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FOSTERING REAL-WORLD LEARNING: EMBEDDING AND EVALUATING TEAMWORK IN A CAPSTONE SUBJECT (IN REAL ESTATE)

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ABSTRACT

Purpose: This paper provides a case study of how the process of student teamwork has been embedded and evaluated for a capstone subject in Real Estate undertaken in a studio environment, in an undergraduate degree. It draws on the experiences of the final-year subject 'Property Analysis Studio' in 2010 and 2011. It describes the University's underlying concept of a capstone, provides a literature review and an overview of the subject together with the methods that were introduced to embed teamwork into the delivery and assessment processes. It sets out the changes that were made in the second year to improve upon the first year's outcomes. There is a considerable body of research on group learning in higher education which indicates that students are often resistant to group work. The evidence from our research indicates that the evolving development of the Capstone subject, over two years, has provided a positive and sound basis for embedding and evaluating teamwork. The case study represents an original contribution to research on subject development and evaluation, group work, cooperative learning and collaborative learning, in Real Estate education at undergraduate level.

Keywords: Higher Education, Capstone, Studio Based Learning, Group Work, Peer Learning, Student Evaluation.

INTRODUCTION

This paper provides a case study of how the process of student teamwork has been embedded and evaluated for a capstone subject in Real Estate, in an undergraduate degree. It draws on the experiences of the final-year subject 'Property Analysis Studio' in the Property Major of the Bachelor of Environment undergraduate degree (Property Major) that is delivered within the Faculty of Architecture, Building and Planning (the Faculty) at the University of Melbourne.

This paper outlines the changes that have occurred in the University's education program over the last seven years that has resulted in the introduction of what is widely known as the new generation 'Melbourne Model'. It describes how the design of the Melbourne Model undergraduate degrees programs introduced capstone subjects into the final semester of the degrees for the purpose of "both disciplinary and cohort coherence and a bridge between undergraduate experience and what lies beyond" (The Melbourne Model report of the Curriculum Commission 2006, p.7).

At the heart of the concept of an effective capstone subject is student group work. This paper describes the historic importance that the Faculty attributes to the concept and use of studio teaching as a primary pedagogical pathway involving student teamwork, though, until the introduction of the capstone, not in the teaching of Real Estate subjects.

A detailed literature review examines capstones undertaken in a wide variety of degrees and programs throughout the world, all of which have incorporated group work as the means by which students learn and are assessed. However, it is significant that none of the literature examined refers to programs related to Real Estate.

This leads to a discussion on the inaugural year's capstone subject, the inclusions that were made to embed and evaluate teamwork, with reference to the Study Guide and other documentation provided to students, in addition to management of the studios by the Delivery Team.

Results from student course evaluation surveys for 2010 are examined. This leads to a description of the changes that were adopted for the 2011 capstone to improve relevant metrics and in particular group work experience.

Finally, suggestions are made to where further research could be directed on these matters.

THE MELBOURNE MODEL

In late 2005 the University adopted a strategy called "Growing Esteem". A new metaphor was adopted by the University, 'Triple Helix' to provide a visual representation of its core activities, articulating the importance of the relationship between learning and teaching, research and external engagement, all supported by the institution's administrative capacities.

The traditional University educational program consisting of large numbers of undergraduate degrees, combined degrees and a series of graduate programs was replaced with six undergraduate degrees and a series of graduate programs. This new combination was designed to provide undergraduates with a sound 'grounding' in academic discipline and breadth and then the potential to advance to either professional masters' degrees or research training. The aim was to provide students with "greater global mobility and multiple points of entry to courses" (University of Melbourne "Growing Esteem" 2010).

The Melbourne Model's curriculum was introduced in 2008. In doing so, the University perceived that students entered a workplace and world that changes constantly and that their graduates require relevant knowledge, flexibility and adaptability.

(a) The Bachelor of Environment (Property Major) (B.Env (Prop))

Students that choose Property as their major within their undergraduate degree (Bachelor of Environments) are required to undertake twenty-four subjects in total, of which nine are required to be taken as core property related units including the capstone subject. The balance of subjects is chosen as breadth or elective subjects. The capstone is restricted to students majoring in Property, though a number of the core property subjects may be taken as 'breadth' by students undertaking different majors from within the Faculty or from other faculties such as the Faculty of Business and Economics.

(b) The 'Melbourne' Capstone

Holdsworth et al (2009, p. 2), in their University of Melbourne guide on Capstones, wrote that the term 'capstone' "is widely used to describe a course or experience that provides opportunities for a student to apply the knowledge gained through their undergraduate degree… [and involves] integrating graduate capabilities and employability skills, and occurs usually in the final year of an undergraduate degree". Key features of the capstone include "…freestanding and authentic or 'real-life', out of class events as components of existing courses, and skill development leading to work- readiness and / or entry to graduate studies" (Holdsworth et al. 2009, p. 2).

Holdsworth et al (2009, p. 3) refer to Levine (in Gardner et al), who described the importance of making the senior year of a degree "special" and that the capstone experience marked the final year as a transition or conclusion, and "an opportunity to provide a retrospective and prospective experience for students", and also used the terms integration, breadth, application and transition to define the realities of a capstone experience.

Thus, under the Melbourne Model, capstone subjects are understood as offering "both disciplinary and cohort coherence and a bridge between undergraduate experience and what lies beyond" (The Melbourne Model report of the Curriculum Commission 2006, p. 7).

The University describes five graduate attributes that it hopes their graduates acquire (University of Melbourne, 2007). Out of these, Holdsworth et al (2009) describe the common generic skills related to those attributes that graduates should acquire in their undergraduate degree, to include "problem solving skills, critical thinking skills, analytical skills, teamwork skills, effective oral and written communication skills, and time management skills". They state that, in effect, there is a close compatibility between these skills and those that employers have named as "desired attributes in potential employee graduates" (p. 5).

Amongst others, Holdsworth et al (2009) suggest that "Problem Based Learning" and "Project Based Learning" are two ways in which capstone experiences can be integrated into the curriculum. The former provides the opportunity to assess students on their ability to deal with a problem solving process which can be "hypothetical in execution but may be a 'real world' problem" (Holdsworth et al. 2009). The latter, requires students to work with specific project content to a specific goal and timeline that more closely mirrors the workplace environment (Holdsworth et al. 2009).

(c) Considerations in designing and implementing Melbourne capstone experiences

In terms of student learning, Holdsworth et al (2009) indicates the importance of building and assessing new skills, which requires teaching staff to offer guidance, time and patience. They point out that student's previous educational experiences may not have prepared them for matters such as being a member of a team or leading a class discussion as well as the concerns that students may have about working in teams, which might include that a team is "not evenly balanced with workload, knowledge, research, presentation and preparation skills" (Holdsworth et al 2009).

According to Holdsworth et al (2009), in terms of teaching environment, students need to understand and experiment with making mistakes in their thinking and assessment tasks. Thus the capstone experiences can provide "a safe and secure environment in which to do this".

They indicate the importance of development of team spirit, commitment and work ethos, team processes and outputs, all of which are "integral" to teamwork and should be considered when developing the assessment process.

STUDIO-TEACHING MODEL IN FACULTY

Studio teaching has been utilized as the major mode of delivery of teaching and learning activities for the design orientated disciplines in the Faculty, namely architecture, landscape architecture and urban design.

Before the introduction of the Melbourne Model, the studio based approach had not been used as a means of delivering Real Estate subjects. Rather, they were taught using the traditional lecture and tutorial method.

Wu and Sintusingha (2010, p. 2) indicate that there has been recognition from the past that "raising and building discipline / professional competence are one of the main strengths of studio teaching …which is aligned with the objective of capstone subjects".

LITERATURE REVIEW

(a) Purpose of Capstone

Based on a comprehensive reading of the literature, capstones are used by a wide range of disciplines around the globe as well as in Australia, as a culminating pedagogical final year experience in undergraduate programs. Examples of disciplines in which capstones are used include sociology, civil and aerospace engineering, medicine, economics, business, marketing, information technology, psychology, architecture and law.

Reasons given in the literature for incorporation of capstone into programs include using them as a source of feedback on the quality of teaching (Black & Hundley 2004), effectiveness of a degree program (Wagenaar 1993) and the extent to which a university's goals are being met (Henscheid 2000).

Berheide (2000, p. 7) indicates that many university departments use their capstone to assess their majors in a variety of ways, ranging from "rudimentary to rigorous". In addition, she came to the view that capstone "products" are also "authentic embedded assessment methods, since they are created as part of normal classroom activities, are an efficient assessment method, since they take advantage of an existing source of data and provide a venue for assessing how successful a curriculum is in achieving its learning objectives" (Berheide 2000, p. 30).

Sum and Light (2010, p. 528) believe that their capstone has proven to be "an efficient and effective vehicle to achieve the ultimate objective for assessment in higher education: student learning".

Sullivan and Thomas (2007), in discussing the capstone in their undergraduate psychology program, state that while passing specific courses provides some evidence of whether students have achieved the desired learning outcomes (of an undergraduate degree), their faculty was of the view that "a developmentally structured program demands a culminating senior experience to assess whether students have attained the desired knowledge, skills and abilities", and that a successful assessment of student learning outcomes requires clear evidence of their achievement at the individual student level and the academic program level, and that senior capstone is an effective way to assess student learning outcomes.

Hanna and Sullivan (2005, p. 62) also concluded that the design capstone undertaken by their civil engineering students was a good evaluator of their undergraduate curriculum and that student strengths and weaknesses were clearly defined by it.

Goold (2003, p. 26) claims that the "aims, objectives and intended outcomes" of their capstone are similar to those reported in equivalent (Information Technology undergraduate) degree programmes in the literature. Goold (2003, p. 26) summarises these to be a capstone that brings together all of the major concepts discussed during the preceding years, that demonstrate skills that are implicit in earlier courses, such as teamwork, conflict resolution, negotiation, planning and time management, and presentation kills.

(b) Benefits of Group Work

According to Mello (1993, p. 258), the main benefits derived from group work are:

a. Group work allows the instructor to develop more comprehensive assignments;

b. The students gain an insight into group dynamics and processes;

c. The students develop their interpersonal skills;

d. The students are exposed to the viewpoints of other group members ; and

e. The students are further prepared for the real world.

(c) Use of Group Work in Capstones

McKenzie et al (cited in Mills 2007, p. 2) report on a survey of 274 capstone engineering design courses in the United States, with 119 responses, indicating a significant shift away from projects undertaken by individual students, with only 10% of respondents indicated that students worked on individual projects, 88% indicated that students worked in teams, and 2% reporting their capstone was "in transition".

(d) Individual versus Team Grading

Group work was used in each of the capstones discussed in the journal articles examined for this paper. There are no examples of "individual projects" discussed.

Several papers discuss the challenges associated with assessment of group work and in particular awarding individual grades to students. Mills (2007, p. 1), posed the question that although "clearly the inputs and learning outcomes of individual students will be different and could be graded differently… this must be weighed against the fact that in professional practice, the result of a company or a project team are assessed as a whole by both external stakeholders and company management, and will inevitably become subjective". Mills (2007, p. 1) concludes that an "acceptable balance between these components can be a difficult problem."

Mills (2007, p. 2) describes the assessment practices "reported for the (group) projects" in McKenzie's study (2004), which tended to contain significant individual components and be focused primarily on a written or product outcome.

Citing McKenzie et al's (2004) survey, Mills (2007, p. 2) reports that " oral and final written reports were the assessment means adopted by 90% of projects, an increasing number also used intermediate written reports and 68%... reported using peer / and or self-assessment". Other assessment methods revealed in McKenzie et al (2004) included "student surveys, student portfolios, focus groups or interviews, self-reflection, journal or papers, logbooks and others" (Mills 2007, p. 2).

With regard to grade assignment, 71% of respondents to McKenzie's survey reported that grades in the capstone design courses were "individually assigned based on integrated individual performance" while 9% reported that the final grades "were the same for all team members based on integrated team performance", and 19% reported that "their grading practice was a combination of these approaches" (Mills 2007, p.2).

Dutson et al. (1997, p. 19) writes that "the very nature of design courses often leads to subjective evaluations" and "(t)he individual effort of a student on a project team is often difficult to identify and reward".

Mills (2007 p.8) concludes that the assessment of a project "should be focused on the full range of skills such as teamwork, communications, life-long learning, understanding of social, environmental and economic contexts and so on as well as technical skills".

(e) Ability to Work in Teams

Goold (2003, p. 27) describes how her faculty prepares students for their culminating project capstone in Information Technology. Students undertake two earlier courses that support the process aspect of the capstone. The first of these is *Concepts and Practice for Software Engineering*, the outcomes for which Goold (2003, p. 27) reports are that students achieve improvements in their presentation, communication and interpersonal skills and achieve an "in-depth knowledge of working in groups from both a theoretical and practical perspective". In the second, *Project Management and Information Systems*, Goold (2003, p. 27) reports that students have acquired knowledge about projects and how they should be managed, thus providing students with the "tools to be able to plan, monitor and control a project effectively".

(f) Active Team Learning

Active learning generally refers to 'instructional activities involving students in doing things and thinking about what they are doing" (Bonwell & Eison 1991, p.1).

Monk-Turner and Payne (2005, p. 166) suggest that there are three types of active learning strategies: collaborative learning, cooperative learning and group practice. Colbeck, Campbell and Bjorklund (2000, p. 61) describe

collaborative learning as a "variety of instructional practices that encourage students to work together as they apply course material to answer questions, solve problems, or create a project".

Millis and Cottell (cited in Monk-Turner & Payne 2005, p. 166) report that cooperative learning refers to "a more structured, hence more focused, form of collaborative learning".

Monk-Turner and Payne (2005, p. 166), describe team based learning as being designed for larger and smaller classes, and "entails strategies in which teams are used as a central pedagogical mechanism throughout an entire course". Monk-Turner and Payne (2005, p. 167) cite research into team based learning by Michaelsen, Knight and Fink (2002), who advocate "team grading" as "critical" and "highly recommend peer assessment".

Monk-Turner and Payne (2005, p. 167) point out that "(w)hile there is debate about how these learning strategies relate, one commonality between them is that group work is consistently used in each of them".

Renzulli (2000, p. 250) believes that group work gives students the opportunity to receive valuable peer and instructor feedback, to work on in-depth rather than "cursory" assignments, and also learn how to work in teams.

Foot and Howe (cited in Walker 2001, p. 33), in drawing a distinction between collaborative and cooperative learning, state that in collaborative learning "group members work together and acquire knowledge through struggle to maintain equilibrium, a process involving the reconciliation of conflict between new and previously owned beliefs", but that in cooperative learning, students work in groups towards the attainment of some "superordinate goal", in which each member of the group has responsibility for a different sub-goal and carries their work out independently, reverting to the group only at the end to produce the final product.

Walker (2001, p.34) advocates the need for students to be aware of the differences between the two types of learning and the need to use a combination of the two by "carrying out the task co-operatively but ensuring enough time is allocated for the collaborative activities of feedback and discussions".

Johnson and Johnson (cited in Colbeck, Campbell & Bjorklund 2000, p. 62) state that cooperative learning theory suggests that faculty must structure group learning activities so that students will interact interdependently. Johnson, Johnson and Smith (cited in Colbeck, Campbell & Bjorklund 2000, p. 62), report that positive interdependence exists when students believe all members of the group must succeed, and that their success depends on coordination of group members' efforts and that as a result of positive interdependence, students should facilitate each others' learning.

(g) Support for Students

Springer, Stanne and Donovan (cited by Colbeck, Campbell & Bjorklund 2000, p. 61) report that their research conducted with college students indicated that participation in group projects promotes students' academic achievement, persistence in college, and positive attitudes about learning.

Bosworth and Hamilton (cited in Colbeck, Campbell & Bjorklund 2000, p. 61) claim that students are more likely to attain positive outcomes from group experiences when instructors provide students with information and guidance about how to work together.

Johnson and Johnson, and Slavin (cited by Colbeck, Campbell & Bjorklund 2000, p. 61), describe the types of guidance instructors should include instruction on interpersonal skills, encouraging positive interdependence among students, making individual goal achievement dependent upon attainment of group goals, and encouraging students to reflect on the group process.

Colbeck, Campbell and Bjorklund (2000, p. 78) reported that prior influences such as the amount of instruction that the students received and the degree of group work experience that they had previously undertaken affected the amount of interdependency constructed between the group members. They also reported that, even though instructors had assigned a common project to each team and gave the same mark to all team members, "few teams united around a common goal". This result somewhat contradicts Johnson and Johnson (cited by Colbeck, Campbell

and Bjorklund 2000, p. 62), who suggested that instructors could encourage interdependence by assigning one project to a group, giving a single grade to all group members for the project, assigning students different "process roles" but also ensuring that each group member makes a separate contribution.

In the same way as students may not be prepared to engage in group projects, Colbeck, Campbell and Bjorklund (2000, p. 61) inform us that instructors may not be trained how to create, direct, and implement group projects in their courses. However, their interviews of students revealed that they believed they had "learned valuable professional skills" from the opportunity to "figure-out" for themselves how to work cooperatively with their peers to solve problems, and were not solely dependent on their instructors for guidance about how to work in groups, having developed insights about how to work collaboratively from prior group experiences, both positive and negative (Colbeck, Campbell & Bjorklund 2000, pp. 77-78).

However, Goold (2003, p. 29) reported that in the case of their capstone at an Australian university, groups were "essentially self-managed and conflict resolution and supervisor involvement in group development and activities were kept to a minimum".

(h) Concerns Raised by Students in regard to Group Work

The literature reflects a number of common themes when it comes to drawbacks observed by teachers. These are reflected in the concerns reported by students.

Mello (1993) refers to interpersonal conflict within the group, which can impact on performance and completion. Daly and Worrel (1999), refer to "slackers" who wish to obtain the benefits of a good assessment due to others' efforts. Colbeck, Campbell and Bjorklund (2000, p. 71-73) reported "that group rewards based on a single group product may set up conditions where one or two members do most of the work" and "many students did talk about two distinct roles that did evolve in their teams: leader and slacker... [and] the potential for slacking increased as team size increased".

(i) Establishment of Groups

In regard to how groups should be established, an examination of the literature indicates a wide variety of views (Goold 2003; Hanna & Sullivan 2005; Walker 2001; Livermore 2010). These vary from student self-selection to instructors allocating individuals to groups using various methods, including regard for work experience, individual student skills, or even using playing cards.

(j) What Students feel are the Benefits of their Capstone

Student feedback in the literature details a number of benefits that students perceive a capstone provides.

Hanna and Sullivan (2005, p. 62) report positive student feedback on their faculty's engineering design capstone. In particular, students found it valuable to work in groups in conjunction with practicing professionals, and to be able to apply their prior knowledge to solve real-world problems. This included dealing with the inherent constraints and complications of a real-world project, sharing ideas with a person who has professional experience, including gaining insights on how a practitioner would solve a problem with which they are grappling. Hanna & Sullivan (2005, p. 62) point out that "(t)he professional adds credibility to the process because they (sic) know what tasks need to be performed".

Colbeck, Campbell and Bjorklund (2001, p. 74) reported that students, responding to the question how group work would contribute to their future careers (as engineers), focused on communication, conflict management and problem-solving skills.

A sample of the students' reported responses are worth repeating here:

As contribution to their career: (pp. 74 & 75):

a. "Teamwork, solving problems, and that there is not a single answer in the book";

b. "communication – how to get along with people";

c. "No matter how knowledgeable we are, if we can't together, the project won't go";

d. "…key is to convince others your idea is correct" – "groups are about argument";

e. "The communication skills you develop will be what get you through";

As contribution to conflict management skills: (pp. 75 & 76):

a. "While not enjoying conflict, recognizing that contradictory opinions might actually help the team though some see conflict as a matter of egos";

b. "…groups are about listening";

c. "Made me realise you don't know everything";

As contribution to problem solving skills: (pp. 76 & 77):

a. Enhance their problem solving skills;

b. Group brainstorming or combining individual solutions;

c. Students need to be open minded for successful brainstorming "because some students might get hurt if their ideas are not used."

(k) Generation "Y" students

Coates (cited in Livermore 2010, p. 59) describes Generation "Y" as having been used to a "highly structured and adult-supervised environment but may also lack the interactional and conflict resolution skills possessed by other generational groups". This leads to their preference for a more team based environment with structure and the opportunity for interaction.

Suggesting that Generation 'Y' want learning "to be entertaining and fun, and become quickly bored in a learning environment that is not highly active and interactive (Livermore, 2010, p. 60).

Coates referring to Yan (2006) (cited in Livermore 2010, p. 60) also suggests that the impact on Generation "Y" of having been raised in a "truly" digital age, with greater exposure to media influences than prior generations has created a link to an increased likelihood of "impulsive and restless behaviour".

DISCUSSION ON PROPERTY CAPSTONE – PROPERTY ANALYSIS STUDIO

In deciding upon and preparing the scope of the inaugural 2010 for the Property major, the subject coordinator (also acting s studio leader) took into account, amongst other matters, the following:

a. The number of students enrolled in the subject, being 42;
b. The critical importance of embedding teamwork into the semester ('process and product' of the work);

c. The scope of the subject would contain the correct amount of work that students could complete in one semester;
d. Student assessment would reflect both group work and individual attainment;
e. Any project that groups would undertake would, as far as possible, reflect a "real world" circumstance;
f. The range of "real world" skills that the subject intended the students to acquire would be comprehensive and provide tacit value for them in seeking employment and/or progressing to a masters degree;
g. The assessment would be continuous throughout the semester duration and cumulative, thus attempting to create the atmosphere, as in "real-life" projects, of practitioners working together as a team, irrespective of personal or professional differences;
h. Providing an atmosphere of "pressure" and excitement for the students so that they might experience, as closely as possible, the real-life risks experienced in commercial business;
i. Provision of appropriate teaching spaces and other physical resources for a studio;
j. Provision of appropriate academic and other teaching personnel to manage the student cohort;
k. Provision of appropriate class time so that students could develop positive relationships with their "group members", and actually work together to achieve the required assessment hurdles.

(a) Course Objectives

The subject was designed to act as a vehicle to develop students' skills in the area of complex property transactions. It used the framework of a staged development feasibility study of a proposed property development project as the vehicle to integrate a broad range of property related applications, including but not limited to:

- Corporate business strategy;
- Site analysis;
- Urban planning
- Market and marketability analysis;
- Development finance;
- Financial feasibility;
- Sensitivity analysis;
- Risk analysis;
- Communication and presentation.

Students were required to develop the skills and techniques necessary to analyse and evaluate property development opportunities.

(b) Course Structure

The subject was designed around the framework of students forming into groups of 4, each group required to:

a. Source three large (3,000 m2 approximately) potential development sites in the central business district (CBD) of Melbourne City, or within 8 kilometres of the CBD, being the inner suburbs of Melbourne;
b. Prepare a "high level" business case, based on planning, market research and site analysis considerations, for each of the sites, and provide an oral presentation in Week 4 to a "board of directors" and the class of their findings and a recommendation of which site to proceed with to the next stage of analysis;
c. Prepare a more comprehensive feasibility of three development options for the chosen site, including an indicative "static" financial feasibility, and provide an oral presentation in Week 8 to a "board of directors" and the class of their findings and a recommendation of which development to proceed with to the next stage of analysis;
d. Prepare a detailed feasibility report to include business objective and financial hurdles setting, site analysis, market and marketability analysis, detailed financial feasibility based upon cash flow modelling, sensitivity and risk analysis, and recommendations to the "board of directors" on how next to proceed including the reasons for the recommendations; and provide an oral presentation in the final Week 12 to the "board of directors" and the class of their findings;

e. That the majority of the group work would be undertaken during the two three hour weekly studio sessions, with the reasonable expectation that other time would be required in group activities outside those hours.

(c) Assessment

The assessment for the subject in 2010 was comprised of two components:

1. Part A – Group Assessment Task (60%) being the staged preparation and presentation of the feasibility report comprising:

    (i) Feasibility Report – 40%
    (ii) First Oral Presentation – pass/fail
    (iii) Second Oral Presentation – 10%
    (iv) Third Oral Presentation – 10%

2. Part B – Individual Assessment (40%) being:
    (i) An individual assignment (30%); and
    (ii) Passing the Estate Master Development Feasibility Software certification examination (10%).

Part A, the Major Assessment Task (MAT), was staged to ensure that groups and (it was hoped) individuals would be constantly engaged and not fall behind schedule.

(d) Embedding Team Work within the Capstone

It was vital that students understood that virtually the entire basis of the capstone was based around group work within a studio model. To respond to the challenge to convey that message, the coordinator decided that there should be a two-pronged approach of message reinforcement, firstly, prior to the first teaching week, and secondly, on a continuous basis throughout the teaching periods.

In the language of the literature review, one in effect needed to inform the students of the detailed requirements that would be made of them, not only in terms of "product", i.e. the components of assessment, but also the "process" of how they were expected to undertake their work in the studio and otherwise to achieve those hurdles.

Pre-Teaching

Three key documents were provided to students on the University's Learning Management System, two weeks prior to commencement of classes:

(i) Study Guide;
(ii) Indicative Workflow Summary; and
(iii) Indicative Weekly Studio Program Guide

In addition to providing information about the subject, the focus of the documentation was to provide a clear message to the students that the studio capstone should be regarded as primarily based around group work.

(i) *Study Guide*

The Study Guide was a highly detailed document that set out the following:

a. Course description;
b. Learning outcomes and objectives;
c. Overview of learning activities;
d. Learning approach and activities;
e. Assessment and feedback;

f. Oral presentations and requirements;
g. Marking criteria;
h. Deadlines;
i. Administrative information.

More particularly, it set out that the Major Assessment Task (production of the feasibility report and three oral presentations) was required to be undertaken and presented as group tasks. The detailed list of tasks to be undertaken set out in the "Learning Outcomes and Objectives" section indicated an onerous but manageable workload if undertaken as a group, but certainly too much for an individual. The requirement to prepare for oral presentations on a regular basis and the need to present summaries of their work to a "board of directors" indicated that student groups were required to source and analyse sites and development options under tight deadlines.

Importantly, it was clearly stated in the "Overview of Learning Activities" section that all components of the major assessment task would be assessed (marked) on a group basis only, and there was no opportunity for individual marking. This section also stated that groups would be "closely supported, advised and mentored throughout the studio process" by the coordinator and tutors. Furthermore it stated:

"*It is an expectation that all students attend every session (2 per week). Absences must be supported by either an original medical certificate or students may apply for Special Consideration. Assessment of individual group activities will be affected by the attendance, behavior and efforts of individuals".*

The "Learning Outcomes and Objectives" section outlined that the students would be guest- lectured and, tutored where possible, by senior industry practitioners so that an atmosphere of "real-life" would be created, and this would also support their work on their feasibility studies.

In addition, the students would be guest-lectured and work shopped by an expert in oral presentation from the University's Academic Skills Support Unit. The Study Guide explained:

"...(n)ot only will [presentation skills support] assist student groups' assessment tasks related to oral presentation, but will provide highly valuable work skills in supporting students in their future professional careers and employment prospects. Prospective employers place great emphasis on presentation skills when choosing graduate level employees".

Finally, the Study Guide indicated that the Faculty was providing considerable support in terms of personnel to support the inaugural capstone. These were to include:

a. Subject Leader, i.e. subject coordinator;
b. Two academic staff from the property group as tutors that would attend all studio sessions;
c. A highly experienced architect from private practice with very strong background in development feasibility that would attend all studio sessions;
d. A highly experienced urban planning consultant that would provide a guest lecture and support during some studio sessions.

In the "Assessment Section" of the Study Guide a discussion on "feedback" was included. In summary it set out that:

a) The purpose of group formation was that it intended to simulate "real-life" circumstances on development projects where human resources are allocated to projects on the basis of skills' requirements rather than historical personal relationships;
b) The simulation of a "real-life" circumstance would provide a realistic and challenging framework within which individual team members would be encouraged to develop, firstly, positive and harmonious professional and personal relationships with members of their project team and other interested parties, and secondly, skills in self-management, time management, team building and emotional intelligence;

c) The studio environment provides an excellent forum for interaction between the project groups and the Subject Delivery Team i.e. Subject Coordinator, tutors, guest lecturers, et cetera and that feedback will be provided to project groups by the Delivery Team on a regular basis during work shopping.
d) Students would be encouraged to give and receive **objective critical feedback** within their respective project groups and, on occasions, between other groups, e.g. after group oral presentations.
e) More formal feedback would be provided after oral presentations and other assessments and that groups were encouraged to practice their presentations before assessment.

(ii) *Workflow Summary and Outputs*

This 5-page A3 document provided a detailed guide in the form of an annotated flowchart to student groups to support their understanding of the "logic" of what occurs in the "real-life" assessment of development projects. These steps included from earliest stage team formulation, creation of a corporate identity, deciding upon corporate goals and market segments within which to operate, setting financial and non-financial hurdles, through to preparing various levels of feasibility study, each oral presentation through to detailed content of a financial feasibility. These "steps" were supported by notes on the support that the student groups could expect during each step. These included preliminary lectures on development feasibility by the studio leader, guest lecturers from Industry, training on the development feasibility software, and work shopping by tutors.

(iii) *Weekly Studio Program Guide*

This 7-page A3 document provided a highly detailed, though indicative guide to student groups on the main activities that would take place in each of the two weekly sessions for the duration of the semester, as well as notes on recommended work to be carried out by groups outside studio sessions.

During Studio Sessions

The teaching resources set out in the Study Guide were available as planned.

The studio leader randomly selected students to form groups of four. A standard "group contract" provided by the Academic Support Unit was provided to each group and was required to be signed by all group members. Guidelines were provided on the type of conditions that groups would consider including in the contract, although the final document was at each group's discretion. These matters included regularity of meetings, allocation of work and necessity to achieve deadlines.

Three one-hour formal lectures by the studio leader were provided. They covered an overview of the subject, components of development feasibilities, setting up student groups, developing corporate objectives and deciding upon financial and non-financial objectives. In addition, a presentation on brainstorming within groups was provided.

Guest speakers from Industry provided presentations on a diverse range of subjects including statutory planning, market research, development finance, budgeting for construction costs, development feasibility software, risks in interpreting financial feasibility studies, and examples of feasibility studies and projects undertaken by property developers.

In addition, the manager of the university's Student Academic Skills Unit provided a guest lecture and workshopping on oral presentations.

The main Delivery Team, comprising studio leader, external development architect and two property group academics provided intensive work shopping, feedback and question and answer sessions for each group throughout the remainder of time available.

The "board of directors" assessing group oral presentations comprised the studio leader, external development architect, head of Student Skills Unit and one property academic.

COMMENTARY ON 2010 CAPSTONE STUDIO

Considering that this cohort of students had never undertaken a subject in a studio environment, or worked in a group work environment, it was adjudged, through observation, by the Delivery Team, that the class adapted quite well to the studio model and made a considerable effort to work through the necessary steps. They clearly enjoyed listening to highly experienced guest lecturers from Industry, and valued the efforts made to provide them with instruction on oral presentations skills. Industry experience within the studio delivery team was clearly highly valued by the students.

For some students, the studio work shopping environment provided a challenge as they felt uncomfortable with revealing their lack of knowledge through having to ask questions.

For most teams, the roles of individual players emerged, such as leader, checker and documenter. The Delivery Team felt that it was better to allow this natural emergence rather than attempt to impose the roles.

Students were required to sign an attendance sheet at the beginning of each studio session. All students were required to attend the full duration of the oral presentations.

A number of concerns came to the attention of the delivery team. Firstly, despite references in the Study Guide of the necessity for attendance, and consistent efforts by the delivery team to impress upon students that the purpose of the studio environment was that groups would carry out the majority of their work in class, the attendance rate was generally no higher than 60%.

Secondly, complaints were lodged in the latter part of the semester by a very small number of groups that one or more members were either not performing satisfactorily or not performing at all. Actions were taken by the Delivery Team to rectify these circumstances, though it became clear from discussions with the complainants that they would have preferred a more formal method of peer assessment to be introduced so these concerns could be addressed earlier in the semester.

The 2010 Student Experience Survey (SES) at the University of Melbourne provided a list of 13 questions for students to rank the subject from 1 to 5. The corresponding range of responses provided to students ranged from "Strongly Disagree (1) to Strongly Agree (5)". There were four broad categories within which the 17 questions were placed:

1. Quality of Teaching and challenges;
2. Progress and involvement with other students and staff;
3. Use of computer-based teaching resources;
4. Overall satisfaction; and
5. Eight "Additional questions" on lectures, tutorials, clarity of assignment and value of assessment to learning.

Four (Ex Q1-4) of the "Additional questions" section were required to be ranked numerically. However, the remaining questions afforded students the opportunity to comment on the strengths and weaknesses of the subject, and any suggestions they had for improvements to the subject.

The relevant numerical rankings to this study are set out in Table 1:

Table 1: Results of Student Experience Survey – 2010 Capstone

Question	Question Content	Ranking
1.	Clear expectations of me in subject	4.0
2.	Well taught	3.9
3.	Intellectually stimulating	4.2
4.	Received helpful feedback	3.8
5.	Teacher showed interest in my academic needs	4.2
6.	Felt part of the group	4.1
9.	Overall satisfaction with learning	4.1
Ex. Q1	Lectures well presented	4.1
Ex. Q2	Studios helpful and added to learning process	4.2
Ex Q3	Assignments clearly worded and intent was clear	3.7
Ex Q4	Assessment helped my learning	4.2

In overall terms, the subject was quite highly rated by the students.

A number of students commented that there could be improvements made to the clarity of and need for more specific guidelines in regard to the assessment, though a number did feel that the feasibility report and the studio environment was a useful mechanism for learning.

A sample of comments included “interesting and engaging”, “bringing all the components in the Industry together”, “takes steps to let us understand the ‘real-life’ [process of] property development”.

A small number of students commented positively on group work. However, a number of students expressed concerns that group work held them back and indicated that, for their groups, some students relied on others to carry out a greater proportion of the work, and that there were issues in regard to lack of commitment, quality of work and failure to adhere to group deadlines with some of their team members. A number of students felt that they would have preferred to have been able to choose their own group members.

Quite a number of students indicated that the workload was too much, that the Major Assessment Task (feasibility report and oral presentations) should be the main focus of the subject, and that it should represent a higher proportion of the total assessment in terms of marks.

It was clear that some modifications needed to be made to the syllabus and assessment for 2011, in addition to some improvements to the management of the studio.

2011 CAPSTONE SUBJECT

Student numbers in the group capstone increased to 62 from 42 in 2010. Due to budgetary and other reasons, the Delivery Team was reduced to two personnel. It comprised the same subject coordinator (studio leader) as 2010 and the same external development architect as 2010, who continued to act as tutor. Guest lecturing by senior Industry practitioners was at the same level as 2010, though there were a small number of changes to personnel. The University's Academic Skills Support Unit again provided a guest lecture and work shopping on oral presentation skills.

Students were randomly selected to form groups of 5, with a number of students being asked to "pick names from a hat". The students appeared to enjoy the experience of being involved in team selection and seemed to appreciate the "fairness" of the random selection process. As in 2010, groups were required to develop their own team contract conditions using the standard contract provided by the University's Student Academic Support Unit as a basis.

Students were required to sign an attendance roll at the beginning of every studio session. With the objective in mind to improve students' willingness to work in groups and more particularly embed their understanding of the necessity to work as a team, the subject coordinator made a number of modifications to the subject. A comparison between the allocation of marks in the assessment between 2010 and 2011 is set out in Table 2.

Table 2: Comparison of Subject Assessment for 2010 and 2011.

2010 Assessment		2011 Assessment	
1. Feasibility Report	40%	1. Feasibility Report	40%
2. Oral Presentations (2 no)	20%	2. Oral Presentations (2 no)	30%
3. Individual Assignment	30%	3. Attendance and Participation	15%
4. Estate Master Certification	10%	4. Estate Master Certification	15%

The subject leader and tutor discussed at some length with the class at the beginning of semester the need for students to work in groups, as the Major Assessment Task, being the group feasibility report and oral presentations, accounted for a high proportion of the total assessment.

It was impressed upon the students that in "real-life" a professional team on any project is assessed by a client or manager on the achievement of the required result as a team, not as a disparate group of individuals, and that the subject and experience being presented to them in the capstone offered them a very strong simulation of "real-life" experience, which they could then readily carry into their nascent professional careers.

In addition, the students were informed through the Study Guide and class discussion of the necessity for "attendance and participation" in studio sessions with the objective of participation in group work. They were also informed that as 15% of total assessment applied to this requirement, that if compliance was not adhered to, students would have marks deducted on the basis of 5% of their total assessment per absence up to a total of 15%, with the first absence being allowed a waiver. Provided a medical certificate or other reasonable evidence for an absence was provided, no deduction would be made. Finally, the class was put on notice that if a student persisted in not attending, and had reached the 15% deduction in assessment, the student would be required to face a committee of the Director of Bachelor of Environments, the degree Course Coordinator and Subject Coordinator, to assess whether a student should be allowed to continue in the subject or be removed from the class.

The Industry guest lecturers were briefed to include references in their presentations, where relevant, of the importance of team work and maintenance of positive professional relationship in the Property Industry, that in

commercial life, professionals and others need to work as a team on projects, irrespective of the strength or otherwise of their personal relationships. One guest speaker, a senior Industry identity, went as far to state that reputations can be made or destroyed on the basis of performance and conduct within those teams. The subject leader and tutor repeatedly discussed these same matters, at appropriate times, during the semester.

An additional requirement was introduced in the form of a fairly basic 360 degree group self-assessment. In week 5, every student was required to provide a confidential commentary on the performance of their colleagues in their group.

What were the outcomes? Firstly, there was a dramatic improvement in attendance over 2010, with attendance being in excess of 95%, with the majority of absences being given a waiver due to medical or other personal circumstances. The Delivery Team's observation was that the atmosphere within the studios improved dramatically over 2010, as students settled down very quickly to work together to achieve the necessary deadlines.

The University introduced on-line Student Experience Surveys in 2011, with some minor changes to questions from the previous year's hard copy survey. The 2011 survey provided for 18 questions, 14 of them to be ranked numerically on a scale of 1 to 5, ranging from "Strongly Disagree to Strongly Agree". Two of the remaining questions provided students with the opportunity to comment upon the subject by asking, "What were the best aspects of the subject?" and "What aspects of this subject do you believe should be improved?" The final two questions asked what major the student was studying and the name of the studio leader. The results of the most relevant questions that could be ranked numerically are given in Table 3.

Table 3: Results of Student Experience Survey – 2011 Capstone.

Question	Question Content	Ranking
1.	Intellectually Stimulating	4.4
2.	Well coordinated	4.4
4.	Well taught	4.2
5.	Have been required to work to a high standard	4.6
6.	Found the assessment tasks useful in guiding my study	4.3
7.	Received valuable feedback on my progress	4.2
8.	Learnt new ideas, approaches and/or skills	4.2
9.	Learnt to apply knowledge to practice	4.5
10.	Have been part of a group committed to learning.	4.5
13.	The subject has equipped me with the skills that will assist my future professional development	4.6
14.	I understand what is expected of me in this subject	4.4
15.	I put a lot of effort into the subject	4.7

In response to the question "What were the best aspects of this subject?" the comments clearly indicated an overall improvement over the previous year in student's feelings in regard the studio setting, group work, their perception that course outline and assessments were more clearly understood and well structured and that the Major Assessment Task was perceived to be useful and practical. Students clearly appreciated the Industry experience of the Delivery Team and the Industry guest speakers.

Some insights into student's perception of group work could be gleaned from the following comments:

"*…Also, I enjoyed the group work dynamic, though it was frustrating, it gave me good training with making the best of situations and organizing a group which I think will help with my future endeavours";*

"…brought a professional atmosphere to the group learning environment which made it very realistic and rewarding. I think this was a very good idea. I like the way the tutorial [sic] sessions were run";

"I have also become part of a successful team which is always rewarding, although at times, it was hard, I have enjoyed working with new people and it has taught me a lot about working with people with different personalities and skills";

"One thing I have loved about this subject is the sense of community we now have within the property major (approx 60 people), spending 6 hours with the same group of people every week has allowed us to all get to know each other and feel part of an overall team….";

"Group work is useful practice".

In terms of suggestions for improvements, these largely concentrated on complaints about the 3-hour duration of the studio sessions, the "usefulness" of oral presentations of group's project work and the number of Industry guest speakers.

One student wrote the following in relation to group work:

"The emphasis on group work. Nearly all assessments was [sic] based on group work, thus if your [sic] randomly paired with someone who has a different work ethic to yourself you suffer greatly".

Another student commented upon the 360 degree peer assessment:

"We had to complete a peer assessment mid semester and I think the methodology for this could be greatly improved. For starters it was too early and we had not had the chance to witness anyone's "true colours", if it was given a week later a much more accurate representation could be given".

CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

An assessment of "Property Analysis Studio" indicates that many of the positives and negatives revealed in the retrospective literature review did emerge in the two years of the capstone that are examined in this paper.

The writer had not undertaken a literature review until after the 2011 capstones class was complete. Once the concerns and challenges experienced in the 2010 were evaluated, it became quite clear that the real issue that needed to be addressed for the 2011capstone was how to imbue the students with the clear understanding that their individual result depended largely on the success of their group's teamwork and that their individual effort, attendance and participation clearly affected their team's final assessment.

The term "interdependence" is used widely in the literature in terms of the efficacy of group work. In practical terms, the changes made in the 2011 capstone to the assessment ("the product") and the manner in which the studios

were managed ("the process"), were developed to achieve this greater "interdependence". This was achieved by providing the incentive, in terms of achieving or losing 15% of the total assessments, for students to turn up for class and participate. The group assessment was increased to 70% of total assessment, and the two together clearly signalled the intent of the capstone and the Delivery Team, that the focus was clearly on the successful undertaking and completion through group work of the feasibility study and oral presentations together with attendance and participation.

Although in retrospect the 360 degree assessment introduced in Week 5 could have been more sophisticated, the impression was left by some students that it had some positive benefits in galvanizing some of their group members to participate more fully. A number of high performing students intimated to the Delivery Team in the final week that there should be more than one 360 degree assessment in future as they felt that there were always going to be some students that would not wish to share the workload equitably with their team members, unless there was scrutiny and peer assessment throughout the semester.

In retrospect, the 2011 capstone provided clear evidence, that the three types of "learning", that Monk (2010) and others referred to – "collaborative", "cooperative" and "group" – were being engaged in by the groups. The Delivery Team's view was straightforward: that there was such a need to help groups create interdependence that measures had to be introduced by the Delivery Team so that students understood quite clearly that there was simply no other alternative for them, as groups and individuals, other than to work together and achieve common goals.

As final year students, they were particularly interested in discussing career options with the Delivery Team and Industry guest speakers, whether they intended to enter the workforce immediately after completing their undergraduate degree, or after completing a master's degree or indeed deferring work or study for a period.

The Student Experience Surveys, particularly for 2011, clearly acknowledged widespread recognition of the value of Industry experience, in the Delivery Team and Industry guest speakers. A clear link had been drawn by the students between the capstone experience and benefits to their future careers.

It is this link that provides some form of conclusion to what is an on-going development of the real estate capstone. That is, a capstone experience needs to take students out of the "academic" comfort zone, stretch them, make them feel something of the "risks" and "pressures" that practitioners face in real life experience, and thus change them, challenge them, and set them on their future path with new, but, in the context of their age and experience, well honed skills, that will stand them in good stead to face the next set of hurdles presented to them, most likely in the work force.

One can reasonably conclude that the personnel best suited and equipped to develop, present and lead a capstone in real estate based on property development feasibility undertaken in a studio environment are highly experienced Industry practitioners with a broad range of relevant professional skills, but with good teaching and academic skills and experience, and these are best supported by highly experienced senior Industry guest speakers and other relevant experts.

There is considerable evidence, from our observation, that Coate's assessment of Generation Y's desire for more interactive learning experience does hold validity. The question for any faculty introducing a studio based capstone based on group work in the final year of an undergraduate program is whether group work skills should be "taught" and / or introduced at an earlier stage of the degree, so that the learning curve on these important skills is not so steep and coincide with developing new property related skills in the capstone.

Future research opportunities on this matter include an examination and discussion on the 2013 capstone, examination, analysis comparison and presentation of Critical Incident Surveys conducted on the 2012 and 2013 capstone classes, examination of more thorough peer assessment techniques introduced in the 2013 capstone and examination of the value or otherwise of introducing studio based forms of learning earlier in undergraduate degrees considering the characterization of Generation Y students reluctance to accept more traditional modes of teaching.

In addition, there is considerable scope to investigate the extent to which the capstone is capable of being used as a basis by Faculty to assess the undergraduate property major as a whole.

It is worth mentioning, in conclusion, that in writing this article, the author has been mindful of Johnson and Johnson's assertion (cited in Colbeck, Campbell & Bjorklund 2000, p. 64) that "most existing evaluations of cooperative learning and other group learning experiences are biased because the evaluators were also the developers of the programs". One has striven and can only hope that that circumstance has not occurred in this case.

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