

# Environmental Planning Education and the possibilities for studio pedagogy

Caryl Bosman\* and Aysin Dedekorkut-Howes

Urban and Environmental Planning, Griffith University, Gold Coast campus

Email: [c.bosman@griffith.edu.au](mailto:c.bosman@griffith.edu.au)

**Abstract:** *Environmental planning has a substantial impact on social, economic and environmental welfare and getting it right is a complex challenge. Teaching environmental planning is challenging at the best of times but periods of rapid political change can present additional difficulties. Planning studio pedagogy (a student-centred, collaborative, inquiry-based/problem-based pedagogy based on a 'real world' project) is a unique and valuable learning and teaching method used to educate environmental planners. Planning studio pedagogy teaches students how to successfully work, in a collaborative way, with 'wicked', complex issues. This paper will focus on the role of studio pedagogy in teaching students about the political landscapes of environmental planning. Students are required to be up to date with the current political contexts of planning during their studies and also develop an understanding of the challenges they will face in the workplace. A number of wicked learning and teaching issues arise in environmental planning education, these include:*

- *Developing student awareness of ethical responsibilities and personal values and dealing with potential conflicts driven by political contexts;*
- *Developing student awareness of the impact of choices made (neutral or advocate) in the workplace and the outcomes of those choices in practice and;*
- *Dealing with the hopelessness students may feel due to particular political setups (what's the point of this exercise if it's not politically viable?)*

*We argue that studio pedagogy is an ideal learning and teaching environment and approach to address these issues and achieve successful environmental planning graduates that are leaders in their field.*

**Key words:** *Studio, Environmental Planning Education, politics*

## Introduction

A review of the literature on environmental planning education showed that while there is quite a bit of research on urban planning education in general there is not much on the environmental component of urban planning education or teaching environmental planning in particular. However, there are a couple of characteristics of environmental planning that makes it even more challenging to teach than urban planning. The interdisciplinary nature of planning requires basic knowledge in many different fields and requires many difficult choices in curriculum planning. Environmental planning makes this even more complicated as it requires a specialist level understanding of biophysical sciences.

As Deknatel (1984) notes designing environmental planning courses pose particular challenges in planning curricula as it requires great diversity of skills and knowledge (Niebanck 1993). In addition to the number and diversity of topics that could be covered in an environmental planning course, including the basic science behind environmental issues, Vos (2000) mentions two other problems that complicate environmental planning education. One of these problems arise from the fact that scientific information is much more important for environmental decision making than other policy arenas and the science behind

environmental issues is not only complicated but also continuously changing and quite often involves uncertainty. The third problem is related to the tension between the triple bottom line of sustainability, namely environmental quality, economic growth and social equity. The values that underlie the trade-offs between these add another layer of complexity to teaching environmental planning. There is no easy way to prepare the students to handle the conflict between environmental, economic, and equity values but they need to be able to understand all three perspectives and consequences of proposed actions on each. Another challenge is related to political viability of proposed solutions. Students feel frustrated when they realise political realities might not allow what they as planners think is the right course of action. What if you cannot communicate the consequences of actions and choices to the decision makers or the society in general effectively (e.g. what is happening with climate change at the moment)?

In this paper we argue that studio pedagogy is an ideal learning and teaching environment and approach to teach students about environmental planning. We draw upon secondary data from environmental planning and studio pedagogy literature to construct our argument. The aim of the paper is to generate discussion and debate on the importance/relevance of studio pedagogy in environmental planning education. We begin with a review of some of the literature relating to environmental planning to establish the context and illustrate the complexities of the discipline area. This then leads into a review of the Australian planning education curricula to identify the degree to which environmental planning is incorporated into it and we highlight the wicked learning and teaching issues related to environmental planning education. The paper concludes with a discussion on the beneficial links between studio pedagogy and environmental planning education.

### **The political landscapes of environmental planning: a review**

Environmental planning has a substantial impact on social, economic and environmental welfare and getting it right is a complex challenge facing governments, the private sector and communities around Australia. Over time, the complexity of planning has grown and planners today are asked to address a wide range of pressing problems in a context of constantly changing community preferences and demands. Some of the issues confronting planners include managing and responding to significant population growth, an ageing population and demographic change, urban congestion, transportation of goods and services, ensuring adequate energy and water supplies, adapting to climate change, managing hazards, responding to disasters, preserving natural and cultural heritage and the growing expectation that residents should be consulted on changes to their neighbourhood (Productivity Commission, 2011 pXXI)

Complex environmental planning problems present significant challenges for policy, institutions and management. Environmental problems are multi-dimensional and often not well understood. They involve spatial and temporal disparities between cause and effect and the effects of planning interventions on people and environments and decision making in complex systems are difficult to predict. Environmental planners need to find ways of dealing with complex problems in multi-scalar natural and human systems (Holling, 1973, 1995).

In complex policy and institutional contexts such as this, scholars and practitioners advocate for innovative arrangements that are holistic (Berkes, Folke, & Colding, 2003; Folke, Hahn,

Olsson, & Norberg, 2005); integrated across public and private sectors and decision-making at multiple scales (Lane & Robinson, 2009); and collaborative to engage different kinds of knowledge for social learning and build mutual understandings of problems and solutions (Armitage et al., 2009; Pahl-Wostl et al., 2007). Scholars and practitioners also emphasise adaptive ecosystems-based approaches to deal with issues of uncertainty (Walters, 1986; Williams, 2011). These approaches accept that the suitability of policy and management approaches are unknown, treat interventions as hypotheses to be tested and learned from, and employ policy 'experiments' to trial, evaluate, and adapt institutional arrangements (Johnson, 1999).

Although widely advocated, adaptive approaches have had limited implementation in practice (Walters, 1986). This is because there is little information available to planners on how to actually undertake adaptive management (Eberhard et al., 2009). The quality of biophysical, social and economic benchmarks and evaluative information against which to assess the performance of planning arrangements is poor (Kenward et al., 2011). Multiple forms of knowledge (e.g. scientific, local, customary, traditional owner, policy) are often not effectively integrated into decision making at various stages of adaptive management cycles (Hill et al., 2010; Hillman, Crase, Furze, Ananda, & Maybery, 2005).

Concepts of resilience, particularly social-ecological resilience are also gaining momentum in environmental planning to better understand the social, economic and governance vulnerabilities, adaptive capacity of communities in managing and overcoming the environmental problems facing them (Marshall et al., 2010; NOAA Science Advisory Board, 2009). Resilience and related concepts however are conceptualized in a number of different ways according to the different disciplines, problem contexts, scale, and objectives (e.g. resisting change, bouncing back, or transforming in response to environmental or social perturbations).

Thus, environmental planning, which is characterised by complex problems, requires planners to integrate multiple forms of data to make decisions transparently under conditions of uncertainty. As described above, the theory about how to resolve environmental problems points to adaptive ecosystems based approaches, which build social and ecological resilience, and take a holistic, flexible, collaborative and dialogic approach to planning and decision-making. Achieving this requires considerable reorientation of current planning and decision-making systems. Current systems are not flexible or holistic across scales and issues. Planners need skills in big picture thinking and analysis to support systemic reform and critical research and evaluation skills to address current shortfalls in the evidence base. Planners need to have the capacity to build and analyse information to undertake adaptive planning and to understand and monitor the impact of planning interventions on social and ecological resilience. They require skills in managing complexity. They need to be able to evaluate planning options in the context of decisions and actions at multiple-scales of decision making to ensure that strategies help rather than hinder solutions. Planners also need to know how to work with stakeholders to negotiate reforms within and across political systems. Finally, environmental planners need coping skills to deal with personal and professional fatigue in dealing with difficult and contested problems, which can seem never-ending, and to deal with ethical dilemmas.

## Planning education curricula

To ensure professional graduate outcomes the professional body, Planning Institute of Australia (PIA), implements a stringent accreditation policy. The objective of this policy (PIA 2011: 4) is 'to encourage and support students ... to become planning professionals, who can think creatively, analytically and critically, undertake independent research, communicate effectively, and act ethically.' In addition the accreditation policy (PIA 2011 p.7) 'identifies core and desirable capabilities, competencies, skills and knowledge, and ethical standards, which are expected to be demonstrated in all accredited planning programs.' These include both generic and core skills as well as supporting knowledge areas:

- *generic skills* include: problem identification and the formation of creative solutions; critical thinking and spatial analysis, understanding and the application of theory to practice and written, verbal and graphic communication and team work;
- *core skills* include the knowledge of all spheres of professional practice, the ability to design and develop plans and manage projects.

Two of the 28 key performance indicators stated in the policy (PIA 2010 p.11) are the:

1. 'Capacity to apply theoretical and technical planning skills to unfamiliar or emergent circumstances, even with incomplete information.'
2. 'Capacity to prepare plans and urban designs to address and manage land use and development issues and opportunities.'

We will return to these two key performance indicators in the conclusion of this paper. All the skills and capabilities stated in the PIA policy are embedded in planning studio learning and teaching. Planning studio pedagogy provides essential benefits for the student experience, retention and professionalisation

Inclusion of environmental issues and sustainability into the planning curricula has been limited in Australia (Hurlimann 2009). Gunder and Fookes (1997) found that on average in 1995, accredited planning-school curricula in Australasia focused less than 5 percent of their total programs on environmental issues. While over a quarter of all programs had no environment-orientated courses the most any program had was only 12 percent of overall course content focused on environmental issues. Sandercock (1997) called for a paradigm shift in the role of planners to prepare them for the twenty first century and included ecological literacy among the needs of planners to work effectively in the changing environment. In contrast to Australia the percentage of accredited planning programs in North America offering environmental planning as an area of specialization increased from 48% in 1984 (Deknatel 1984) to 86% in 2000 (White & Mayo 2005) and Association of Collegiate Schools of Planning (2000) describes environmental planning as one of the five primary areas of planning practice.

A recent survey of planning professionals in Australia (Hurlimann 2009) identified perceived gaps in environmental knowledge of planners in the areas of climate change and water management and skills gaps of critical thinking and independent inquiry. This is not surprising if we consider how little environmental planning is emphasized in the Accreditation Policy of PIA (PIA 2011). The only allusion to environmental issues in core competency areas is in performance outcomes: "knowledge and theories of urban and regional planning and systems, including but not restricted to principles of land use, urban form, infrastructure,

*natural systems*, transport, the integration of land use and transport, heritage conservation, landscape and human settlement patterns” [emphasis added]. Environmental planning is one of the five main areas of supportive knowledge the policy identifies and elaborates on, however, it is made clear that these areas are not intended to be mandatory and individual planning programs may include all or some of these areas or substitute others if they see fit. The competency objective PIA (2011, 20) identifies in environmental planning is: “Planners take a collaborative role in the production and implementation of environmental plans, whether these are discrete plans, components of other plans, or by providing environmental planning analyses of others’ plans or actions.” The four performance outcomes expected include:

1. Knowledge of the main principles of sustainable development, ecological systems and key issues such as climate change.
2. Knowledge of natural hazards and planning approaches to managing those hazards.
3. Capacity to produce basic environmental plans at a level demonstrating understanding of broader principles and policy implementation.
4. Capacity to practically and critically link plans into wider frameworks of environmental action and influence at a variety of scales (PIA 2011, 20).

In 2007 the Australian Research Institute in Education for Sustainability (ARIES) published a report entitled *Shifting towards Sustainability: Education for Climate Change Adaptation in the Built Environment Sector* that focussed on planning, engineering, architecture and landscape architecture and was supported by the relevant professional organisations including PIA (Lyth, Nichols & Tilbury 2007). It suggested that graduates in the built environment area should have nine competencies that would enable them to:

1. think about problems holistically and through the ‘prism’ of climate change
2. understand principles of sustainable development
3. problem solve using lateral and integrated thinking
4. comprehend the significance of the climate change problem
5. interpret information about climate change from a range of sources and disciplines
6. effectively interpret information about impacts and vulnerabilities specific to the locality, region or sector they are working in to develop appropriate problem solving strategies for climate change adaptation
7. make judgements for decision making based on interpretations of degrees of uncertainty associated with scenarios for local and regional impacts
8. think beyond social and professional practice norms to develop creative climate change adaptation strategies
9. demonstrate resolve to make decisions despite uncertainties about local and regional climate change impacts (Lyth, Nichols & Tilbury 2007, 7).

With regards to the current state of climate change adaptation knowledge and skills around the country, the ARIES research found that planning graduates had an “inconsistent level of knowledge and skills” and they gained these skills in something of an ad hoc manner; there was a lack of professional development programs for existing planners; and teachers needed more training, resources and experience with climate change adaptation (Lyth, Nichols & Tilbury 2007, 26).

## **Wicked learning and teaching issues**

### ***Diversity of Skills and Knowledge***

When there is such a variety of subjects to be covered tough decisions need to be made regarding what to include in the curricula. In environmental planning education the key question is whether environmental knowledge or general skills of implementation and analysis are more important (Hurlimann 2009). *Environmental or foundational knowledge* includes theoretical principles and provides scientific and ideological perspectives to analyse the issues. White and Mayo (2005) identify five foundational knowledge topics in environmental planning as ecological concepts, environmental economics, environmental philosophy, environmental psychology, and sustainability. They also identify areas that have *general skills or implementation methods* to apply these principles as environmental design, geographical information systems, environmental impact assessment, environmental policy and law, and site planning. Foundational topics are usually taught at the beginning of the program and applied skills are toward the end.

Which one of these is more important for an environmental planner depends on a number of factors such as what type of job a planner is likely to have. Hurlimann's (2009, 655) study found that "for a significant number of respondents, skills are more important for planners to possess than specific knowledge in order to address environmental problems... However, it could also be argued that planners must have sufficient environmental literacy to be able to adequately and accurately apply their skills to these issues. It is argued that possession of research and analytical skills, accompanied by specific knowledge in one or two environmental areas will equip planners well with the skills to address environmental challenges." White and Mayo's (2005) findings for North American planning schools are similar: For students, applied knowledge skills are more important for getting employment and succeeding initially in practice since most new planners are expected to perform as technicians. However, as they move toward management positions foundational knowledge (i.e. understanding of ecological concepts), philosophical knowledge and political skills gain importance. The changing needs of the practicing planner in time indicate that the challenge does not finish within graduate levels but continue throughout their career. Like all professionals continued education is crucial for a successful career.

### ***The Role of Science in Environmental Decision-Making***

Understanding ecological processes is a prerequisite to identifying solutions to environmental problems (White & Mayo 2004). While planners will not necessarily undertake environmental research themselves they should have enough environmental literacy to understand the technical and science-oriented members of the interdisciplinary teams they need to work in as well as understand and recognize key issues in technical reports (Vos 2000). Cardew (1999) argued for the importance of integrating environmental management into urban planning education focusing on the key questions of how much environmental science planners need, how is it to be taught, and by whom (generalists or specialists). Generally science courses are taught independently from planning courses but discussion of the role of science and uncertainty in environmental decision-making is also necessary.

### ***The Role of Values: Balancing Environment, Economy, Equity***

One of the toughest challenges planners face every day is balancing the competing claims of environment, economy and social equity. This requires knowledge in all three areas of environmental decision making (Vos 2000), environmental science, economy and the actual costs of all the decisions made, and equity, the social implications of the decisions and how they affect people. But having this knowledge does not mean value-free, scientific and objective decisions will be made, ultimately the decision is based on which one of the values weighs heaviest at the moment the decision is made.

Back in the 1970s Ian McHarg (1978) claimed that planner's most important role is to elicit the value systems of the people who are seeking to solve a problem because these values would ultimately determine the planning solutions. Planner's job in this sense is to help the community make its values explicit. McHarg further defined an ecological planner as one who identifies alternative solutions with attendant costs and benefits based on an understanding of both biophysical and social systems. Planning is not a value-neutral applied science but "an inherently social, communicative, and ethical undertaking" (Klosterman 1995, 247). A planner is not a value-neutral technician and it is important for planning students to understand the importance of values in planning decisions as well as planner's own values. Hence, one issue to discuss with students in the classroom is their own values, the roles they may take as a professional planner and their ethical responsibilities in upholding planning principles. Are there going to be some that become the advocate planner and do advocacy on behalf of certain groups or certain issues?

### ***Political Viability***

Planning students are challenged particularly by looking for realistic and politically viable yet effective solutions. We try not to stifle their creativity and expect them to stick to their principles and invariably face with questions such as what is the point of this exercise if the recommendations are not politically viable. They may feel particularly hopeless and discouraged during periods such as now when planning is not looked at all that favourably. What tools can we equip them with to deal with these situations in real life?

The political nature of planning is an important issue planning students need to come to terms with. Planners are not decision makers but they advise the decision makers. In their capacity as advisors they can influence events through their capacity to articulate viewpoints and develop consensus and coalitions (Levy 2003). Discussing the kinds of powers planners have (persuasion, logical argument, communication skills) with planning students will prepare them for the realities of the workplace.

### ***Toolbox of the Environmental Planner***

So how do we prepare future planners to deal with this complicated work environment and the challenges they will face at their work place? The scant literature on environmental planning education contains plenty of suggestions in terms of specific knowledge and skills an environmental planner should have. The literature reviewed highlights a number of *foundational knowledge topics* that are important including environmental ethics (Martin & Beatley 1993, Beatley 1995), environmental justice (Washington & Strong 1997, Gunder 2006), and sustainability (Martin & Beatley 1993). The *skills* that are identified to be

important for environmental planners include negotiation, arbitration and conflict resolution (Niebanck 1993, Susskind 2000), and critical inquiry (Gunder 2006).

### ***Environmental Ethics***

Beatley (1995) views an understanding of environmental values and ethics as an essential underpinning not only for environmental planners but all planners since “value-neutral discussions of management tools and techniques such as environmental impact assessment, growth management, or carrying capacity are simply not possible” (Martin & Beatley 1993, 123-124). As such, Beatley (1995, 321) argues that environmental ethics is “an especially important component of any environmental planning curriculum or concentration.” However, Martin and Beatley’s (1993) survey of planning curricula in North America found that in the early 1990s only three out of 87 responding programs offered a separate environmental ethics course, though 64 percent indicated that the subject was covered to some degree in other courses.

Beatley (1995) claims that tertiary education is one of the last opportunities for students to engage in informed moral reflection and to clarify and critically assess their personal values and moral convictions before entering the “world of professional practice, political compromise, and economic expedience” (Klosterman 1995, 248). As such, exposure to ethical literature is necessary to help students develop their own personal ethical frameworks (Beatley 1995). He further suggests that rather than relegating environmental values and ethics to a single course, consideration of ethics should be injected wherever possible.

### ***Environmental Justice***

Washington & Strong (1997) argue for an emphasis on environmental justice in the planning curriculum as the issues raised by the movement are within planners’ professional responsibility, yet neither planning practice nor education has paid much attention to it. They claim that planning education should provide students with an understanding of planner’s role in decision making (i.e. they are not neutral experts) and values, norms and rules of professional practice. Washington & Strong (1997) suggest that environmental justice can provide a framework for examining both planner’s own personal and professional values as well as those of the stakeholders. Gunder (2006, 218) points out planning educators’ additional responsibility to ensure that “social justice is not swept aside in the dualistic tension between market efficiency and environmental protection, even if economic growth always continues to seem to prevail. His suggestion is to achieve this through developing core skills of critical inquiry and ethical judgment in planning students.

### ***Sustainability***

Martin and Beatley (1993) argue that given the focus of planning on managing land use and human settlement patterns, coverage of sustainability in planning curricula in addition to environmental ethics is essential for providing normative guidance to planners. Their survey of planning programs in North America found that only two-fifths of the programs offered courses that explicitly addressed issues of sustainability at that time. In conclusion they suggested in the early 1990s that sustainability needs to be incorporated into the planning curricula more explicitly and directly. White and Mayo’s (2004) research found that sustainability was considered to be one of the most important knowledge topics by the faculty in environmental specialization of North American planning programs. With



sustainability becoming a dominant concept in planning education by the new millennium concerns on its conceptualization arose and led to warnings that triple bottom-line based sustainable development is quite different than ecological sustainability (Gunder 2006). This shifted the focus of the discussion to which sustainability planning education should emphasize.

### ***Negotiation, Arbitration and Conflict Resolution***

The roles and skills an environmental planner needs have to go beyond procedural organisation to structuring and coordinating decision making processes involving many interests much like a mediator or a coordinator. An environmental planner needs to have increased substantive knowledge as well as ability for interdisciplinary teamwork (Deknatel 1984).

Niebanck (1993) suggests previously neglected skill areas of negotiation, arbitration and conflict resolution should be included in environmental planning education. He argues that one form environmental planning takes is targeted action and in addition to negotiation and communication skills this needs advocacy planning. Ethics and values underlie planning as principled action.

### ***Critical Inquiry***

The importance of balancing environment, economy and equity values in making environmental planning decisions has already been discussed. Gunder's (2006) warning of the dangers of the way sustainability is perceived and taught in planning schools has also been mentioned. His specific concern is that even though economic growth always continues to seem to prevail in particular social justice may be swept aside in the dualistic tension between market efficiency and environmental protection. To prevent this he suggests that planning education must develop in its students core skills of critical inquiry and of ethical judgment.

## **Studio Pedagogy: What is it?**

After establishing the importance of foundational environmental knowledge in environmental planning education; confirming its limited inclusion in planning curricula, especially in Australia; visiting the particular challenges of teaching environmental planning; and reviewing the foundational knowledge areas that are emphasized in the literature our focus turns to solutions. In designing environmental planning program curricula the tough choice between environmental knowledge and general skills/implementation methods can be overcome by striking a good balance between them. However, this is easier said than done. Experiential learning and project-based courses such as studios can deliver environmental knowledge and principles along with the practical skills that will lead to jobs.

Planning studios are student centred learning and teaching environments characterised by problem based learning and learning by inquiry pedagogies which emphasise active independent student-focused learning. Planning studios require students to draw upon personal knowledges and experiences as well as their academic learning from all their courses. Students are required to work collaboratively with input from the profession and staff where the staff: student ratio is typically high (see Zehner et al. 2009). The main value comes from shifting the role of the student from passive receiver of information to an active

and engaged learner. Studios provide the opportunity for teachers and students to explore problems and identify and reflect on solutions in a reiterative way. Students learn from their teachers' experience, from their peers, their application of concepts and they develop deep understanding by doing. Likewise, teachers gain knowledge of students and their challenges in learning, in conceptualising problems and in engaging in the theory-practice interface.

The studio curriculum is project based and provides a balance of theory and professional practice, using multiple teaching and learning approaches, with the aim to equip students with the skills, knowledge and practices that underpin their academic and professional careers. Studio learning and teaching is flexible and innovative to accommodate the studio project and diverse student needs. Properly conceptualised, designed and delivered, planning studios can provide students with confidence, self-esteem, substantive knowledge about environmental planning and a range of generic skills including communications skills, creative problem solving and critical thinking. Studio learning and teaching practices can positively impact retention, the student experience and engagement with professional practice. As identified by Tippet, Connelly and How (2011 p. 28) the challenges for studio teaching are primarily: staff and student contact time, a high level of summative and formative feedback on assignments, dealing with the complex and messy problems relating to a real site, staying up to date with rapidly changing environmental, political and urban contexts, working in a collaborative environment and a context of institutional resources scarcity.

The studio environment is characterised by more frequent, longer and more informal contact with peers and teaching staff in a dedicated classroom or studio. The planning studio becomes a space/place of transition into academia and the profession. The collaborative, project and problem/inquiry based studio curriculum encourages students to develop collegiality. The studio project aims at capturing and stimulating the enthusiasm of many first year students and channelling this energy into positive learning and teaching outcomes. Students learn from peers by working in the studio and in small groups which actively engages them in teaching and learning and university life, which develops institutional commitment. This environment encourages students to become less 'isolated learners' and to form bonds of friendships (Tinto 2003). The high degree of interaction between staff and students that characterise studio pedagogies, also goes some way to provide students with a sense of belonging and purpose because students feel that staff and peers know them. Staff student interaction is largely structured around feedback on assignment tasks which begin on day one and continue over the studio semester. Continual feedback in the form of diagnostic, formative and summative assessment act as a means of transition to higher education because they encourage and support students and heighten satisfaction.

Studios offer opportunities for excellent student experiences both social and academic. These positive experiences go some way to reduce attrition.

- The interaction between staff and student and between students in different years and across disciplines is embedded in studio learning and teaching. This increased interaction among peers and staff provides students with a sense of belonging and purpose which is essential among factors relating retention and graduate outcomes.
- Studio learning and teaching is flexible and innovative to accommodate the studio project and diverse student needs.

- Studio is project based and focuses on a real project. This means the learning is relevant to the program and to the workplace. Active learning is essential as the studio is problem and project based. Links between theory and practice are made explicit in studio pedagogy.
- Studio also prepares students for the professional workplace and makes them highly employable. Studio learning and teaching focuses on student leadership rather than staff domination. Leadership skills are embedded in the learning and teaching methods and student outcomes. There is also increasing input from profession to ensure learning outcomes are aligned with expectations of employers.

The key to studio teaching and learning is of course student engagement. This is easily achieved in the studio environment.

### **Studio pedagogy and environmental planning**

The literature highlights negotiation, arbitration and conflict resolution (Deknatel 1984, Niebanck 1993, Susskind 2000), and critical inquiry among *generic skills* important to environmental planners. Plan making, evaluation and related tasks that are at the heart of planning studios involve creative and critical thinking and analysis (Higgins 2009, Balsas 2012). Developing critical thinking ability is among the learning outcomes of studio courses (Németh and Long 2012). Furthermore, studio pedagogy often involves team-based learning through which students learn to collaborate, understand group dynamics and develop interpersonal cooperation skills (Németh and Long 2012, Senbel 2012). Problem solving element of the studio pedagogy helps students develop skills in negotiating oppositional viewpoints and dispute resolution (Higgins 2009, Németh and Long 2012) and “dialogical experience” in the negotiation of solutions within and across teams (Senbel 2012).

Studio courses may have dealing with ethical issues as a learning outcome (Balassiano, and West 2012) and aim at teaching students to assess planning outcomes based on a set of values such as justice or sustainability (Németh and Long 2012). As such, through the selection of projects, *foundational knowledge* areas of sustainability, environmental justice and environmental ethics may be explored through a studio course. Project discussions are a valuable way of discussing role of values in decision making. Through the projects in a planning studio students are challenged to balance the competing claims of environment, economy, and equity and how science is included in the process. In this simulated planning environment they understand the various roles of the planner and develop their personal professional ethics (Németh and Long 2012).

### **Conclusion**

The scant literature on environmental planning education highlights a number of challenges: diversity of skills and knowledge that needs to be covered, the role of science and values in environmental decision-making, and political viability of solutions.

Studio type courses relying on project-based learning where foundational knowledge and planning principles can be integrated as well as practical skills and principles are applied to a real project can provide an efficient way of teaching the two sets of knowledge and skills

necessary for an environmental planner. Recommendations on dealing with the other challenges focus on the topics and skills that should be included in the environmental planning curriculum. A review of the literature on suggested emphasis in the curriculum shows agreement on the core themes that are deemed important in environmental planning education. Social and environmental justice forms one of the three pillars of sustainability. Both environmental ethics and environmental justice emphasize the importance of values in planning. Planner's role in the process is also a recurring theme. The skills that are emphasized include critical inquiry, negotiation, arbitration, and conflict resolution.

While recommendations are aplenty in terms of what should be included in the curriculum, there are no studies that confirm or reject the importance of these topics and skills in relation to environmental planning education. This points to a need for additional studies that can not only test these suggestions but also evaluate them.

We said we would return to the two key PIA KPIs. The principal aim of the studio is then to prepare students for professional practice; to prepare students for real life planning projects where there are situations of uncertainty, where answers are not known in advance, and where there may be multiple solutions to a problem, and to equip students with the skills and knowledge to 'prepare plans and urban designs to address and manage land use and development issues and opportunities.' Higher education institutions require effective, efficient and relevant teaching methods and content to achieve well rounded, critical thinking, employable leaders in their profession. In addition many Gen Y students respond well to active and engaged pedagogies such as those characterised by studio learning and teaching. In short, and using the jargon of the institutions, planning studios:

- create an engaging, motivating and intellectually stimulating learning experience;
- encourage the spirit of critical inquiry and creative innovation informed by current research;
- enhance student engagement and learning through effective curriculum design, pedagogy and assessment strategies.

In this paper we have argued for the importance of a studio teaching and learning environment as an important and valuable component in the GU planning program. The studio, we suggest, is just as relevant today for teaching environmental planning to Gen Y students as it ever was in previous times, as a method of teaching planning to generations of Boomers and Gen X students. And it will remain core to educating environmental planners in future generations

## References

- Armitage, Derek R, Plummer, Ryan, Berkes, Fikret, Arthur, Robert I, Charles, Anthony T, Davidson-Hunt, Iain J, et.al. (2009). Adaptive co-management for social-ecological complexity. *Frontiers in Ecology and the Environment*, 7(2), 95-102. doi: doi:10.1890/070089
- Association of Collegiate Schools of Planning. (2000). *Guide to undergraduate and graduate education in urban and regional planning* (11th ed.). Atlanta, GA.
- Balassiano, Katia, and David West. 2012. Seeking the Studio Experience Outside of the Studio Course. *Journal of Planning Education and Research* 32 (4):465-475.

- Balsas, Carlos. 2012. What about Plan Evaluation? Integrating Evaluation in Urban Planning Studio's Pedagogy. *Planning Practice & Research* 27 (4):475-494.
- Beatley, T. (1995) 'Teaching environmental philosophy to graduate planning students', in Hendler, S. (ed) *Planning ethics: A reader in planning theory practice and education*, New Brunswick, New Jersey, Center for Urban Policy Research, 321-343.
- Berkes, F., Folke, C., & Colding, Johan. (2003). *Navigating social-ecological systems: building resilience for complexity and change*. Cambridge: Cambridge University Press.
- Cardew, R. (1999) 'Two cultures, common purpose: Integrating environmental management into urban planning education', *Australian Planner*, 36 (3), 134-141.
- Deknatel, C. Y. (1984) 'Choices of orientation in teaching environmental planning', *Journal of Planning Education and Research*, 3(2): 118-125.
- Eberhard, R., Robinson, C. J., Waterhouse, J., Parslow, J., Hart, B., Grayson, R., & Taylor, B. (2009). Adaptive management for water quality planning - from theory to practice. *Marine and Freshwater Research*, 60(11), 1189-1195. Doi 10.1071/Mf08347
- Folke, Carl, Hahn, Thomas, Olsson, Per, & Norberg, Jon. (2005). Adaptive Governance Of Social-Ecological Systems. *Annual Review of Environment and Resources*, 30(1), 441-473. DOI:10.1146/annurev.energy.30.050504.144511
- Friedmann, J. (1996) 'The core curriculum in planning revisited', *Journal of Planning Education and Research* 15 (1), 89-104.
- Gunder, M. (2006) 'Sustainability: Planning's saving grace or road to perdition?', *Journal of Planning Education and Research*, 26(2): 208-21.
- Gunder, M., & Fookes, T. (1997) 'Planning school programs in Australia and New Zealand: A comparison of accredited programs', *Australian Planner*, 34 (1), 54-61.
- Higgins, Marilyn, Elizabeth Aitken-Rose, and Jennifer Dixon. 2009. The pedagogy of the planning studio: A view from Down Under. *Journal for Education in the Built Environment* 4 (1):8-30.
- Hill, R., Williams, K. J., Pert, P. L., Robinson, C. J., Dale, A. P., Westcott, D. A., O'Malley, T. (2010). Adaptive community-based biodiversity conservation in Australia's tropical rainforests. *Environmental Conservation*, 37(1), 73-82. DOI: 10.1017/s0376892910000330
- Hillman, Terry, Crase, Lin, Furze, Brian, Ananda, Jayanath, & Maybery, Daryl. (2005). Multidisciplinary Approaches to Natural Resource Management. *Hydrobiologia*, 552(1), 99-108. doi: 10.1007/s10750-005-1508-3
- Holling, C.S. (1973). Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics*, 4(1), 1-23. DOI:10.1146/annurev.es.04.110173.000245
- Holling, C.S. (Ed.). (1978). *Adaptive environmental assessment and management* Chichester, UK: Wiley.
- Hurlimann, A. C. (2009) 'Responding to environmental challenges: an initial assessment of higher education curricula needs by Australian planning professionals', *Environmental Education Research*, 15(6), 643-659.
- Johnson, Barry L. (1999). The Role of Adaptive Management as an Operational Approach for Resource Management Agencies. *Conservation Ecology (online)* URL: <http://www.consecol.org/vol3/iss2/art8>, 3(2), 8.
- Kenward, R. E., Whittingham, M. J., Arampatzis, S., Manos, B. D., Hahn, T., Terry, A., Rutz, C. (2011). Identifying governance strategies that effectively support ecosystem services, resource sustainability, and biodiversity. *Proceedings of the National Academy of Sciences of the United States of America*, 108(13), 5308-5312. DOI:10.1073/pnas.1007933108

Klosterman, R. E. (1995) 'Introduction to Ethical Theory and Planning Education', in Hendler, S. (ed) *Planning ethics: A reader in planning theory practice and education*, New Brunswick, New Jersey, Center for Urban Policy Research, 247-260.

Lane, Marcus B. & Robinson, Cathy J. (2009). Institutional Complexity and Environmental Management: The Challenge of Integration and the Promise of Large-scale Collaboration. *Australasian Journal of Environmental Management*, 16(1), 16-24. DOI:10.1080/14486563.2009.10648757

Levy, J. M (2003) *Contemporary Urban Planning* (Sixth Ed.) Upper Saddle River, New Jersey, Prentice Hall.

Lyth, A., Nichols, S., & Tilbury, D. (2007) Shifting Towards Sustainability: Education for Climate Change in the Built Environment Sector. North Ryde: Australian Research Institute in Education for Sustainability (ARIES), Macquarie University.

Marshall, N.A., Marshall, P. A., Tamelander, J., Obura, D., D., Malleret-King, & Cinner, J.E. (2010). A Framework for Social Adaptation to Climate Change; Sustaining Tropical Coastal Communities and Industries (pp. 36pp). Gland, Switzerland. IUCN.

Martin, E., & Beatley. T. (1993) 'Our relationship with the earth: Environmental ethics in planning education', *Journal of Planning Education and Research*, 12(2): 117-126.

McHarg, I. (1978) 'Ecological planning: The planner as catalyst', in Burchell, R. W. and Sternlieb, G. (eds) *Planning theory in the 1980s: A search for future directions*, New Brunswick, New Jersey, The Center for Urban Policy Research, 13-15.

National Oceanic and Atmospheric Administration [NOAA] Science Advisory Board. (2009). Integrating Social Science into NOAA Planning, Evaluation and Decision Making. A Review of Implementation to Date and Recommendations for Improving Effectiveness: A Report from the NOAA Science Advisory Board. Silver Spring: NOAA Science Advisory Board.

Németh, Jeremy, and Judith Grant Long. 2012. Assessing Learning Outcomes in U.S. Planning Studio Courses. *Journal of Planning Education and Research* 32 (4):476-490.

Niebanck, P. (1993) 'The shape of environmental planning education', *Environment and Planning B*, 20, 511-511.

Pahl-Wostl, C., Craps, M., Dewulf, A., Mostert, E., Tabara, D., & Taillieu, T. (2007). Social Learning and Water Resources Management. *Ecology and Society*, 12(2), 15.

Planning Institute of Australia. (2011) Accreditation policy for recognition of Australian planning qualifications. Canberra: Planning Institute of Australia National Secretariat. <http://www.planning.org.au/documents/item/3406>

Productivity Commission. (2011). *Performance Benchmarking of Australian Business Regulation: Planning, Zoning and Development Assessment Research Report*

Rittel, Horst W. J., & Webber, Melvin M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4(2), 155-169. DOI: 10.1007/bf01405730

Sandercock, L. (1997) 'The planner tamed: Preparing planners for the twenty-first century', *Australian Planner*, 34 (2), 90-95.

Senbel, Maged. 2012. Experiential Learning and the Co-creation of Design Artifacts: A Hybrid Urban Design Studio for Planners. *Journal of Planning Education and Research* 32 (4):449-464.

Susskind, L. (2000) 'Environmental planning: The changing demands of effective practice,' in Rodwin, L. and Sanyal, B. (eds), *The profession of city planning: Changes, images and challenges 1950-2000*. New Brunswick, NJ, Center for Urban Policy Research, Rutgers University, 161-173.

Tinto, Vincent. (2003). Learning Better Together: The impact of learning communities on student success. *Higher Education Monograph Series*. Syracuse University, 1-8.

Tippett, J., A. Connelly and F. How. (2011). You want me to do what? Teaching a studio class to seventy students? *Journal for Education in the Built Environment* 6, no 2: 26-53.

Vos, J. (2000) 'Teaching environmental planning and policy by linking theory and praxis', *Journal of Public Affairs Education*, 105-113.

Walters, C.J. (1986). *Adaptive Mangement of Renewable Resources*. New York: MacMillan.

Washington, R. O., & Strong, D. (1997) 'A model for teaching environmental justice in a planning curriculum', *Journal of Planning Education and Research*, 16(4): 280–290.

White, S. S., & Mayo, J. M. (2005) 'Environmental education in graduate professional degrees: The case of urban planning', *The Journal of Environmental Education*, 36(3): 31-38.

White, S. S., & Mayo, J. M. (2004) 'Learning expectations in environmental planning: Predictions and interpretations', *Journal of Planning Education Research*, 24(1): 78-88.

Williams, Byron K. (2011). Adaptive management of natural resources framework and issues. *Journal of Environmental Management*, 92(5), 1346-1353. DOI: 10.1016/j.jenvman.2010.10.041

Zehner, Robert, Forsyth, Graham, Musgrave, Elizabeth, Neale, Douglas, Harpe, Barbara de la, Peterson, Fiona, & Frankham, Noel. (2009). Curriculum Development in Studio Teaching: STP Final Report (Vol. Volume One ). Strawberry Hills: Australian Learning and Teaching Council