

# Green Buildings in Use: Post Occupancy Evaluations

By Chris Watson, Architect

*This article briefly describes users' experiences of two "green" education buildings. It goes on to conclude that stakeholders' negotiation of building performance is necessary to minimise environmental impact, just as it is necessary to achieve other aspects of building performance.*

## NOOSA ARTS AND ENVIRONMENTAL TOURISM CENTRE

Noosa Arts and Environmental Tourism Centre near Australia's Pacific coast, offers courses in art, business, English and technical skills. The buildings are designed to provide comfortable classrooms and studios in the hot Queensland summers while using a minimum of electricity, which is obtained via the public power grid from carbon-emitting coal-fired generators. The buildings also incorporate water collection and conservation features. In a departure from 20th century practices, few of the trees were chopped down and native species are protected from invasion of exotic weeds. A large proportion of the site has been left in its natural condition to protect endangered species of animal.

Sixty-one students, staff and building professionals were involved in the Post Occupancy Evaluation interviews and a questionnaire in February 2007. Stakeholders found the facilities to be an extremely pleasant place to work, although it becomes too hot (at around 30° C) in summer and there were complaints in relation to transport. The building design uses natural ventilation, ceiling fans, stack effect, insulation and shading, and yet occupants were still uncomfortable at the peak of summer. Recommendations to reduce temperatures focus on increasing natural ventilation, broadening user sensitivity, and checking and fine-tuning some building features. A "real time" display of carbon emissions was proposed by the evaluation along with information about design strategies.



The sight and sound of rain water running off the roofs and into the collection channels is particularly sympathetic to the purpose of the buildings. We reflected that the art school could also celebrate water with a suitable water feature and benefit from the sound of splashing.

Before the evaluation, there was an option to reduce excessive summer temperatures of classrooms and studios with air conditioning, despite inefficient performance being ensured by the uninsulated walls and the contradictions with the environmental values espoused by the occupants and the state government.

## DEANBURN PRIMARY SCHOOL

Children of Bo'Ness, Scotland (United Kingdom) attend Deanburn Primary School, which overlooks the Firth of Forth. Falkirk Council architects designed the building to minimise impact on the environment. They incorporated double glazing and other insulation to retain warmth, a planted roof and wind turbine for on-site electricity generation.



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Participants in the Post Occupancy Evaluation were very positive about the building. They particularly appreciated the classrooms and associated teaching spaces, gymnasium and interior natural light.

Deanburn Primary School uses the building's green features for environmental lessons and they have attracted the interest of national television. This positions the school well to analyse its environmental impact for both teaching and managing its path to sustainable operation.

Deanburn, and most other schools in the Falkirk area, have a School Travel Plan which seeks to promote walking and cycling to school and to reduce the number of car journeys. Participants in many education building evaluations complain about traffic, saying that it endangers children, contributes to obesity, diminishes the playground experience through noise and takes valuable playground space from children, and that its congestion and parking problems stress and irritate them. This issue is one where communication is needed to design infrastructure and behaviour solutions to achieve stakeholders' needs and sustainability.



## MANAGING THE RELATIONSHIP BETWEEN PEOPLE AND BUILDINGS

Evaluators find that systematic communication between occupants and other stakeholders is necessary to achieve operational performance. All too often stakeholders say that the Post Occupancy Evaluation is the first time they were consulted about their building needs. Stakeholders frequently point out design features that diminish educational outcomes. For example, in several school and university classrooms which have been evaluated, students and teachers have reported difficulty hearing one another. Acoustic conditions prevent students being able to concentrate on routine work and exams or to sing without disturbing others. Systematic communication of occupants' experiences is necessary for architects to achieve building performance necessary for educational outcomes.

Experience with these and other green buildings suggests that systematic communication can also help minimise environmental impact and use the building as an educational tool. The Australian example illustrates how careful negotiation between stakeholders about the details of the problem, institutional values and design options is necessary to achieve sustainable thermal comfort. The United Kingdom example shows how the school building can be the subject of learning and how analysis of the school's environmental impact can extend this further. Already some building foyers feature real time displays of environmental impact. Such links between behaviour and environment are vital for making school buildings sustainable for the students.

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