

Design learning from case studies

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Abstract

Not many buildings are carefully evaluated either from a user perspective or from the view point of sustainability. Students develop design strategies from reading magazine articles (Architects Journal, Architecture Today etc) Magazine articles avoid discussion of features in the building that are not successful. This skews the learning process. Design can be improved by a deeper understanding of the complexities of buildings. Carefully assessing performance of existing buildings can inform both future design as well as existing projects. This paper explores and reviews a case study approach to learning in the module u30020 'Technology and sustainability' for second year architecture students at Oxford Brookes University

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1 Background

The distance between architects and the finished building is a relatively new separation; designing, building, using were all part of the same continuum in previous societies. Architectural training does not encourage students to spend much time actually building or directly experiencing buildings or analysing how successful the buildings are in use. Oxford Brookes is the only undergraduate architectural course in the UK that encourages post occupancy studies in its undergraduate courses but it is widely acknowledged that architects need closer experience of buildings- Alexander (Carpenter 1997) suggests that '*architects should develop an awareness that every part of a building has its life*' Investigating curriculum in Architectural education, Bunch regrets that '*no institution (in America) made a concerted effort to develop post occupancy studies as a formal part of the curriculum. This is unfortunate because students never learn how to learn from their mistakes*' (Bunch 1993) Developing from this omission are generations of architects who lack these same skills

At this time there is a particular need to develop buildings that are more sustainable, and to demonstrate that they actually deliver the performance anticipated. Buildings are unlikely to become more sustainable until there is more interest taken in the final performance of buildings. How do the buildings perform? Do they support their intended activities? Were they difficult to build? Are they conservative with energy use and materials? Will they require lots of maintenance? Information collected can inform the sustainability credentials of each building, and used in practice, can inform a virtuous circle in design.

Technology occupies around one eighth of the curriculum (measured in units of modules) in the first and third years of the undergraduate course and a little more in the second year when the students follow this module as well as applying technology within their design project. Teaching of technology in the Bachelors in Architecture (BA) has three identified stages: The first year introduces topics associated with producing buildings- often referred to as 'technology' but clearly central to design! The second year is approached through investigating how other designers have made buildings (case studies) and in the third year students are expected to express technology in the development of their own design projects.

2 The module

This case study module takes place in semester 1 of the second year. The assessed work is 80% individual report and 20% group marks preparing the wiki data source (as a group depository for information) and presenting a five minute video of the building.

The learning outcomes for the module focus on the student developing skills in :

Observing and recording the construction of a small building, analysing and explaining how the building operates and responds to its users, recording the structural form and behaviour through annotated sketches. It is intended that the module helps the student to develop professional skills, for example, reading architectural drawings, collecting evidence from secondary sources and analysing the performance of buildings from a range of both primary and secondary data sources. Working in groups of six, students identify a building in conjunction with the unit tutor and then carry out a detailed case study, evaluating the building's performance, reporting on how the building is resolved structurally, drawing a section through the building and presenting a construction detail, and making suggestions for improvements.

The lectures are grouped together in the first four weeks of the module to introduce the requirements of the case study and to set out aspects of making a case study that might not be obvious- deciding on the relevant research questions and achieving University ethics approvals for example.

Students have to personally visit the building, so the choice needs to be made at the beginning of the semester to set up the necessary arrangements for access.

3 The building choice

Choice of a suitable building is critical to the whole process- the choice of a building that is architecturally interesting is the most important feature- we have had good studies from students who chose buildings where the access was very limited- for example the choice of the Lloyds building in London encouraged the students had to be very ingenious in their information collection!

Some buildings have much more data available in published form- sections, and plans and this tends to make collection of information about the construction and detailing easier. Architecture students lives revolve mainly around the design studio so the study has had increased success since the building choice changed to one linked to the studio design projects. Following the suggestion of Mike Neary (ex CETL, Warwick), the students have been encouraged to make their study visits unaccompanied. This transfers responsibilities for collecting the data to the student- if a guided tour is set up and the tutor attends, very often the person carrying out the tour will respond to that person, and that tends to transfer the responsibility back to the teaching staff, inhibiting the students as learners and researchers.

4 Review

Student study visits to buildings are increasingly difficult to fit into the curriculum. 'Issues of health and safety, increasing student numbers and increased staff workloads' (Wilson and Crisp) all combine to make building visits more difficult. It therefore seems particularly important to fit in building visits where possible. Visiting completed building offers opportunities for observation of the building in use and presents reduced risk management problems in comparison with visits to construction sites.

Thomas (CEBE case study) points out that in the developing area of sustainable construction, text books are often an outdated source of information so direct observation gives more up to date knowledge.

Students often produce user questionnaires with responses that contribute little to expand their understanding of the building. Students need to be helped to develop a cognitive map of the

problem- analysing a building is often not something they have previously considered and they start with little idea of the shape of the problem. Zeisel points out that preconceptions can be a helpful starting point for hypothesis to test in the research questions. In the next run of the module it is proposed to ask students to generate hypotheses about how the building works; their questionnaire can then be focussed to establishing the validity of the hypotheses. (Zeisel 2006) Wilson and Crisp (CEBE case study) recount that their Barcelona case study visit for built environment students is preceded by a dummy run in their home town of Edinburgh- which gives the students experience of the approach required and increases their confidence. Our data collection on the Wiki is intended to provide a virtual field trip that could be used in the same way- students will be encouraged to set up hypothesis to analyse building data on the wiki as a practice run to gain experience both in setting up the hypothesis and research questions and identifying the additional information that would make the task easier.

Students who choose a building that is well written up in the journals with sections and plans generally have an easier time assembling their structural and construction information than those who opt for an unpublished building. They have complained that the marking system is unfair in relation to construction because the starting point is not the same for all. Sometimes there have been doubts about how students have assembled sophisticated sections. Brunus-Wagstaff and Norton comment (Rust 1998) that if students perceive that the assessment is not fair they resort to surface learning approaches, for example playing the system. The introduction of a sketch made on site as a starting point for the construction detail could be helpful in resolving this difficulty. Wilson and Crisp at Herriott Watt have required students to sketch on site – they favour sketches over photos ‘*because use of a camera makes students more passive in their observations and sets up a screen between the observer and the object*’ (CEBE case study) Ruslan Ramanau evaluated the group work in the module as part of the Pathfinder project. He reported ‘*All of the respondents felt that not everyone was pulling their weight... Some respondents saw the source of misunderstandings in cultural differences: one international student found it difficult to follow some of the discussions because of the language difficulties*’ The problem of group working is more acute when a large percentage of the marks hangs on the group work. Cultural differences and language barriers are often underestimated and not fully accommodated. Strategies for improving this aspect of multinational undergraduate teaching need to be investigated.

In the same survey, Ruslan reported ‘*The students felt that they could have used the Wiki more, but knew relatively little about it, although there was always somebody in the group who had some knowledge of this technology*’ It was unexpected that students were not confident using the wiki- a single training session for the wiki is demonstrated to be inadequate, and should be expanded to include a practical training session.

5 Conclusions

Student feedback indicates that the building visit and the interaction with people perceived as clients are high points of the module- building owners and operators who have co-operated in the study are often keen to receive copies of the finished reports; this interaction is valuable for the students.

References

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