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Studio teaching for the property discipline

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Abstract

Studio teaching has formed the major mode of teaching and learning activities in Built Environment schools around the world – especially for the design disciplines of architecture, landscape architecture and urban design. This study investigates studio teaching for a final year undergraduate property subject at a time of significant change being part of the Australian university education reform ‘pilot tested’ at the University of Melbourne. This research uses a modified version of Brookfield’s (1995) “critically reflective lenses” and Schön’s (1985) education model towards the “reflexive practitioner” to investigate and develop studio teaching mode for a real estate subject that is regarded as “non-design based” subject. We identified that the studio teaching model, through the purposeful application of its ‘model of interaction’ and ‘model of space’, provides the tools that can address the pertinent challenge at the particular juncture of the university reform in Australia. We found that the ‘model of interaction’ at least has significant parallels with the Assessment of Professional Competences (APC) of professional bodies such as the RICS. We also found that the success of the application of the studio model to non-design subjects will depend on the additional teaching resources and funding that are required. The study has strong theoretical relevance to university teaching and practical value in benefiting industry and professional practice.

Key words

Studio teaching; non-design discipline; property discipline; Australia; reform

INTRODUCTION

In the Faculty of Architecture, Building and Planning (ABP), the University of Melbourne, studio teaching has formed the major mode of delivery of teaching and learning activities – especially for the design disciplines of architecture, landscape architecture and urban design. This research investigates studio teaching at a time of significant change for both the University and the Faculty in the transition into “the Melbourne Model”: a significant Australian university education reform/‘pilot tested’ at the University of Melbourne. From interviews with senior staffs in faculty, this change will also affect existing studio teaching as, for the first time, it has been planned that studio teaching will be utilized to deliver cross-disciplinary teaching and learning experiences through co-teaching mixed cohorts of students at the undergraduate and the postgraduate programs.

The paper investigates the key concepts of the Melbourne Model, studio teaching, capstone subject, and education requirements of the property discipline and, base on this review, investigates and speculates a possible conceptual model of studio teaching for non-design programs in the Faculty using *Property Analysis Studio*, a subject of the undergraduate Property major as a case study. The case study is a new final-year subject that will commence for the first time in July 2010 and is designated as a “capstone” subject. The challenges here are that Property stream subjects have traditionally been taught/delivered lecture-based while on the other hand, the Bachelor of Environment degree is not a professional degree but is conceptualized as a cross-disciplinary path that assists/informs students in decision-making towards professional masters degrees. Yet it is expected that graduates will be equipped with employable skills.

The development and proper execution of final year capstone subjects is key to the Melbourne Model. Also, both generic undergraduate and professional postgraduate training (Professional masters programs) could benefit from studio teaching method for non-design professional degrees (fields) – particularly because there is the recognition that raising and building discipline/professional competence is one of the main strengths of studio teaching (Waks, 1999, Oxman, 1986, Schon, 1985, Roberts, 2004) which is aligned with the objective of capstone subjects.

RESEARCH DESIGN

The study started from Posing the question: In the context of teaching and learning activities at the Faculty and the newly introduced Melbourne Model, how to apply studio teaching to a non-design discipline capstone subject? The study addresses the above question through three main components, namely a literature review, a reflective analysis, and a subject design – utilizing Brookfield’s “critically reflective lenses” of “our colleagues’ experiences”, our own experiences, contemporary practice and “theoretical literature” (Brookfield, 1995, p.29-30). We begin with a review of the key concepts of Melbourne Model, studio teaching, capstone studio and the property profession which is then discussed and synthesized into a framework for the design of the subject. This is followed by a brief discussion of our autobiographical experiences and peer review.

The key objectives are: the formulation of analytical framework to examine the research problem; an analysis of studio teaching and its implications in modern university education, focusing on the built environment area; development of a case of third year subject basing on a review process involving senior academics, peers and the industry

(see figure 1 and more details in figure 3). We then propose a case study of a final year BEnv capstone subject, Property Analysis Studio, in the property major to explore the identified key research issues: the reformed education Model in relation to Faculty; studio teaching and learning; capstone subject design especially the expectations for Property Analysis Studio as a final year capstone subject for the property major; and the non-design discipline: Property.

A modified critical reflection process for subject development

High level of uncertainty usually accompanies any reform process, especially in the early planning/design phase before any testing/experimentation can be conducted (Beckert, 1999). This study focuses on the initiation and the early stage planning of the subject hence empirical reflection from students' eyes is not yet possible. On the other hand we recognise the demand of the industry for "professional competence" which is examined via professional accreditation as a crucial factor influencing the design of subjects; hence we propose a modified Brookfield's "four critically reflective lenses" for this study. (See figure 2 and detail description in p5) It includes reflections of personal experiences (previous teaching experience in non-studio and studio subjects and the experience of being through the education reform); the industry e.g. Australian Property Institute and the Royal Institution of Chartered Surveyors (Reflection of the student will be postponed till after the delivery of the subject); our colleagues who are involved in developing the capstone subjects; and, the relevant theories that are available.

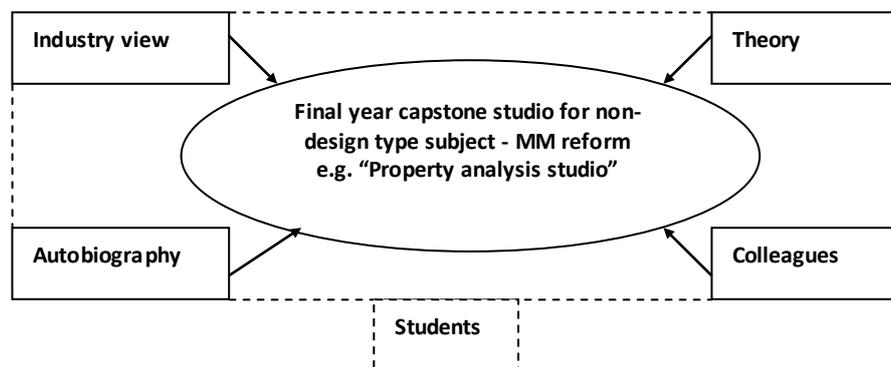


Figure 2 modified critical reflection process

In being "reflective" Schön (1985) refers to the education model that yields reflective practitioners and professionals with greater consistency and competency, while Brookfield's "critically reflective" (1995) applies to the design, delivery and review of the education model from outside the designer's "comfort zone" to achieve effective teaching and learning outcomes. These two dimensions have a common objective of enhancing training and learning processes which is consistent with the concept of constructive alignment in achieving effective learning (Ramsden, 2003, Biggs and Tang, 2007). The two perspectives, when integrated, will enable, in theory, a solid foundation for the development of capstone studio.

Process of subject development

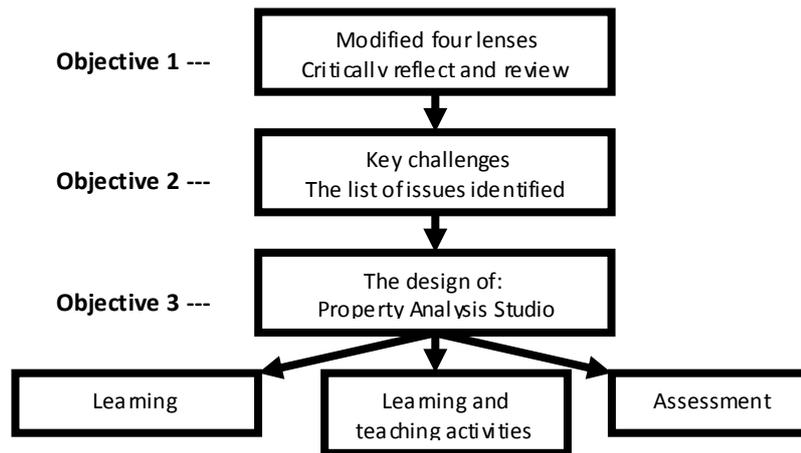


Figure 3 process of subject development

A preliminary framework and general process of subject development of final year capstone studio consistent with our research objectives are illustrated in figure 3. Some Key steps in the subject design include: (1) collect required data: expected student numbers; expected student background; teaching resources (academic and industry); policies; and other relevant data; (2) to define expectations and content of the subject, and (3) to apply reviewed studio teaching principles to the delivery; (4) senior academic staff, involved in the design of the capstone subjects, to review the course design in terms of addressing/achieving the Melbourne Model objectives.

CRITICAL REFLECTIVE LENSES: EDUCATION AND PRACTICE

Melbourne model reform: education evolution not revolution

The Melbourne Model may be described as: “a broad undergraduate curriculum that ensures students learn the fundamentals of diverse disciplines and different ways of thinking, while acquiring deep knowledge of a particular discipline... followed by professional education at graduate schools similar to those in the United States” (The University of Melbourne, 2009). This is translated into six bachelor degrees that was consolidated from 106 degrees previously offered which is followed by two years of discipline specific graduate studies.

The impact of the reform varies across faculties and schools. For example the faculties of Architecture Building and Planning, Engineering and Arts (including Law and Commerce) are all significantly affected under the new model whereas the medical school and a few others may experience minor changes of governance and restructuring. The change entails top-down mechanism i.e. the Growing Esteem Strategy (that introduced the Melbourne Model) that the university management is implementing and bottom-up mechanism driven by departments and disciplines the intention to break boundaries and to create/redefine relationship among disciplines after years of debates. In the words of Professor Glen Davis (the Vice Chancellor) the education reform entails being “firm on ends, but flexible on means” (The University of Melbourne, 2009).

Studio-teaching model

University education are meant to create and transmit ‘useful knowledge’, although the definition of “useful knowledge” is relative (Boulton and Lucas, 2008) and can be variously defined as, for example, new knowledge, inspirational and well-informed in

practice. In this context, Gu (2003, p.62) stated: “Knowledge taught in universities is only suitable for well-defined problems. But there are the indeterminate zones of practice, which presents a conflicting situation of complexity, uncertainty, and uniqueness. It is a failure of modern university education that it does not train students to deal with the problems derived from such indeterminate zones.” The training carried on in architectural education provides a valuable exception. (Schön, 1983; Gu, 2003), although like clinical training in medical schools, design studios can be costly to run (Carbone and Sheard, 2003b).

This paper investigates the studio as a specific university teaching and learning experience with the aim to apply to a non-design discipline. The nature of design and its associated behavior have been discussed extensively (for example: Lawson 1994). Traditionally lectures and studios are regarded as different pedagogical and discipline-specific approaches (modes) to university teaching. It is hoped that these two approaches can be reconciled to reach a sound teaching and learning outcome (Gelernter, 1988) that utilizes known studio teaching benefits such as the interactions that enhance active learning. While the literature often focuses on the architecture studio, we discuss characteristics that apply to the design studio in general.

Competence Vs Performance

Writing specifically for architectural studio education, Oxman (1986), borrowing from the learning of languages, calls for a clear differentiation between *competence* and *performance* in studio’s teaching and learning process and that studio should consciously focus more on competence. To Oxman (p.22), “Competence is the ability to manipulate the syntactic rules of a language; performance is distinguished as a measure, not of operative knowledge, but of applicative ability”. This provides a pedagogical and process approach to the research project in its clear articulation of the objectives and aims of the studio process. The summary also has relevance for conceptualizing ‘capstone’ subjects favoring an inductive learning process:

“The teaching of architecture involves multifarious forms of knowledge. The exigencies of the separate parts: situation, elements and measures, methods and tools, structure and construction, formal languages, each represents a potential vehicle for entering the design. The teacher is forced to select a key, and given that there exists no comprehensive theory, this multiplicity of doors makes consensus regarding architectural education difficult...Any program built upon this assumption would probably have beginning students start with separate pieces, atoms of knowledge, and grow through the successive years in the ability to synthesize this knowledge. Complexity in the pedagogical program of design studies is not directly connected with scale; it is perhaps more a function of the integration of various types of knowledge... It would be a great challenge to develop such an educational program; one which builds a successively more sophisticated competence in the language of built form while simultaneously teaching other forms of knowledge and expertise.” (Oxman, p.28)

Here we observe that the building of ‘competence’ is potentially an area where the design studio has a clear advantage over lecture-based teaching with exams based assessment which is more geared towards measuring ‘performance’. On the other hand, the benefits of the studio teaching approach is also related to its application across year levels and so a studio that is created as a ‘one-off’ subject over the entire degree (such as the capstone case that this paper discusses) may find it hard to yield a full process that effectively synthesizes knowledge and experience and successively builds up sophisticated competence compared to typical design degrees.

The design studio's assimilation of other discipline's approaches

Joroff and Moore (1984) noted that in the education and training of the designer, everything that is necessary for creating a built space, the process from initial concept to full-scale creation needs to be mastered in the learning process. Joroff and Moore pointed out that the design studio has its limitations in fulfilling the requirement suggesting that case method teaching that is popular in business/law schools (Harvard Business School and Chicago Law School are typical cases) should be integrated into studio teaching for design professionals. They argued that “Case method teaching” is regarded as effective towards this goal, being based on a real or hypothetical process it often contains key elements in a typical project.

By definition, “as an educational format, case method teaching develops around the skilled facilitation of students’ discussions of carefully constructed cases, written records of factual events involving some situation, issue or controversy requiring some degree of resolution” (Joroff and Moore, 1984, p14). Today it is observed that studio teaching in practice is a refined or hybridized version of the traditional design studio teaching approach used in most architecture schools and the case-method teaching principles popularly used in business schools. The key is to bring together the investigation of forms to enhance creative, formal and spatial skills, and the organizational issues that are equally important in the practice.

Place, program and execution coinciding with the ‘idea’ of the discipline

Gu (2003) contextualized architecture studio teaching in the context of modern university education and, in particular, of professional education which, according to Schön, is philosophically dominated by the positivist epistemology to its detriment. Schön (1988) argues that the optimum teaching and learning experience for both science and design, traditionally considered divergent practices, due to the positivist epistemology which gives science a particular image, occurs “most favorably in the context of a reflective practicum”. In other words, a learning-by-doing approach of design studio that puts students in direct contact with the phenomena which reflects and parallels science practiced as a prospective inquiry. Schön’s paper is relevant to this project as it clarifies the unique reciprocal engagement process between the “coach” and the student that typifies the design studio while the attempt to bridge the two systems (arts and sciences) of professional education sets clear precedence for our study.

Gu (2003) further expands on Schön’s view on design studio teaching from Schön’s “model of interaction” – which Gu argues does not address the “underlying force that which causes an interaction to happen” – to a “model of place” that focuses on the ideology and pedagogy embedded in the studio. Gu investigated the ‘model of place’ through the three historical teaching models in chronological order: The Ecole des Beaux-Arts’ “atelier” which continued the tradition of apprenticeship but in an “academic sense” where the “whole endeavour is devoted to “designing on paper” in drafting rooms and where the preferred teaching method is demonstration; the Bauhaus’ “workshop” which introduced the design process based on model-making and encouraged experimentation and exploration. It differs from traditional workshops in the shift from making products to experimental prototypes (Gu, 2003, p.64). Texas Ranger’s “design laboratory”, which adopt a scientific view of the design studio, both as a reflection of previous teaching models and the emergence of professional full-time design teachers and in response to the demands of university education, making the

process of teaching transparent. The design lab seems to be a closest form of or an exemplar of design teaching in current university systems.

According to Gu (p.61), “successful studio teaching only becomes possible when the aspects of the design studio – place, program, and execution – coincide with an idea of architecture.” It is argued that modern architecture is “a quasi-autonomous discipline that participates in and, in certain ways, transforms the social and material structures of society” (2003, p.10), a definition more consistent with and relevant to its educational pedagogy and practice in the modern studio. The contemporary challenge for architecture is manifold especially in the context where “...the subject and object have become intertwined in a world mediated by mechanized instruments” (Pai, 2003, p.289) especially with the increase prominence of digital design processes. Arguably, this renders ambiguous the differentiations between Schön’s “Model of interaction” and Gu’s “Model of place”.

Capstone subjects

According to Holdsworth et al. (2009) the term “capstone” means “a course or experience that provides opportunities for a student to apply the knowledge gained throughout their undergraduate degree. This involves integrating graduate capabilities and employability skills, and occurs usually in the final year of an undergraduate degree.” There are pertinent issues concerning the ‘capstone’ in relation to the Melbourne Model undergraduate curriculum. First, the issue of breath vs. capstone – currently students are required to take at least a quarter of their subjects from outside their major area of study (UoM, 2009). In the semi bottom-up approach and implementation of the curriculum reform, the definition and the content of breath subjects are constantly reviewed which will affect the level of inclusion and contents to be synthesised by capstone subjects. Both the level of coherence and the structure of pathways will affect the role of capstone subjects in concluding the undergraduate degree. The capstone is also viewed as a platform to directly link students to current research (UoM, 2009). Key features of the capstone include (Holdsworth et al, 2009): Free-standing 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.

This is, in fact, consistent with studio teaching method in the ‘Model of Place’ that Gu (2003) discussed and studio teaching appear to have advantage to achieve the objectives. Moreover, capstone subject “need to be designed to provide students with activities that synthesize discipline specific knowledge, such as communication skills, with the ability to apply this knowledge to real world scenarios” (Holdsworth et al., 2009), which is consistent with problem-based and case study-based studio learning. Although it may appear straight-forward to design a capstone subject to meet each of the key criteria and expectations mentioned above, the true challenge lies in the understanding of the discipline, program or subject specific needs. Crucial to understand the needs is to understand the nature of the profession and the way it will evolve which in turn will define and drive the design and the use of the studio method. For example, if the property profession is not fully described by valuation (valuer), then it imposes the challenge of defining the effective studio teaching. The added dilemma is that the subject is to be designed for students, mid-way towards a professional qualification (the Bachelor of Environments degree is a non-professional degree. The need and the level of professional competency are yet to be defined.

Property profession and education

In applying reflective practice, there is the need for the teaching model to reflect the changing conditions of the industry into which it supplies cadets. Historically the design/surveying profession has moved from master builder/engineer (Pfammatter, 2000) to a highly complex group of professionals namely architect, planner, engineers, developer, quantity surveyor, landscape architect, project administrator, and valuer - commonly known as “the design team”. The dynamics and the evolution of the industry and associated professions are subject to continuous debate which reflects the uncertain nature of modern economic/political systems. A consequence of this evolution is that the boundary between professions is not always clear; and arguably it shouldn't be clear given the complexity of modern professional practices. By extension, this complexity in practice will influence the way studio teaching for property is designed and delivered. A critical reflection from the industry is supported by the fact that the profession (industry) will determine the ultimate aim, need and delivery of employees – the graduates from universities and other education institutions. In short the industry shapes the defining characteristics of the profession. The same issue has also been discussed by Dr. Paolo Tombesi in his Inaugural Professorial Lecture held in Melbourne University on 20th October 2009. A recently edited book discussing the Construction Management as a discipline (Langford and Hugh, 2009), attempting to address the evolution of the CM as a discipline in regard to its early formation/development, its education system in the UK, its supporting institutions and its supporting research environment.

As discussed, there are distinctive characteristics between design and ‘non-design’ disciplines in terms of creativity, expression and the level of control/regulations. On the other hand, they all share common features in the framework of professional standards, by-laws and rules of conduct. In the context of the Australian property industry, two professional bodies – the Australian Property Institute (API) and the Royal Institution of Chartered Surveyors (RICS) play significant role in facilitation and governance. Both developed principles and guideline of professional competence in relation to core skills and practical requirements to maintain high-standard in the property industry. In architecture and landscape architecture practice, the Australian equivalent is the Royal Australian Institute of Architects (RAIA) and the Australian Institute of Landscape Architects (AILA) respectively.

In regard to professional competence, the Australian Property Institute Practice Standard suggests: “a valuer must have the knowledge, skill, and experience to complete the assignment efficiently in relation to an acceptable professional standard. Only those Valuers able to conform to the definition of the Valuer set out in Definition (para. 3.3 above) should undertake work in connection with these standards.” (API, 2007) Overall, the API sets out competence descriptions according to the code of conduct defined by the International Valuation Standard Committee (IVSC), which focus on three key aspects, namely acceptance of instructions, outside assistance and efficiency and diligence. (See API, 2007, p25) It should be noted that the competence standard of the API and the IVSC are valuation focused in contrast to the broader approach of the RICS which governs a variety of linked professions.

The RICS is a global professional body for the disciplines of property, construction, land and the environment. Its standard of professional competence has been discipline-specific, but is defined within a framework of general standards. Three competency types are considered, namely (1) common compulsory competencies e.g. personal and interpersonal skills, business skills, data/information technology, professional practice,

law, measurement and mapping; (2) compulsory core competencies e.g. construction contract practice, construction technology and environmental services, economics and construction and procurement and financial measurement; and (3) optional competencies e.g. project management, property investment management and arbitration. (RICS, 2000)

Both the API and the RICS's required process of achieving professional competency by members are built on a process called Assessment of Professional Competences (APC) which is a highly interactive process involving the candidate, the candidate's mentor and the industry practice through a self-reflective process of the candidate's work experience over the defined period of assessment. It can be observed that this process in the way the industry reviews its employees is consistent with university capstone subject delivered in the studio Mode of Interaction.

CRITICAL REFLECTIVE LENSES: AUTOBIOGRAPHY AND PEERS

Autobiography as teachers and learners

Like many academics in the design disciplines, Sintusingha had no formal training as a 'teacher'. His teaching approach has been derived from many years experience as the 'learner' through both architecture and landscape architecture degrees and then as a tutor in architecture history and landscape design studios and as guest critic in numerous architecture, landscape architecture and urban design studios. Arguably this process, apart from actual practice in industry, is the formal training of a professional design teacher and in Schön's Model of Interaction, it is observed that the roles of 'coach' and student in dialogue triangulated with the student's project (Gu's Model of Place) is fluid and the roles, in Sintusingha's case, gradually switched. What is being taught and learnt – exchanged – in this process are form, space, function, structure, fabrication, typology, morphology, process etc. The experienced practitioner transmits these knowledge and skills to his/her apprentice, while the experienced teacher transmits knowledge and skills accumulated through studio teaching.

Similar to Sintusingha, Wu's experiences as teacher and learner have been accumulated through his previous roles as tutor, academic trainee, guest lecturer and his understanding of the need by the industry through industry engagements such as committees and projects. In regard to the initiation and preparation of the capstone studio subject this study addresses, his view about the proper design of the subject is reflected by his previous involvement in a similar subject (Property Development) which has served as a "capstone" for the program, however not delivered in the form of studio. Wu's view about the potential and challenge of the proposal capstone subject is also influenced by his experience in dealing with large class non-design subjects in the property stream; more so, the way he sees the potential form of the new subject is affected by his view about the profession i.e. the less well mentioned the evolution of the property and construction and planning professions. To the author, the way the subject is designed demands a fuller understanding of the nature of the profession as well as other attributes that the capstone subject would demand which is partially addressed by peer reflection.

Critical dialogue and reflection with peers

The discussion with program coordinators has raised interesting and highly relevant aspects. What is faced is that there is a tension between existing curriculum design,

which favours indeterminacy in the training of built environment profession, and objectives of the profession, which favours determinacy.

The new Melbourne Model that is discussed above expects a practical need for the capstone subject to link academic study to industry practice to improve employment opportunities (and the utilization of popular software such as EstateMaster and group work process partially addresses this). Ideally this requires substantial industry involvement, one of the strengths of typical studio teaching model, through guest critic and participation in student presentations and workshop activities such as brain storming. It is speculated that typical studio components such as project presentation and critique throughout semester may potentially be useful for non-design subjects. The design of an interactive communication among students, between students and academics, between students and industry practitioners and others are critical. A concern raised here is the funding to support the additional teaching activities required in studio delivery as clearly studio is much more costly to run. Practically, timetabling also needs to suit the studio-teaching mode.

The extent to which skills and industry norms are considered and addressed is also considered. There is the potential to incorporate cross-disciplinary teaching through role playing or real mix of students of different disciplinary backgrounds as part of team activity and assessment. This has been done, at a general level in the past where property analysis was combined with project management and planning subjects. Additionally, international practice being part of teaching and learning is critical. The US Urban Land Institute and the University of Hong Kong studio for real estate and construction may provide valuable experience. Typical design studio outputs are the physical forms that addresses set architectural queries and programs. Capstone property studios could be focused on the overall feasibilities that are essential in actual practices. This approach can better utilize the strengths of a multidisciplinary faculty in built environment education and its strong international standing. This aligns with the existing debate about the future of the disciplines in relation to industry practice in light with the competitiveness of graduates at domestic and global levels.

A framework for Property capstone subject design

In the context of the subject design, we address the following challenges implicit in this change at ABP: (1) studio teaching in the transition; (2) applying studio method in capstone subject; (3) studio method applied to non-design-based subject, and (4) the provision of professional training to improve employability of graduates. From the review of studio teaching, it is surmised that studio-based learning can be an effective means to achieve graduate attributes specified by the education model. The critical question for this research is how to adapt this teaching and learning mode for those non-design disciplines strongly tied with a profession? This forms part of a broader question that is not addressed here: to what extent and how does the transition into the Melbourne Model potentially influence or redefine studio teaching in the University? With the education reform itself an evolving construct, the two questions are in fact interlinked which reflects a dynamic interaction that is observed in the Faculty's operation in the past two years.

On the other hand, of the proposed studio approach does not imply a one-dimension transition. While studio teaching is consistently in flux responsive to both academic and professional drivers consistent with "the Model of Place", there are significant variations within the design disciplines and the Model must also be differentiated

between architecture, landscape architecture and urban design. In this context, the relevant question may be what is the 'model of interaction' and 'model of place' in property and construction?

The 'model of interaction' and the 'model of place': the two studio linkages

The review of studio model has revealed two independent lineages of the studio teaching model. The first originally established for the training of design professions such as architecture and landscape architecture. The second studio teaching model, originated in the pioneering work of Donald Schön (Schon, 1983, Schon, 1985, Schon, 1987) in his theory of the reflective practitioner, is a method that is flexible enough to be implemented in non-design disciplines. Since then, this lineage of studio teaching has been used in undergraduate education in non-design disciplines such as information technology (Carbone and Sheard, 2003a, Carbone and Sheard, 2003b). Here the principles underpinning studio teaching has to be applied in conjunction with the nature of the specific profession at a specific time, for example in the case of the studio model for the architecture-design profession as discussed earlier. So the key for an effective use of studios in the teaching of property, construction and planning, and in other fields such as accounting and finance depends on, firstly and primarily, the understanding of each of the profession (i.e. the industry) in its present and plausible future contexts. For instance, the teaching of architectural design has experienced changes from technological advancement which has challenged the traditional studio-based model (Roberts, 2004).

This leads us to the 'model of interaction' aspect of studio teaching which may be problematic in the case of large classes. Studio teaching, as observed, is 'customized' to the specific needs of students (in the design studio, this is triangulated with the project) and hence more expensive. Carbone and Sheard (2003a) found that the cost of running studio is approximately three times more than teaching with traditional approach. How do the design programs at ABP manage? We hypothesize that studio teaching time may be subsidized by altruistic practitioners wanting to 'return something' to education institutions – a tradition which some disciplines may find difficult to acquire.

DESIGNING THE CAPSTONE STUDIO SUBJECT: A CASE STUDY

The subject design aims to combine the strengths of studio-teaching with knowledge and skills expectations for the various disciplines at the Bachelor level. The key driver of this new capstone studio-based subject design is to improve the quality and strength of the faculty in training built environment practitioners.

General overview

This study is primarily concerned with the interactions between the Melbourne Model, studio teaching and the use of studio-teaching in traditional subject delivery. The 'tensions' that drive the inquiry are that the recent reform has basically restructured the existing model which has led to the generic undergraduate degree and the graduate school model to train professional masters and research higher degrees. At the same time within the faculty, the co-existence with little synergy of two major delivery modes of studio teaching for design subjects and class-based teaching in most programs has led to the search for a more effective way to train the future generation built environment profession. Reading between the lines, we surmise that the objective of studio teaching in transition as part of the Melbourne Model reform is to deliver cross-disciplinary teaching and learning through co-teaching mixed cohorts of students at both

undergraduate and graduate levels. As Biggs and Tang (2007, p21) put it education is about conceptual change, not just the acquisition of information. This is constructively aligned with the key settings and strengths of studio teaching, which is done through interactive activities and critical thinking and engagements.

Key challenges

Utilizing “the modified four lenses of critical reflection”, the key challenges for the subject design are identified. For coordinators with limited design experience the studio is a specific type of education practice to be learnt anew together with the utilization of studio method as an effective way to deliver skills and knowledge. Given the previous sections, some of the challenges faced in the capstone studio for non-design disciplines are discussed here:

- (1) Students in property major have not developed experience in studio learning; hence an effective introduction to the studio environment is critical. It was noted that unless students take one of the design-based breadth subject in year one, they will be exposed to studio teaching for the first time. Otherwise the subjects that they will have taken are predominantly lecture-based with exams forming major assessment.
- (2) The shift from lecture-based model to student-centred model focusing on enhancing interactions which is lacking under the current setting. Part of the enhanced interaction is student-student interaction. Studio environment is an effective means for this purpose.
- (3) Industry involvement is key to this component as it would increase students' awareness of what to expect in future practice. This is critical as a hidden function of the capstone as being an “exit point”. The subject is about introducing key professional skills to meet industry requirement, as well as to enhance competence as a practitioner in the property profession
- (4) The subject is expected to bring together of skills and knowledge acquired by the students of selected breadth and depth. There needs to be a clear sense of ‘purpose’, for example, in building design, students learn to “design” which combines art, history and technology, whereas in property, students learn to “value” which combines science and art. Considering the field of the ‘built environments’, the sense of purpose is less obvious. This may imply sufficient breadth, but insufficient depth.
- (5) Capstones are meant to “cap” of previous learning of both breadth and depth of the undergraduate study. It serves to educate and to inspire i.e. the pursuit of professional career and/or graduate study, further training in specialist fields. One of the concerns raised is whether the students have obtained 'sufficient' knowledge? It is not clear whether the knowledge and skills that are expected to be capped has been clearly defined.
- (6) The subject serves as the foundation for graduate study which promotes self-learning skills and basic research skill. Under the course structure, there could be ‘gaps’ or ‘disconnection’ between year one and year two.
- (7) As the subject is designed for property major only, a challenge is engaging the multi-disciplinary interaction as one of the strengths of studio model. This was

reinforced in the review by peers with design background. All students in the subject are in property major – thus a closer relationship among the five capstone subjects to enable cross-disciplinary teaching e.g. combining the group component of all five studios will help. A multi-disciplinary interaction in the studio environment is ideal with clear framing of “contents”, “methodology” and “process”.

- (8) One of the challenges is that for the property major, the capstone studio subject is proposed as a one-off one semester subject whereas a typical studio has a double weight. The workload constraint is a weak point for effective studio teaching in property.
- (9) Administratively there remain a number of uncertainties such as the number of enrolment is yet to be confirmed. If the class size becomes too large, studio teaching might not be the ideal teaching and learning environment. Even at this stage, a year before the delivery of the subject, it is noted that student’s major choices is unclear.
- (10) Last but not least, the higher cost of running studio is apparently a constraint faced (Carbone and Sheard, 2003a).

In terms of the effective teaching and learning process, one of the co-author’s own studio teaching experience emphasises the importance of “constructive alignment” between teaching & learning activities (TLA) and assessment: Group and individual work. In a landscape studio subjects, the author uses group work (whether assessed or not) as the main tool to create ‘a vibrant and embracing social context’. The key here is to encourage students to realize the ‘social capital’ within their cohort, that there is much that they can learn through discussing and working with their colleagues. The students are also encouraged to utilize their assigned groups for both support and constructive criticism – even after the duration of the group work. Earlier in the semester, the role of tutor is to help instigate and facilitate discussions in each group which, with more familiarity, gradually become less needed.

In the first phase of the landscape studio, students in groups carry out reviews of and analyse the case council area focusing on open spaces and ecological/rural/urban patterns over time. They then synthesize the data into design scenarios of ‘as is’, where developmental processes carry on business as usual, and the ‘more sustainable’, whereby the processes are adjusted and environments retrofitted with sustainability principles. From these broader design frameworks, students individually select their own sites for finer scaled landscape design interventions, based on their personalized interpretations of ‘sustainability’ and selected ESD techniques developed through class presentations and essays. Projects are highly varied in their theme and scale including the creation of alternative models for urban-rural interfaces, resuscitating urban-rural hydrology, retrofitting urban centres, creating integrated public transport networks for regional towns.

In this context, Property development could be a “useful carrier” of the attributes that reflect the true nature of the profession and the knowledge students learnt in the property major. It is also worth exploring whether there are other approaches i.e. whether a multi-tasks or multi-projects approach could be used? For example, consultancy projects subject to peer and mentor’s evaluation and criticism. But this appears to be too resource demanding, although it provides opportunities, in property

alone, to address issues such as development, investment, valuation, asset management, legal, transaction, project administration and facilitation and finance. Overall, we use a 'site' (project) as a package of resources (e.g. physical, human and momentary) to address service demand by a variety of stakeholders. And the aim is to bring knowledge together through effective learning and critical interactions with industry orientation and engagement, using a development project as the medium.

The level of exercise in the capstone studio is subject to several factors such as existing knowledge and skill background of students. Capstone property skills should focus on feasibility, not simply role-play. What the students learnt in past subjects and how they comprehend are key concerns. Out of these skills, what level of competence and what kind of careers can be expected? This is the starting point of the design of a capstone subject. While there is a clear aim for typical design studio, it is argued that valuation is not the aim of the proposed property capstone subject, although it could be one of the "focuses" of the *Property Studio* along with others such as finance, cost implications and investment alternatives. Alternatively, a broader meaning of the valuation could be adopted in the capstone studio subject that utilizes valuation as a tool to serve multiple purposes associated with practical problem in the profession. The authors realise that the sense of a clear duty or duties defined and performed by the property profession is not as rigid and narrow or as apparently strong as in Engineering, Architecture, Law and Accounting.

CONCLUSIONS

As this paper is about education reform that is still in progress, many questions, including our own research question, remains unanswered or are only partially addressed. It remains to be seen how the key challenge of striking an effective balance in the teaching and learning activities of the capstone studio that assist students in synthesizing knowledge in their pathway towards professional masters and building competence towards employability.

What we have clarified here is that the studio teaching model, through the purposeful application of its 'model of interaction' and 'model of space', provides the tools that can address this pertinent challenge at this particular juncture in the Melbourne Model. We have also found that the 'model of interaction' at least has significant parallels with the Assessment of Professional Competences (APC) of API and RICS, the Property professional bodies. We also note that the success of the application of the studio model to non-design subjects will also depend on the additional teaching resources and funding that is required.

As co-researchers from different disciplines, we acknowledge that the gap of understanding between our disciplines and its practices has persisted (some of which manifest in our writing). This is certainly part of a broader challenge of the Bachelor of Environment's and the Melbourne Model's objective to create a cross-disciplinary education model. We find that this research has been helpful in narrowing the gap – and if continued into the longer term, could lead into more fruitful collaborations with more significant implications. This research is not an empirical study of teaching and learning experiences of students, instead it is an in-depth critical analysis of specific elements within the education reform illustrated through actual design of a subject responsive to and as a consequence of the reform. We have designed a reflective process to identify key issues and challenges which helps to confirm the consistency between learning outcomes and its revision that informs the subject design. Given resource restriction and

limits of this research, more comprehensive reviews that include the reflection from students and other relevant parties will be carried out in future studies.

References

- Australian Property Institute (2007) *Professional practice - 6th edition*, ACT, Australia, Australian Property Institute and New Zealand Property Institute.
- BECKERT, J (1999) Agency, Entrepreneurs, and Institutional Change. The Role of Strategic Choice and Institutionalized Practices in Organizations, *Organization Studies*, Vol. 20, No. 5, 777-799
- BIGGS, J. & TANG, C. (2007) *Teaching for quality learning at university*, New York, Open University Press, McGraw-Hill Education.
- BOULTON, G. & LUCAS, C. (2008) What are universities for? *League of European Research Universities*.
- BROOKFIELD, S. (1995) *Becoming a critically reflective teaching*, San Francisco, Jossey-Bass.
- CARBONE, A. & SHEARD, J. (2003a) Developing a model of first year student satisfaction in a studio-based teaching environment. *Journal of Information Technology Education*, 2, 15-28.
- CARBONE, A. & SHEARD, J. (2003b) A studio-based teaching and learning model in IT: what do first year students think? *SIGCSE Bulletin*, 34, 213-217.
- DUTTON, T. (1987) Design and studio pedagogy. *Journal of Architectural Education*, 41, 16-25.
- GELERNTER, M. (1988) Reconciling lectures and studies. *Journal of Architectural Education*, 41, 46-52.
- GU, D. (2003) The design studio the formation of the place and its pedagogy. *2003 Nanjing International Architectural Education Forum: Regionalism under the trends of globalization*. Nanjing, South-Eastern University.
- HOLDSWORTH, A., WATTY, K. & DAVIES, M. (2009) *Developing capstone experiences*, Melbourne, Centre for the study of higher education, The University of Melbourne.
- JOROFF, M. L. & MOORE, J. A. (1984) Case method teaching about design process management. *Journal of Architectural Education*, 38, 14-17.
- Langford, D & Hugh, W (2009 Edited) *Building a discipline: the story of construction management*, Association of Researchers in Construction Management
- LAWSON, B. (1994) *Design in mind*, London, Butterworth Architecture.
- NORTH, D. (2005) *Understanding the process of economic change*, Princeton and Oxford, Princeton University Press.
- OXMAN, R. (1986) Towards a new pedagogy. *Journal of Architectural Education*, 39, 22-28.
- PAI, H. (2003) *The portfolio and the diagram: architecture, discourse, and modernity in America*, Cambridge, MA, The MIT Press.
- PFAMMATTER, U. (2000) *The making of the modern architect and engineer: the origins and development of a scientific and industrially oriented education*, Basel, Birkhauser.
- RAMSDEN, P. (2003) *Learning to teach in higher education*, London, Routledge.
- RICS (2000) *Setting a world standard: assessment of professional competence*, Australia the Royal Institution of Chartered Surveyors.
- ROBERTS, A. (2004) Problem based learning and the design studio. *CEBE Transactions*, 1, 1-3.
- SCHON, D. (1983) *The reflective practitioner: how professionals think in action*, London, Temple Smith.
- SCHON, D. (1985) *The design studio: an exploration of its traditions and potentials*, London, RIBA Publications
- SCHON, D. (1987) *Educating the reflective practitioner*, san Francisco, Jossey-Bass.

- SCHON, D. (1988) Toward a marriage of artistry & applied science in the architectural design studio. *Journal of Architectural Education*, 41, 4-10.
- THE UNIVERSITY OF MELBOURNE (2007) *Nine principles guiding teaching and learning*, Melbourne, Australia, the University of Melbourne.
- THE UNIVERSITY OF MELBOURNE (2009) Refining our strategy: a discussion paper that invites involvement and response. Melbourne, the University of Melbourne.
- WAKS, L. J. (1999) Reflective practice in the design studio and teacher education. *Journal of Curriculum Studies*, 31, 303-316.