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The Educational Green:
Researching Ways of Combining Professions

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Abstract

The *Educational Green* was an innovative 3rd year design studio held in 2007 in the faculty of Architecture, Building and Planning at the University of Melbourne. The studio both informed and was informed by the authors' involvement in a Research Council (RC) grant (ongoing 2007-2010). It involved collaboration between university staff and students, a teacher educator and staff and students at a local secondary school as a case study and the studio leader wished to experiment with her teaching, evaluate it and respond to her evaluation immediately.

Key words
School Design; Environmentally Responsible; Sustainability

Context and development of the research

The aim of an ongoing Research Council (RC) research project in which Hes and Wilks were involved drove the Educational Green studio content. The 3-year RC project aims to evaluate emerging environmentally responsible and pedagogically innovative school designs using iterative conversations with key stakeholders such as students, teachers and designers. Hes wished to use the studio as a pilot study and, employing an action research model, kept a reflective diary, using photos as a selected sample of reality (Collier, 1967) and some text to collect her thoughts and record the participants' feedback – i.e. the tutors, school teachers, and students from both the university and the school around which the studio was based.

Central to the studio content was Hes' belief that architecture can enhance the educational experience by providing spaces that reflect educational ideologies, environmentally responsible and healthier environments. Research suggests (Nair & Fielding 2005; Fisher, 2004) that teachers do not perceive the physical environment as a major indicator of educational outcomes and are therefore unlikely to fully explore the potential of the environment as a 3D textbook that facilitates learning[1].

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1 The concept of the 3D text book is not new, for example Nair and Fielding (2005) outlined the potential for the building to be part of the leaning experience. The idea of the buildings as a 3D textbook, in relation to sustainability, is that if you design a building to be more environmentally responsible then why not use it as part of a curriculum to teach students about heating and cooling, temperature transfer, sun angles, lighting and so forth. Further, as a 3D textbook the

Schön (1983; 1987 in Hatton & Smith, 1995) stressed the need for professionals to learn how to frame and reframe the complex problems they face, evaluate and test out various interpretations of what is occurring, and then modify their practice as a result. Hes' studio drew on a range of perspectives - students, colleagues and teacher educators - to critically reflect over an extended period in order to explore alternative ways of conducting the studio. Its aim was to engage the students in real projects while bringing space, sustainability principles and learning together. It therefore offered new methods of engagement and unique assessment tasks. The tutors wanted to avoid what one often observes in conventional studios – either the students' disappearing a week or so after receiving the design brief, or students' sitting idly in the studio waiting for the tutor to have some one-to-one time to discuss their designs.

Students who elected into The Educational Green studio did so because they liked its scope and the opportunity to be engaged in 'big' design concepts, practical and 'real world' tasks, and the emphasis on education pedagogies and the concept of a 3D textbook. They felt the focus on and immersion in construction and sustainability assisted the development of their designs. Day-long studio time was incorporated to enable focus on their design and in-depth exploration of topics.

Behind both the RC grant and the studio design was the belief that, in Australia, architects are rarely around to assist with the teachers' adjustment to the new spaces. As well, Australian educators who have not been party to the design of their school, or trained to use new educational spaces, are bewildered at worst, and at best are not using new spaces to educational advantage. Also, our teachers lack knowledge of current environmentally responsible and pedagogically innovative school designs and the research of bodies like The Commission for Architecture and the Built Environment (CABE) and the National College of School Leadership's projects in the UK.

Methods used

Reflective Practice

In undertaking this research, Hes was trying to understand several issues: a) effective ways of teaching a design studio encompassing a multidisciplinary set of objectives, and b) the ability to link space design and what teachers and students wanted from their spaces, and c) pedagogy and the ability to build sustainable buildings that could be part of the learning experience. In attempting to develop these understandings, a flexible, intuitive, learning model - something that would support an experiential journey - was sought.

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building can embody its philosophy overtly, hanging its green credentials on its sleeve, with access to electricity meters, control mechanisms, data, sustainability philosophies etc. For example, the work by *Mimmi Ferdin towards the end of this article where a g*reen ribbon runs throughout the buildings, providing shade, food, connection to seasons and epitomising the idea of the 3D text book being the building, even carrying this through to the presentation of her scheme.

Thus reflective practice and action research were used. For a more detailed outline of the application of this to improving practice see Hes (2005).

The general aims of the studio were outlined above. Hes' specific aims were to improve both her studio teaching practice and the student experience. To investigate the first, an electronic reflective diary, mainly comprising photo images, along with notes on each week's outline on what worked and what did not work was kept. The student experience was sought through offering constant opportunities for feedback.

Teaching the studios occurred from 9am until 5pm on Fridays, after which the tutors and Hes would debrief on the day's activities for about an hour. Issues discussed included what worked and what did not, how students were progressing and any other feedback from the day. Notes were not kept at the meeting, though they did inform the notes Hes made on each week's subject outline as part of her reflection process.

A student survey was also conducted at the completion of the studio (see later). Thus the tools of back-talk, critical reflection, reflection-on-action were employed (immediate - with the tutors after the studio and notes on each week's outline and the collation of the diary - and longer term - the writing of reflective papers using data collected through the survey).

The pit-falls of reflective practice (Bleakley, 1999; Cross & West, 2002; Eraut, 1994; Kinsella, 2003; Mackintosh, 1998; Zeichner, 1994) were experienced by Hes as the semester passed. This included a lack of time for reflection-in-action and a lack of the ability to reflect-for-action, as it is often within the action that it becomes clearer what the aims could have been. Equally, Hes would have liked to be able to record and reflect in more detail on the student and tutor experiences through greater data collection, but time constraints and lack of resources meant this was not possible.

Action Research

The method chosen to inform the studio research and the reflection was action research because of the Authors' desire to explore from within the practice of teaching the studio:

> (t)o use a modern expression, in action research, the journeyis the goal, because the journey of discovery, reflection and enhancement is intended never to arrive at a destination that legitimises stopping the process of being on such a journey. (Munford, 1997: 317).

Hult and Lennung (1978) describe action research as encompassing seven potential inputs for reflection. They are listed below with their relevance for Hes' data collection and aims of the studio in brackets after each point:

1. *assisting in practical problem-solving* (each week Hes aimed to teach the students specific aspects of educational spatial design, sustainable building design, pedagogy, educational theory and architectural practice - data collection though images of student work, notes on weekly sessions and reflection with tutors);

2. *expanding of scientific knowledge* (the students were asked to research and become experts in aspects of school design - data collection through

assessment of student work and reflection on their ability to use their knowledge using observation, their design and their end of semester feedback);

3. *enhancing of actor competencies* (the students were supported with the integration of their research and their designed output - data collection as above);

4. *it can be performed collaboratively in an immediate situation* (through building a team of experts in various areas, the students could access a greater amount of knowledge to inform their designs – data collection as above);

5. *using data feedback in a cyclical process* (weekly assessment and feedback processes provided students with knowledge about how they were performing and interested input into their fellow student's ideas - data collection through observation and the reflection on end of semester survey);

6. *aims at an increased understanding of a given social situation* (the architecture students had access to students and teachers at a secondary school to ground them in real world needs and wants from the spaces they were designing - observation and reflection on what the students' expected, what the teachers and Year 8 students wanted, and what they found mattered after access to these 'clients'); and,

7. *applicable for the understanding of change processes in social systems* (supporting Hes' reflection on the studio for review, understanding and improvement in order to improve her teaching practice).

Methodology for the studio

The student brief was that the school had outgrown its capacity and a nearby parcel of land was available for the development of a junior secondary environmental studies precinct. As an exemplary model of teaching practice (engagement, real world experience, learning from experts etc. as per Middle Years' pedagogies – Hill & Russell, 1999; Wilks, 2005), the school teachers' incorporated the studio into a junior secondary built environment and sustainability component of their core teaching, within the maths, science and communications classes. Figure 1 shows architecture students working with surveyors to understand the site, teaching both what site surveys can show and a pragmatic link of outputs (maps) with actual site. Figure 2 shows the year 8 students reviewing and discussing the designs with the architecture students.

Fig 1. Students at the site carrying out a survey

Fig 2. Year 8s giving feedback and engaging with the architecture students

 While focusing on practical concerns and the principles of sustainability, the studio required a high level of design thinking and experimentation. Students were asked to operate within the canon of architecture, explore educational theories associated with use of space and develop an appropriate architectural language. As well, they were expected to work with the school students as occupiers and communicate the ideas they were developing for them as well as listen to them as clients. This studio exemplified both current school curriculum requirements and the university's teaching and learning principles. Wilks, a teacher educator involved in curriculum reform provided the university students with strategies for communicating with and engaging secondary school students and some theoretical background to the curricula foundations of the new learning environments.

Evaluating emerging, environmentally responsible and pedagogically innovative school designs

Hes' main field of research is the integration of environmentally responsible approaches into building design capitalising on the opportunity of ensure both designer and users benefit from the process and product. At the time she was designing the studio, an experienced colleague suggested she link it to her research.

The Smart Green Schools RC project in which both Hes and Wilks are involved was uncovering a great deal of literature and this was disseminated to the students. Further, work from the students themselves was fed back into the studio teaching, for example, research carried out by one of the students, Maria Ferdin (2007) on green walls and roofs was used as an example of a 3D

textbook approach to building student understanding of seasons, thermal issues (shade, insulation, evaporative cooling, etc), water, potential to grow food, botany and weather.

Mimmi Ferdin's work for the studio is illustrated below. She had a green ribbon running throughout the school buildings, providing shade, food, connection to seasons, thus epitomising the idea of the 3D textbook being the building (Figure 3). She carried this through to the presentation of her scheme (Figures 4 and 5).

Fig 3. Maria Ferdin's design concept

Fig 4. Ferdin's, use of concept to communicate scheme

Fig 5. Detail of Ferdin's scheme

Further, the students' work on environmentally responsible design approaches and their evaluation of others' projects informed the RC project. One set of students looked specifically into evaluating school environmental

performance through interactive technology and linking this to learning. The RC 'Smart Green Schools' project will take this work further by working with 4 schools, their teachers and students to develop a curriculum that includes students' evaluating the performance of their spaces through interactive monitoring as part of their curriculum.

In their end of semester reviews of the subject the students commented on both the scope and content of the subject. They felt the focus on, and immersion in, construction and sustainability in a school with students as 'real' clients assisted the development of their designs.

Although they appreciated the need for in-depth research, the students would have liked less emphasis on this aspect of the subject and more time to develop their designs. Hes had hoped the students would link the research to their designs. She realised that the volume of activities and exercises (all helpful in their own right) had taken away any time the students may have had to engage in reflection. Because of the demands of the exercises the tutors had little opportunity to assist the students to reflect on the research in relation to their designs.

The students desired more one-to-one time with their tutors so that they could progress with their schemes rather than often having to frequently present their work and 'crit' other presentations. The concept of crit sheets being designed around a particular focus (eg aesthetics) was sound (Brady & Kennedy, 2001). However, although a model crit sheet was given to the students, the staff were disappointed with the products and believed they might have been of a higher standard had they been included as an assessment task.

Although Hes planned the day-long studio to enable the students to focus on their design and in-depth exploration of topics, they felt this time was not necessarily well used by either themselves or the teaching staff. Some questioned the value of the lengthy site visits. Some students felt two half-day studios might have been better than a full day, as they found the volume of work prohibitive when combined with other third year subjects' requirements. The staff agreed that the volume of work was onerous and that it probably did not represent a typical day in a design studio. They decided that tasks could be combined in the future to enable the presentation of fewer, but more substantial products.

The students appreciated the assignment submission times being spread across the semester. However, some commented that some assessment requirements were unclear. They also requested a clearer idea of the scope of subject from the beginning. When the staff observed the amount of effort the students were putting into early tasks, they decided to reward them by altering the percentage weighting of the tasks. The students cited this as a major annoyance. The tutors were disappointed by this reaction, but it points to the need for clarity of intention and scope where assessment is concerned. They hoped the students would see them as responsive to the learners' needs, but the students viewed them as indecisive.

Having 'lectures' interspersed through the semester was met with a mixed response. Some topics were seen as helpful for their designs and understanding of educational theories, but there were calls for clarity about

how and where the lecture content fitted into the design process. Communication with the 'players' at all times is a vital ingredient. Contact with so many staff and students within both the university and the school is a demanding task for a subject co-ordinator. It occurred, but the university students remained partially in the dark about intent and rationales for the tasks and it was difficult to maintain intensive contact with the school.

Conclusion

For some time, educational theorists have been calling for classrooms to become learning and information environments (Ritchart & Perkins, 2004; Perkins & Tishman, 2001; Lankshear & Knobel, 2001). This studio was an example of educators' responding to this call by creating a new and exciting program. It was a successful model of an integrated curriculum. Imaginations were fired up and concepts and various forms of representation were explored. The school teachers, who previously regarded themselves as subject 'specialists', planned and worked with teachers from other disciplines and other sectors of the education community. Covering the studio's BIG ideas and lengthy timelines demanded that they consider the students' broad backgrounds and find ways of engaging them in the learning process. The benefits of this approach were that students and teachers, working together to solve problems, integrated knowledge from a range of sources, and, when generating ideas on how to meet a unit's challenges, engaged in a variety of research modes. Taking an interdisciplinary approach to teaching meant that the broad skills and knowledge gained were stronger because of the connections made.

Currently, a substantial part of the school building stock within Australia needs replacement or refurbishment. Embodied energy, environmental impacts, and operating and life-cycle costs demand cost-effective decisions. Concurrently, education is changing from traditional classrooms into learning and informational environments meaning that current classroom designs are outdated.

This studio combined environmental and educational imperatives together in innovative ways that hopefully served as a model for future partnerships. Central to the studio was the idea that architecture is not just about designing a building but also working with the occupiers during the design process. It can enhance the educational experience by providing spaces that reflect educational ideologies. If environmental and educational imperatives are not combined in innovative ways then embodied energy costs and government funds will be wasted on buildings that do not last.

The educational theories that emphasise collaborative group work and problem-based learning are changing traditional classrooms into learning and information environments and making current classroom designs outdated. The Educational Green studio combined environmental and educational imperatives together in innovative ways that served as a model for education departments and for future partnerships with architecture firms associated with the RC project. As part of Wilks' Hes' ongoing research within and outside the studio and classroom, they will report their findings at staff meetings and conferences (university, school and professional associations) describing the

traps for beginners, the outcomes, and what the designers, staff and students learned.

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