

THE CUBE PROJECT AND THE PRODUCT DESIGN CURRICULUM

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ABSTRACT

This Paper outlines the CUBE Research Project and its value and integration into the 0Degree Programmes in Product, Industrial and Interior Design at the University of Hertfordshire. The CUBE Project, managed within the Faculty of Psychology, mission statement is to: 'Build a living space for one person with an internal dimension of 3 metres cubed' The CUBE will have a minimum dependence on external supplies of energy and water. It will also consider material flows during specification and construction. The first CUBE will be constructed on Campus in Hatfield. Concurrent with and informing the development, are a series of talks by experts within the fields of energy and sustainability and companies who supply products relevant to the project. These talks are open to students and staff of the University as well as externally to the local business community. They form a forum for discussions on the CUBE Project and sustainable issues. The students have been directly involved in the design and development of the CUBE. Initially working in cross-disciplinary teams, ten proposals were presented to the Research Team. These proposals were the first visualisation and physical consideration of the use of space and layout of the CUBE. The concepts generated within this initial design challenge are informing the final design of the CUBE. To progress the development five students were selected to join a steering committee making the design decisions for the physical construction of the CUBE. They join the research team and professional designers who will realise the concept.

This paper will expand on how the research project is managed and the value to the students' academic experience. Issues covered will include cross-disciplinary working, integration of research into studio practice, professional context and trade-offs and very importantly Sustainability in the wider context.

Keywords: Sustainability, research into practice, collaboration

1 CONTEXT

The following paper outlines a work in progress, the CUBE project, and its relationship to the Product, Industrial and Interior Design students learning experiences at the University of Hertfordshire (UH). At the time of writing the project was about to enter the construction phase so this paper will briefly outline the history of the project, current position and future developments and possibilities. Importantly it is the projects relationship to the students experience which is the theme of the paper.

2 THE CUBE PROJECT

The CUBE project's origins were in 2008 when Dr Mike Page a Reader within the Faculty of Psychology sought and obtained seed funding from the University to:

'Build a living space for one person with an internal dimension of 3 metres cubed which has a minimal ecological footprint'

Realising that the potential of the project was best fulfilled by a multi-disciplinary team Dr Page sought partners from across the University's Academic staff. From a broad initial interest key internal partners were Dr Ben Anderson, Interior Design, Richard Adams and Julian Lindley, Product & Industrial Design. Through the first months of 2009 the structure of the project was mapped out. Three key interlinked objectives were highlighted which related to the criteria stipulated within the initial funding agreement. Firstly a feasibility study on the practical aspect of the project to be presented with initial design proposals in early 2010. Secondly there was a need to investigate

available technologies to inform the design process. This knowledge should be available too and engage the local community and industry. Thirdly the Project had to demonstrate a value to the learning experience(s) of students at UH. With the second objective a bi-weekly evening seminar series was organised running throughout the Autumn Term 2009. Each of these seminars had a theme relating to eco-efficiency usually companies who supplied products with strong eco-credentials. As examples presentations on Solar Panels (Mitsubishi), Timber Frame Buildings (Kingspan Ltd), Reed Beds (Yorkshire Reed Beds) and Composting Toilets (Natsol Ltd) were given. These were well attended by Academics and Students but equally importantly representatives from local Industry (Architects and Planners, Environmental Populations a local network of SME's interested in ecological issues) and the community (for example, representatives from St Albans Transition Town). These seminars provided a lively forum for debate and networking both during the seminars and afterwards at a drinks reception in the design studios. All of these proved invaluable experiences for students.

Essentially the project is an exploration into application of the current technologies associated with reducing energy and water demand, material consumption and waste management. From the ideal of zero impact the reality is a trade-off between this and cost or practicality. Stipulating an interior dimension of three metres cubed highlights the demands to be efficient.

3 INITIAL STUDENT INVOLVEMENT

By the beginning of the Autumn Term 2009 the structure of the project, objectives, time-plan and seminar series were in place. An information portal in the shape of a website (www.cubeproject.org.uk/) to record the project while creating a forum for informed discussion was also in the progress of being launched. However the concept only existed in words. Therefore the decision was taken to engage students in the first design (3D) investigations. Final year students on the Interior, Product and Industrial Design Programmes were divided into ten multi-disciplinary teams. These were given an introduction to the project which included:

1. The background to the CUBE Project.
2. Context of need, ecology, resources and material consumption.
3. Waste management.
4. Energy requirements.
5. Heating, lighting and ventilation.
6. Dimensions and the requirements for a single resident within the cube.

Importantly they were briefed not to see the project as an assemblage of the latest technology but a living space with all the psychological, aspirational and visual aspects considered. What would it be like to live in the space? How do you entertain? What are the minimum requirements for possessions/storage? The teams were given two weeks for this investigation. After the first week the teams gave a presentation of their research findings and outlined their individual approach to the challenges inherent within the brief. At the conclusion of the exercise each team gave a ten minute presentation supported by models, to the CUBE Team. These provided not only the first visualisations for the project but cause for debate on internal layout, visual identity and position of the cube, for instance one team proposed burying half the CUBE to conserve heat.



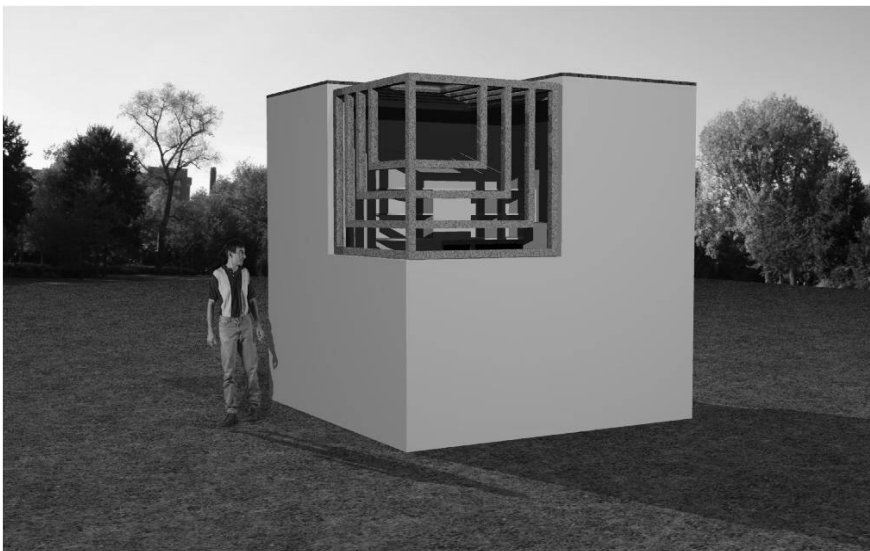
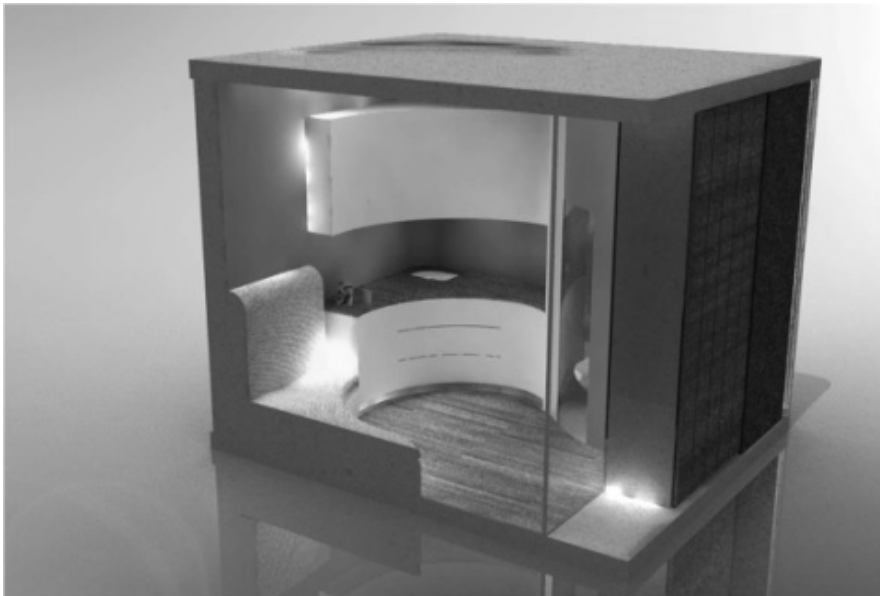


Figure 1. Four of the initial student proposals

4 PROLONGED STUDENT PARTICIPATION

After the initial team presentations it was impractical to keep the whole cohort involved in the project. Therefore it was decided to keep students involved and interested in two ways. Firstly students were invited to attend the seminar series and actively engage in the discussions. Secondly five students were selected to join the steering panel for the project to have an active involvement in design generation and decision making. They were chosen on their performance during the team project. It had already been decided that the complexity of the project and timescales which did not match academic schedules would rule students out of producing the development and production drawings. For the purpose of delivering and supervising the construction project two professional designers Linden Davies and Nick Edwards were engaged and invited onto the steering panel. The students have also been called upon to further investigate aspects of the design, namely internal fit-out once the construction architecture had been defined. These activities were both research and design proposals for consideration by the steering panel.

5 FUTURE OF THE PROJECT

The first phase of the research project is now concluded and the project is entering the second phase of building a working CUBE. At the time of writing funds have been secured to construct a first prototype. This has in part been achieved by gaining the co-operation of companies who have agreed to provide services, components and products at reduced or no cost. The current target for the completion of the first CUBE is mid-summer day 2010. This will be constructed on the UH campus in Hatfield. Students will be able to participate in some of the construction and there are opportunities to spread the experience of the project to students of other disciplines, initially film and media to document progress. From initial interest generated by the project the Edinburgh Science Festival agreed to display the CUBE during Easter 2010. However this target was not feasible so agreement has been reached for display in 2010. The team is currently exploring other methods of disseminating the knowledge gained from the project through other media channels. It is hoped that the evaluation of the initial CUBE will generate interest and funding for further investigations. Two possibilities currently being discussed are commercial applications and a second phase of the CUBE to explore the impact of technologies not yet available. The fluidity and openness with development possibilities and knowledge is shared with students.

The CUBE project is just one of several research projects within UH. It is hoped that the experience of involving design students can be replicated with other projects to the mutual benefit of all parties.

6 BENEFITS TO STUDENT EXPERIENCE

Some benefits are simple, students respond well to briefs set externally to the programme(s) and gain transferrable skills working in teams and presenting to professionals. This is in line with the UK's Quality Assurance Agency for Higher Education which states:

Group projects engage art and design students in extending their creative abilities into the arena of collaboration and negotiation, employing inter-personal skills and working as members of teams, and developing their understanding of project management. [1]

However the unique benefit of this particular research project to the student experience is Sustainability in practice, understanding the complexities of moving from theory to practice, seeing the connection between research and outcomes, working alongside professional designers, understanding negotiations with industry. In this context the project moves from a studio based exercise towards a 'real' project allowing students to experience many of the parameters which influence design decisions.

Ultimately the experience of being involved and contributing validates the project, both collectively to year groups and individually to students on the steering panel. It has also been important to UH to connect research to tangible outcomes and the students' experience. They (the students) can see the value in research and the role which design can play both in investigation and moving from knowledge generation to design propositions. One key aspect of this is the fact that the project is real in that it will be built but more importantly has involved external organizations and designers. Students gained confidence in the respect afforded to them and their ideas by these professionals and companies. The students on the steering committee are not observers but active participants in the evolution of the

CUBE. Students have become involved first hand with important ecological issues of our times and feel valued in understanding and developing solutions for these issues.

The CUBE is not the answer to building homes on a large scale but a vehicle in which to explore the available technologies and debate sustainable futures. Students are experiencing how designers cope with compromise and engages and negotiates with industry. Students have joined the “professional team” when visiting companies. Having two professional designers developing the concepts from the students initial designs and producing professional drawings has been an invaluable insight as it is rare that students see their ideas progress beyond prototypes and models. This, in part, addresses a concern within the Cox Review of Creativity in Business:

Higher education courses should better prepare students to work with, and understand, other specialists [2]

In a broader context students have gained from the experience and there are indications that they are making connections with the value of input from other professionals, principally in this case the Psychology Faculty to their own studies. Students on their own initiative have approached lecturers outside their own Faculty for advice on research and reflection on their own design proposals (major projects). All of this is good grounding for the dynamic world of the professional designer. The other side of the exercise is that UH Research Project have acknowledged the contribution that design, and students can make. This is particularly evident in the ability to make complex ideas accessible visually both in 2D and 3D. Hopefully this project will lead to other co-operations between Research Teams and students.

7 REFLECTIONS AND DRAWBACKS

The key frustration of integrating a complex project such as the one outlined above is timing and engagement. That is maintaining the students interest when external organizations sometimes respond slowly and developments (within the CUBE Project) can be sporadic. This does not fit with standard curricula development and students had to understand that seeming lack of progress was not due to diminishing of the project but commercial timescales and other external factors. However the benefits outlined above far outweigh project management issues.

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REFERENCES

- [1] Quality Assurance Agency for Higher Education, Benchmark for Art & Design 2008 p7.
- [2] Cox Review of Creativity in Business 2005 Chapter 6, P1.