Theoretical support for PBL is legion. Using an information processing perspective Schmidt (1983) argues that because current learning is related to past learning PK should be activated. We understand the present by plugging into the past. PBL activates PK and fosters learning. The PK which people have, regarding a subject, is the most important determinant of the nature and amount of new information which can be processed.

The availability of relevant PK is a necessary, yet not sufficient, condition for understanding and remembering new information. PK also needs to be activated by cues in the context of which the information is being stored. Knowledge is structured and the way in which it is structured in the memory makes it more or less accessible for use. Storing information into the memory and retrieving it can be greatly improved when, during learning, elaboration on the material takes place. The ability to activate knowledge in the long-term memory and to make it available for use depends on contextual cues. To be motivated to learn prolongs the amount of study time and hence improves achievement.

Schmidt (1993) argues that PBL has the following influences on student learning:

- Activation of PK- the initial analysis of a problem stimulates the retrieval of PK
- Elaboration of PK via small-group discussion
- Restructuring of knowledge to fit the problem under discussion- the construction of a semantic network.
- Learning in context- the problem serves as a scaffold for storing cues which may support retrieval of relevant knowledge when needed for similar problems
- Epistemic curiosity can be expected to emerge- the problems are considered in open discussion by the students and are relevant to them

Adherents of 'discovery learning' argue for the encouragement of active participation in the learning process and the organisation of the learning situation around problems. Thus the transfer of learning takes place when the learning situation is close to the application situation. PBL is real life oriented and knowledge is better assimilated when elaboration in the form of discussion, reflection and questioning takes place. Therefore, the elaboration of knowledge is a key characteristic of PBL

PBL is consistent with the recommendations arising from contextual learning theory (CLT). There are three elements to CLT. The problem statement provides the context. This context primes the student to receive other new material, in the information stage, which is obtained in the self-study period in the 'study landscape'. Finally the new information is set up against and related to the prior existing knowledge in the reporting stage.

### 3. Problem Based Learning in Practice

#### A typical PBL session

*Note:* This is the second meeting (of nine) of an Auditing module in our BA in Accounting and Finance degree programme. The first meeting would have been an introduction to the subject via a Problem Statement.

There are twelve students in the group plus the Module Leader (lecturer). All thirteen sit at desks arranged in a vaguely circular format. Some furniture inevitably gets moved around. The student group agrees which of them will be the Chair for the session and another student will be chosen to act as the Minutes Secretary. The Module Leader gives Problem Statement 2 to the Chair who distributes it to the rest of the group. The Problem Statement reads as follows:

**ACC 204- Auditing- 1994/5**

**Problem Statement 2- Independence**

“What is the difference between an auditor and an airport luggage trolley ?” asks Sir David Tweedie, Chairman of the Accounting Standards Board, the body which decides how financial information is presented in the UK. “The trolley has a mind of its own.”

*Extract from an article in the Financial Times, 7th July 1994*

The students consider the Problem Statement. Silence ensues. However, there may be a few laughs as the Statement has a witty element to it. Successful problem statements should attract the students i.e. should be one/all of the following - topical, real-life, interesting, relevant to the students' experience, amusing. A dry, irrelevant statement is less likely to produce a stimulating session.

The Chair's role today is to steer the group through the first five stages of PBL's '7-Jump Step'.

The Minutes Secretary will compose a written record of the proceedings. Students are encouraged to make use of the white board and/or overhead projector to help them elucidate any arguments or explanations being put forward. As this is 'active learning' the more student involvement and interest that exists the better.

**Step 1:** The Chair asks if there are any words and/or concepts in the statement that are not understood by the Group.

If this is the case then the group will endeavour to clarify the matter. As this is a fairly short Statement and the language used is straightforward then it is unlikely that there will be queries at this stage. If there were and the group couldn't explain the word/term then the Module Leader, who is acting as an observer/facilitator, might advise. An alternative course of action would be for the group to bring a dictionary to each session which could be consulted.

**Step 2:** The Chair will then ask the Group what they think needs to be explained in the Statement. In other words, what is the Statement about?

At this stage the students will know little of the subject and their existing knowledge is being sought.

Points raised by the students might include :

- "It's about independence." (A fairly obvious suggestion bearing in mind the title of the Statement. It is vital, however, that the students feel at ease when contributing to the session. Simple and/or naive suggestions are encouraged. Embarrassment will, naturally, lead to inhibition. If students are active then they will learn more effectively). However, the "independence" of whom ?
- "The independence of the Accounting Standards Board"
- "The independence of companies"
- "The independence of the auditor"
- "It concerns the auditor's relationship with the Accounting Standards Board"
- "It's about the presentation of financial information by the auditor"
- "It's suggesting that the auditor doesn't have a mind of his/her own"
- "Why not ?"
- "Which auditors are we talking about here? Internal or external ?"
- "Is this about environmental auditing or statutory auditing, or both ?"

Thus a number of suggestions are made and the Chair will need to move the discussion on to Step 3

**Step 3:** Brainstorm session. What do the students know about any of the points raised thus far ?

It is here that a large amount of information will be exchanged and discussed. Hopefully a vigorous discussion will take place. The students will make contributions. For example, bearing in mind what has already been said, the students will, hopefully, move the discussion onto independence and the external auditor.

*Note: If the discussion stalls then it may be necessary for the Module Leader to intervene and advise. However, this is a last resort. It is to the students' advantage if they work through the Statement and its implications unaided. This is not easy for many lecturers who are used to being active whilst the students are passive recipients.*

If the group can agree on the main discussion/learning points of the Statement (i.e. independence and the external auditor) then the following issues might be raised and discussed:

- "Why don't auditors have a mind of their own ?"
- "Who is influencing the auditor's judgement ?"
- "Is it important for the auditor to be independent ?"
- "What will be the effect of an auditor who isn't independent ?"
- "How is independence measured ?"
- "Of whom should the auditor be independent ?"
- "Are there laws governing auditor independence ?"

From these matters raised much will be discussed and, in some cases, agreed upon. However, there will, in all likelihood, be a number of gaps in the students' knowledge. This is dealt with at the next stage.

**Step 4:** An inventory is made of all the issues raised. What is understood and agreed upon? What is still unclear and needs to be explained? The Chair will guide the group through this and agree the list of unclear points.

For the purposes of this article we shall assume that the student group, being new to the subject, did have ideas about the points raised at step 3, but not in sufficient detail to feel confident. Thus all of these points were listed as needing further explanation.

**Step 5:** Now the group agree their Learning Objectives (LO). These will be (bearing in mind Steps 3 and 4):

LO 1 "Why is it important for the auditor to be independent ?"

LO2 "What will be the effect of an auditor who isn't independent ?"

LO3 "Of whom should the auditor be independent ?"

LO 4 "Who is influencing the auditor's judgement ?"

LO 5 "Are there laws governing auditor independence ? If there are, what are they ?"

Students will write these down. It is important that all group members agree the exact wording of the Objectives.

The Chair will now close the meeting. This will have lasted for between 30 to 60 minutes (depending on the time available for this meeting). The group will, normally, reconvene in a week's time (note: if the module is being run as a "short fat module" i.e. in condensed format, as this one was, then meetings will be twice a week).

**Step 6:** The group will now collect information to enable them to address the LO's. This is done individually. References provided with the Problem Statement will be the main source of information.

**Step 7:** The group meet again one week later. The Chair asks the Minutes Secretary to read out the first LO. The group, following their research, will make their contributions. The Chair can deal with this either formally (i.e. by asking each student in turn for his/her views) or informally (asking the group as a whole for any views). We would suggest that when the group are new to PBL and are not, perhaps, working confidently as a team that the formal approach would prove more effective.

If this LO is not, in the Module Leader's view, answered in sufficient depth then it will be carried forward and the students will need to conduct further research into it.

All the LO's will be dealt with in this way and the Problem Statement is, normally, concluded at this stage.

For the remainder of this session the group will consider the next Statement.

The group will thus agree which of them will be the Chair for the next Statement. Another Minutes Secretary is also chosen.

The Module Leader gives the next Problem Statement (number 3) to the new Chair who distributes it to the rest of the group and guides them through the first five steps of the Seven Jump Step.

*Normally, therefore, each group meeting will consist of a debrief (Step 7) of one Statement and an introduction (Steps 1 to 5) of the next Statement. In a one hour session, the group would typically spend 25 minutes on the former and 35 minutes on the latter. Time is thus of the essence. If the timetable is fairer (unlikely in these days of burgeoning student numbers) and more than an hour is available, then both parts of the session can be expanded, to the students' advantage.*

The Minutes Secretary will produce a set of minutes (maximum length 2,000 words) within a fortnight of the conclusion of the Statement. These minutes might form, for that student, part of the coursework assessment for the Auditing module. Each student will be Secretary once and ideally a Chair once in the module.

The minutes will provide an effective record of the group's discussions and conclusions. The student's performance as the Chair is not, at present, assessed formally. However, acting as Chair is (and the students are reminded of this constantly) an important element of developing their personal skills.

Informal research has led us to the conclusion that too many students think that an ability with numbers is the key to a successful career in accountancy. The emergence of the computer has meant that the days of the "bean counter" are over. Students' competence in other areas (problem solving, research skills, negotiation, communication, working in teams) is thus of prime importance and PBL is, we feel, an effective and enjoyable means of developing these academic and inter-personal skills.

#### 4. Student evaluation

The students who participated in this module were provided with the opportunity to evaluate the PBL-delivered course. Below the results of the evaluation exercise of April, 1995. The results are typical of other evaluations. The lecturer's responses are given in the third column.

What did you particularly like about the course ?	How would you improve it ?	Lecturer response to suggested improvements
"Group interaction- exchange of knowledge."	"More lecturer intervention needed."	Not the idea of PBL. Induction issue. Only one student made this comment.
"Intense acquisition of knowledge."	"Give individuals specific Learning Objectives rather than all students do all of them."	No- again this is not the idea of PBL. All students must cover all of the ground or else there will be gaps in their knowledge. Only one student made this comment.
"Intensity meant one had to keep up. Increase in group spirit."	"Some group members didn't do anything."	PBL is student centred. It is up to the student to contribute. If they don't then they won't achieve as much. Induction issue. Also, consider marking each student's contribution at Step 7.
"Theory to scenario links useful."	"Mature students dominated the session - too much argument by them."	PBL <i>will</i> lead to argument in class hopefully. Induction issue.
"Learnt by mistakes and so remembered."	"More structure needed at the end of Step 5."	OK- point to consider for next year
"Social approach beneficial."	"More guidance on preparation of the minutes."	OK- point to consider for next year



"Second sessions were good for developing understanding."	"Lectures as well please."	OK - point to consider for next year. One or two lectures? PBL to be one part of a portfolio of learning styles ?
"Instant feedback."	"Textbook could be better."	OK- point to consider for next year. Only two students made this comment.
"Intensity meant that the whole module was fresh."	"More references needed within the PS's."	OK- point to consider for next year
"Group skills improved."	"Exam should be more immediate - revision is more difficult. Could it be done at the end of the module ?	Caused by a need to deliver this particular module in half a semester. Not normally a problem.
"Best method of teaching I have ever come across. It's what university teaching should be like."	"Module was compressed - other modules suffered."	Caused by a need to deliver this particular module in half a semester. Not normally a problem.
"Enjoyable way of learning- not too serious."	"How about coffee and biscuits at each meeting ?"	Who's paying ?
"Dynamic, relevant, interesting, motivational, group/student oriented."		

## 5. In conclusion

The module leader's key roles in PBL are (i) to ensure that students are introduced effectively to this style of learning, (ii) to design the particular module in such a way that the benefits of PBL are not wasted (iii) to draft Problem Statements that are relevant and interesting to the students and (iv) to ensure that gaps in the students' knowledge following their diet of PBL meetings are filled

Once these issues have been addressed then the leader's role is that of a guide or facilitator

An increasing number of our colleagues in the Business School recognise how the PBL approach can enhance the effectiveness and enjoyment of their modules. It is difficult for staff to 'convert' to PBL for, as we mentioned earlier, many of them are used to being more active (as in the traditional lecture) and controlling matters whilst their students are relatively passive recipients.

The evaluation in section 4 demonstrates that the students are clearly supportive and their comments are, we feel, a reasonable reflection of the views held by those students learning through PBL in this faculty. Where we *have* received negative comments from the students we have striven, where we deem the comment to be relevant to our objectives, to make the necessary improvements.

This generally positive student feedback supplements a substantial justification for PBL with respect to current learning theory. Students develop higher level cognitive skills - skills of analysis, synthesis and critical evaluation - as well as inter-personal skills. Even if one does not fully espouse PBL one can still adopt or adapt aspects of PBL. As is the case with any teaching/learning innovation, one is caused to think seriously about what it is one is attempting to do/achieve. This, in itself, may no bad thing.

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