Problem-based learning (PBL): Does accounting education need it?

ABSTRACT

Problem-based learning (PBL) has been used successfully in disciplines such as medicine, nursing, law and engineering. However a review of the literature shows that there has been little use of this approach to learning in accounting. This paper extends the research in accounting education by reporting the findings of a case study of the development and implementation of PBL at the Queensland University of Technology (QUT) in a new Accountancy Capstone unit that began in 2006. The fundamentals of the PBL approach were adhered to. However, one of the essential elements of the approach adopted was to highlight the importance of questioning as a means of gathering the necessary information upon which decisions are made. This approach can be contrasted with the typical 'give all the facts' case studies that are commonly used. Another feature was that students worked together in the same group for an entire semester (similar to how teams in the workplace operate) so there was an intended focus on teamwork in solving unstructured, real-world accounting problems presented to students.

Based on quantitative and qualitative data collected from student questionnaires over seven semesters, it was found that students perceived PBL to be effective, especially in terms of developing the skills of questioning, teamwork, and problem solving. The effectiveness of questioning is very important as this is a skill that is rarely the focus of development in accounting education. The successful implementation of PBL in accounting through 'learning by doing' could be the catalyst for change to bring about better learning outcomes for accounting graduates.

Keywords:
Problem-based learning
PBL
Accounting education
Professional skills
Questioning
Teamwork
Problem solving

1. Introduction

In recent years, a number of authorities have called for the development of a broader range of required skills in accounting graduates. For example, the International Federation of Accountants (IFAC) released as one of its eight International Education Standards (IES) a standard called *IES3 Professional Skills and General Education* (IAESB, 2009). This standard emphasizes the development of Professional Skills, which include not only intellectual, technical and functional skills but also personal skills, interpersonal and communication skills, and organizational and business management skills. Similar skills were emphasized by the American Institute of Certified Public Accountants (AICPA) in its *Core Competency Framework* (AICPA, 2010a; AICPA, 2010b); and the Institute of Chartered Accountants in Australia and CPA Australia in their document *Professional Accreditation Guidelines for Higher Education* (ICAA & CPA Australia, 2009) used to accredit Australian accounting programs. The Australian Learning and Teaching Council also released a paper entitled *Accounting for the Future: More Than Numbers* (Hancock et al., 2009), which investigated the changing skill set for professional accounting graduates and strategies to embed those skills into professional accounting programs. Finally, the Australian Business Deans Council released details of an investigation of existing resources, strengths, gaps and challenges to be addressed for sustainability in teaching and learning in Australian university business school/faculties. A major project that was recommended was building and assessing the development of generic skills across the business curriculum (Freeman et al., 2008).

The above views were echoed ten years earlier by Albrecht and Sack (2000) in their monograph entitled *Accounting Education: Charting the Course Through a Perilous Future*. They stated that "Following the advice of the Accounting Education Change Commission (AECC), it is time that we, in accounting education, move away from our reliance on lecture and move toward teaching approaches that convey critical KSAs (Knowledge, Skills and

Abilities)" (Albrecht & Sack, 2000, 64). Albrecht and Sack also cited many skills to concentrate on, including cases that deal with uncertainty and analytical skills, group work to teach leadership and working together, and for students to do research on the Web and use the wide variety of data services available.

The AECC referred to by Albrecht and Sack (2000) was created in 1990 with the specific goal to generate action – the implementation of needed improvements in the education of accountants, not only in the United States where the commission was established, but throughout the world (Sundem & Williams, 1992). The AECC's Position Statement Number One (AECC, 1990) on the objectives of education for accountants stated that students should be active participants in the learning process; learning by doing should be emphasized; working in groups should be encouraged; students should have the ability to locate, obtain and organize information, and develop the ability to identify and solve unstructured problems in unfamiliar settings; and to exercise judgement based on comprehension of an unfocused set of facts.

The abovementioned references all call for accounting educators to diversify their content-based, knowledge-focused approach and to start emphasizing process and skills. One possible response to this call could be the development of problem-based learning (PBL). Indeed, Milne and McConnell (2001) placed on notice the need for PBL to be incorporated into accounting education. Johnstone and Biggs (1998, 424) held similar views stating that "While implementation will be complex and will differ from one institution to another, the medical literature provides an important resource for understanding some of the issues involved with implementing PBL in accounting curricula. As with any major curricular change, the implementation of PBL will entail a great deal of effort, time, and creativity."

The rise of PBL is generally attributed to medical education in Canada and US in the 1950s and 1960s[1] (Barrows, 1996; Boud & Feletti, 1991; Gijselaers, 1995; Savin-Baden, 2000; Spaulding, 1969). As well as medicine, PBL has been successfully adopted in a variety of disciplines including nursing, engineering, social work, law, management, science, business and economics (Boud & Feletti, 1991; Daly & Gijbels, 2009; Duch, Groh & Allen, 2001; Gijselaers et al., 1995; Heagy & Lehmann, 2005). This is mainly due to the perceived benefits that the PBL approach brings to learning. Compared to conventional teaching methods, Barrows (1996) found that medical students had better clinical problem-solving skills and were stimulated and motivated using the PBL method. In analyzing the use of PBL principally in medicine but also in economics and computer science, Strobel and Van Barneveld (2009) found that PBL was beneficial in terms of long-term retention of knowledge, skills development in terms of clinical performance, and satisfaction of both students and teachers. Similarly, Hmelo-Silver (2004) outlined the goals of PBL as helping students develop flexible knowledge, effective problem-solving skills, self-directed learning skills, effective collaboration skills, and intrinsic motivation.

However, in reviewing the accounting education literature, there has been scant use of PBL and this educational gap provides the motivation for this paper. The aim is to extend the research on PBL in accounting by providing a case study detailing how PBL was implemented in a final-year Accountancy Capstone unit at the Queensland University of Technology (QUT) in Australia. An essential element of our approach was the importance of questioning as a method of gathering the required information to solve accounting-related problems. In typical educational cases in accounting, all information is given and students

[1] Interestingly, a form of problem-based learning contextualised to business occurred around the time Luca Pacioli (1494) wrote *Summa de Arithmetica, Geometria, Proportioni et Proportionalita* (Sangster, Stoner & McCarthy, 2007, 449). All the subjects in the *Summa* were taught in *abbaco schools*, which were established through the financial power of merchants for the instruction of their sons and so the curriculum was entirely focused on the needs of future merchants. Even in those times, the solving of problems and being able to acquire the skills to transfer knowledge to merchandising situations was deemed important.

do not have to search for all the facts. This does not occur in accounting professional practice. Questioning is critical in the medical and legal education disciplines but accounting education seems to have overlooked this important skill. Another essential feature was to ensure that students worked in groups and participated responsibly in the learning process. Students worked together in the same group for an entire semester (similar to how teams in the workplace operate), thereby emphasizing the importance of teamwork in solving unstructured accounting problems similar to those likely to be confronted in professional practice. This study reports the nature of the students' experiences and perceived learning outcomes from PBL, especially in relation to the skills of questioning, teamwork and problem solving. The paper will also evaluate how effective the program was and discuss possible implications for further reform of university accounting education.

The rest of the paper proceeds as follows. The next section outlines the nature of PBL and reviews the literature on the use of PBL in accounting. A description of how PBL was implemented at QUT will be discussed in the third section followed by an outline of the evaluation strategy which asks students to rate the perceived effectiveness of their learning. The paper concludes by reporting key findings, implications and limitations of the study, and suggests areas for further research.

2. PBL and its use in accounting education

PBL is a pedagogy that is based on the learning theory of constructivism.[2] Constructivism views the learner as central in the creation of meaning where students construct their own knowledge rather than the knowledge being transmitted by the teacher (Biggs, 1996). As noted by (Biggs, 1996, 348) "… learners arrive at meaning by actively selecting, and cumulatively constructing, their own knowledge, through both individual and social activity." Students bring their existing knowledge, attitudes and interests to the learning

[2] Other constructivist pedagogies include discovery learning and inquiry-based learning.

situation (Howe & Berv, 2000) where "knowledge is *made*, not *acquired*" (Phillips, 2000, 7). According to Tan (2004), PBL uses authentic, unstructured, real-world problems to act as the beginning and anchor point of the learning process and is very much an active-learning and learner-centered approach. "PBL is not just about problem-solving processes; it is a pedagogy based on constructivism in which realistic problems are used in conjunction with the design of a learning environment where inquiry activities, self-directed learning, information mining, dialogue and collaborative problem-solving are incorporated" (Tan, 2004, 123).[3] Tan (2004) argues further that the architecture of PBL is based on a shift in three areas namely (1) content coverage to problem engagement; (2) role of lecturing to role of coaching; and (3) students as passive learners to that of active problem-solvers.

Tan (2003) also argues that the fundamentals of a PBL approach usually include the following characteristics:

- the problem is the starting point of learning;
- the problem is usually real-world, unstructured and is meant to be as authentic as possible;
- the problem calls for multiple perspectives with the use of cross-disciplinary knowledge being a key feature of PBL;
- the problem challenges students' current knowledge, attitudes and competencies, thus calling for new areas of learning;
- self-directed learning is the primary focus resulting in students assuming major responsibility for the acquisition of information and knowledge;
- harnessing of a variety of knowledge sources and the use and evaluation of information resources are essential PBL processes;
- learning is collaborative, communicative and cooperative with students working in small groups with a high level of interaction for peer learning, peer teaching and group presentations;
- development of inquiry and problem-solving skills is as important as content knowledge for the solution of a problem;

[3] For a discussion of the higher-level thinking processes offered by PBL, see Tan (2007).

- closure in the PBL process includes synthesis and integration of learning; and
- PBL concludes with an evaluation and review of the learner's experience and the learning processes.

Another critical issue in PBL is crafting the problem. Hicks (1991) states that there are four things implicit in a problem: (1) we recognize that there is a problem, (2) we do not know how to resolve the problem, (3) we want to resolve it, and (4) we perceive that we are able to solve it. According to Tan (2003), a good problem is one that is real-life, namely relevant and authentic; generates multiple options; encourages creative and independent thinking; requires new core knowledge; integrates several topics; has realistic deliverables and outcomes; engages students and engenders curiosity (i.e. has a "hook"); and is outcomes-based.

In PBL, the problems presented are more realistic because they are unstructured, or using Stepien and Gallagher's (1993) term, "ill-structured." As in real life, the information search is motivated by the problem. In fact, the definition of the problem may change as additional information is acquired. During the process, students must make many decisions, notably on the relevance and reliability of the information acquired from various sources to solve the problem. As in the real world, students will never know if the proposed solution was really the best possible one. They will have had the experience of having to make the best possible decision based on the information at hand (Stepien & Gallagher, 1993).

The characteristics outlined in the above review provide the building blocks for the successful implementation of PBL in accounting education. Given the objectives set out by the AECC, the views of Albrecht and Sack (2000), and the recent authoritative calls for accounting graduates to possess greater skills, PBL would appear to be a suitable model to achieve these objectives. However, as indicated by the following discussion, little attention to date has been given to PBL in the accounting literature.

There have been two theoretical papers published which address the use of PBL in the context of accounting education. The first was by Johnstone and Biggs (1998) who outlined four strategies for accounting educators considering implementing PBL. They recommend that PBL be implemented only after basic technical accounting knowledge has been acquired; that appropriate problem-solving strategies should be explicitly taught; that innovative approaches for teaching problem-solving skills should be encouraged (small group and student-centered learning emphasized); and faculty members teaching in PBL classes should possess expert technical knowledge of the subject area.

The second major theoretical work was developed by Milne and McConnell (2001). Their paper provides an extensive review of the development of PBL, particularly looking at the empirical evidence from the medical literature where PBL has undergone its greatest application. The purpose of Milne and McConnell's (2001) paper was to offer accounting educators a mechanism, namely PBL, by which case-study material can be purposely used to motivate the acquisition of new knowledge, to give students the freedom to develop their own learning, and to deliberately promote the development of self-directed learning skills. Milne and McConnell (2001) conclude that accounting educators will face challenges in making PBL work, not least in terms of facilitating and supporting the learning process, and reorienting the students to take responsibility for their own learning. "However the potential of the approach to provide students with experiences that bridge the gap between tertiary education and life as a professional seems too great an opportunity not to experiment with it" (Milne & McConnell, 2001, 78).

There were also two empirical papers published on PBL in the context of accounting education, namely Breton (1999) and Heagy and Lehmann (2005). Breton (1999) compared the effects of two different teaching methods used concurrently on two comparable classes of accounting theory. The first class used the traditional lecture with assignments and

examinations; and the second class applied the PBL approach. Breton (1999) offered some support for the hypothesis that, in an accounting education context, PBL methods produce better academic results than traditional lectures. This study also presented evidence suggesting that PBL students were conscious of having acquired some knowledge and ability which they expect to be more useful in the long-term.

Heagy and Lehmann (2005) investigated the use of PBL in a graduate and undergraduate Accounting Information Systems (AIS) course. However, this approach was at the elementary level of the PBL taxonomy (see Barrows, 1986[4]) as it was case-based. It attempted to validate the learning value of PBL in an AIS course to determine whether it was an improved delivery method over the traditional lecture format with in-class activities by comparing the performance of students on basic knowledge questions in a class with PBL to those students in a class without PBL. Similar to studies in the medical field, Heagy and Lehmann (2005) found that academic performance on basic knowledge exams did not differ significantly between the students subject to PBL and the traditional curriculum. In addition, PBL did not negatively affect the acquisition of basic knowledge but it could lead to greater student satisfaction.

In summary, the literature has espoused the successful use of PBL in several disciplines. It is an approach that might potentially meet the call for accounting education to be more about learning to locate, obtain and organize information; the ability to identify and solve unstructured problems in unfamiliar settings; and to exercise judgement based on comprehension of an unfocused set of facts. While PBL offers the possibility of meeting these objectives, it is apparent from the literature that accounting educators to date have failed

[4] Barrows (1986) outlines a taxonomy of PBL that could be used in medicine. The six variations ranked in order of effectiveness from lowest to highest are lecture-based cases, case-based lectures, case method, modified case-based, problem-based, and closed-loop problem-based. Only the last two of these variations could be characterised as problem-based learning. For further discussion of this taxonomy, see Milne and McConnell (2001, 67) and Johnstone and Biggs (1998, 409).

to take up the challenge and implement it. Our aim is to outline how PBL was implemented in accounting, particularly in relation to how the relevant materials were developed with an emphasis on questioning, teamwork, and the use of the PBL methodology (termed FIRDE) adopted.

3. The implementation of accountancy PBL at QUT

The authors are both academic staff at QUT in Brisbane, Australia. We were asked to develop an Accountancy Capstone[5] unit and so our initial role was as educational program developers. We wanted to develop a unit that offered our students relevant, authentic, work-related experiences within a classroom setting. Having gone through the various approval university processes from accountancy staff, School Advisory Committee, and School and Faculty teaching and learning committees, our roles changed to actually teaching the newly-developed third-year unit AYB339 Accountancy Capstone and conducting research on the unit's implementation. The unit ran for the first time in semester two, 2006. In the first three semesters, it was offered as an elective unit and was seen as a pilot before becoming compulsory for all accountancy major students in semester one, 2008. It was decided to implement PBL in the final year of the degree programme so that students would have at least two years of accounting content knowledge. This was consistent with the views of Johnstone and Biggs (1998) that PBL is more effective and should be implemented only after basic technical accounting knowledge has been acquired by students.

The unit was aimed at undergraduate accountancy students majoring in Professional Accountancy in the final year of their degree. The undergraduate accountancy degree is a three-year degree comprising 24 units. Included in the degree are units relating to financial, company and management accounting; business law and ethics; company and taxation law; computerized accounting; and auditing. It also includes a range of other disciplinary units

[5] In general, the three purposes of a capstone unit are to integrate the curriculum, to provide students with an opportunity to reflect on the course as a whole, and to prepare students for the professional workplace (see Burns, 2006; Cuseo, 1998; Gardner & Van der Veer, 1998; Jervis & Hartley, 2005).

such as economics, business organisation and management, government, marketing, international business, and business statistics. Essentially, each of the units in the degree uses traditional teaching methods comprising lectures, tutorials, assignments and exams. As well, the content of each unit generally does not overlap with the content of other units and in this respect, each unit is taught independently and in isolation.

The new accountancy capstone unit was designed to bring together parts of the accountancy degree already studied. At the same time, some new concepts were introduced throughout the unit. The unit also recognized that the client issues/problems often span across many aspects of accountancy. As such, the professional advisor/consultant must be able to provide advice across a number of disciplines. The emphasis of the unit was therefore on active problem-solving rather than technical content. We adopted a "less teaching, more learning" philosophy as outlined by Chalmers and Fuller (1996). The total number of students enrolled in the unit each semester was broken into individual classes consisting of a maximum of 20 students. These 20 students were then asked to form smaller groups of four or five, which resulted in no more than four groups per class. Unlike many of the other units in the degree that required students to work in groups on specific assessment items that lasted approximately three to four weeks, in this unit students worked together in their group for the entire semester. This was designed to give students a new experience in group work. Students therefore knew from the beginning that they had to work together constructively for 13 weeks, building rapport, addressing and solving potential conflicts that may arise, determining strengths and weaknesses of each group member, and working together to discuss and solve unstructured accounting-related problems typically encountered in the profession. In the first week each group was asked to create a firm name and design a letterhead both of which were to be used to identify that group in all of their communications

during the unit. This gave each group a business identity and helped create the real-world context in which the students worked.

Each group was required to solve multi-disciplined accounting problems spanning a range of accounting disciplines (such as financial accounting, taxation, business law, management accounting, computerized accounting systems and auditing). The nature of each problem required students to research the various issues, discuss their ideas with group members in class, and present and justify their answers. The six topics covered in the unit, each spanning two weeks, were: business planning and structuring; operations/transactions; employment issues; taxation; reporting (internal and external); and audit and ethics. For each of these six topics, two PBL scenarios[6] were crafted for students to discuss in a two-hour discussion forum each week for two weeks. In recognition of the fact that this was the first time that the students were exposed to the PBL approach, the first topic on business planning and structuring was formative in nature. This was designed to act as a "trial run" for students so they could become familiar with the PBL process.

3.1. Problem-solving methodology used

According to Tan (2003), students need to be guided in self-directed learning. To assist students, Tan (2003, 33-35) provides a PBL process for solving problems that comprises seven steps: meeting and defining the problem; analysing the problem; generate ideas (and hypotheses); identify learning issues; discovery and reporting; solution, presentation and reflection; and overview, integration and evaluation. Other authors use similar PBL methodologies. For example, Breton (1999) uses a 10-step problem-solving methodology and Milne and McConnell (2001) use an eight-step process. The authors of the present study were conscious that their students should not have to refer to a long and detailed PBL methodology such as those outlined above. Rather we wanted a problem-solving

[6] For the first three semesters, three PBL scenarios were worked on by the students each fortnight – two major and one minor. This was reduced to two on the basis of student feedback indicating that the work involved for a standard 12-credit point unit was too much.

methodology that was easy to remember particularly given that this was our students' first and only exposure to PBL. Therefore, we developed a five-step PBL methodology referred to as FIRDE, an acronym that was easy to remember. In designing our five-step methodology (see Table 1), we combined and shortened several of the steps proposed by Tan (2003), Breton (1999) and Milne and McConnell (2001). We also wanted our students to be able to apply this methodology to any problems they might face in the future.

--Insert Table 1 here--

The acronym FIRDE was used throughout the unit to remind students of the problem-solving methodology. It will also be used in the next section to explain how the problems were developed.

3.2. Development of the PBL materials

The unit did not adopt traditional materials such as lecture notes, textbooks and tutorial questions that were used in many undergraduate accountancy units. Instead, new materials were developed to suit the PBL requirements. Given that both Tan (2004) and Breton (1999) believed that PBL was a way to develop a learner-centered approach, the crafting of problems was vital to the success of achieving this objective and the criteria outlined by Tan (2003) and Stepien and Gallagher (1993) were adhered to. Since the unit began in 2006, multiple PBL scenarios have been created, developed and tested by the authors for each of the six topics in the unit. The following discussion centers on how the problems were crafted into PBL scenarios (hereafter referred to as PBLs).

For each topic, each group was presented with two PBLs. An attempt was made to ensure that each problem was authentic, had a real-world focus and was written at a level appropriate to the types of problems graduates would typically expect to be presented with when entering the workforce. These problems were developed based upon the authors' own practical experiences and by seeking input and feedback from staff members and accounting

practitioners. Each problem was relatively short, concise, consisted of incomplete facts and contained the necessary "hook" to sustain the interest of the students over a two-week period. It was the responsibility of each group to decide what content was relevant to solve the problem and the solution to the problem could change depending upon the extra information that was gathered from the client. The process of solving the problem was the crucial learning experience.

Each of the four groups in a class took on the persona of the professional advisor/consultant, while the facilitator (being the academic staff member) took on the persona of the client. These personas were very important as they added context and boundaries around what was being done. The first task required each group to identify the given facts. Each group was then required to formulate and ask relevant probing questions seeking additional information from the facilitator. The ability to ask the "right" questions was a key element of the unit. As part of this process, students were required to document in writing questions they asked the facilitator. These questions (and the facilitator's response) were submitted with each groups' submission. This process avoided disputes that could arise later in terms of whether a question was asked and what response was provided by the facilitator. It is important to note that the facilitator only provided additional information based on the "right" questions being asked, i.e. questions that were relevant to solving the specified problem. One of the key capabilities in a PBL approach is developing the student's ability to probe for additional information. If appropriate questions were not asked, students were not provided with the additional information and this severely limited the group's ability to come to an appropriate recommendation. This is a very important skill for accounting students to learn. This questioning skill and the ability to gather all the necessary information to solve a problem is not adequately practised in the traditional lecture/tutorial/case study

approach to accounting education and was considered an integral element in our PBL approach.

Following the recommendation of Johnstone and Biggs (1998), which emphasized the explicit teaching of appropriate problem-solving strategies, the FIRDE model we developed was crucial to the success of the PBLs. The process used in class over the two weeks of discussion forums for each topic is outlined in Table 2.

--Insert Table 2 here--

As Stepien and Gallagher (1993) note, in the real world students would never know whether their recommendation was the best outcome. At the end of this process, each group experienced making the best possible decision based on information obtained through either questioning or research over the two-week period.

To illustrate an example of an accounting-based PBL, Table 3 sets out a typical problem used in class.

--Insert Table 3 here--

As can be seen in Table 3, a typical PBL presented to students has two to three sentences of information and requires each group to apply the FIRDE model to solve the problem and make a suitable recommendation to the client. This process can be seen in Table 4.

--Insert Table 4 here--

From the above example, it can be seen how important it is for students to ask the appropriate questions of the client. If they fail to do this, the group will base its recommendation on incomplete facts and most likely provide the wrong recommendation to the client. For example, when this PBL was given to students, virtually no group asked whether the franchise fee of $120,000 shown in Note 14 of the Balance Sheet was purchased or internally generated or whether it was recorded at cost or fair value. Most groups

incorrectly assumed that the franchise fee (an intangible asset) was recorded at cost in the Balance Sheet. This occurred despite the fact that these same students had successfully completed a whole semester of financial accounting, which included lectures and tutorials on *AASB 138 Intangible Assets* and whether intangible assets such as franchise fees could be revalued from cost to fair value. In addition, few students related this to the problem they were presented with and thought it appropriate to confirm whether the client had revalued the franchise fee from cost to fair value under the revaluation model as per AASB 138.

When these issues were reflected upon in class discussion, the students were amazed that they had not thought of them. This is the power of PBL. The students may have been told many times in previous units that intangible assets could only be revalued to fair value in very specific circumstances, but when it came to applying the content to a problem, the link was not made. PBL enabled the students to experience this problem and highlight their failure to make the link. They have learned by experience (doing) and as a result, should find it easier to remember that experience in their professional endeavours.

Another example of the importance of experience is based on the results of the students doing their research. In one instance, various members of a group were given research tasks to do and each student reported back to the group what had been found. Based on the findings of one member, the group decided on a certain course of action. However, none of the other students in the group checked the accuracy of the research and the student in question had misinterpreted what was found. The group's decision was completely wrong as it had taken one person's view and had not checked it. When reflecting on this error, the students had not thought that checking each other's research was important. The phrase "healthy skepticism" was coined by the authors to alert students to this problem – be skeptical of what is being presented by group members until it is proven correct. When reporting back to the group in future, students not only had to share what they had found in researching the

issue, but also justify to the rest of the group that his/her research findings were correct and came from a reliable source. “Show me the evidence” was important and other students had to read what was found and come to the same conclusion before basing a decision on this research.

Linked to this is another experience that relates to the research phase of FIRDE. In the very early stages of the semester, various members of a group were given tasks to research. One student reported back to their group and started discussing a piece of legislation that appeared directly relevant to the PBL being discussed. The student had used the search engine *Google* to find what was considered to be “relevant” information and was reading out various sections of the Act to the rest of the group members. The facilitator overheard the group discussing sections of the legislation and because the sections appeared to be relatively unusual, inquired what Act the student was quoting from. It became apparent that the student had not limited her *Google* search to Australia and instead had found legislation pertaining to South Africa. As such, this had no relevance to the Australian PBL that was being discussed. The facilitator decided to discuss this with the class as a whole and again reiterated the concept of “healthy skepticism.” Once again, this is an experience that the students should remember long into their professional life.

4. Method/evaluation methodology

4.1. Rationale

The method used was a descriptive case study that used a combination of quantitative and qualitative data obtained from a questionnaire provided to students (Stake, 2005; Yin, 2003a; Yin, 2003b). A questionnaire was used to obtain student perceptions about the use of PBL in their learning. The student questionnaire is generally acknowledged as a valid means of evaluating teaching and learning environments with Ballantyne, Borthwick, and Packer (2000, 222) arguing “… it is generally considered that, provided students are asked about

those aspects of teaching environments which they are qualified to comment upon, student evaluations are more useful, accurate and valid than other measures of teaching performance …" The questions in the survey were based on a standard set of Student Evaluation of Unit (SEU) questions used at QUT. As per the recommendations of Heagy and Lehmann (2005, 245), additional questions (both quantitative and qualitative) were developed that specifically related to this unit and in particular the three skills (questioning, teamwork, and problem solving) to be specifically developed from the PBL approach. The questionnaires were applied over a four-year period (2006-2009) covering the first seven semesters of the unit.

4.2. Changes to the program and the effect on the data

In the first three semesters, the two authors were the only teaching staff involved in the capstone unit. However, as the number of students increased and the unit became compulsory, more staff became involved. All teaching staff were experienced lecturers, having taught in a variety of units at both undergraduate and postgraduate levels at QUT. This is consistent with the recommendation made by Johnstone and Biggs (1998, 415-416) that staff be experienced and possess expert technical knowledge of the subject area. Because this type of teaching is very different from traditional lectures and tutorials, appropriate training had to be provided. This training consisted of meetings to discuss the approach taken, the role of the facilitator in acting as a client, and how to manage the class in terms of timing. New staff members were also required to "sit in" on classes conducted by the authors for the first two weeks of the unit to get a 'feel' for what was required. They were then given their own class. Because teaching staff take on a facilitator role and not a traditional teaching role, the student data would not be significantly influenced by different teaching staff. The survey questions centered around student learning because the learning primarily comes from interactions within each student group.

Over the period of the study, no substantive changes were made to the structure of the first two PBLs. However, during the first two years of the unit, students were required to complete a third small PBL scenario. Based on student feedback, this third PBL was deleted due to concerns about student workload. The only other change was in semesters one and two 2009, where a mark out of 5% was awarded to each student for making an oral presentation of the group's response to one of the PBLs. Previously, this was given orally by the students but no marks were allocated for the actual presentation. Once again, the student data collected via the questionnaire did not relate to these elements and so would not have had any significant influence on the data.

4.3. Student questionnaire

The questionnaires were applied over four years involving seven separate student cohorts with the administering of the questionnaire meeting QUT's ethical requirements. As shown in Table 5, a total of 481 students were surveyed with an 86% response rate ranging from 74% to 100% of the total population each semester.

--Insert Table 5 here--

All students enrolled in the unit completed the questionnaire at the same time each semester. This occurred in class in the last week of the semester when all the PBL work and related assessment had been concluded.

The quantitative data was collated from responses to the questionnaire based on four different types of questions - questions involving a 5-point Likert-type scale; questions based on a 5-point Likert-type scale and requiring explanations for their response; questions involving a yes/no answer and requiring explanations for their response; and open-ended questions requiring a written response only. The qualitative data obtained from the written comments in the questionnaire capture a range of student experiences and provide richer data about the students' perceptions of learning and the reasoning behind their particular views.

The analysis of these written comments was facilitated by adopting a content and thematic analysis. Boyatzis (1998) outlined four stages in developing the ability to use thematic analysis (sensing themes, doing it reliably, developing codes, and interpreting the information and themes in the context of a theory or conceptual knowledge), all of which were used in the present study.

Where students provided a written response, the text was analyzed. As a result, various patterns occurred and themes began to take shape. In addition, within these themes, various sub-themes began to occur so these had to be coded and the data collated. Sometimes, there were dissenters from the common view or there were comments that indicated that problems had occurred. These were also coded and collated. It is from this data that a clearer understanding of student perceptions was obtained.

5. Results

5.1. Overall results

To obtain an overall indicator for what the students perceived was of assistance to them, they were asked to answer the question "Overall, which aspect of the unit was of most assistance to your learning?" The results are shown in Table 6. Students could indicate several elements here or none at all and so the total responses of 525 are greater than the total number of students who completed the questionnaire (481).

--Insert Table 6 here--

Other than the 12 students (2.5%) who responded with all aspects, the main aspect related to the PBLs (123 students with 25.6%) and the problem-solving that was required (18 students with 3.7%). These two elements together indicated that 29.3% of students thought that having to solve the PBLs was of most assistance to their learning, which is a very positive result. This was followed by 87 students (18.1%) for teamwork, 84 students (17.5%) indicating questioning, and 82 students (17%) indicating research as the aspects of most

assistance to their learning.

Looking further, certain results provided important evidence relating to the perceived effectiveness of student learning and the development of skills which the PBL approach was trying to improve. The results for these are shown in Table 7 with individual semester details shown in Appendix A.

--Insert Table 7 here--

As discussed in the literature, the unit was designed to challenge students; to provide a methodology for solving real-world, unstructured accounting problems; to apply the content knowledge learned in other units; and to improve generic skills, particularly in the areas of problem solving, teamwork and questioning. The results reported in Table 7 indicate that while students found the unit to be challenging, they "agreed" (mean of 3.9 or above) that the unit improved a number of key skills such as research and teamwork. More importantly, the students perceived that the PBL approach improved their ability to deal with unstructured problems and problems based on incomplete facts and that they could apply the FIRDE methodology to new situations. All of these skills should be important to them when they enter the workforce and begin their professional career.

Despite the positive quantitative results relating to the learning outcomes, there were some other revealing results. Students were asked:

- if they enjoyed using the PBL approach and 78.6% (378) responded with "Yes,"[7] 16.8% (81) said "No," and 4.6% (22) did not respond.
- how they found the level of the PBLs with 33.9% (163) saying "Just Right," 58.8% (283) "Hard," and 4.8% (23) "Too Hard."
- how they found the workload with 39.7% (191) indicating "Just Right," 46.2% (222) "Heavy," and 12.3% (59) "Too Heavy."

[7] Not all students gave a reason for whether or not they enjoyed the PBL approach. Of those who said they enjoyed it, 68 indicated it was because of the real-world context, 41 because it was "different" to other units, 37 because of teamwork and 34 because it was "a good way to learn."

These results indicate that although the students saw the benefits from what they were doing and generally enjoyed it, there were some negative aspects of the PBL experience. This confirms the view of Milne and McConnell (2001) regarding workload and challenge.

5.2. Quantitative and qualitative data – student questionnaire

To provide a richer context of the students' perceptions of their learning, qualitative data was collected in three main areas, namely questioning, teamwork, and problem solving.

5.2.1. Questioning

The first area related to the asking of questions by the students to obtain the necessary information from the facilitator (client). In response to the question in Table 7 "I liked the way we had to ask appropriate questions to obtain the necessary extra information relating to a PBL", the overall response was 3.4, which approaches a "neutral" response of 3.0. However, when the students were asked "In this unit, you had to frame many questions. Did you find asking questions to get more information a useful skill to learn?" 86.9% (418) responded with "Yes" and 8.7% (42) said "No." This indicates that although the students did not necessarily like that they had to ask appropriate questions to obtain information, they agreed that it was a useful skill to learn.

In relation to the qualitative data, many themes became apparent. The first strong theme related to the usefulness of developing the skill of questioning:

> *Not everyone has the skill or knowledge to do that at first, but in this unit we had the chance to develop this skill which was great*. (S3A)
>
> *It teaches you to ask the right question.* (S37B)
>
> *Learning how to ask questions is useful.* (S4D)
>
> *The skill of asking specific problem-related and relevant questions was invaluable.* (S67F)
>
> *To ask relevant questions is very important. This is a great way to learn this skill. (S26G)*
>
> *It is a skill we need in practice but never learn in our degree.* (S37G)

Related to the need to develop questioning skills was the view that this was a different way of thinking, with the following comments indicating that students had to think outside the square (box) and think broader than what they were used to:

> *Helps you change your way of thinking as in other assessments, you are usually given all the answers you require. (S25C)*
>
> *Good to help you think outside the square. (S71D)*
>
> *Builds a questioning mindset. (S120D)*
>
> *It pushed you to think broader. (S34F)*
>
> *It was very beneficial and good for learning quick thinking and lateral thinking. (S27G)*

Another strong theme related to questioning was the real-world focus:

> *In the real world, you do not receive all the information you need on a platter. (S19A)*
>
> *Sense of real life. (S1C)*
>
> *I will have to address questions to clients in the real world. This has given me the experience on how to handle future situations. (S12D)*
>
> *This is what is required in the real world as the client will not always give you all the necessary info at first. (S84G)*

Despite students indicating strongly that questioning was a useful skill and one that would be required in the real world, they did find it challenging:

> *Trying to think of the right questions is still challenging though. (S33B)*
>
> *Knowing what to ask was sometimes a problem. (S45C)*
>
> *I often could not think of the right questions. (S15G)*

However, some students felt that the PBLs did not reflect the real world:

> *It is good to know. However, if our clients were real, they would be more forthcoming with information about all aspects of the business. (S11A)*
>
> *However the clients some weeks were very dumb or unknowledgeable and if it was a real client you would be able to clarify points or look at their records/ paperwork to help clarify. (S11C)*

> *Sometimes you had to pull teeth to get information. Clients will generally tell you what you want – too limited. (S96E)*

The perception by some students that facilitators may not have provided as much information as a "real world client" was true to some extent because if the students did not ask the "right" question, then the information was not given by the facilitator. This was part of the learning process. The questions had to be specific and to the point, which was something students found frustrating at times.

As well, some students were very conscious that this questioning was assessable and affected their marks:

> *It does make you think a little more but it damages your result if you can't think on the spot. (S53D)*

> *Besides, questions were always 'stolen' by other group members even though others came up with them - so other people were getting credit for other people's work. (S89E)*

Finally, as shown in Table 6, 84 students (17.5%) indicated that questioning was of most assistance to their learning. On the other hand, 22 students (4.6%) said that the questioning aspect of the unit did not foster their learning. Given the overall results of this data, it indicates that the PBL approach adopted was generally effective in developing the skill of questioning.

5.2.2. Teamwork

The second main area is in relation to the skill of teamwork and being able to work in groups. In Table 7, the response to the question "My skills relating to working in teams has improved as a result of this unit" received a rating of 3.9, which indicates general agreement. In response to the qualitative question "What is your opinion about working in groups for the whole semester? Was it successful?", there were 456 responses with 384 (84.2%) indicating that it was successful, 49 (10.8%) indicating that it was not successful, and 23 (5.0%) responding with a neutral position.

Of those that responded positively, 75 did not offer any reason for its success. Typical comments included "Yes. It is a good idea" (S53C), "It was great and I love it" (S49F), "I had the best group ever in my degree" (S46G). Of the other 309 positive responses, various reasons were given for its success. By far, the strongest theme related to finding the strengths and weaknesses of each member of the group and using that to the group's advantage. Typical comments were as follows:

> *You soon learn who has what skills and use this to your advantage. (S35B)*
>
> *I liked it because you got to know each person's strengths and weaknesses by the end of the semester and thus work more efficiently. (S17C)*
>
> *Very successful – got to know strengths and weaknesses of the other members, then you just have to deal with that for the rest of the semester. Great consistency. (S1D)*
>
> *It was successful as you learn each other's strengths and how best to work as a group to achieve. (S26E)*
>
> *We were able to use each other's strengths to complete PBLs more effectively. (S59G)*

Another strong theme that emerged related to the friendships and relationships that were formed and the strong bonding that occurred as a result of the PBL experience:

> *It is good because as the semester continues the bond within the group strengthens. (S21D)*
>
> *Because the working relationship grew and you could trust each other's knowledge/ability more. (S50C)*
>
> *Yes, got to know people/able to trust people etc. (S92E)*
>
> *I made new friends. I didn't want to let them down. (S48G)*
>
> *Yes, successful because you get to know the people you work with and form a rapport with them. (S22D)*
>
> *Yes, it gave us a chance to build relationships just like work colleagues. (S37G)*

Over many semesters, the authors observed first-hand how quickly students bonded. When the groups were created in the first week and certain students were asked in later weeks to

move to another group due to late enrolments, there was generally a reluctance to move. In semester 2 2009, one student steadfastly refused to move despite subtle pressures and so an alternative student volunteered to move.

Related to this was the working style of the particular group students were placed in:

> *You form a good working formula. (S62F)*
>
> *We get to know each other's work habits so it worked pretty well. (S69F)*
>
> *I liked it – got to know people and how they handled workload and nut out problems. (S41F)*
>
> *It was good. It allowed you to get used to everyone's styles and be able to get to know each other. (S87E)*
>
> *Allows the group to get to know each others style and streamline the preparation of answers. (S30B)*
>
> *I believe you get to learn … how to work together best to solve problems and get the work done on time (S124G)*

On the other hand, there were 49 (10.8%) students who said that the group work was not successful. Of those 49 students, 12 students did not offer any explanation for their response and a further two stated that they wanted more individual work. Another 15 students said that they would have liked to have changed groups rather than remaining in the same group all semester:

> *Perhaps it would have been better to switch around once or twice. (S85D)*
>
> *Not very successful. May have been better to work with different people. (S46C)*
>
> *I hope to change groups during semester so I could know the difference when working with others. (S17E)*

The remaining 22 students indicated that they had been a member of an ineffective group with individuals not contributing as much as they should have and free-riders in the group contributing very little:

> *I didn't like it. If there was someone who doesn't pull their weight, you can't rely on them to do work for the whole semester, increasing the other member's workload.*

(S52F)

Not successful, we needed some incentives and penalty to discourage free-riders. (S10F)

We had to "carry" the other group members. (S11D)

No. I think when you get time to get used to a group, some people start to find ways to get out of doing work etc. You know the others will do the work. (S24B)

To minimise this free-rider problem, for each item of group assessment, the students completed a form signed by all members stating the contribution of each member of the group. Some groups changed these percentages to reflect each member's contribution. However, some groups did not take advantage of this. "It's all well and good having the contribution thing but everyone writes 25% to keep the peace in the group" (S133E).

Finally, as shown in Table 6, 87 students (18.1%) indicated that teamwork was of most assistance to their learning. On the other hand, 42 students (8.7%) said that teamwork did not foster learning for them. Given the overall results of this data, it indicates that working in teams using the PBL approach was generally effective.

5.2.3. Problem solving

The third main area relates to problem solving and working with unstructured problems and incomplete facts. In Table 7, in response to the statement "I liked learning through the use of PBLs in this unit" the average response reported was 3.6, which approaches a neutral response of 3.0. However to the crucial qualitative question "Do you feel more comfortable dealing with unstructured problems and problems based on incomplete facts as a result of this unit?", 396 (82.3%) indicated "Yes" and 75 (15.6%) said "No." Once again this suggests that although the students did not necessarily like dealing with unstructured problems and incomplete facts, the unit made them more comfortable with these problems.

In terms of themes emerging from the qualitative data, the first theme relates to the students expressing the view that they are better equipped to deal with a problem and have a

process that they can follow:

> *I have learned a way to approach such tasks. (S1A)*
>
> *Gained an insight on the processes behind solving different accounting problems. (S50C)*
>
> *I now know how to approach real world client dilemmas. (S94E)*
>
> *I know how to start on unstructured problems. (S38G)*

This is pleasing because the FIRDE model developed was an integral part of the problem-solving process. It was developed so that in the real world as graduates, if faced with a problem that they are unfamiliar with, they will have a process to assist them.

Another theme related to questioning and obtaining extra or missing information:

> *Have a better idea of which questions need to be asked to gain relevant information. (S9A)*
>
> *Once again helped me narrow down my questions and stay on track. (S6C)*
>
> *Learnt to ask relevant questions. (S17D)*
>
> *Now have a better idea of how to phrase questions to obtain sufficient information and to not look just at the obvious or expected issues. (S26E)*
>
> *This unit challenged me to the degree that I start thinking what else is missing and is critical to the problem. (S66E)*
>
> *I now know how to ask specific questions to be able to extract relevant information. (S1F)*

Once again, these students emphasized the importance of obtaining the information through questioning and this has made them more comfortable with the problem-solving process.

Another theme was the ability to do research as part of the problem-solving methodology:

> *I know an approach to take and how to research and find information to solve problems. (S7A)*
>
> *Have improved my research skills and now have a process embedded in me as to where to start to solve a problem. Have process, now familiar with a wider range of resources. (S21D)*

> *I learnt problems are able to be solved once you go away and research it. The knowledge doesn't always have to be known. (S73E)*
>
> *The research aspect makes you widen your scope if answers aren't forthcoming straight away. (S19E)*
>
> *Know how to research and fill in the gaps of information left by the client. (S79G)*

As shown in Table 7, the statement "My research skills have improved as a result of this unit" obtained a rating of 4.0 (agree). Research is an essential part of the FIRDE problem-solving model and this qualitative data indicates that these students see this as an important part of the problem-solving approach.

However not all students were comfortable with this approach with some indicating concerns in the following statements:

> *I don't think I will ever feel comfortable in dealing with these problems but it has made me more prepared to deal with them. (S26D)*
>
> *I feel better than before but I still need more practice. (S75G)*
>
> *It is not comforting at all but I'll know what to expect and won't be overwhelmed. (S107G)*

Despite concerns, these students perceive that their ability to solve problems has improved as a result of this approach.

Finally, as shown in Table 6, the PBLs being real, practical and challenging (123 students) and the problem solving attached to that (18 students) was of most assistance to the learning of 141 (29.3%) students. However six (1.7%) students said that this aspect did not foster their learning. Given the overall results of this data, it indicates that the PBL approach was generally effective in helping students become more comfortable with problem solving.

6. Conclusions

This paper reports the findings of the development and implementation of PBL in a new Accountancy Capstone unit at the Queensland University of Technology. In designing the unit, the broad fundamental characteristics of PBL approaches (Tan, 2003) were adopted.

Furthermore, the four implementation strategies recommended by Johnstone and Biggs (1998) for the successful implementation of PBL in an accountancy curriculum were adhered to with particular emphasis on a problem-solving model called FIRDE, which was created to give the necessary structure for approaching the real-world problems presented.

Unlike the findings of Breton (1999) and Heagy and Lehmann (2005), which concentrated on the academic performance of students exposed to PBL, our paper sought to obtain student perceptions of their PBL experience. Both the quantitative and qualitative data collected from students over seven semesters indicate that the use of PBL in this accounting unit was very successful. The students "agree" that their understanding of concepts and principles in this field has improved, they can apply principles from this unit to new situations, the unit contained an appropriate breadth and depth of learning materials to challenge them, and as a result of this unit, they feel more comfortable dealing with unstructured problems and problems based on incomplete facts. In addition, the focus of the PBL approach centered on three main features: the importance of questioning by students who were initially presented with incomplete facts (as a professional advisor would experience when dealing with a client for the first time); solving unstructured problems; and students working together in groups sharing their research findings and solving problems for the entire semester. The results indicate that PBL was generally effective in all these areas.

The most important result of the study relates to the use of questioning to obtain information. This is a vital skill in other disciplines but seems to have been overlooked in accounting education. The students surveyed indicated that the skill of questioning was very useful even though they sometimes found it difficult. Despite this, the student responses' reveal that the PBL approach adopted was effective in developing this skill. This research indicates that PBL is an ideal vehicle to embed this vital skill in a real-life accounting context.

Another important result of the study is the skill of teamwork. Teamwork is often difficult to manage in a tertiary environment with many students disliking teamwork as part of their studies. However, PBL has shown that the approach adopted was successful. A similar result was obtained for problem solving. The students generally agreed that they were now more comfortable dealing with unstructured problems. These three skills are vital in the accounting profession and if PBL offers an effective way to improve those skills at the university level, then a PBL approach to learning should be encouraged. These results also confirm Tan (2004) who asserted that PBL creates a learning environment where inquiry activities, self-directed learning, information mining, dialogue and collaborative problem-solving can be incorporated in the design to enrich the student learning experience.

However there are some important factors to be considered if PBL is to be adopted. The most important relates to time. The implementation of PBL is a time-consuming process especially the development of the PBLs. Because this is new to accounting, all PBLs had to be specifically written, with the appropriate "hook" to encourage the students. Secondly, the role of the teaching staff changes in a PBL environment. Teaching staff are not the "giver of content" as would normally occur in a lecture/tutorial. Staff control of the classroom is more relaxed with students constantly searching for data and information, discussing issues on their own, and coming to conclusions without the aid of the staff member. Some staff may not enjoy being in this less controlled and different atmosphere. Finally, no university should begin this path without the support of the School through the Head of School, school advisors, and faculty/school teaching and learning committees. Without appropriate support, implementation of a PBL approach may be very difficult.

Based on the results of this research, the answer to the question "Does accounting education need PBL?" is a definite "Yes." Overall, the results from seven semesters indicate that the use of PBL can be successfully implemented into an accounting curriculum, and

despite the time, effort and creativity required to develop and implement PBL, significant rewards can be reaped in student learning outcomes especially in skills development. This should encourage others to consider using PBL and in the words of Milne and McConnell (2001, 78) “seems too great an opportunity not to experiment with it.”

In terms of limitations, the questionnaire was the only form of data collection. Another limitation is that the paper only reports the views of students enrolled in the unit. The views of graduates, practitioners or employers were not canvassed.

In terms of future research, student interviews could be conducted to reveal richer student perceptions of the PBL experience. In addition, further research could be conducted on the university-to-work transition by canvassing the views of graduates, practitioners and employers to determine whether the skills developed by our students in this unit translated into the workforce. Our experience over multiple semesters indicates that PBL enhances the development of certain student skills. Future research could be undertaken in order to determine whether this occurs in the students’ first year as a graduate accountant.

Acknowledgements

The authors greatly appreciate the comments and suggestions provided by two anonymous reviewers and David Stout, the editor of the Journal of Accounting Education.

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Appendix A

Data for Table 7

Results from selected statements ranked by overall mean.

Ranked Statement No	Statement	Sem 2 2006	Sem 1 2007	Sem 2 2007	Sem 1 2008	Sem 2 2008	Sem 1 2009	Sem 2 2009	Overall Mean
1	The unit contains an appropriate breadth and depth of learning materials to challenge students	4.3	4.3	4.3	4.3	4.3	4.4	4.1	4.3
2	My understanding of concepts and principles in this field has improved	4.7	4.2	4.2	4.6	4.4	4.1	4.1	4.2
3	I can apply principles from this unit to new situations	4.5	4.3	4.2	4.4	4.2	4.2	4.1	4.2
4	My research skills have improved as a result of this unit	4.4	3.9	3.8	4.1	3.9	4.1	4.0	4.0
5	As a result of this unit, I feel more comfortable dealing with unstructured problems and problems based on incomplete facts	4.3	3.8	3.9	4.0	4.1	3.8	3.9	4.0
6	My skills relating to working in teams has improved as a result of this unit	3.9	3.7	3.9	4.1	3.7	4.0	4.0	3.9
7	I liked learning through the use of PBLs in this unit	3.7	3.5	3.8	4.0	3.6	3.6	3.5	3.6
8	I liked the way we had to ask appropriate questions to obtain the necessary extra information relating to a PBL	3.4	3.2	3.6	4.0	3.3	3.3	3.3	3.4

A five point Likert Scale was used with 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. Based on an independent samples t-test, there was no statistically significant difference (sig. 2-sided $p < .05$ and $p < .01$) in the results for the three elective semesters (semester 2, 2006 to semester 2, 2007) and the four compulsory semesters (semester 1, 2008 to semester 2, 2009).

Table 1
FIRDE problem-solving methodology.

STEP	***ACTION***
Facts	Define the problem, gather **F**acts and ask relevant probing questions
Ideas	Generate **I**deas and consider alternatives
Research	**R**esearch each issue pertaining to the problem
Decide	Collaborate, share ideas and make a **D**ecision
Execute	Communicate the decision to the client and/or **E**xecute the chosen option

Table 2
PBL process adopted using FIRDE.

	STEP	***STUDENT ACTIONS***	***FACILITATOR ACTIONS***
Week 1 Discussion Forum (2 hours)	**F**acts	Define the problem, gather **F**acts and ask relevant probing questions	Problem given to each of the four groups of students in a class
	Ideas	Generate **I**deas and consider alternatives	Throughout the whole process, the facilitator takes on the role of the client for each of the two PBLs. Visit each group for approximately 10 minutes and answer questions that each group has formulated relating to each problem. This is done quietly so no other group can hear the questions or the response provided by the facilitator. The facilitator does not guide students in any way and does not answer questions relating to technical content. Students are entirely responsible for their own research and decisions made
	Research	By the end of the first discussion forum, the group assigns each member certain tasks to **R**esearch	
In Between Discussion Forums	**R**esearch	Each student **R**esearches the issue allocated to them and summarizes his/her findings	No action required. No group can ask additional questions of the facilitator outside the discussion forums
Week 2 Discussion Forum (2 hours)	**R**esearch	Each student presents their **R**esearch findings to their fellow group members for them to consider and discuss. Further questions may be asked of the facilitator	Visit each group and answer questions the group may still have in relation to each problem. Once again, the facilitator only provides additional facts to the problem based on questions asked
	Decide	Collaborate, share ideas and make a **D**ecision	
	Execute	Having made their decision or recommendation, the group is required to **E**xecute their chosen option, either in the form of a written report or a presentation to the client	After each group has made their decision/recommendation, award a mark, engage discussion and provide feedback to each group

Table 3
Example of a PBL presented to students.

You have been presented with the draft financial statements of Harbour Spa Pty Ltd for the year ended 30 June 2012. Harbour Spa Pty Ltd is a franchisee of a health and beauty spa called "Indulgence" located at Portside in Hamilton, Queensland.

The managing director of the company, Kelly Jones, has drawn your attention to the following note in the draft 2012 financial statements:

Note 14:	**Intangible Assets (Non-Current Assets)**	**$**
Franchise fee		120,000

Required:

Write a letter to Kelly Jones outlining whether the franchise fee complies with appropriate Australian Accounting Standards. Please cite relevant paragraphs within relevant Australian Accounting Standards in your answer.

Table 4
Example of PBL provided to facilitator.

Applying the FIRDE model, results in the following:

Facts (Determined from the problem given to students):

- Harbour Spa Pty Ltd is a franchisee of a health and beauty spa at Portside in Hamilton, Queensland
- Draft financial statements have been prepared to 30 June 2012
- The franchise fee has been recorded as a non-current asset in the Balance Sheet at $120,000
- From the draft financial statements, it is apparent that no amortisation has been provided for in respect of the franchise fee

Facts (Additional):

Students are required to ask the facilitator relevant questions in order to obtain the following information. If the question is not asked, the information is not given and therefore students may come to an incorrect conclusion.

- Harbour Spa Pty Ltd is an Australian company
- The accounting period is 1 July to 30 June
- The company is a small proprietary company and a non-reporting entity
- The franchise was purchased from the franchisor for $100,000 on 1 July 2011
- This is the only franchise the company owns
- It is a 5-year franchise with an option to renew for a further 5 years at an additional cost of $100,000
- There is a strong probability that the franchisee will renew the franchise at the end of the fifth year
- However, after 10 years, no further renewals of the franchise is permitted
- At the end of 10 years, the franchisor buys back the franchise at an amount calculated at one (1) times gross revenue of the franchisee
- On 1 January 2012 (6 months after acquisition of the franchise), the directors revalued the franchise fee from the cost of $100,000 to $120,000 (an increment of $20,000). This was based on a phone call that Kelly made to the franchisor. She found out that the "Indulgence" franchise licenses are currently selling for $120,000 (an increase of $20,000 since she bought hers on 1 July 2011 for $100,000)
- Ignore the tax-effect of the revaluation
- This was the first time the franchise was revalued
- The company does not have any other intangible assets
- There are only five "Harbour Spa" franchises throughout Australia
- The prices to acquire this franchise are not publicly available
- Each franchisee pays a royalty fee (equivalent to 10% of gross sales) to the franchisor each year
- For the 2012 financial year, the company derived gross revenue of $840,000
- The company has undertaken impairment testing of the franchise and at 30 June 2012, the franchise fee has a value in use of $130,000 and a fair value less costs to sell of $110,000
- Ignore the effects of the Goods and Services Tax (GST)

Ideas:

- Determine whether the franchise fee is a tangible asset (AASB 116) or an intangible asset (AASB 138)
- Determine whether the franchise is acquired or internally generated
- Determine whether the franchise is able to be revalued by reference to fair value in an active market
- Determine whether the franchise has a finite or indefinite useful life. This will determine whether the franchise should be amortised (and if so, over what period)

Research:

- AASB 116 Property, Plant and Equipment (equivalent to IAS 16)
- AASB 138 Intangible Assets (equivalent to IAS 38)

Decide:

- The franchise is an identifiable intangible asset. It comes within the scope of *AASB 138 Intangible Assets*
- As a purchased intangible asset, it can be recorded in the Balance Sheet of the company at cost (i.e. $100,000)
- However, the franchise cannot be revalued to $120,000 because there is no actively traded market as defined in paragraph 75 of *AASB 138 Intangible Assets*. Having only five franchises in Australia does not constitute an "active market" under AASB 138
- Accordingly, the $20,000 revaluation increment needs to be reversed
- As the franchise has a finite useful life, it must be amortised over a 5-year period. Hence, the annual amortisation is $20,000 (i.e. $100,000 divided by 5 years)
- The carrying amount at 30 June 2012 should therefore be $80,000 (being cost of $100,000 minus one year's accumulated amortisation of $20,000)
- As the carrying amount of $80,000 is lower than the recoverable amount of $130,000 (being the higher of value in use of $130,000 and fair value less costs to sell of $110,000), the asset is not impaired. Hence, it can be shown on the balance sheet at its written down value of $80,000
- Any change in accounting policy or error must be accounted for in accordance with *AASB 108 Accounting Policies, Changes in Accounting Estimates and Errors*

Execute:

- Write a letter to Kelly Jones outlining whether the franchise fee complies with appropriate Australian Accounting Standards. Please cite relevant paragraphs within relevant Australian Accounting Standards in your answer.

Table 5
Response rate.

	Sem 2 2006 A	Sem 1 2007 B	Sem 2 2007 C	Sem 1 2008 D	Sem 2 2008 E	Sem 1 2009 F	Sem 2 2009 G	Total
Students Enrolled	19	24	61	32	144	93	189	562
Student Responses	19	23	58	27	137	78	139	481
Response Rate	100%	96%	95%	84%	95%	84%	74%	86%

Note: The unit became compulsory in semester 1, 2008; A – G are used for referencing relevant comments by students provided in the questionnaire, for example, S14E refers to student 14 in semester 2, 2008 whilst S122G refers to student 122 in semester 2, 2009.

Table 6

Results from the open-ended question ‘‘Overall, which aspect of the unit was of most assistance to your learning?” [a]

	Total Responses from 481 Students over 7 Semesters	% of 481 Total Respondents
All	12	2.5%
PBLs, real and practical, challenging	123	25.6%
Problem solving	18	3.7%
Teamwork	87	18.1%
Questioning of client, learning what questions to ask	84	17.5%
Research	82	17.0%
PBLs bringing together all accounting units and concepts	43	8.9%
Communication	11	2.3%
Information sessions, Powerpoint slides	8	1.7%
Self Learning, Independence	8	1.7%
Nothing	4	0.8%
Other	[b] 45	9.4%
	525	

[a] Not all of the cohort responded to this question and some students responded with more than one aspect.

[b] Includes infrequent comments relating to specific staff members, feedback, specific content and another piece of assessment which was the case study.

Table 7
Results from selected statements ranked by overall mean.

Ranked Statement No	Statement	Overall Mean
1	The unit contains an appropriate breadth and depth of learning materials to challenge students	4.3
2	My understanding of concepts and principles in this field has improved	4.2
3	I can apply principles from this unit to new situations	4.2
4	My research skills have improved as a result of this unit	4.0
5	As a result of this unit, I feel more comfortable dealing with unstructured problems and problems based on incomplete facts	4.0
6	My skills relating to working in teams has improved as a result of this unit	3.9
7	I liked learning through the use of PBLs in this unit	3.6
8	I liked the way we had to ask appropriate questions to obtain the necessary extra information relating to a PBL	3.4

A five-point Likert-type scale was used, with 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.