



<p><b>Title of Case Study</b></p> <p>Teaching with a Building as a Case Study</p>	<p><b>Discipline/Course/Subject area:</b> Architecture</p> <p><b>Institution(s):</b> School of Architecture, Edinburgh College of Art</p> <p><b>Impact:</b></p> <p>The practice was introduced:</p> <p><input checked="" type="checkbox"/> within a course unit/module</p> <p><input type="checkbox"/> across a degree programme/s</p> <p><input type="checkbox"/> across a faculty/school/group of departments</p> <p><input type="checkbox"/> across the institution as a whole</p> <p><input type="checkbox"/> in collaboration with other higher education institutions</p> <p><b>Length of time project has been running:</b> 1 year</p> <p><b>No. of students:</b> 44 in 11 groups of 4</p> <p><b>Level/Year of students:</b> 3</p> <p><b>No. of staff involved:</b> 8</p> <p><b>Main Author:</b> Lynda Wilson</p> <p><b>Co-Authors:</b></p>
<p><b>Summary</b></p> <p>This study describes and evaluates a project which enabled level 3 architecture students to gain knowledge of the integration of technology prior to demonstrating their learning in the development of their own proposals for their main design project of the year.</p>	
<p><b>Key Words</b></p> <p>Integration, Building Technology, Design Studio, Group Work, Communication</p>	
<p><b>Key Points of Good Practice</b></p> <ul style="list-style-type: none"> <li>• The case study building was award-winning, very local, unoccupied and fully accessible including plant, ductwork and floor spaces.</li> <li>• Basic floor plans and sections were made available to the students, so that time was not wasted compiling basic information.</li> <li>• All the staff involved in the case study had some prior knowledge in their own discipline of the case study building but only used this to help students in tutorials and workshops. They did not impart the information direct in lectures, so the students had to work from first principles.</li> </ul>	

- The case study was at a stage of the course, i.e. Level 3, when the students had sufficient prior knowledge and skills to maximise the learning from it.
- The case study was at a stage of the course when the students had an incentive to fully commit to it because they knew they were to undertake a subsequent individual integrated technology design project and they also were soon to begin their first year in practice. Additionally, there was time for reflection before beginning the implementation of the learning in the subsequent project.
- Other studio design work was suspended for the period of the case study so that time could be fully devoted to it and no group members could cite other pressures of work to avoid contributing to the work of the group. This suspension also reinforced the integrated technology aspect of the case study, as it was perceived by the students as a studio, and therefore a design project.
- The publication standard outcome exploited and reinforced the teaching and learning in that term's module in Presentation and Publication.
- Tutors and visiting staff from differing disciplines were prepared to work together towards agreed criteria, within a common timetable and within joint workshop and tutorial sessions with the students.
- Group sizes were tailored to suit the project so that it was difficult for there to be passengers, but at the same time the students were not overloaded with excessive work.
- A method of assessing group projects was used that was perceived by most students as being fair and transparent.

## Description of Implementation

A group case study, four students per group, to examine the integration of nine factors in the design of a completed building:

1. structure
2. construction
3. environmental issues and services
4. lighting
5. acoustics
6. building regulations
7. health and safety issues
8. inclusive design issues
9. budget

The learning outcomes were: the demonstration of an understanding of the integration of the above criteria in a coherent architectural design, and the demonstration of an ability to work as part of a team.

The case study building was a local speculative office, to which there was full access. The project architect gave an introductory talk before the students and all involved staff made an initial visit to the building. There followed over the next two weeks, workshops with specialist staff and seminars with studio staff and the project architect. The study ran concurrent with a communication module: Presentation and Publication. The main component of the final submission for the study was designed to reinforce communication teaching and learning and took the form of a publication-standard group report emulating and extending the building studies published regularly in the Architects' Journal. There was to be a general introduction, followed by an explanation of each factor and the ways in which it influenced the design and was integrated into the whole. The report was to be illustrated with relevant drawings and diagrams and contain a bibliography and references.

Students often perceive there to be unfairness in the assessment of group projects, sometimes feeling that 'passengers' gain higher grades than deserved. It was pointed out to the students that this is in the nature of any group endeavour and is part of the learning process of the project, and that they should try to achieve a group dynamic which made passive participants unacceptable. To allay these fears somewhat and to achieve balance, the final submission was in two parts: the first part was the group journal article contributing 75% of the final mark and the second part an individual written report describing the students' own contribution to the project and how this related to the group findings and submission, which contributed 25%.

## **Perceived Benefits**

### ***For Students ...***

Case studies generally give students exemplars for their own work and provide knowledge quickly but are often presented as complete to students in lectures and e-learning environments; however this can represent passive learning. This case study demonstrated a fast and active student-centred learning method. As the students created the case study themselves, they were already 'inside' the subject matter and so more able to integrate the knowledge when it came to applying it to their own work.

The staff who collaborated in the teaching were from multidisciplinary backgrounds so the students were able to witness this type of integration, thus reinforcing the learning outcomes.

Communication skills were developed through group work and through the physical presentation of the findings.

### ***For Teaching/Support Staff...***

The individual members of the teaching team learned from each other, increasing their knowledge of other disciplines and related technology. Staff had points of reference for subsequent discussions about technology in the studio.

Standards were set for subsequent programmes.

The delivery of knowledge was efficient in terms of staff time.

They experienced a teaching method of relevance and value to other programmes.

## **Issues/Challenges**

### ***For Students ...***

The project ran in the middle of Term 1, in the same term as a design module. The proposals made within the design module continued to be developed over the whole academic year.

Despite the case study being ostensibly a technology project it was run as a studio project with other studio work suspended for the period. The students had had four weeks to develop initial proposals for their main design project of the year. The study provided a break from this so that they could reflect on it and then come back to it afresh later in the term. The findings from the study prompted them to think more about the integration of technology in their own project, which they would more fully address and demonstrate later in the year, after a period of reflection.

Much of the first two weeks was taken up with lectures, workshops, seminars, information gathering, and group organisation. The final week was taken up with collating, writing up and producing the final article.

Especially in student groups where there is no pre-established hierarchy, group work has drawbacks in that there can be passengers and over dominant personalities. However, a great amount of information can be gathered and processed and then disseminated quickly to other members of the group through meetings, workshops and seminars. The groups were selected by staff to comprise mixed abilities and, as intended, the abilities of the more able students raised the standard of the others.

### ***For Teaching/Support Staff...***

For the programme co-coordinator, there is the amount of research and information gathering required before selecting the building to be studied.

Then there is the task of co-coordinating other staff and visitors and ensuring that tutors from differing disciplines are prepared to work together towards agreed criteria, within a common timetable.

### **Enablers that helped the project to work**

Although the building studied was selected partly for expediency, it was ideal. It was within a short walking distance, so time was not wasted in travel. The architects gave us copies of the plans, sections and elevations. The project architect introduced the building, describing the design process, and he later answered questions the students raised after an initial period of study. The building was empty but with a full-time caretaker so was always accessible by short notice for follow up visits. The owner was extremely helpful, giving us full access to all areas, the plant, services, ductwork and to the raised floor, which would have been very difficult in an occupied building. The fact that it was empty meant that the study was not diverted into issues of post-occupancy evaluation, which while obviously important in itself, was not part of the intended learning in this study.

Despite being a speculative office building, it is award-winning, of high quality in its overall design. This was important. The students were more enthusiastic about the whole project because of the quality of the building and so were more inspired to produce first-rate submissions themselves.

Why is it better to have used a building as a case study rather than published or presented case studies of integrated technology? The students had to start from scratch and work from first principles as the information was not available in the format they were to present it in themselves. It was important that they had to sift out for themselves, for example, how public health and safety issues had prescribed the structural materials and how the siting of the building, bounded on two sides by busy city streets, had influenced the air intake positions. They could really understand that no design decision on a particular issue had been made without some influence from another issue. Being level 3 students, they had sufficient knowledge and experience to make these connections in a much more holistic way than they would have in their earlier architectural education.

Using a real place allowed the students to set eyes on, for example, service elements which they had previously seen only in photographs and drawings.

## **Details of project evaluation**

The standard of the final submissions was high in terms of both the information presented and its presentation. The students had clearly relished the task and demonstrated a considerable increase in their knowledge base and their understanding of the successful integration of the issues within a coherent architectural design [see Fig. 1 and Fig. 2 in the Appendix].

Formal module feedback forms were issued and collected, the results analysed by an administrator and distributed to all staff involved and available to all staff in the school. The outcomes of the module and its extremely positive feedback were discussed at an Undergraduate Course Committee, at which student representatives were present. The feedback from the staff involved in the study was through subsequent discussion. The physical outputs were shown to, and discussed with, external examiners and visiting critics, all of whom were enthusiastic about the outcomes.

In the feedback, a few students felt the period was too short and too frantic but most had relished the challenge, feeling that they had achieved much more than they otherwise would without the tight deadline. Later, a year-out employer of a student involved in the project saw the presentation in the student's portfolio at interview and, unprompted, fed back to us his positive view.

The staff who facilitated this case study taught on the subsequent module where students were to demonstrate their understanding of integrated technology within their own design proposals. Not only was the case study useful for referencing particular elements during later teaching, but it also provided the students with a model for their own work, in terms of an ability to integrate technology and to present it in an appropriate way. Again, the final submissions for this later project were high and the feedback from the students was very positive. They felt they could not have achieved the results they did in this later project without the earlier study and felt more confident about their approaching year out in practice [see Fig. 3 in the Appendix].

### **Possible improvements/enhancements**

The study building should be changed at least every two years to avoid staff becoming stale and over familiar with it, and to avoid students accessing previous studies as a shortcut to making their own studies.

More satisfactory ways of assessing group work should be pursued, to better reflect the input and learning of individual students.

### **Points of advice for others who may wish to replicate the techniques used**

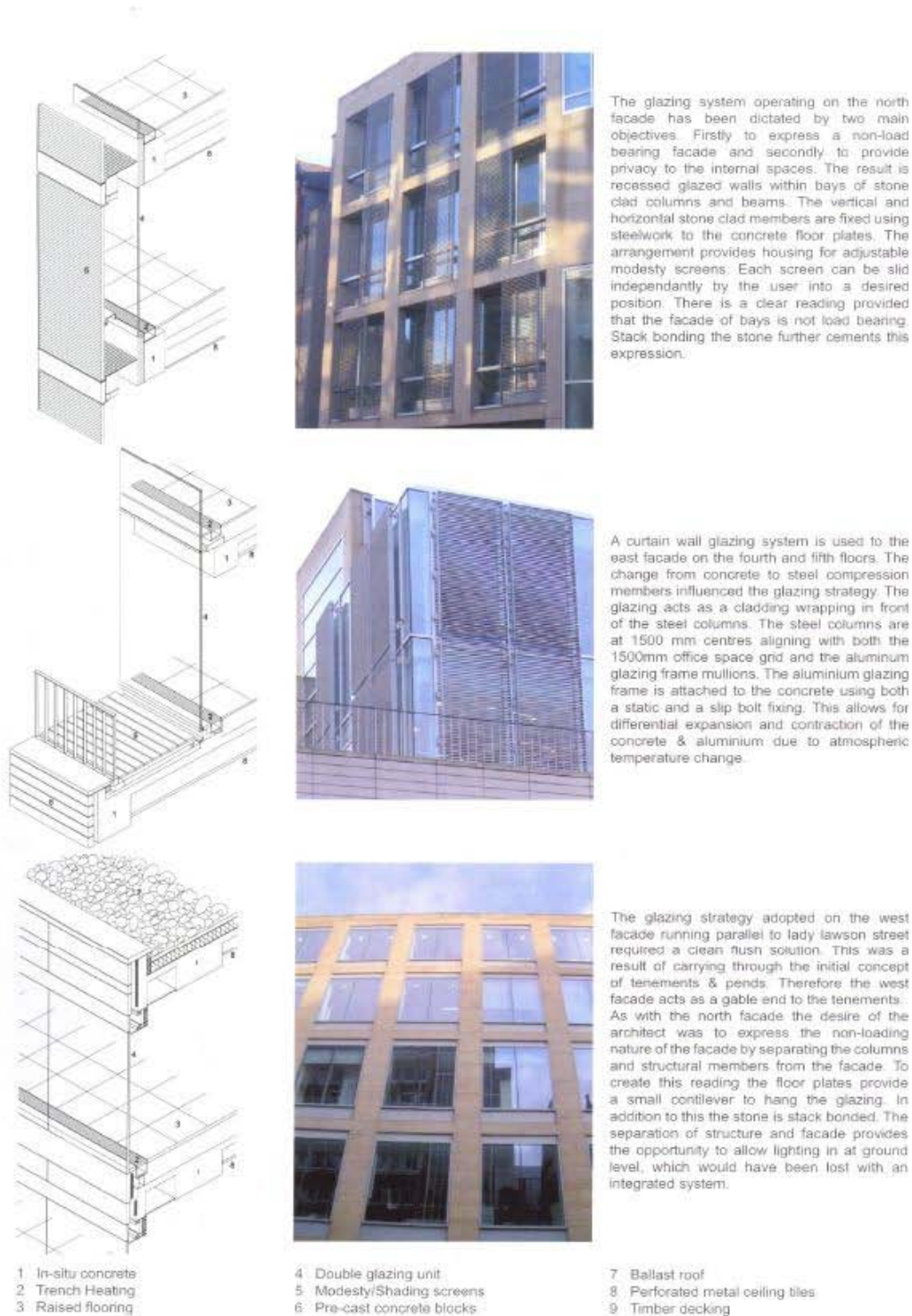
Other students, design studio teachers and technology teachers would benefit from the integration aspects of the study. The wider lessons from the group work and communication methods could be applied, with different emphases as appropriate, to other higher education courses, not just in built environment, and are particularly relevant in courses where preparation for practice is important. The example group report used for presentation purposes could be substituted by a journal relevant to the particular course.

This is the flexible aspect of the study but the core comprises the standard of output required, the relevance of the study to later projects and therefore the timing of it.

All participating staff must be agreed on the relevance of the study and be willing to co-operate with other disciplines. Everything must be organised and timetabled in advance so that there is no opportunity for dissatisfaction to hinder the student learning process and quality of output.

<b>FURTHER READING</b>		
<p><b>Relevant publications by those conducting the case-study</b></p> <p>Interdisciplinary teaching:</p> <p>Chrisp, T.M. <i>et al.</i> (2003) Developing Architectural Awareness in Structural Engineers. <i>The Structural Engineer</i>, 81(7). 27-32.</p> <p>The real versus the paper.</p> <p>Wilson, L. and Chrisp, T.M. <i>Study Visits: their integration into the curriculum through assessment and increased student learning</i>. Centre for Education in the Built Environment.  <a href="http://cebe.cf.ac.uk/learning/casestudies/case_pdf//lwilson.pdf">http://cebe.cf.ac.uk/learning/casestudies/case_pdf//lwilson.pdf</a></p>	<p><b>Publications in the research literature</b></p> <p>Buildings as Case Studies:</p> <p>Gorst, T. (1995) <i>The Buildings Around Us</i>. London: E &amp; FN Spon.</p> <p>Orton, A. (2001) <i>The Way We Build Now</i>. London: E &amp; FN Spon.</p> <p>Case studies of how 11 architects design including how they integrate technology:</p> <p>Lawson, B. (1994) <i>Design in Mind</i>. Oxford: Butterworth Architecture.</p> <p>Engineers and architects design collaboratively:</p> <p>Rice, P. (1996) <i>An Engineer Imagines</i>. London: Ellipsis.</p>	<p><b>Cross references to other materials/resources in the topic</b></p> <p>Individual Building Studies:</p> <p><i>The Architects' Journal</i>. All issues 2006-07</p> <p>Presentation:</p> <p><i>The Architects' Journal</i>. All issues 2006-07.</p>

# APPENDIX



**Fig 1**  
 How the façade integrates a historical typology, structure, daylighting, privacy, office layout and construction technology.

### Services Strategy

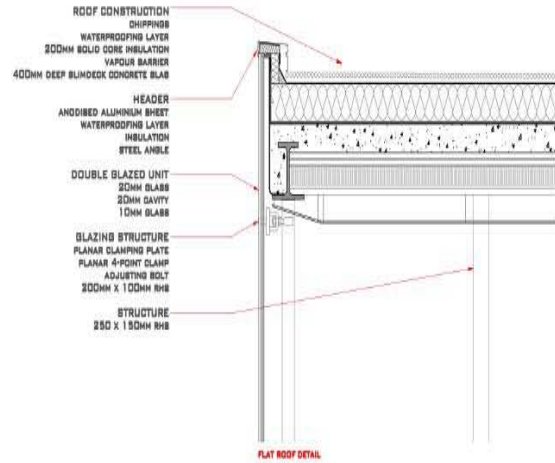
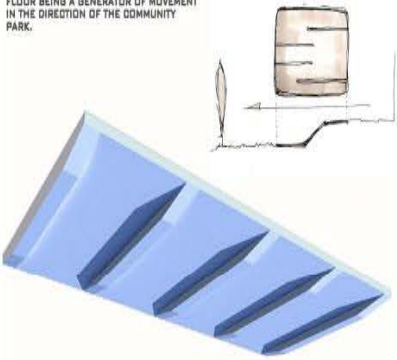
The master plan of the services arrangement in Evolution House was the provision of solid vertical "core" areas within the floor plan to accommodate services, along with light shafts, vertical circulation and sanitary accommodation. This strategy is closely linked with the overall structural concept of the tenement and wynd – the wynd translates in an inverted sense into the solid vertical service cores dividing the office spaces. Through the provision of this central core, the services, ductwork and pipework are accommodated in a very simple way, eliminating the need for complicated twists and turns by providing a clear vertical space.



Fig 2  
How the services strategy integrates efficient service distribution, daylighting, circulation, ancillary accommodation, structural concept and historical typology.

THE STRUCTURE HAS BEEN USED TO REINFORCE THE BUILDING'S DESIGN DIAGRAM - WITH THE GROUND FLOOR STIMULATING MOVEMENT BETWEEN THE PUBLIC SQUARE AND THE PARK, WITH THE MAIN IDEA STORE BLOCK SUSPENDED ABOVE IT.

THE RIBS ON THE UNDERSIDE OF THE REINFORCED CONCRETE SLAB THAT FORMS THE PLINTH FOR THE IDEA STORE BLOCK ARE EXPOSED. THIS VISUAL ELEMENT REINFORCES THE IDEA OF THE GROUND FLOOR BEING A GENERATOR OF MOVEMENT IN THE DIRECTION OF THE COMMUNITY PARK.



THE MATERIALS USED IN THE BUILDING'S STRUCTURE HAVE BEEN CHOSEN, AGAIN TO REINFORCE THE BUILDING'S DIAGRAM.

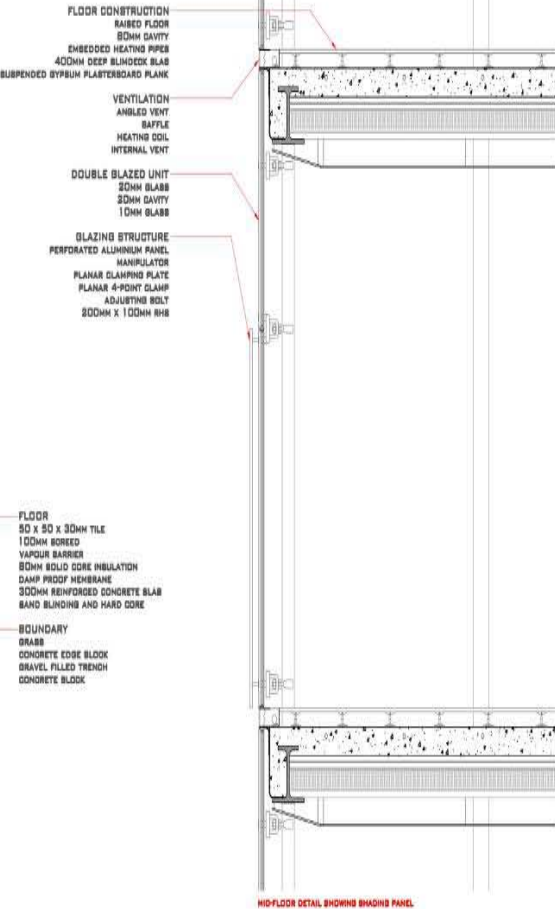
THE GROUND FLOOR HAS CONCRETE COLUMNS AT WIDE 10M CENTRES TO FORM THE THREE BAYS WITHIN THE FLOOR. THE THICK CONCRETE SLAB THAT THESE COLUMNS SUPPORT ENHANCED THE IDEA OF THE IDEA STORE BEING RAISED UP OFF THE GROUND, AND THAT THE GROUND FLOOR IS A CONTINUATION OF PUBLIC SPACE.

ONCE THE BUILDING MOVES UP INTO THE IDEA STORE SECTION, THE COLUMNS CHANGE TO STEEL RECTANGULAR HOLLOW SECTIONS. THIS WAS DONE TO ALLOW FOR SLIMMER COLUMNS. THE COLUMN CENTRES VARY ON THE UPPER FLOORS AND THE COLUMN SIZES AND FLOOR THICKNESSES ARE ALL THE SIZES REQUIRED FOR THEIR MAXIMUM HEIGHTS AND SPANS, TO KEEP THEM CONSISTENT.



INTERNALLY, THE COLUMNS HELP TO DEFINE THE SPACES OF THE IDEA STORE AND CREATE A DIFFERENT ATMOSPHERE ONCE YOU RISE UP FROM THE OPEN GROUND FLOOR.

THE COLUMNS WHICH ALLOW THE CREATION OF THE ATRIUM SPACE, STAND WITHIN THE ATRIUM ITSELF AND CONTINUE FROM THE FIRST FLOOR ALL THE WAY UP TO THE ROOF - EMPHASISING THE HEIGHT AND THE INTEGRATION BETWEEN THE FLOORS.



**DETAIL SCALES 1:20**

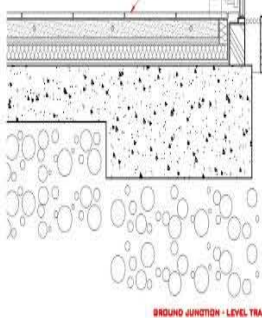
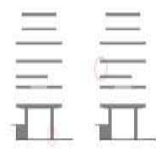


Fig 3  
The integration of programme, structure, environment and façade in a student's subsequent individual design project.