Broadening Horizons: Teaching planning students about climate change at the Griffith School of Environment

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ABSTRACT: Climate change is a problem that requires action on many fronts. Society needs to both reduce its greenhouse gas emissions and adapt to impacts that cannot be avoided. Meeting such challenges requires a concerted effort by all sectors of society (government, business and the community) and this in turn places new demands on many professions. Planners will have a particularly important role to play and the challenge for educators is how to best provide graduates with the appropriate skills and knowledge. One of the key problems is how to integrate climate change into an already crowded professional curriculum. Should it be inserted as a topic in existing courses, should separate courses be created, or should a combination of these two approaches be adopted within a degree? What new skills and background knowledge will planners need? What is the best mode of delivery? This paper addresses these questions using examples from the Griffith School of Environment that has built up considerable experience in this area of professional education over several decades. The school offers a variety of degrees (in urban and environmental planning, architecture, environmental management and environmental science) and provides a useful perspective on the challenges faced by a broad range of professions across all sectors.

Keywords: climate change, urban and environmental planning, education, sustainability, Australia

Introduction

Climate change poses a profound challenge to the built environment. On the one hand settlements must reduce net greenhouse gas emissions to mitigate the problem and avoid the worst effects. On the other, the urban environment must adapt to the impacts that cannot be avoided. Planners obviously have an essential role to play in both mitigation and adaptation but how are they to be taught about climate change? This paper addresses this question using the Griffith School of Environment as a case study. Section one outlines a brief history of planning, environment and climate change education at the tertiary level and points out some of the key competencies and issues. The second section delves into the core skills and knowledge of planning education and relates these back to the identified competencies. In section three a brief history of urban and environmental planning education at Griffith

University is given and the final section reviews the current programs to explain how the core competencies and issues identified in the earlier sections are addressed.

1) A Brief Educational History

The history of education for planning, the environment and climate change stretches back a long way and it is difficult to do it justice in a short space. Palmer (1998, 4) attributes the Scottish Professor Patrick Geddes with being one of the pioneers of both environmental and planning education in late-Victorian Britain and his work was followed by the rise of 'nature studies' in the early part of the twentieth century. The term 'environmental education' stepped onto the world stage with the formation of the International Union for the Conservation of Nature and Natural Resources (IUCN) in the late-1940s and the idea was promoted at the 1968 UNESCO Biosphere Conference in Paris. By 1970 a growing list of environmental incidents and ongoing problems forced governments around the world to respond with new policies, plans and agencies (Howes 2005, 8-18).

The 1972 United Nations (UN) Conference on the Human Environment in Stockholm was a major turning point, with governments meeting to address both environmental and development issues. By this stage environmental education was seen as an essential component of any response and Principle 19 of the Stockholm declaration stated that:

"Education in environmental matters, for the younger generation as well as adults, giving due consideration to the underprivileged, is essential in order to broaden the basis for an enlightened opinion and responsible conduct by individuals, enterprises and communities in protecting and improving the environment in its full human dimension ..." (UN 1972, Principle 19).

One of the outcomes of the Stockholm conference was the creation of the UN Environment Programme (UNEP) that co-founded the International Environmental Education Programme (IEEP) (Palmer 1998, 7). The 1977 IEEP conference in Tbilisi set out the principles of environmental education that remain current to this day, including: life-long learning; an interdisciplinary curriculum; the interconnectedness of society and the environment; the multi-dimensional nature of environmental issues (including the social, political, economic and technological aspects); energy and material resource limits; global and future dimensions; critical thinking and problem solving; and, values and ethics (Palmer 1998, 10-11).

In 1980 UNEP, the IUCN and the World Wildlife Fund (WWF) released the *World Conservation Strategy* that promoted 'sustainable development' as a systematic response to Speaker Reference: 1812.383

the growing list of environmental, economic and social problems (section 20). The underlying idea was that if we are careful we can still get the benefits of industrial development without destroying the environment on which we depend. Section 10 gives a special place to planning, particularly with regards to environmental assessments and resource allocation decisions. Section 12 deals with training and suggests that universities should play a key role in educating professionals, such as planners, with an emphasis on interdisciplinary courses.

The idea of sustainable development was taken up by the World Commission on Environment and Development (1983-87). Its final report, *Our Common Future*, has become famous for defining sustainable development as "development that meets the needs of the present while compromising the ability of future generations to meet their own needs" and education was given a significant role in achieving the necessary transformation (WCED 1987, section 2.1; Palmer 1998, 16). The meeting of world leaders at the 1992 United Nations Earth Summit led to the adoption of *Agenda 21* as a plan of action. Chapter 36 of this plan stressed the importance of environmental education and opened with a reference to the Tbilisi principles (UN 1992, section 36.1). In the wake of these developments there was a shift in emphasis from environmental education to education for sustainability with many universities committing themselves to various sets of principles (Wilensky 2007, 2).

The growing recognition of climate change as a major issue over the last decade has seen a further shift within education for sustainability programs in Australia. 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 the Planning Institute of Australia (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).

The report argued that adaptation had been somewhat neglected (due to the popular focus on mitigation) and that built environment professionals such as planners had a major role to play (Lyth, Nichols & Tilbury 2007, 12-13). With regards to the current state of planning education around the country, the ARIES research found that: planning graduates had an "inconsistent level of knowledge and skills"; that they gained these skills in something of an ad hoc manner; that there was a lack of professional development programs for existing planners; that teachers needed more training, resources and experience with climate change adaptation; and that climate change adaptation should be integrated into programs with partnerships developed to share resources (Lyth, Nichols & Tilbury 2007, 26).

2) The Core Skills and Knowledge for Urban and Environmental Planning

Curriculum, pedagogy and assessment are the three interrelated elements of an education system. In essence they concern respectively, what is taught or learned, how it is taught or learned; and how that learning is evaluated or assessed. On the first two, the planning literature and profession have been quite vocal. On the latter, it has been relatively silent: for example, work on how planning scholars, practitioners and students conceptualise academic standards in the assessment of work-placement-based education.

Delving into curriculum and pedagogy compels us first to take a step back to situate consideration of curriculum and pedagogy within broader debates and context about planning and education. Planning education occupies a peculiar space in education primarily because

¹ There are several differences in terminology between ARIES and Griffith University. Degrees are referred to as courses by ARIES but Griffith refers to them as programs. At Griffith subjects are referred to as courses. To avoid confusion we will adhere to the Griffith system.

the nature and boundaries of planning practice have always been difficult to define, at least by academics. Almost 40 years after "If planning is everything maybe it's nothing" was written, it seems hardly less true that "[p]lanners can no longer define a role for themselves. From old American cities to British new towns, from the richest countries to the poorest, planners have difficulty in explaining who they are and what they should be expected to do" (Wildavsky 1973, 127). Continuing Wildavsky's theme, Huxley (1999) posits in her paper that "If planning is anything, maybe it's Geography". Indeed, the challenge of defining planning echoes in the fact that planning education historically has occupied a variety of schools including architecture, business, engineering, environment, geography, real estate, social science and urban studies, each with their attendant curriculum, pedagogies and epistemologies.

It should hardly be surprising then, that consensus concerning the pedagogy and curriculum of planning have remained elusive. Relevant intertwined and sometimes even hostile debates have included, but not been limited to, the role of practice and practitioners in education and of theory in planning (e.g. Watson 2002; Rosier 2001; Schön 1982; Bolan 1980); the disconnection or otherwise between theory and practice (Myers & Banerjee 2005; Sandercock 1999; Sorensen & Auster 1999a; 1999b); the desirability of practice exposure in education (e.g. Coiacetto 2004; Watson 2001); the nature of core curricula and substantive basis of planning (e.g. Sandercock 1997; Huxley 1999); and even whether core curricula can be defined.

Perspectives on the role of practice in planning education have shaped planning pedagogies. Studios, in particular, have played a central role in planning pedagogy in many and perhaps even most, but definitely not all planning programs. While this is partly attributable to the roots of planning in architecture and design, it also relates to curriculum debates in that it derives from streams of thought that see the substance of planning as not an analytical study, like urban studies, social science, or geography, but one that is action-oriented and solution-oriented and deals with messy, multi-dimensional, complex, ambiguous, unclear, real-world problems. Put prosaically, in studios, students learn to plan – they learn to operationalise knowledge (Coiacetto 2008; Roakes & Norris-Tirrell 2000; Lang 1983). Moreover, and this is pertinent where dealing with emerging and relatively unchartered challenges like climate change, studios involving real-world projects can be places where learning occurs by both deduction and induction: deduction in that theory is

applied to the specific project and induction because new insights emerge from the execution of the case study project (Coiacetto 2008).

Contemporary Australian planning education takes place in a context of significant reorientation of universities that includes the privileging of research over teaching, pressures to do more with less, and a shift from a broad and liberal education towards vocation training (Markwell 2007; Davis 2006). The vocational orientation is possibly relatively easier to achieve in an Australian context where the prime avenue to a planning career is via a four year undergraduate program, compared, for example, to the American model of a postgraduate platform built on a broader and more liberal undergraduate footing (a route which only one Australian university appears to be taking).

Accompanying this vocational orientation, has been a recent stronger articulation by Australia's planning program accreditation authority, the Planning Institute of Australia, of what it sees as core planning skills and competencies (PIA 2010). The 22 page policy defines three components being:

- A. "Generic capabilities and competencies, namely: Problem identification; research; analysis; self reflection; spatial thinking and application; strategic thinking; problem solving; communication; teamwork, and work readiness.
- B. Core curriculum competencies, namely: (1) Professionalism, practice and ethics (2) Plan making, land use allocation and management, and design; and (3) governance, law, plan implementation and administration.
- C. Supporting knowledge areas, namely: (1) urban design (2) economic planning (3) social planning (4) environmental planning; and (5) transport planning."

Climate change (nor sustainability for that matter) is not specifically listed in these components but there are three points that can be made relative to climate change curriculum and pedagogy. First, its list of Generic Capabilities and Competencies, suggest planning should be taught using pedagogies and approaches that would develop these capabilities (e.g. problem identification and solving; team work). Second, as part of the curriculum, climate change surely fits under the Supporting Knowledge Area No. 4, Environmental Planning, but arguably is relevant to the others too. Third, in curriculum and pedagogical terms, the link to climate change is easiest to make in the 8th and 9th Performance Outcomes of the first of the Core Curriculum Competences (Professionalism, Practice and Ethics):

"8. Capacity to apply and develop planning knowledge to identify problems, devise ways to investigate and solve these problems drawing on research based evidence, and producing solutions as the basis for appropriate action

9. Capacity to apply theoretical and technical planning skills to unfamiliar or emergent circumstances, even with incomplete information."

The terminology of these Performance Outcomes – apply, develop, identify, devise, investigate, solve, unfamiliar or emergent, incomplete information - suggests pedagogies that emphasise application, practicality, problem solving and creativity in real-world contexts.

Three years before the PIA Accreditation Policy was introduced, the Australian Research Institute in Education for Sustainability (ARIES) published the findings and recommendations of its research into "Education for Climate Change in the Built Environment Sector" (Lyth, Nichols & Tilbury 2007). The findings have been summarised in the previous section and disregarding the substantive omission of sustainability and climate change principles, the ARIES competencies (outlined in the previous section) are not inconsistent with the PIA competencies. They too point to problem-oriented pedagogies, something which has been core to the design of Griffith University's schools and programs.

ARIES also recommended a "need for quality control and competency standards in climate change adaptation education" and for a key role for the accrediting authorities in this quality control (Lyth, Nichols & Tilbury 2007, 43). This raises questions about how to *assess* these competencies, a key matter for future research in planning education.

3) The Development of Urban and Environmental Planning Education at Griffith

The beginnings of the Griffith School of Environment can be traced back to the opening of Griffith University in 1975. It was one of the first four schools that formed the new university and was initially known as Australian school of Environmental Studies (AES). The other three schools included Humanities, Modern Asian Studies and Science. Griffith was founded on the idea of problem-based schools or faculties rather than strictly disciplinary ones that were the rule in Australian universities at the time (Quirke 1996).

AES was the first environment studies program in Australia. Its goal was to foster an understanding of: the nature of the Australian environment; the interrelationship of its parts; and the laws and processes by which the parts influence one another. The initial thinking

about environmental studies at Griffith began in 1971 with a two-page plan - it was so cutting edge for the time that no one had even defined the field. Eventually there was agreement that AES would be defined by the following four characteristics: a systems approach to environmental concerns; an evidentiary basis for the study of environmental problems; a strong database involving field work, analysis and statistics; and a strong interdisciplinary link between the social and natural sciences (Metcalf 2000).

AES evolved into a leader in the field and became an international success story. This was in part due to the fact that university administrators did not plan it in advance and it was left to the first two professors hired to run the school. The field of environmental studies grew and prospered which resulted in the formation of several other schools all housed under the Faculty of Environmental Science (established in 1990). By 1996 the Faculty comprised five schools: AES (1975); the Graduate School of Environmental Sciences and Engineering (1990); Environmental Engineering (1991), Mathematics and Statistics (1991); and Environmental Planning (1995). The structure of the Faculty was altered in 1998 to reduce the number of schools to four: AES, Environmental Engineering, Environmental Planning (all at the Nathan campus) and Environmental and Applied Sciences (on the Gold Coast campus). Twenty-five years after its formation environmental studies at Griffith has been recognized for its capabilities to: (1) bring together the skills of social and natural scientist, mathematical modellers, statisticians, environmental educators, economists, planners, political scientists, lawyers and engineers; (2) study the interconnected and diverse character of non-human and human communities and their ultimate dependence on the quality of the land, water and air; and (3) increase the understanding of the interconnectedness of natural, economic, social and cultural aspects of the environment (Metcalf 2000). These resonate with both the ARIES and PIA competencies outlined in the previous two sections.

Planning was part of environmental studies for many years and was an area of undergraduate concentration with graduates leaving Griffith University to get formal postgraduate qualifications elsewhere. One of the key courses offered by AES was the Environmental Planning (also known as the Land Use Analysis) Field Trip, which has been running since the early 1980s. In this course, students are required to undertake an environmental impact assessment of a real major land use change proposal.

A School of Environmental Planning (EVP) was first proposed in 1993 by two AES staff (Geoff McDonald and Lex Brown). One of the reasons for offering this new degree was the

growing interest of the importance of incorporating environmental concerns into planning issues. The Faculty of Environmental Science agreed to the proposal and the first intake of students into the school began in 1995 (Metcalf 2000). The primary goal of the school was to produce graduates who will have an operating knowledge of biophysical and social sciences as well as a thorough grounding in the theory and practice of planning. With the success of the undergraduate environmental planning degree, joint degrees with environment science and law were also established which can be completed in five years rather than seven years if done separately. With a growing interest on the part of those with undergraduate degrees in other areas, a decision was made to offer postgraduate degrees in 1998. Until 2006 environmental planning was only offered on Griffith's Nathan (Brisbane) campus. In 2006 the undergraduate degree was initiated on the Gold Coast campus.

In 2005, Griffith University began a restructuring process so that in 2006 the School of Environmental Engineering was moved to the School of Engineering and in 2007 the remaining three schools were merged into one large Griffith School of Environment. In 2009 the school was expanded with the addition of architecture programs. Planning became a discipline area within the new school but operates in much the same way as when it was a separate school (the main difference is the lack of a separate budget). The restructuring did not change degree structures or the interdisciplinary philosophy. Planners still take environmental science subjects, while environmental science and architecture students take planning subjects. The name of the discipline was also changed in 2007 from "Environmental Planning" to "Urban and Environmental Planning". The reason for this change was confusion on the part of some prospective students that an "environmental planning" degree would not qualify them to be "town planners". Therefore the name of the discipline and the degrees were changed to reflect an urban as well as an environmental focus.

Within the planning community the undergraduate urban and environmental planning degree at Griffith University is unusual in the Australian context – particularly given that all students are required to complete environment science subjects like ecology and earth science. Based on an analysis of the accredited planning degrees in Australia done in 2009, the Griffith University degree is different from most other degrees with its environmental focus and by having core environmental science subjects as degree requirements.

4) Current Griffith Programs and Courses

Although the Urban and Environmental Planning programs at Griffith University are taught on two campuses they share the same interdisciplinary philosophy and basic structure. As most other planning degrees in Australia, the undergraduate program is four-years with an embedded honours option. The required course list is designed to satisfy PIA accreditation requirements as well as the interdisciplinary philosophy and the environmental focus of the school but students still have the flexibility to take up to seven elective courses.

There are three main approaches for including climate change in planning education: integrating it as a topic into existing courses, creating new separate courses and using a hybrid approach of both. Griffith followed the first approach until 2010 as the environmental focus of the program makes it fairly easy to incorporate climate change related topics into the existing courses. One third of the core courses taken by urban and environmental planning students include climate change in some way. This may involve dealing with it as a separate topic, working it into several related topics and/or requiring some assessment item be completed. In terms of content, the science of climate change as well as the policy and planning responses for both mitigation and adaptation are included. Exposure to the issue starts early with most of the first year subjects discuss climate change to varying degrees. Modes of delivery are also variable: some of the courses are 13-week; some are intensive; some are in-class; and, some are online.

In 2011 the Griffith School of Environment launched climate change both as a new major within the undergraduate environmental science programs and a specialisation within the Master of Environment and Graduate Certificate programs. They all involve four specialised courses on climate change as their core covering both the natural and social science dimensions of the problem. Project-based learning is a central part of these new majors and specialisations. Undergraduate planning students can take the new courses as electives while the postgraduate programs provide opportunities for practicing planners to update their qualifications (a need highlighted by the ARIES report). These developments have shifted Griffith's programs towards the hybrid approach, with both specialisations or majors and a substantial element of climate change education embedded within existing courses.

Incorporating climate change into planning education is relatively easy at Griffith due to the involvement of teaching staff in a number of research centres and program that have developed a specialisation in climate change. These include the Urban Research Program, the Griffith Climate Change Response Program and the National Climate Change Adaptation

Research Facility. Such initiatives, in partnership with the school, have provided staff with

the opportunity to develop their own knowledge of climate change through research and use

the findings in their teaching (another area highlighted by the ARIES report). In a remote

sensing course, for example, students undertake satellite oceanography assignments where

they estimate (a) the emissions of dimethyl sulphide from oceans; (b) the draw down of CO2

in oceans or (c) classify phytoplankton species in oceans (some draw down more CO2 or

emit more dimelthyl sulphide than others). Other examples of topic which demonstrate this

research-teaching nexus include governance issues; policy responses; impacts on bio-

diversity; extreme climatic events; and disease transmission impacts of climate change.

Indeed, because climate change is a rapidly evolving area, teaching is necessarily informed

by current research.

Conclusion

Planners play an essential role in attempts to mitigate and adapt to the impacts of climate

change. This paper has demonstrated how the educational areas of planning, the environment

and climate change have developed and changed over time. It identified the core

competencies and issues that need to be addressed when training urban and environmental

planners about climate change. The Griffith School of the Environment and its programs have

developed over several decades to meet the changing needs of undergraduates, graduates and

academic staff.

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