

# **CASE STUDY THROUGH ROLE PLAY AND ITS EFFECTS ON THE LEARNING EXPERIENCE**

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## **ABSTRACT**

This paper discusses the relationship between meaningful explorations of case studies (termed active case studies) with role-play in seeking effective understanding of the technological elements of product design education. Its aims are to facilitate a deeper learning and 'real world' experience for students of this subject. This experience involves role-playing the client/designer relationship to enhance and improve upon existing real life products. Lasting comprehension of specific manufacturing technologies, and the appreciation of design for manufacture and how parametric solid modelling aids this process is a key aim of this work.

*Keywords: case study, role-play, live project*

## **1 INTRODUCTION**

The Design for Manufacture (DFM) module taught at year two for Consumer Product Design at Napier University Edinburgh is part of the Transparent Module System where modules are interconnected and their deliverables are co-ordinated. The rational and outcomes of this approach are centred around the creation of an holistic approach to design teaching as discussed in *Subverting the Modular Structure*, Rodnes et al [1]. Learning outcomes for DFM indicated that although the module would support the design and business activities of the other modules, independent learning activities would take place in order to satisfy the requirement for a general overview of the subject area.

The effectiveness of case studies in contextualising theoretical concepts has been previously demonstrated by Raju and Shanker [2]. Whilst books like *Materials and Design* [3] by Ashby and Johnson offer clear diagrammatic views and excellent relational comparison between material and processes and is core to DFM teaching at Napier, such texts can only offer a surface learning experience unless they are connected with a problem solving activity.

This Paper will detail a case study undertaken by Napier students, which dealt with a lighting fixture currently installed at The Edinburgh Film House. The fitting featured a back plate fixed to the wall and a cover that had four security allen fixings to secure it to the back plate. It was put to the students that this design would benefit by the application of Design for Manufacture and Assembly techniques as created by Boothroid and Dewhurst [4]. They were asked to redesign the cover and design the back plate in a suitable aluminium alloy using either investment casting or extrusion as the manufacturing process. Their designs would be detailed using parametric CAD (Solid

Works). The exercise was constrained by not allowing change to the dimensions or aesthetic of the original design. This allowed the cohort to concentrate on the same task.

Crucially in this active case study the relationship between lecture and student was abandoned in favour of a designer/client one. This role-play extended to the setting of the brief and subsequent requests from the client. These themes would involve redesign, and evaluation of several manufacturing processes, materials, and finishes. The link between roll play and greater understanding of the problems and the generation of solutions in design has been developed by such international design consultancies as IDEO [5]. This project aimed to utilise and expand upon these techniques to create a real time design environment for students. The model hoped to allow effective research, comprehension, retention, and creative and effective problem solving.

The rationale for creating the active case study is based upon observations of the student experience during 'live' projects. Specifically when faced with the unknown, students generally work harder for their presentations to ensure that their work is intelligible and comprehensive. The Film House Light Project has been running for three years, with student feedback from each year incorporated into subsequent versions. This paper discusses the project in its third incarnation which was run between October 2006 and January 2007. A 'live' project with another group running in the same period was observed for similarities and differences in the cohort's behaviour. This group were interviewed at the end of the project and asked to describe what they felt, if any, were the differences in the way they approached the live project and a studio project. This data was cross-matched to interviews with the Film House Light Project house students.

The project structure was set out to closely relate to a real life experience from a design to manufacture scenario viewpoint, through a four-stage process.

Two dummy websites were set up to allow student to access information. The first was a website that represented the clients business, it had information regarding the services that the clients provided to its own customers, and examples of projects that it engaged in. The other website was set up as manufacturing resource. This website purported to be specialists in the manufacture of aluminium products and listed such services as die casting, investment casting, and extrusion. It offered the service of accepting e-drawings from Solid Works, and emailing back quotations. Drawings received were used as a feedback device for the manufacturing resource; requests for clarification and suggestions to facilitate the manufacturing process were annotated and sent back to the students. Realistic pricing, price breakpoints, and lead-times were also included in the feedback.

## **2 STAGE 1 - PROJECT INTRODUCTION**

Students were given the project brief and asked to redesign the Film House Light taking out the pre-identified design flaws. The brief itself contained errors and missing information that the students were expected to spot and ask for clarification. Restrictions on materials (aluminium alloy), processes and aesthetics were placed upon the students and they were asked to produce sketches and sketch models to illustrate their design, see fig 1. In terms of process, extrusion and investment casting were identified as the options. After evaluation these designs were transferred to CAD, and client presentations were prepared which were sent to the 'client'

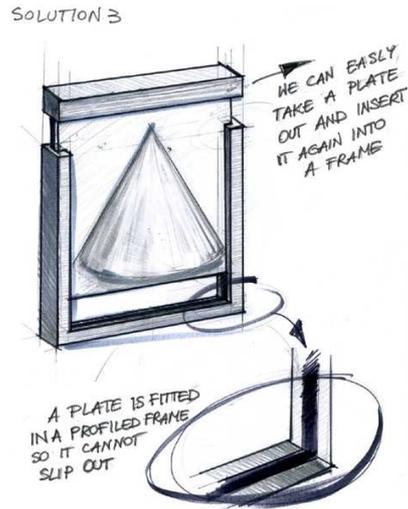


Figure 1 Student sketches

### 3 STAGE 2 – CLIENT INTERVENTION

The rationale for this client intervention was to introduce the students to the all too familiar scenario of despite having done a good job, external influences on the client side like budgetary considerations can force the designer to make soul destroying changes. This inclusion was seen to be important to maintain the realistic nature of the exercise. It was also useful as a device to introduce another material and it's related manufacturing processes.

The Film House Light is a design that consists of a front cover and a wall plate. The front cover could only be sensibly manufactured as an investment casting, the wall plate could be either investment casting or extruded depending on the design. Client feedback for the Stage 1 presentations was that whilst the front cover was acceptable, budgetary considerations meant that the wall plate needed to be re-designed using cheaper material and processes. Students were informed that they would have to modify their design for the sheet metal fabrication process.

### 4 STAGE 3 – PRESENTATIONS TO CLIENT

Students were informed that for the final presentation they would be placed in groups of three and would be required to select the design that they thought best fitted the original client brief, and the later adaptations. This design would then be worked up for presentation. The presentations were scheduled to take place in a venue outside the university, and to the clients themselves. The meetings took place in a conference room at a local hotel, See figure 2, and the two clients selected were people that the students had not met previously. Client one is a theatre director who had recently set up a business that specialised in coaching people from the creative industries, and client two is a practising designer. All of the presentations were done on the same day, at the same location, and were videoed. The clients informed the students that the company specialised in interior design, and had recently branched out into related products after being offered the design rights to the Film House Light and other lighting solutions. Client 1 was introduced as the managing director, who had little direct design experience, and client 2 as an interiors specialist, with marginal product design

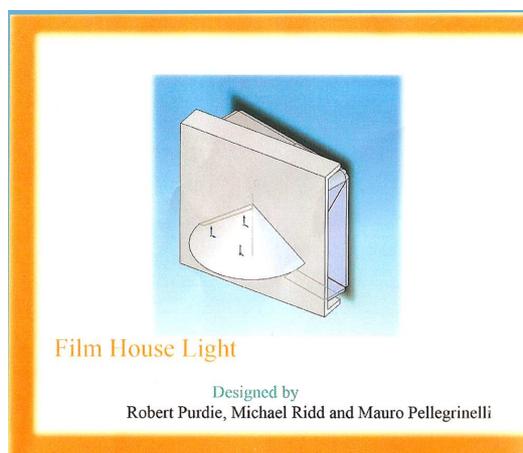
experience. This allowed the clients the leeway of asking questions that were designed to test the levels of understanding of the students with relation to materials and processes.



*Figure 2 Client presentations*

## **5 STAGE 4 – FEEDBACK**

The ‘clients’ were asked to feedback on how they thought the students had conducted the presentation in relation to professionalism and content. This feedback was passed on to the students in a de-briefing that was augmented with edited highlights from the video footage. The feedback also centred on how effectively the students had communicated their presentation, and how they had worked as a group.



*Figure 3 Client presentation materials*

## 6 CONCLUSIONS

As stated previously this project was run concurrently with a live project with a group from the same subject area and parallels were drawn with the behaviour of both cohorts. Students from the live project were interviewed and asked to draw comparisons with that project and any other project that they had enjoyed doing in their time at university. Students from the active case study were asked if they thought the project had differed from the previous projects, and crucially, were these differences an enhancement to their learning experience. The students from the live project groups universally remarked that the project had taken them out of their comfort zone. A quote from one of them illustrates this point 'we know that our lecturers have an understanding of our work and of us. When we presented to the people at AMG we had no idea of their levels of understanding, so we felt we had to explain more'. The active case study group concurred with this statement, adding that having to review the projects content, for the purposes of creating the client presentation, helped them to comprehend the task as a whole. All of the groups had felt the need to produce materials that were to be left with the clients to aid communication, See Fig 3. Another similarity that can be drawn from both groups' responses to the interview questions was that having to go to an unknown location to present their work had focussed their attentions on how to construct a presentation and what materials they would require to articulate their ideas clearly and professionally. This contrasts with presentations that take place in the studios where there is a high level of familiarity with the surroundings.

The major conclusions that form the findings of this study are that students see lecturers as less strict and with a more detailed knowledge of their projects than strangers, and therefore though not skimping on work, they do less preparation for presentation. Resulting in their personal review of the project is less comprehensive than might otherwise be the case. The venue for the presentation is clearly important in fostering this sharpened attitude. The revelation that the active case study and the live project returned similar results would indicate that the study's aims were a success.

## REFERENCES

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