

# EFFECTIVENESS OF PROJECT-BASED LEARNING AS A STRATEGY FOR PROPERTY EDUCATION

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## ABSTRACT

*Project-based learning (PBL) is a student-centred instructional approach used to promote active and deep learning by involving students in investigating real-world issues in a collaborative environment. In this paper, we discuss how PBL was implemented in an introductory property course running in semester one, year one, which is offered in multiple modes of study. Two qualitative student surveys were conducted during the study period to solicit feedback from students on their learning experience. Comments from students suggested that PBL provides beneficial insight into the valuation process, and the field work and group exercises help motivate students and make the subject matter more interesting. University conducted, end of study period evaluations were used to compare the outcomes of the new course to other courses in the property program and the University. Finally, we identify a number of challenges in implementing PBL; these include workload issues, teachers' content knowledge, lack of experience from both teachers and students, and the need to develop specialised material for off-campus study.*

**Keywords:** Project-based learning, active learning, deep learning, constructive alignment

## INTRODUCTION

Today's higher education institutions embrace various teaching and learning strategies to enhance students' learning outcomes; one of the important techniques is to use assessment to engage the student. Assessment is about understanding the processes and outcomes of student learning, and understanding the students who have done the learning (Ramsden 2003, p. 180). As suggested by Tyler (1949, p. 63),

‘Learning takes place through the active behaviour of the student, it is what he does that he learns, not what the teacher does.’

Building on that, Biggs (2003, p.1) puts forward that ‘Constructive alignment is an approach to design a curriculum that optimises the conditions for quality learning’. He argues that students are the ones who construct meaning through relevant learning activities; thus, what is important is what the student does. On the other hand, ‘alignment’ means that what the teacher does is to provide a learning environment that supports the learning activities appropriate to achieving the desired learning outcomes (Biggs 2003, p.1).

Inevitably, assessment has been acknowledged as a critical factor in stimulating student learning activities (Biggs & Tang 2007; Ramsden 2003; Shuell 1986). From the student’s point of view, the assessment is the curriculum (Ramsden 2003). They will learn what is assessed, not what is in the curriculum, or even what has been covered in the class (Biggs 2003, p. 3). Put simply, improving student learning means improving the way we assess students (Havnes 2004).

Various teaching strategies have been devised to improve the quality of teaching in property education in Australia; these include the use of new technology in engaging both internal and external students (Cornish et al 2009). To enhance student engagement, problem-based learning is well-recognised in real estate education for its pedagogical advantage, despite its various limitations (Anderson, Loviscek & Webb 2000; Callanan & McCarthy 2003; Yu 2001). In order to promote active learning, the Project-Based Learning (PBL) approach was used in an introductory property course to engage first-year students from their first day of study. PBL is a student-centred approach that engages students in exploring important and meaningful questions through a series of investigations and collaborations (Krajcik, Czerniak & Berger 1999); in this study, the students were exposed to experiential learning in which they were required to go through a range of activities involved in the valuation profession. The primary objective was to provide scaffolding to the students by breaking the major valuation assignment down to smaller projects, so that they learn to solve practical problems step by step. Feedback from students suggested that PBL provides insight into the valuation process, and field work with group exercises helps to motivate them and make the subject more interesting. Also, we have identified challenges in implementing PBL; these include workload issues, teachers’ content knowledge, and lack of experience from teachers and students, as well as the need to develop specialised material for off-campus study.

The structure of this paper is as follows. First, we discuss past literature on assessment and PBL. We then illustrate how PBL was implemented in the *Introduction to Property and Valuation* course, followed by discussion on student feedback and staff reflection, and, lastly we present our conclusion.

# LITERATURE REVIEW

## Assessment

Assessment is about getting to know students and the quality of their learning (Rowntree 1977). Therefore, assessment should be used as an approach to teach more effectively by knowing exactly what students know and do not know (Ramsden 2003). As Ramsden (2003, p. 177) explains:

‘Assessment is about reporting on students’ achievements and about teaching them better through expressing to them more clearly the goals of our curriculum. It is about measuring student learning, diagnosing misunderstandings in order to help students to learn more effectively.’

Because students’ perceptions on assessment have a considerable impact on their attitudes to learning (Struyven, Dochy & Janssens 2005), it should be used to encourage deep learning to achieve intended learning outcomes (Ramsden 2003). Therefore, in defining the intended learning outcome, we have to specify not only the topic content, but also the level of understanding that we want our students to achieve (Biggs 2003). In other words, we design an assessment task that will inform us as to whether they have achieved those outcomes.

Students are going to learn what will be assessed (Biggs 2003); hence, we have to ensure that the assessment tasks are aligned to the intended learning outcomes. A good assessment encourages students to adopt deep learning processes. One of the most important influences on the students’ learning approach is the assessment strategy used (Rust 2002). Students are more likely to use deep learning ‘if they can see the relevance and importance of what they are required to do’ (Rust 2002, p. 150). Thus, assessment tasks should reflect realistic problems whenever possible to encourage deep learning (Orrell 2008; Ramsden 2003).

It is also important to show students that the assessment is non-threatening (Rust 2002) which will lessen their anxiety (Ramsden 2003). To facilitate the learning process, rubric or grading criteria must be made explicit and public (Brown 2004; Ramsden 2003; Rust 2002) so that students can better understand the lecturer’s expectations. As well, timely and relevant feedback, linked to the assessment criteria, is crucial to encourage student engagement (Brown 2008, 2004; Rust 2003). Nevertheless, without requiring students to engage with the feedback, it will have a limited effect (Rust 2002). Hence, we must create activities to drive them to reflect and improve on their mistakes.

Put simply, active learning is crucial in constructing knowledge and student engagement. Learners construct knowledge through their own activities and by

building on what they already know (Biggs & Tang 2007). By extension, PBL is a teaching approach that emphasizes student participation in the learning process to construct their knowledge in an active learning environment (Hadim & Esche 2002).

### **Project-based learning (PBL)**

Constructivism has a long history. As early as the 1900s, John Dewey, the father of progressive education, supported ‘learning by doing’; he promoted teaching strategies that helped students actively engage in learning about topics relevant to their lives (cited in Krajcik, Czerniak & Berger 2003; Grant n.d.). Teaching is not a matter of transmitting knowledge, but requires students to construct knowledge with their own activities, building on what they already understand (Biggs & Tang 2007).

PBL is a comprehensive, deep learning approach to classroom teaching and learning that engages students in the investigation of authentic problems (Blumenfeld et al. 1991, p. 369). Adderley et al. (1975, p.1) put forward an important definition of PBL:

1. It involves the solution of a problem, though not necessarily set by the student himself/herself;
2. It involves initiative by the student or group of students, and necessitates a variety of educational activities;
3. It usually results in an end product (e.g., report, computer programme, a model);
4. It often goes on for a considerable period of time;
5. The teaching staff assumes an advisory role instead of an authoritarian role.

Problem-solving is essential to the development of expertise; thus, students should be exposed to real-world problems from the outset of tertiary education (Helle, Tynjala & Olkinuora 2006). The driving question or problem is essential in PBL; as it helps to drive activities in creating the final product that address the questions (Blumenfeld et al. 1991). As well, it is imperative to provide students with appropriate goals from the outset to help them to understand the relevance and importance of the project (Barron et al. 1998).

As defined by Krajcik, Czerniak & Berger (1999), the PBL approach engages students in exploring important and meaningful questions through a series of investigations and collaborative activities. These students ask questions, collaborate with each other in designing their investigation activities, collect and analyse data, share ideas, draw conclusions and create final products (Blumenfeld et al. 1991). These active

investigations enable them to learn concepts, and apply information in creating their final products (Houghton Mifflin n.d.), which is vital in constructing new knowledge. PBL is an instructional approach centred on learners' learning activities where the learners are more autonomous as they construct meaningful artefacts through their learning process (Grant n.d.). Autonomy helps to maintain learners' interest and motivate them to take responsibility for their own learning (Worthy 2000). Furthermore, by giving control to the student, they maximise their opportunity to utilise prior knowledge and experience in finding solutions to the problems (Morgan 1983).

To make PBL effective, teachers play an important role in motivating students and creating a classroom environment conducive to students' learning. Collaboration among the students, teachers and others in the community is important so that knowledge can be shared and distributed among the members (Houghton Mifflin n.d.). In addition, students' progress needs to be observed, so that problems can be detected early (Winn 1995). Therefore, teachers' support, as well as continual tutorial discussions involving teachers and students, is imperative to sustain students' motivation in the PBL process (Blumenfeld et al. 1991). For instance, teachers can help by providing access to information and can support learning by providing instructions to make the tasks more manageable. It is argued that teachers should break down tasks to make the assignment more manageable, coaching students in formulating strategies to solve problems, and gradually releasing responsibility to the students (Blumenfeld et al. 1991).

## **Benefits and challenges of PBL**

There are various benefits associated with the PBL approach. With real-life application of principles learned from the course, PBL improves students' motivation and gives students a sense of satisfaction (Blumenfeld et al. 1991; Green 1998; Hadim & Esche 2002). Krajcik et al. (1999) note four benefits of PBL: students develop an integrated understanding of the materials; students learn to collaborate with each other in solving problems; it promotes independent learning as students assume greater responsibility for their learning; and, as PBL involves various types of tasks, it satisfies different learning styles of students.

PBL has the potential to enhance deep learning, as students have to acquire and apply concepts and principles in solving authentic problems; it also promotes critical and proactive thinking, since they have to formulate plans and evaluate solutions (Blumenfeld et al. 1991). In addition, PBL promotes active learning and improves knowledge retention and the learners' ability to apply prior knowledge in creating their final product (Felder et al. 2000). Besides enhancing students' participation in the learning process (active learning and self-learning), it also helps to improve communication and collaborative skills that are important in their later working life (Hadim & Esche 2002).

Despite the numerous benefits of the PBL approach, it presents several challenges for the teachers. These include the teachers' content knowledge, students' lack of experience in PBL and their preference for a traditionally structured approach that emphasizes passive learning; in addition, the organisation and administration of PBL can be very time-consuming (Anderson, Loviscek & Webb 2000; Frank, Lavy & Elata 2003; Helle, Tynjala & Olkinuora 2006).

It is important that projects be designed to sustain student motivation; thus, teachers must be supported by management in creating this type of learning task. Blumenfeld et al. (1991) propose a number of factors to be considered in project design to make sure the intended outcome is attainable. These include whether the students find the project to be interesting and worth doing, whether they have the competence to complete the project, and whether they focus on learning rather than on grades.

Due to the constraints on time and resources, the PBL project needs to be feasible and manageable for both teachers and students (Blumenfeld et al. 1991). Also, students who are inexperienced in the collaborative learning environment may find difficulties working in groups (Johnson & Johnson 1989). Consequently, the teacher should provide support for group work and conflict management to facilitate the process.

## **IMPLEMENTING PBL IN A PROPERTY COURSE**

The use of PBL in the Property program at the University of South Australia (UniSA) started in the 1970s; however, changes to the tertiary education sector in the 1990s led to severe cut backs and it was completely removed from the first year curriculum and replaced with a requirement for students to take a first year core curriculum of general business courses. After some years, and declining student satisfaction, it was decided to reintroduce a basic property course into the first semester of study, and the PBL approach was chosen to facilitate student engagement. *Introduction to Property and Valuation* is a first semester, first-year course for students in the Bachelor of Business (Property) program. This means that the course needs to meet a broad range of objectives additional to courses that are typically taken by students later in their program or from courses offered as electives. The course aims specifically to create a "road map" for future studies, to introduce students to tertiary education, to provide them with an environment in which they can develop strong peer groups, and to offer an opportunity for students to meet with members of the property profession and industry.

Staff members expect that students will gain significant graduate qualities from this course; in particular:

1. A significant body of knowledge which includes a broad introduction to the various legal, social, economic and physical aspects of property, as

well as basic valuation principles and practice together with an understanding of national and international valuation standards.

2. Students will begin their long road of discovery of how to be a lifelong learner, probably more so in this course than in any other first-year course taken in large classes across the business faculty. It should assist students to develop a more adult style of learning, showing them how to approach problems and challenges involved in study, and being able to meet challenges at a personal level, by drawing upon a wide range of experience and resources.
3. A significant development in the students' ability to become effective problem solvers. As the course is designed using a PBL approach, students are given a major assignment, which they work at progressively across the semester; this major assignment requires them to engage with the material. The assignment involves an individual real-world problem for each student, which requires them to find a property, describe and assess it against each of the major aspects of property and produce a simple valuation using at least two valuation approaches. This involves collecting primary and secondary data, analysing the data, and reporting it in a client-focused manner.
4. An improved ability to work as a member of a collaborative team to solve workshop problems and then transfer this to an autonomous environment to complete their own personal project.
5. A grasp of ethical and professional standards that are required in all personal interactions and in dealing with any data that they collect. They must also work within the necessary valuation standards and ethics.
6. Better skills in written and diagrammatic communication. In particular, we enhance their ability to draw plans and diagrams and communicate with a client using effective figures and charts in addition to improving professional written communication.
7. The comparison of local and international valuation standards and practice, which enables students to see an international perspective.

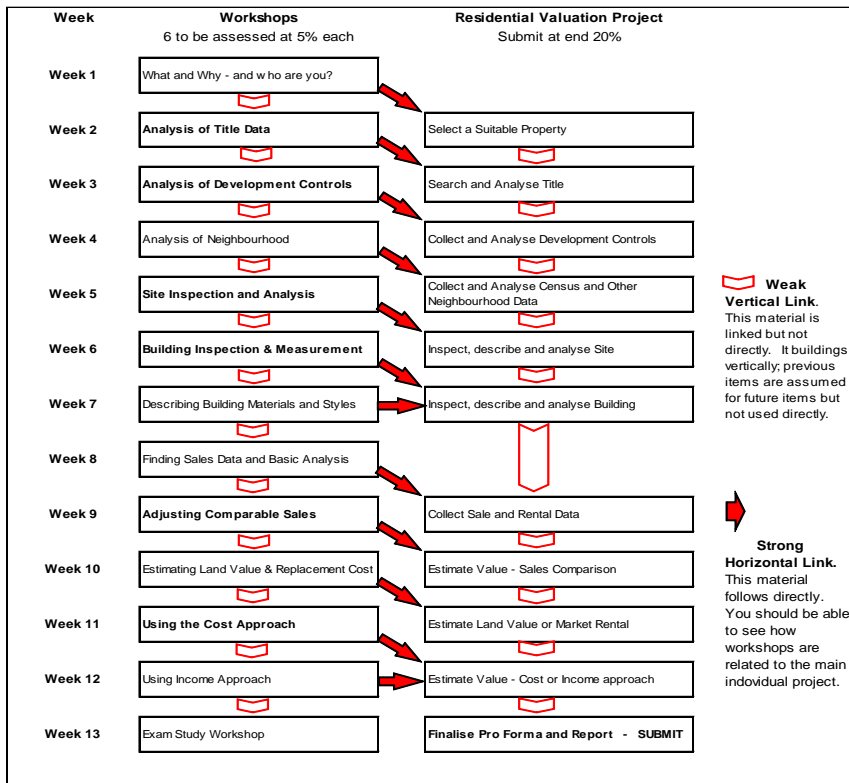
Three assessment items were designed to meet the above learning objectives: weekly workshop exercises, an individual valuation project, and a final examination. The weekly group exercises and the individual project were the two main assessments to expose students to experiential learning, while at the end of semester the final examination focused on valuation principles and concepts and solving simple problems.

The major valuation project required each student to focus on a different residential property; they were to collect and analyse their own data and reach their own conclusions. The project was broken down into a series of smaller tasks to make the overall project more manageable, but the final output was one client-focused project report which was presented at a professional standard and assessed as such. A series of lectures were delivered to provide an overview of all material, and this was supported by assigned reading material. The key element of the course was attendance at weekly workshops which required students to apply the principles and concepts covered in lectures to a series of simple problems that they tackled in groups (internally) or via discussion forums (externally). Collectively, each of these simple problems addressed some aspect of their individual assignment. One of the greatest advantages of the workshop assessment was that it provided almost immediate feedback to inform students of their mistakes and offered them ways to improve. The workshops also provided an opportunity for students to seek advice on their personal projects.

As illustrated in Figure 1, the weekly exercise was critical for student learning, as they learned how to apply theory to solve simple tasks in the workshops which in turn helped them to tackle their individual projects. For example, in Week 2's workshop, students were taught how to collect and analyse title data. Students were instructed in interpreting actual title details and how these could affect valuation. They were then required to identify the residential property for their own individual assignment, and conduct a title search and analysis of that property. In Week 3's workshop, they learned how to interpret development control data and the impact on valuation. After that, they were to collect and analyse the development controls for their own property. In other words, lessons were provided each week through the workshop exercise so that they were able to complete their main project smoothly.



**Figure 1: Study plan**



Besides introducing students to a university learning style, these exercises at the workshop helped students to develop a peer group of other property students which is not possible within the very large business core courses which are attended by students from other business programs. As well, staff hope that by students taking a personalised individual project, they will develop confidence in dealing with challenging situations, and they will be provided with an environment where they can adapt to a university style of education in a supportive environment. This is particularly important when students are faced with other first semester courses that are part of a broad Business core curriculum, where class sizes are 200 to 500 or more.

To enable the same approach for online (external) students, a significant web site has been established with weekly workshops that address the same issues. In some instances, these were the same as for internal students, but where the workshop included a field component they differed. In order for students to complete the

workshop tasks, there were online audio and video presentations as well as numerous animated examples. Because these students were disadvantaged by having zero face-to-face contact, the student discussion forum was very active, and prompt feedback from staff was crucial to engage them.

## EVALUATION OF PBL IMPLEMENTATION

This is an exploratory qualitative study where a case-study method was used to understand how students responded to PBL adopted in their first year of study (see Silverman 2000 and Yin 2003). This qualitative approach is complemented by standard university evaluations of the course and staff which enable comparison with other courses and programs.

For the initial qualitative study, two groups of students were involved: Group One consisted of 36 internal students and Group 2 consisted of 12 students who studied online (external). In each instance, an open-ended survey questionnaire was administered in week six. The texts of the questions are provided in Table 1.

At the end of the study period, the standard University Student Evaluation of Teaching (SET) was given to all students in the course and they could also choose to complete a Course Evaluation Instrument (CEI).

### Student evaluation survey questions (after 6 weeks)

This survey contained coded and open ended questions.

Question 1	Gender	Coded
Question 2	Age	Coded
Question 3	Student status (international – domestic)	Coded
Question 4	Student load (full or part time)	Coded
Question 5	Year in University (first year or other)	Coded
Question 6	Previous highest level of education	Coded
Question 7	Is English your first language?	Coded
Question 8	Are you working?	Coded
Question 9	If working - Number of working hours	Coded
Question 10	Name three best aspects of teaching that help to motivate and engage you in your study. (E.g. helpful feedback, the tutor makes the subject interesting, approachable, etc)	Open
Question 11	How do the aspects from Question 10 assist in motivating	Open

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	and engaging you in your study?	
Question 12	How do the aspects in Question 10 aid your transition to the university learning environment?	Open
Question 13	Name two things that you would like the tutor to do to assist you in this transition to university learning.	Open
Question 14	Overall, how satisfied are you with your learning experience in the tutorials/workshops?	Open
Question 15	Any other comments?	Coded

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### **Preliminary student survey (Week 6)**

Twenty-eight of the thirty-six internal students (78 percent response rate) provided written feedback, while only five of the twelve external students did (42 percent response rate). The lower response rate of the external students probably reflects the situation of the survey – in class for internals and online for external students. Most students who completed the survey made useful written comments in the open ended questions.

The preliminary survey allowed the students to give feedback at an early stage before any major assessment had been carried out, but after six workshops that involved in-class minor assessment, with feedback. It was considered that students had adequate experience of the course to comment on the implementation of PBL.

Timely, quality feedback is crucial for student engagement (Brown 2008; Rust 2003). The provision of helpful feedback was commented on by almost 50% of students (13/28 internals and 4/5 externals) and compared (positively) against other courses which are not based on a PBL approach. Comments from students included:

“It helps to receive feedback within in a short time period .... because it is more meaningful whilst topics are still fresh in your mind.” (External student)

“The tutor being helpful and providing feedback and support is important to help you settle in and understand expectations of university courses.” (External student)

And from a mature internal student:

“Positive feedback builds self esteem and interesting topics keep students focused.”

Internal students generally found that the style of study, particularly the workshops, made study more interesting and that group discussion helped both in learning and in adapting to a University style of study. On working in groups, internal students commented that it was “*more interesting especially in groups*” and that “*working in groups helps provide confidence*”. It also enhances discussion, helps to improve communication and collaborative skills (Hadim & Esche 2002), and brings a feeling of inclusiveness:

“... group work means you don’t have to do everything on your own.” (Internal student)

and

“... group work creates discussion about the topic.” (Internal student)

Students can easily identify that this course is taught using a different approach and seem to associate this as being more interesting:

“... this subject has a different approach to others and it seems to be much more interesting and fun. I look forward to this class every week.” (Internal student)

and

“You feel more motivated and engaged.” (Internal student)

In total, 15 of the 28 internal students made positive comments about the approach in terms of motivation, interest and supportive group work.

An important aspect of the use of PBL in this first semester, first year unit is the opportunity to allow students to see links with real world practice (Helle, Tynjala & Olkinuora 2006). Much of this occurs in workshops through practical exercises. These add a dimension to study that a typical lecture/tutorial situation does not allow. This leads to genuine excitement from students: “*Practical exercises are exciting*” and “*Practical exercises breakup the tut routine*”. Even at the early stage in the course (Week 6), students could see “real world” context in their study:

“Seeing how things work in the real world through practical exercises is a great way to learn as too often I feel that the learning at Uni is too far detached from how things are in reality.” (Internal Student)

Also, the teaching method:

“... allows me to learn at a good pace rather than cramming and gives me an ability to take a real interest in [the] topic ..... I’m able to understand how to apply the concepts.”

The student’s introduction to a “university style” of study in a less confrontational manner was also an important factor in course design. The survey conducted in Week 6 was deliberately designed to gather thoughts of new students about their adaptation to university study. The staff hoped that students would find the style to be challenging, but achievable with staff support (Blumenfeld et al. 1991). One internal student commented:

“... structure makes it similar to high school but with more of a Uni feel involving more freedom but increased responsibility.” (Internal Student)

Another noted:

“... encouragement to go through tough tasks makes it helpful to continue this University journey.”

In practice, for PBL to be effective, the students need to feel that staff are approachable and accessible (Blumenfeld et al. 1991), and this was mentioned by 12 of the 28 internal students. The interaction also helps to focus students on their study:

“Constant interaction between teachers and students means that the students always have to stay focused.” (Internal student)

For external students, this is achieved though online discussions and 4 out of 5 external students mentioned its importance:

“Prompt response to questions on discussion board are helpful, especially being external, the tutor is showing they are interested in your learning and outcomes.” (External student)

“.... was very helpful and answered queries or questions a lot quicker than other courses I have, this was great and the turnaround for feedback on assessments was also quick and I think this makes it more effective.” (External student).

Overall, the students were very satisfied with the course after six weeks; they could clearly identify the approach as being different from other courses and found the

group work in workshops and practical exercises to be helpful in learning as well as establishing their peer group. Many new students found it to be a more friendly way of introducing the greater responsibility involved with University learning, but much of this may have been because they found the staff to be approachable and accessible throughout the process.

### **Student evaluation of teaching (end of study period)**

At UniSA, student and course evaluation takes place automatically at the end of each study period. These evaluations enable the comparison of individual courses against groupings of other courses. The results in this paper are based on aggregation levels set by the University's system. Raw scores are not available.

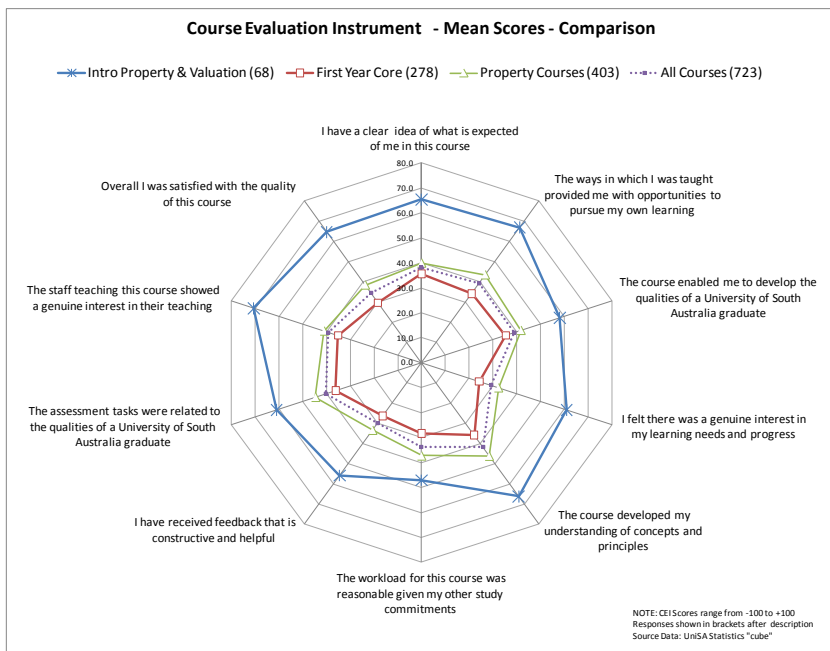
### **Course evaluation**

The course evaluation instrument (CEI) has ten questions with a 5-point Likert scale; the results of which are then "averaged" to create a scale from -100 to +100 with 0 being satisfactory. They can be compared against other aggregated groups of courses. The statistics available from the University statistics cube require a minimum number of responses in each "cell". As a result, the results needed to be aggregated for 2007 to 2009, the three years the new course has run. Only those responses from students who studied within the Bachelor of Business (Property) program were included. This is particularly important when comparing results to the first year business core courses which involve large student numbers over many programs. The *Introduction to Property and Valuation* course is compared against the aggregated score for all first year business core courses, the aggregated score for all property courses, and the aggregated score for all courses taken by Property students where the number of responses was greater than 5. The results of this comparison are shown in Figure 2.

The numbers of responses in each category are indicated in brackets. When comparing the PBL-based *Introduction to Property and Valuation* to courses that students study at the same time (the first year business core courses that are taught without a PBL approach), there is generally a much higher level of satisfaction for the PBL course for all questions. This is also the case when comparing the PBL course to the aggregate of all property courses. Responses are generally in the 50 to 70 range on the -100 to +100 scale and this far exceeds student satisfaction across all property courses. The question with the closest level of satisfaction to other course relates to workload, suggesting that students find workload to be an issue across all courses, but that the PBL approach probably tends to lead to a higher level of workload, especially on a weekly basis. Even so, while it is the lowest of the satisfaction levels and the workload is considerable, the nature of the work seems to suggest that students are prepared to do more work on this course without greatly affecting the overall level of satisfaction. The experience with these surveys is that students who are generally satisfied or very satisfied with the course will tend to give higher scores across the board and vice-versa; however, some patterns do emerge in the responses. Students' responses to the two questions regarding staff teaching ('staff teaching showed a

genuine interest' and 'I felt there was a genuine interest in my learning needs and progress') were noticeably better in the PBL-based course than in the comparison courses. This is most likely due to the teaching style and application of experiential teaching through PBL. The results of the CEI show that the use of PBL certainly does not have a detrimental effect on student satisfaction and that the style of course seems to provide positive outcomes and high levels of satisfaction with the course. This end of study period quantitative survey supports the qualitative responses from the survey taken at Week 6 and comments received earlier.

**Figure 2: Course evaluation instrument (CEI) - comparative mean scores and response numbers**



## Student evaluation of staff

As with the CEI, the Student Evaluation of Teaching (SET) has 10 questions with a 5-point Likert scale which are then "averaged" to create a scale from -100 to +100 with 0 being satisfactory. However, there are different levels of aggregation for comparison and it is not possible to isolate the results from particular programs of students.

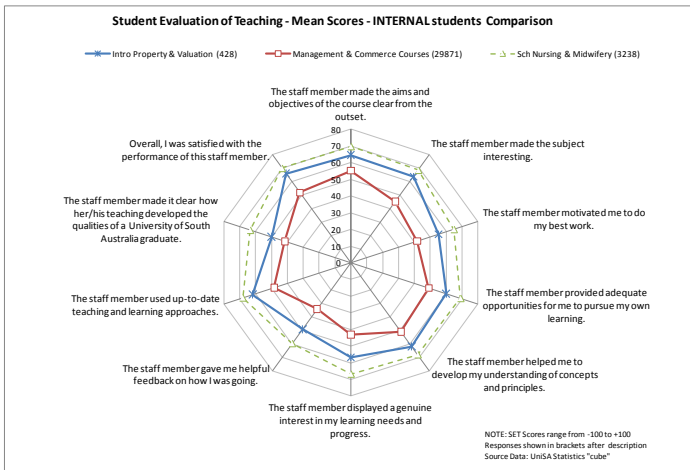
The CEI and SET can show different levels of satisfaction with a course. Students may be satisfied with the content and outcomes from a course (CEI), but less happy with the teaching style of individual staff (SET). By comparison, students can find individual staff to be good teachers, but the content and outcomes of the course to be less worthwhile. Also, the experience between internal and external students is often different in the SET because of the different challenge in teaching students in these two different modes. Courses that have high experiential components, such as PBL, are often very difficult for external students who can't receive the in-class assistance.

For the SET, it is only possible to look at mean levels of responses at the course level (this includes all students, not just property students) and the comparisons are more general. In this instance, the chosen comparisons are against the aggregate score for all Management and Commerce courses; this includes all property courses at UniSA and most of the courses taken in the property program. For this study, a second comparison is made against the aggregate score for courses in the School of Nursing and Midwifery; the School is well-recognised both within the University and externally as an excellent provider of quality experiential learning incorporating PBL. It is useful to compare a new PBL course to an established quality provider of PBL. Results for internal and external students are shown separately as Figures 3 and 4. Figure 3 shows that staff in *Introduction to Property and Valuation* receive higher mean SET scores than the aggregate of Management and Commerce courses for all questions, but fall short of the scores from the more experienced Nursing and Midwifery staff, who will generally have been delivering PBL courses for a much longer period of time.

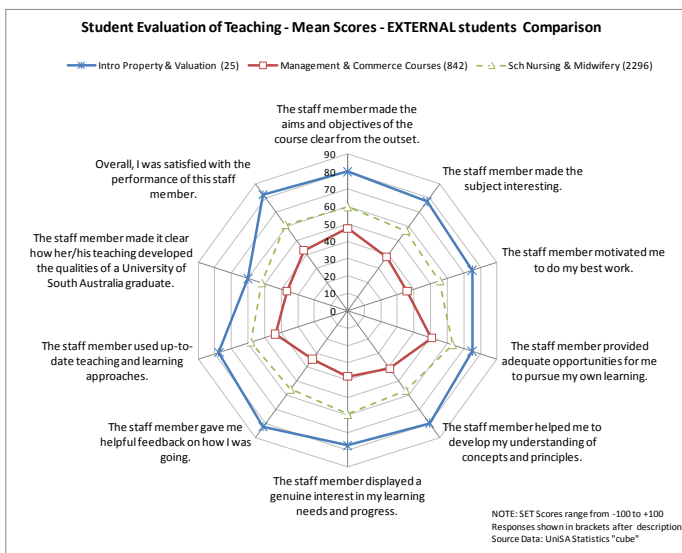
The comparison of these results to those of external students provides some interesting insights. In Figure 4, it is obvious that scores in management and commerce and nursing and midwifery are significantly lower for external students than for the equivalent internals. Generally, for both of these aggregated scores, the values are around 10 points lower for external students compared to internal students, although the reduction for the question relating to helpful feedback is only marginally lower. However, in the course *Introduction to Property and Valuation*, the external scores are 10 to 15 points higher than for internal students. One possible explanation for this may be the low response rate; however, while the external response rate was lower than the internal response rate across all the comparison courses, the sample sizes still reflect response rates of around 30-50% of active students at the end of each study period. What is more likely is that external students are responding positively to the high level of online development and support that occurs in *Introduction to Property and Valuation*, primarily to support the PBL approach. These scores support the very positive feedback from the qualitative results in the Week 6 survey. Certainly, the results show that it is possible to implement an experimental course incorporating PBL in an external context and have a high level of student satisfaction with the teaching.



**Figure 3: Student evaluation of teaching (SET) comparative mean scores - internal students**



**Figure 4: Student Evaluation of Teaching (SET) comparative mean scores - external students**



## Staff reflection on the course

There were five teaching staff involved over the period of 2007-2009; and three to four academics were required for each study period due to the sheer number of workshops and coordination of this course. Most of the scaffolding took place in the weekly 2-hour workshop; this was mainly to assist students in solving simple problems, while preparing them to work on their own individual assignments later on. Two of the academics are new with little experience in teaching, however armed with a wealth of industry experience; this fits well with the nature of PBL.

Staff teaching *Introduction to Property and Valuation* have found that the introduction of PBL has provided significant rewards, both in terms of the academic achievement of students and the personal satisfaction from using this approach. The adoption of PBL has brought many of the anticipated advantages, such as more active learning and evidence of deeper understanding of the material. Students seem more motivated and developed a broad range of qualities in addition to acquiring knowledge. Many of these advantages manifest themselves in the attitudes and behaviour of the students. The following points of interest were elicited from staff, upon their reflection of teaching this course.

- Student attendance and participation in workshops is a feature of the course and this is probably due to the use of PBL. In most cases, attendance is nearly 100%, and students will often apologise for missing workshops. This compares favourably with other courses, where staff report poor tutorial attendance.
- Students appear to have developed a significant respect for staff and develop an expectation that the outcome of their performance (particularly the final grade) is due to their own attitude and effort. As examples of this, we find that having discussed poor performances with students they inevitably accept responsibility for their poor result, do not request formal re-marks and accept that their performance is inadequate. Students who re-took the course (having failed to meet the satisfactory standard the previous year) invariably did well and continued through the remainder of the programme with significant success. These outcomes are considered to be more significant than students simply achieving high grades, which could simply be the result of low standards.
- In all classes and on the external student discussion board, there is a significant “buzz”. Students appear to genuinely enjoy engaging with the material, and this is reflected in their evaluation comments. It is significant that students find the course to be both challenging and time-consuming, yet still provide positive feedback on all aspects of the course.

- PBL seems to be an important approach considering the changes in student attitudes, which seem to have emerged with the arrival of “Gen-Y” students at university. Students appear to require more motivation and inspiration in order to maintain focus and find that learning in group environments provides a significant advantage over self-study. Students’ commitment to study has a lower priority than in the past, and social activities and work seem to be more important. Given these circumstances, it is easy for students to decide not to attend class, and not to engage with the material. The inevitable outcome is that students will fail courses and leave the tertiary education system. By engaging students through PBL, we find that the attrition rate has decreased, particularly in the long term, and students more rapidly adapt to a university style of study and accept responsibility for their own outcomes.

While there are these significant advantages in adopting a PBL approach, there are also a number of challenges which need to be considered before implementing such an approach.

- PBL will inevitably require heavier workloads than the traditional lecture-tutorial format and this will involve more continuous development of materials and projects (see Frank, Lavy & Elata 2003; Helle, Tynjala & Olkinuora 2006).
- This situation will be compounded where students are given individualised projects, and where engagement of students does not occur in the classroom, such as with external and online delivery.
- PBL is dangerous to implement without suitably qualified staff, with a significant content knowledge and real world experience. The use of teaching assistants and graduate students, who lacked real world experience, may not be appropriate. In many circumstances, the effective PBL teacher has to “think on their feet” and will need to be able to explain how to solve problems in a real world context, in a number of different ways, without time for preparation.
- In addition to content knowledge, teachers require understanding and experience of how to deliver PBL. It is not sufficient to “talk at students” and then set them a project task. Teachers need to learn how to engage students in the classroom, without simply telling them what to do. In the same way, they cannot simply give them a written task and expect them to work at it on their own. The delicate balance in deciding when to intervene takes experience as does the role of the teaching staff as adviser for the student discovery process. Students may also find the method to be unfamiliar and their ability to learn through PBL will increase with their experience of the approach.

- Using a PBL approach for external and online students requires the development of significant materials, which specifically link the project to the materials they need to engage with. The experience with this course is that a week by week teaching format does not work effectively with most online students because they lack the weekly structure of classes. External students need to be able to engage with the material in different ways, and at different levels. This requires not only a significant volume of material, but also careful consideration about how they are linked and accessed by students. The need to communicate with students on a regular basis also has considerable workload implications. Staff endeavouring to introduce a PBL approach with external or online students need to accept that it is more time-consuming than dealing with students in the classroom.
- In a typical university context, where resources are scarce and there are pressures on staff to produce high level research outputs as well as quality teaching, it is essential that university management support initiatives such as PBL in order for them to be successful (Blumenfeld et al. 1991). It is very easy for University management to suggest that teaching needs to improve through better student engagement and motivation and by implementing practice based and experiential teaching. It is a different matter for management to create an environment where this can take place. PBL is a method that can provide these outcomes in certain circumstances. However, there are significant constraints and risks implicit in the introduction of such methods, and management can not simply expect that staff can move from a traditional teaching style to a PBL style without increases in teaching resources, better staff mentoring and the occasional mishap.

## CONCLUSIONS

PBL is a teaching approach that has significant potential to transform teaching from a dull and mundane process of passive learning to one where students actively engage with the material, resulting in deeper learning and significant other outcomes. The use of PBL is re-emerging as a teaching approach, as universities strive to incorporate experiential learning into a broader range of university programs. The experience of the introduction of PBL to an introductory property course at UniSA has resulted in many positive outcomes for students and staff; however, there remain challenges that we have to address to continue its success as a teaching approach.

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