

The Vernacular as a Model for Sustainable Design

Amanda Heal, Caroline Paradise and Dr Wayne Forster

Welsh School of Architecture, Cardiff University, Cardiff, Wales

ABSTRACT: The paper describes an innovative approach to teaching and learning the subjects of vernacular architecture and sustainable design. The method forms a key part of the World Architecture module, which is taught to first year students at The Welsh School of Architecture. A week-long environmental design block course employs the collection of vernacular buildings at St. Fagans open air museum as 'laboratories', enabling students to appreciate how design with climate is effectively conducted in vernacular architecture. In this experience-based learning context, students develop skills in measuring, observation, recording and analysis; leading to an embedded understanding of the physical characteristics and environmental performance of real buildings. Following the block course and a series of lectures focusing on issues in world vernacular architecture, students are encouraged to 'model' lessons learnt from the vernacular, and to employ them in their own designs. The module uses and addresses issues raised at the recent conference 'Vernacular Architecture in the Twenty First Century: Theory, Education and Practice'. The paper illustrates both the educational process and outcomes that have been achieved using vernacular architecture as a source of information and inspiration.

Keywords: education, vernacular, sustainable design

1. INTRODUCTION

Considering the quantity and diversity of vernacular architecture in the world, it plays a surprisingly small part in architectural education. Where academics do address vernacular architecture, it usually involves an historic documentation. The recent 'Vernacular Architecture in the Twenty-First Century: Theory Education and Practice' conference aimed,

'to further the debate on the importance of vernacular architecture studies now and throughout the twenty-first century, not as a study of past traditions, but as a contribution to new methods, solutions and achievements for the future built environment'. [1]

This paper describes an innovative educational method that uses vernacular buildings as a source for teaching sustainable design.

Today, sustainable design and building technology are fundamental to the education of architectural students. With the ever growing global concern for the use of energy and resources and associated climate change, architects have a greater responsibility to design buildings that are environmentally sustainable. The performance of these buildings must also ensure a comfortable and healthy atmosphere for their occupants. Therefore, it is important that architecture students develop a thorough understanding of climate, building performance and human comfort at an early stage in their education. Indeed, the RIBA's *Tomorrow's Architect* states that;

'at Part 1 students will demonstrate [...] the ability to integrate knowledge of human well being, the welfare of future generations, the natural world, consideration of a sustainable environment [and] use of materials'. [2]

Recently, there has been a reliance on energy-consuming technology in the form of heating, cooling, ventilation and lighting systems to achieve human comfort in buildings. These systems are often 'added on' once the form, layout and materiality of the building have been decided. An approach to design where building technology is integrated with concept design has the potential to reduce the need for high-tech systems and reduce the energy consumption of buildings.

In most schools of architecture, issues of building technology, sustainability and environmental performance are taught in the lecture theatre. The problem with this method of teaching is that the lecture theatre is detached both from the design studio and from real buildings and their surroundings. Building technology modules are often a series of theoretical lessons on individual topics, followed by lessons in how these might be applied to design. Students then find it difficult to understand how to integrate these lessons with their design concepts, and technology becomes an element to add in the later stages of a design project in order to meet course requirements. Furthermore, the lecture theatre environment does nothing to make this an engaging and stimulating subject. Many students find it a boring necessity, and its important relevance to architectural design is lost.

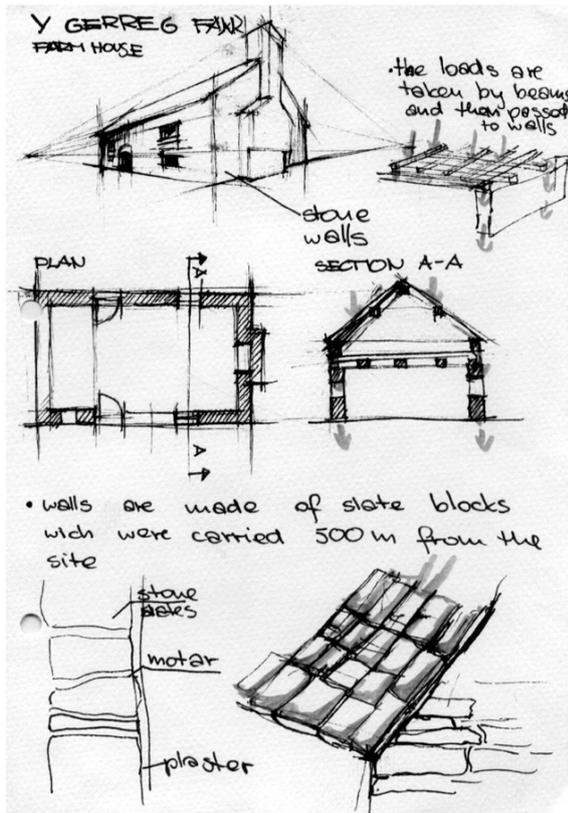


Figure 4: Notebook example: structure and materials

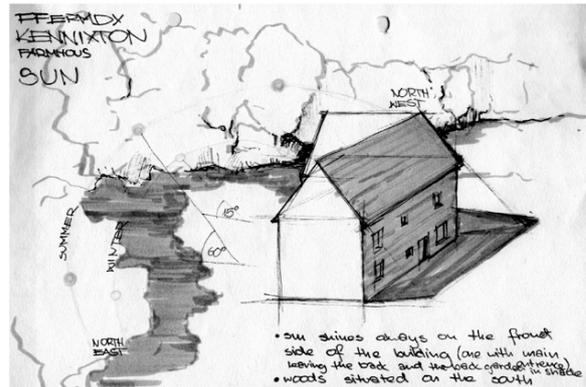


Figure 6: Notebook example: site and climate

3.2 Lecture Series

The block course is accompanied by a series of World Architecture lectures that use examples of vernacular architecture from around the globe to illustrate further building design topics and to give an insight into other vernacular cultures. Issues such as Culture, Function and Use, Gravity and Wind, Materials, Settlement and Refinement help to tie together building technology with other aspects of design through studies in the vernacular. Students are set weekly, lecture-related studies that add to their notebooks.

3.3 'Model' and Design Week

The module results in a week-long design exercise that aims to put students' new skills and knowledge into practice. Firstly, they are asked to develop and draw a 'model' based on their understanding of vernacular architecture. Using their model, they then design a small building, such as an artist's or writer's hut, which they must site in a given location.

4. COURSE OUTCOMES

Through learning in real buildings rather than in the lecture theatre, students are able to experience the climatic conditions and internal environments they are studying. As well as gaining knowledge of the scientific principles, they can see, smell, hear and feel the architecture, developing a sensory awareness of its physical characteristics: What does 300 lux feel like? How warm does it have to be to feel comfortable in this space? These are the sort of questions that students can find answers to through this learning method. (Fig.7) The museum setting also encourages students to imagine how the people would have interacted with the buildings and, therefore, how the building provided for their needs. This deeper understanding means that they can start to intuitively make design decisions that use the building to modify the climate in a resourceful and responsible way.

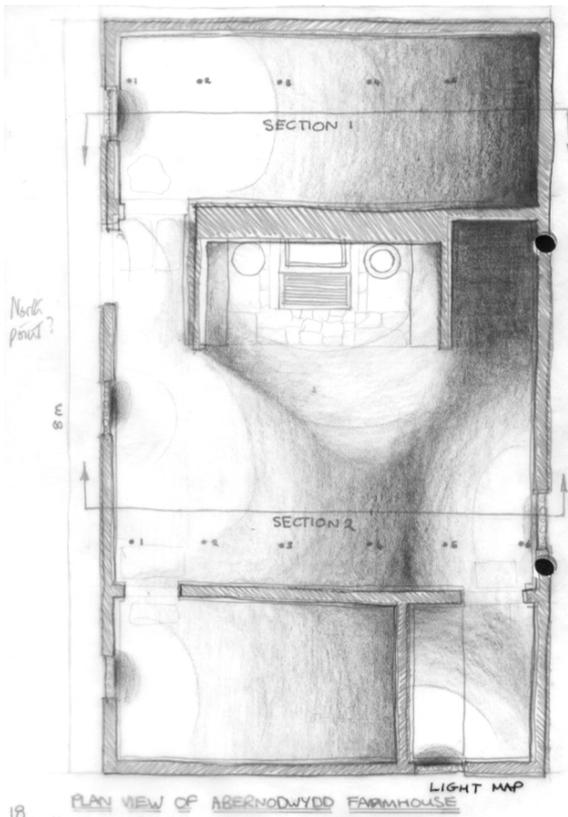


Figure 5: Notebook example: visual environment



Figure 7: Students learn through tactile experience

Using the vernacular buildings at St Fagans gives students a holistic understanding of the built environment. The buildings simply demonstrate how climate can be modified through orientation, form, materiality and layout to achieve conditions for human comfort internally. (They also highlight that perception of human comfort has changed through history and makes students review their own perceptions of comfort.) Vernacular architecture does not rely on high-tech, energy-consuming systems for heating, cooling, ventilation and lighting, and therefore encourages students to think about passive, sustainable systems in their own designs. To adopt passive environmental systems requires consideration in the early stages of design, when initial decisions about orientation, form and materiality are being taken. The World Architecture module stresses the links between building technology, sustainability and concept design. Through their studies at St Fagans, students understand how site and climate, built form and people are integrated through design. (Fig.8)



Figure 8: Site, building form and people are integrated

As well as providing a wealth of knowledge, the intensive block-course also allows students to quickly develop a range of practical architectural skills. These skills, such as site analysing, measuring, observing, analysing and sketching are valuable to students for the rest of their studies and future careers.

The week-long design exercise that concludes the World Architecture module is a chance for students to put into practice their new skills and understanding. In developing a 'model' for design that is informed by issues of vernacular architecture, they are compelled to consider how the lessons they have learnt are relevant to design right from the concept stage. They re-examine their understanding of response to site and climate, use of materials and resources, structure and construction and building form and use. Their design decisions are based on observations and experience of real buildings, producing considered and realistic outcomes to add to their design portfolios.

5. THE VERNACULAR AS A MODEL

The use of the vernacular as a model is inline with current thinking on vernacular architecture. At the 'Vernacular Architecture in the Twenty-First Century: Theory Education and Practice' conference in December 2005, Amos Rapoport presented his paper 'Vernacular Design as a Model System'. He suggests that it is time that vernacular studies moved on from 'describing and documenting buildings' to 'the next "problem-oriented", comparative, integrative and more conceptual/theoretical stage': That we should learn from vernacular design, and that 'this is best done by looking at vernacular design as a *model system*'. [3] He argues that this approach bridges the gap between real buildings and theory.

Rapoport discourages the copying of 'certain formal qualities (shapes, massing, details etc.), often based on a romanticised version of the vernacular', but suggests that a more,

'valid approach is to derive more or less general lessons and principles by analysing vernacular environments using [...] models and the like, and applying these lessons to design'. [4]

Amongst other topics, he identifies that vernacular buildings can offer lessons in response to climate, energy use and notions of environmental quality; and that vernacular design can 'offer a most useful entry point' to these studies because aspects are more 'clear-cut, more extreme, [...] rather than the more ambiguous cases of many present day environments'. [5]

Rapoport's paper, as well as others presented at the conference, emphasise the potential contribution that studies in the vernacular can make to the education of the architects of the future.

6. CONCLUSION

The World Architecture module at the Welsh School of Architecture employs the collection of vernacular buildings at St. Fagans to address the challenges faced in teaching sustainable design. It makes building technology an engaging and stimulating subject for students at an early stage in their education, stressing its importance in a holistic approach to design.

The studies undertaken provide students with an integrated understanding of site and climate, sustainable building design and human well-being. The experiential methods of teaching and learning lead to an embedded awareness of the issues related to this subject, allowing students to intuitively apply lessons learned to their design work. During the course the students quickly develop a range of skills and techniques that will be valuable to their studies and as architects of the future.

Other schools of architecture could benefit by drawing on vernacular architecture as a source of information and inspiration. In this way, more students could be taught sustainability and building technology as an integrated part of the design process.

This paper has identified one way in which vernacular architecture can contribute to the future of the built environment, through education, as a model for sustainable design.

ACKNOWLEDGEMENTS

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- [4] *Ibid.*, p. 182.
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