CASE STUDY

6

TITLE

Seeking to engage students in their work, beyond the reward value of a marking system

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Tiago Faria

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Tiago Faria is a practicing architect and part-time tutor at the School of Architecture UCD.

Outline

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Abstract

This case study sought to explore opportunities to diversify student engagement within a given collaborative mode of work. As such, the intention was to provide a variety of settings for contributions to the collective work effort, in such a way as to make opportunities accessible to all the cohort and allow for an organic development of individual participation within the greater scale of the collective.

Module Name

ARCT40870 Design / Build / Agency

Discipline

Structural Engineering and Architecture

Level

Stage 4, 5 credit optional Module

Student numbers

30

Introduction and Context

This module (ARCT40870) brings together a group of 4th year Civil/Structural Engineering and Architecture students. As an optional module, it was offered initially to Architecture students, but over the years the number of Engineering students in the Module has been building up to reach a near equal ratio, at present. The Module has been running in its current format for 8 years. From the outset, to integrate the diverse cohort of students from different courses has been a guiding element in its design and implementation. For the first year of this study, in 2019/20, the Class comprised 15 students from Engineering, 15 students from Architecture, of which 12 were female and 18 were male. Between UCD's own students, along with Transfer students, International students and Erasmus Exchange students, the cohort had members from India, Saudi Arabia, Italy, China, Spain, Poland, Germany, Mexico and Ireland.

The vehicle for this module is a singular "design & build project", which entails an association between the Class and a Client with a specific requirement (brief) and budget. Other than learning through a "real life" project that gets built, the principal aim of the Module is to implement a collaborative mode of work, where all students are expected to contribute significantly to the work required for the project to happen. This happens, with the pre-established acknowledgement that such contributions may come in different modes from each individual participant.

Every year, the course of the project evolves organically, as a result of the interaction between all parties involved and the specific requirements at any time. For this reason, opportunities naturally present themselves for different modes of contribution. "Agency" in the title of the module and as a grading component, refers to the ability of the Class, as a collective, to take ownership of the questions at hand, in each project worked on. The entire Class receives the same grade.

The Inclusive Teaching Pilot provided an opportunity to assess and adapt teaching and learning practices that had evolved over the years of the module's history.

Context

ARCT40870 is a 5 Credit Module, timetabled once weekly for an afternoon session of 4 hours, over the 12 weeks of the taught Spring Trimester. According to UCD's published academic regulations, a 5 Credit Module requires a total student effort of between 100 and 125 hours. As there is no exam for this Module, the expectation of working hours is set at 105 hours of work over the 16 weeks of the entire Term (12 weeks taught, 2 weeks study, 2 weeks exams). The basis for work requirement is:

Weekly Tutorial (2 to 6 pm)	28 hours
Autonomous work (done in between Tutorials)	28 hours
Building Period	35 hours
Assembly/Report	14 hours

Work is assessed over the following headings:

Inception/Brief Development (Weeks 1 and 2)	10%
Developed Design (Weeks 3 and 4)	10%
Production Information (Weeks 5, 6 and 7)	15%
Building (weeks 8 and 9)	50%
Report	10%
Agency	5%

Design and implementation of the initiative

In order to integrate every student's engagement in the work dynamic of the group and also to try and ensure participation at all times, two strategic operational principles are in place:

- Clear tasks are set specifically, to be worked on during the week and then discussed at the weekly Class meeting.
- Groups of students working together to complete each task set, are mixed and re-mixed along the course of the project.

The intent of these strategies is to create opportunities for every student to participate in the group's endeavour through all the various stages and different modes of work required throughout. These include individual design work, group design work, research on materials, market research on suppliers and costs, presentation and discussion with peers and with clients, and practical (building) work.

To implement the initiative of inclusive teaching, these strategies were assessed and revised over the course of the pilot study. In practice, there are three distinct phases to this project:

- A design phase, which lasts for weeks 1 to 7 of Term.
- A Building phase, which happens immediately after the design phase, over the course of the two-week academic break, in the School of Architecture's Building Laboratory.
- Assembly on site, which usually occurs in the closing weeks of Term.

Below, is a typical sequence of work progress throughout the Term:

Week 1	Site visit and briefing with the Client. Task for the week set as an individual strategic proposal, responding to the Brief.
Week 2	Class discussion of all preliminary ideas prepared during the week. 3 options are chosen by Class vote, to be presented to the Client.
Week 3	Meeting with Client to present and discuss all 3 options prepared during the week. Presentations are made by each group in turn, to the Client and the entire Class.
Week 4	The entire Class meets to discuss Client feedback. The Class is subdivided into new groups, to independently progress different aspects of the chosen single proposal.
Week 5	Client meeting to finalise outline design. Presentations are made by each sub-group and discussed in the presence of the entire Class.
Week 6	Detailed design / specification presented to the Building Laboratory Staff, for a check on technical feasibility. Logistical elements of the project are progressed in parallel.
Week 7	Assembly of working drawings and specification for one last discussion with the Client, to obtain "sign-off" and order materials.
Weeks 8, 9	Building phase of work is condensed into the two weeks of the academic spring break.
Completion	Assembly on site will vary according to each project's circumstances. Student's involvement can be limited by virtue of insurance not covering work outside of UCD.

Module Changes

In 2019/20, the numbers of students in ARCT40870 nearly doubled unexpectedly at the time of registration, from 15 the previous year, to 30 students. This shifted the dynamics of student participation in the learning process, as it brought a new balance of students into the class which had previously been primarily made up from Architecture students and then became nearly equal with Engineering students.

Student feedback at the end of the module listed concerns regarding unequal contribution to group work and confusion in the spread of the overall grade. To address these comments, whilst trying to maintain the principle of collaboration as core to the module, changes to the module for 2020/21, were put in place:

— Be more rigorous in the formation of groups along the design phase of the project and find a greater variety of modes of work, when members in each group are shuffled.

— Revise and publish grade breakdown, to make more evident the components attributed to project stages.

Ultimately, the goal is to encourage the emergence of Agency relative to the project within the Class, by maximising opportunity for diverse contribution. Specific detail for the implementation of these strategies is given below, matching the week-by-week project development pattern, as described above:

Week 1

All weekly Class meetings are minuted, with a clear action list set and allocated to and by the Class itself, such that actions can be followed up on at the following meeting.

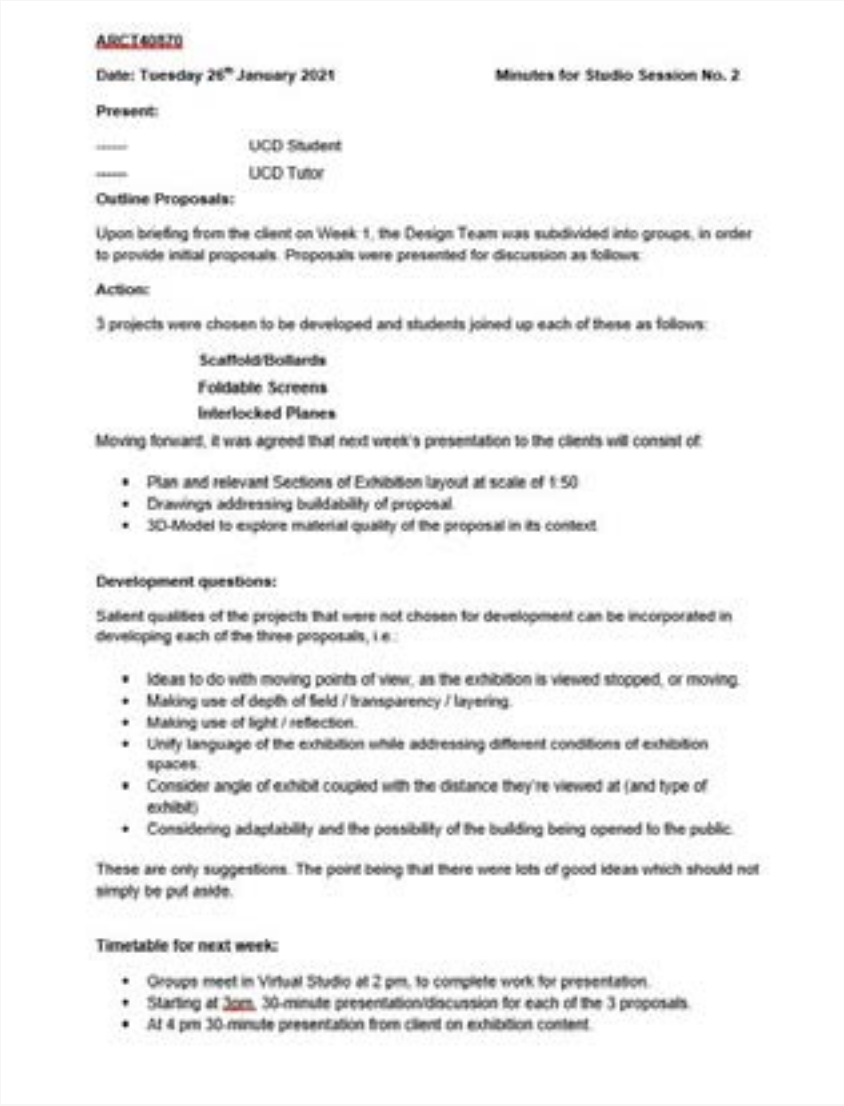
The first set of Minutes is done by the module co-ordinator (to create a template). Subsequent minutes are taken by a volunteering student.

Figure 1. Slide from initial on-line Class briefing

Week 2

(in the absence of the module co-ordinator) the Class selects three of the individual proposals to be developed.

Based on commonality of individual strategic approach, 3 Groups of 10 students are assembled by the module co-ordinator to ensure a mix of students from different courses. Each group develops one of the proposals for discussion with the Client.



ARCT40870

Date: Tuesday 26th January 2021 **Minutes for Studio Session No. 2**

Present:

------ UCD Student
------ UCD Tutor

Outline Proposals:

Upon briefing from the client on Week 1, the Design Team was subdivided into groups, in order to provide initial proposals. Proposals were presented for discussion as follows:

Action:

3 projects were chosen to be developed and students joined up each of these as follows:

Scaffold/Bollards
Foldable Screens
Interlocked Planes

Moving forward, it was agreed that next week's presentation to the clients will consist of:

- Plan and relevant Sections of Exhibition layout at scale of 1:50
- Drawings addressing buildability of proposal
- 3D-Model to explore material quality of the proposal in its context

Development questions:

Salient qualities of the projects that were not chosen for development can be incorporated in developing each of the three proposals, i.e.:

- Ideas to do with moving points of view, as the exhibition is viewed stopped, or moving.
- Making use of depth of field / transparency / layering.
- Making use of light / reflection.
- Unify language of the exhibition while addressing different conditions of exhibition spaces.
- Consider angle of exhibit coupled with the distance they're viewed at (and type of exhibit)
- Considering adaptability and the possibility of the building being opened to the public.

These are only suggestions. The point being that there were lots of good ideas which should not simply be put aside.

Timetable for next week:

- Groups meet in Virtual Studio at 2 pm, to complete work for presentation.
- Starting at 3pm, 30-minute presentation/discussion for each of the 3 proposals.
- At 4 pm 30-minute presentation from client on exhibition content.

Figure 2. Minutes for Week 2

Week 3

While awaiting Client feedback, the week's task for each group is to critically appraise each other's proposals looking for opportunities to overlap ideas.

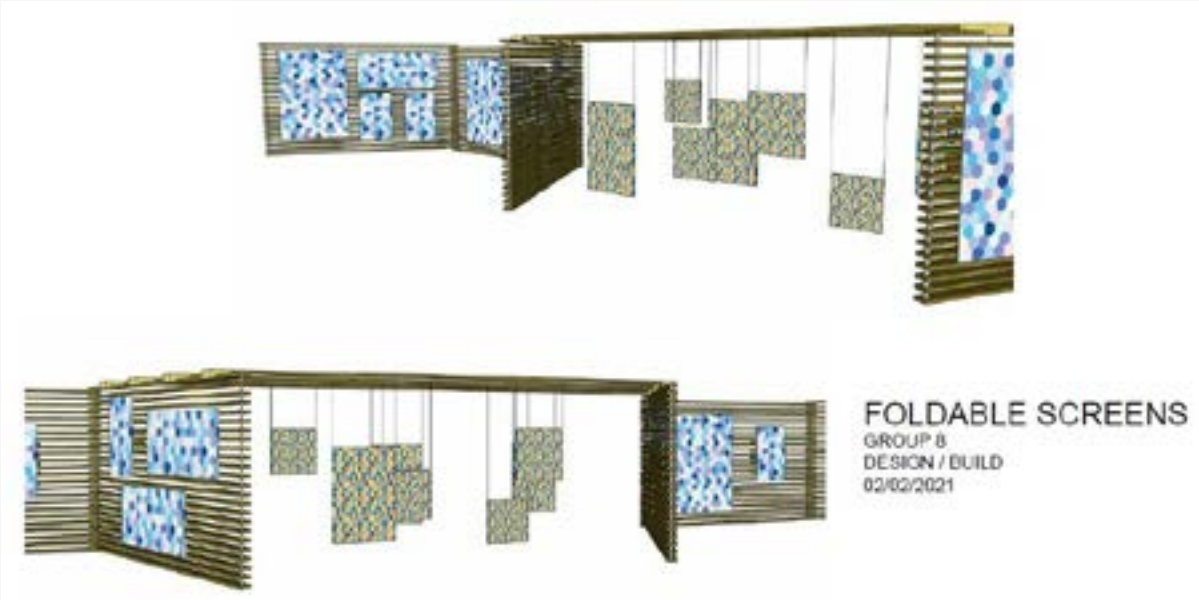


Figure 3. Slide from the first of the three Group Presentations

Week 4

With a single option picked, the overall proposal is broken down into distinct components to be developed. 4 new groups of 7/8 students are formed, to each develop one of these components. Each strand of development is done independently, with overlap ensured through Class discussion and minutes.

Students choose their own group, with moderation from the Module co-ordinator, ensuring a mix of students from different cohorts is achieved in each case.

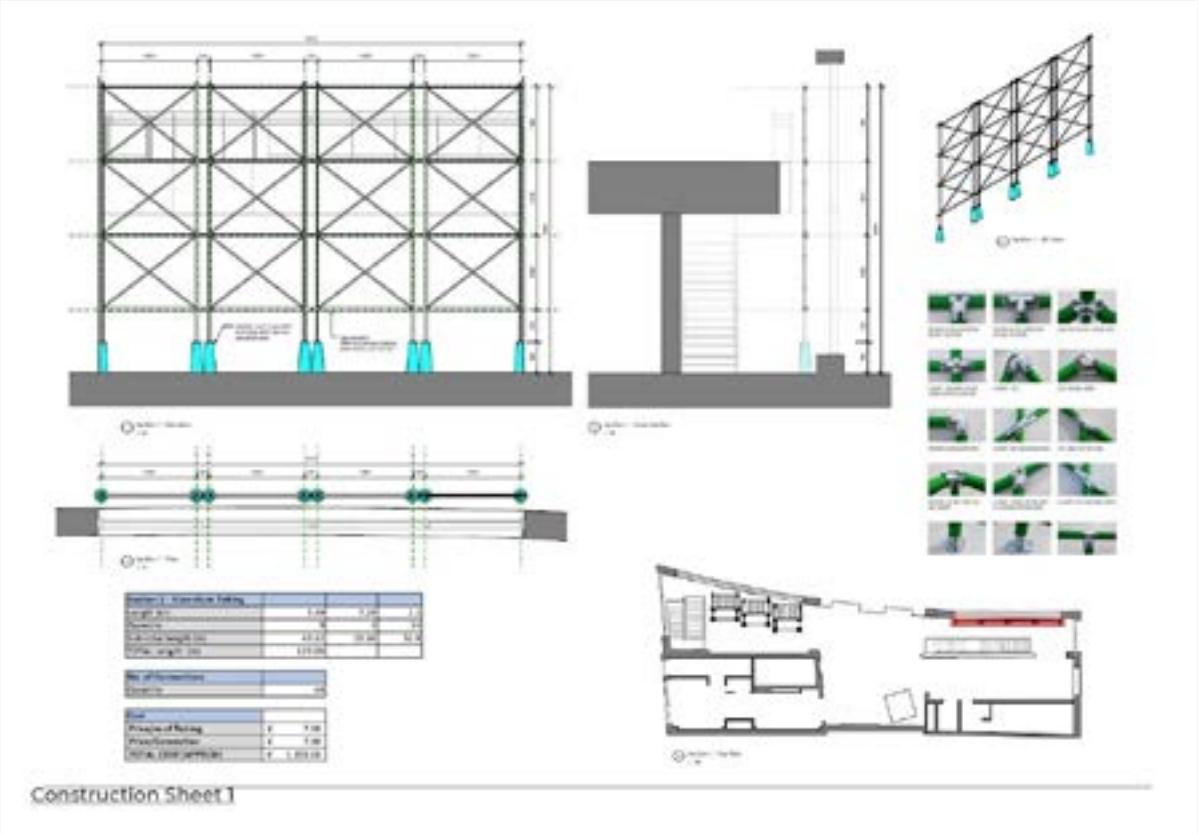


Figure 4. Development of a component of the chosen option

Week 5

New groups are formed, to progress work on a specific task, rather than a component basis, i.e.: Technical detailing, sourcing of materials and budgeting, Health and Safety implementation, project planning and resource coordination. Each student's natural inclination leads them to choose an area of work they prefer This will influence their contribution to the project henceforth.

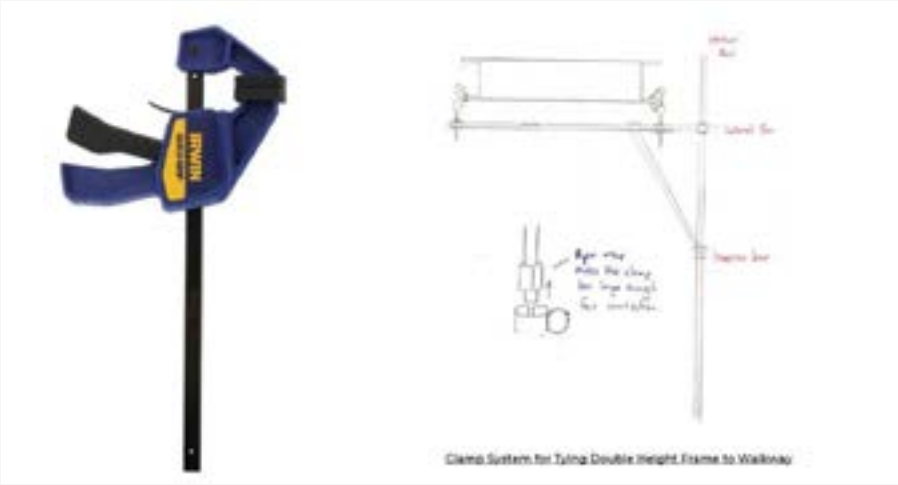


Figure 5. Proposal for lateral restraint of tall frame

Form 4.0 – Method Statement Revision:

Part A – Contractor Details

Part B – Project Details

PART C – Personnel Involved

Part D – Equipment Required

Part E – Safety

Figure 6. Method Statement for H&S compliance submission

Week 6

Students continue to work in their chosen area of interest. At this point, the project planning and coordination group is retained and becomes responsible for overseeing all different strands of the work.

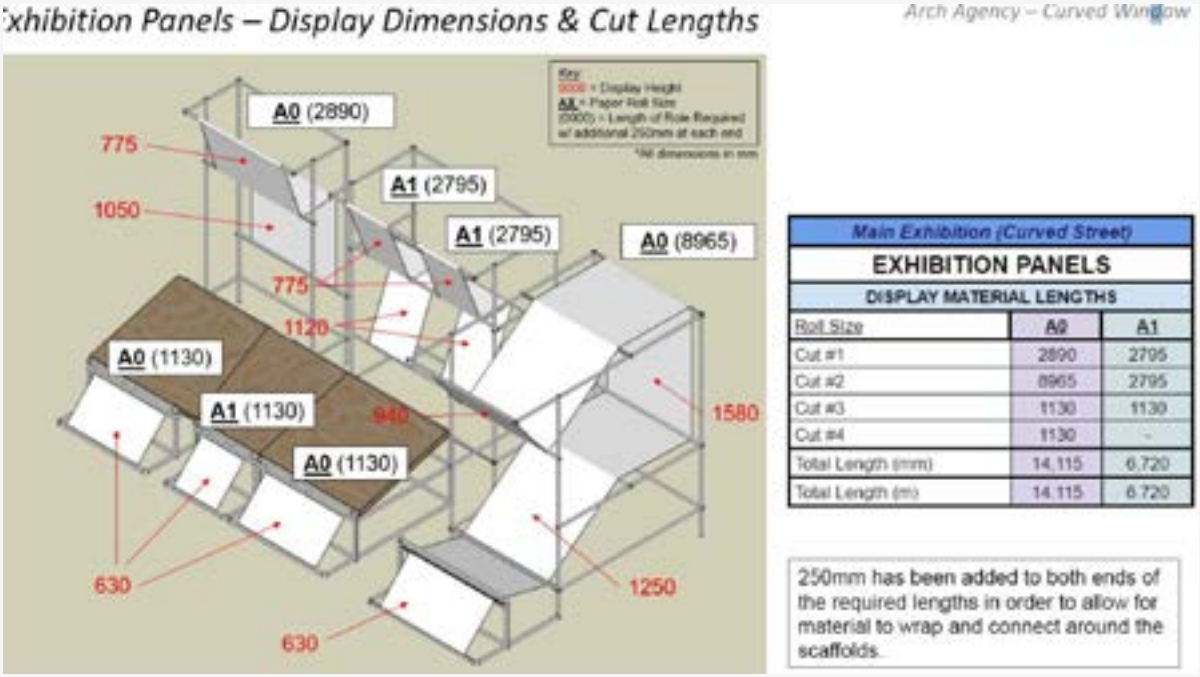


Figure 7. Listing of Materials required

Figure 8. Sourcing of materials and Budgeting Exercise

Week 7

For the completion of the overall proposal, Groups revert back to being component based (week 4). This formation is retained for the building phase.

The coordination group is responsible for the ordering of materials, in time for building work to commence.

Question 1:
At the end of [illegible] Trimester, will it be feasible for you to take part in a week of exhibition construction? If not you will take on more of the report/instruction manual document work instead.

- Yes, I could take part - 15 votes
- No, I will do more of the report work instead - 11 votes

Question 2:
What week during the exam period would suit you best to come to the Richview building lab to construct the exhibition?

- 25th - 30th of April - 4 votes
- 2nd - 7th of May - 6 votes
- 10th - 14th of May - 5 votes
- None of the above - 10 votes

Question 3:
Do you have any other suggestions of how we could get the exhibition built during term time?

- To do it during term time does not seem feasible

- Do the construction shortly after exams

- Ask other modules coordinator to try their best to give us indicative exam dates so we can start working around them for the building lab schedule

- Maybe that a day on a Saturday or Sunday if we can get the building lab open

- I have ticked all the above answers as I am happy to help whenever however this will depend on when portfolio is due. I am available anytime after that date.

- If it can be done after the examination period. It is not feasible to do very much after the reading weeks until the research project is complete, we will also have at least three other major assignments during that period (bridge engineering, economics, design of structures). Unless there is an extension of one or two weeks for the research project module, or if the exam timetable reveals that our exams will be almost over by 10th may

- It could be interesting to build a virtual exhibition for virtual reality or something like that, if the school has the software.

- Not sure what date studio portfolios are being submitted so basing my selected dates on other modules

Figure 9. Class questionnaire prepared by co-ordination Group

Figure 10. On-line polling for dates of construction

Weeks 8, 9

The entire Class is required to contribute 35 hours of work (the equivalent of one week). A Rota is drawn by the coordination Group to allow for all students a choice of when to work.

Workflow needs to be spread throughout the two weeks of the building period as much as members of each component being present throughout.

In the case of a singular project, where separate components can not readily be established, the sequence of building actions becomes the guiding parameter for student allocation to tasks, according to their time of participation.

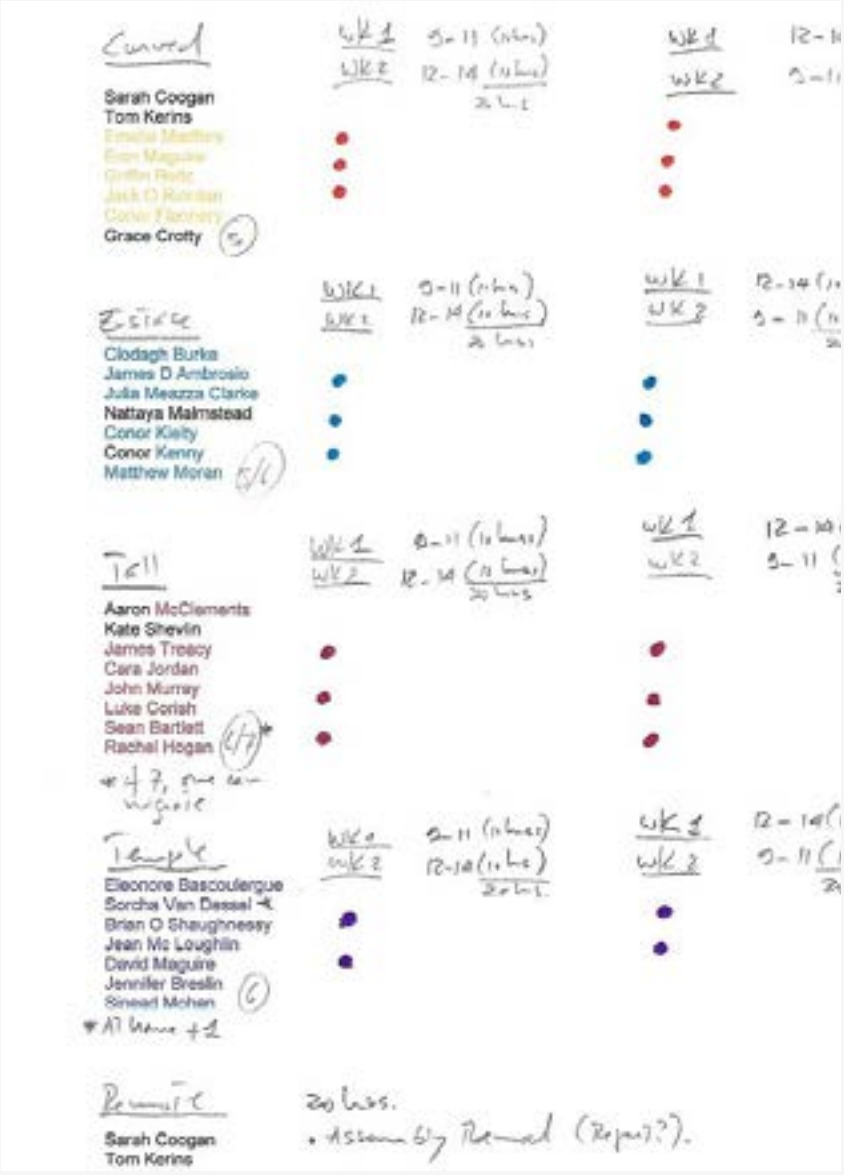


Figure 11. Building Rota

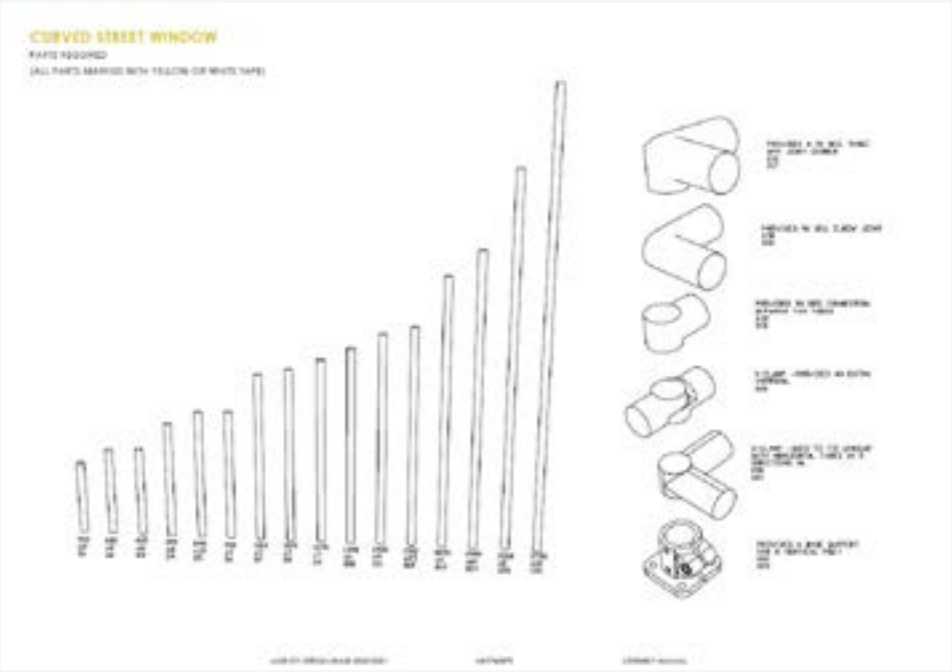
Figure 12. Construction in the Building Laboratory

Figure 13. Delivery / Assembly on site

Completion

Once the project is installed on site, a report detailing the chronological steps of the process is assembled for submission at the end of Term. This will be graded and form part of the presentation to External Examiners.

Some students are typically not able to participate at some stage or other of the project. These students are allocated the task of editing the contributions to the Report received from all members of the Class.



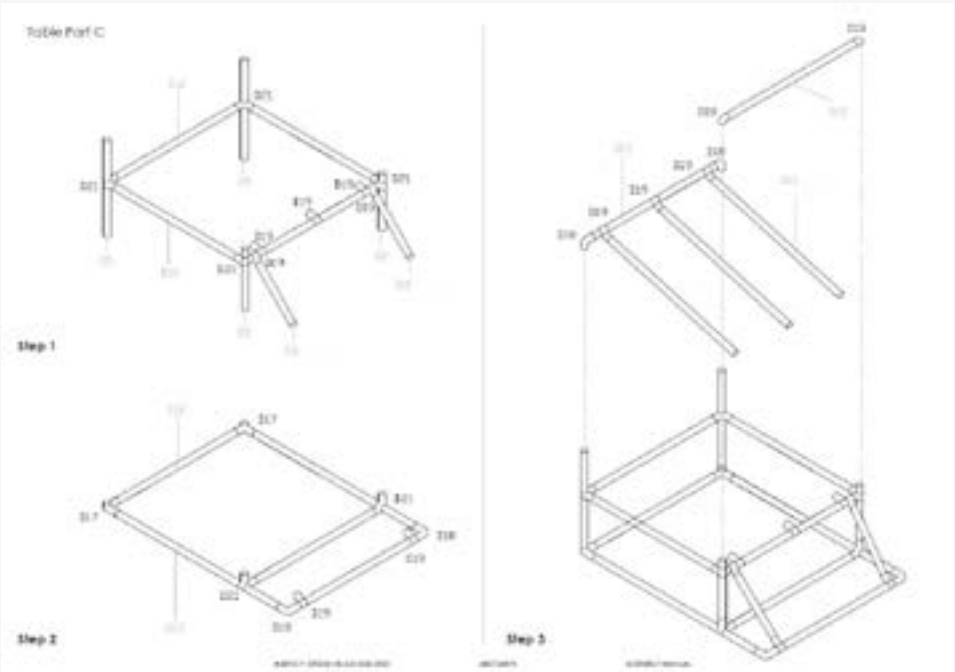


Figure 14. Assembly Manual

Results/Findings/Feedback – Evidence of Impact

Student Feedback was sought at the end of Term, with limited response. Sample set of answers below:

Clear communication:

Were the learning outcomes and rationale for the learning modes (projects, presentations, discussions, labs, etc) and assessments made clear?

Yes, they were made very clear via written communication with the class and uploaded to Brightspace for further viewing, as well as a talk-through of these outcomes with the class at the start of the module. Assessment areas and grading percentages were broken down, as well as the overall structure and organisation of the module.

Engaging students:

Did you feel able to participate in class and other learning activities, or were there barriers to engagement?

Yes, the module was very inclusive and it was easy to participate in class discussions in larger groups as well as smaller groups with students and lecturer. Each student could determine their own level of engagement as there were no strict structures to classes which was very freeing and beneficial for learning practically.

Flexibility:

Was the teaching material and its delivery (lectures, online material, in-class discussions, etc.) sufficiently diverse to support your learning?

Because the module was based around student's discussion and ideas there weren't really any formal lectures which was a nice change. The structure of the discussions varied as much as necessary and there was good communication between module coordinator and students. Maybe some sort of visual prompts for discussion would benefit students who aren't as comfortable coming forward and speaking in a large group on Zoom but not sure what this would entail.

Was learning supported by a variety of learning modes (projects, presentations, discussions, labs, etc) or do you feel there were other ways to enable your learning that could be offered as alternatives?

Yes, there were very varied modes of learning to be taken on throughout the module from group work, individual work, practical work, research, presentation and discussions with the class etc. Students could also work to their strengths in this way and choose which type of work they wanted to pursue in the group which allowed everyone to reach their full potential in the module.

Did the assessment strategy build in flexibility and variety to address different learning styles?

Yes, there were plenty of different modes of work to be carried out depending on people's strengths and where they felt comfortable. Assessment was not based on one mode alone and the strategy was discussed with the class to gauge whether people were able.

This feedback suggests that the intent of the strategic changes made to this module seem to be having effect, particularly in relation to student's perceived opportunities for engagement in different modes of work. Out of this years' experience emerge other ways where the thrust of this intent may be further explored. The relationship of the student cohort with the Client could be further enhanced. At present it is practical and useful for it to primarily go through the single point of contact that the Module Co-ordinator provides, but the role of "go-between" could feasibly be deputised to a student. This could be achieved by an earlier and clearer setting of roles, as the "coordination group" emerges.

Equally, the role of coordination between different strands of the design process can be further developed. This role could possibly become more formal, in order to make more evident to the designers the overlaps with parallel strands that they have to take into account for their own work.

Advice to others for implementation

This year, the mode of running the module was substantially affected by Covid-19 teaching restrictions. The direct mode of communication typically employed was replaced by online remote discussions, where the number of participants became an impediment to participation. Breaking down the conversations into smaller sub-groups was the only way to somewhat circumvent this issue. But in doing so, the overlap which is sought between the various components of a given project was more difficult to achieve.

The Class was not afforded the use of the Building Laboratory when it usually would have (after Week 7 of Term). The feasibility of getting the project built remained in precarious balance throughout the entirety of Term and was eventually only agreed upon at the very end of the teaching period, for the two weeks post-examination period, just before the closing of the grading process. This timing was advantageous, as it provided clearance from all other College work (like the two mid-term weeks usually do).

Not all students in the Class could be in Dublin to participate in the building phase of the project. Administrative components of the work were therefore allocated to those students, in equal measure (estimated time) to the commitment from those who participated in the building process.

Though the actions described above are all specific to the mode of work in this project, general principles that could apply in other settings are:

— Module co-ordination assumes a role of "enabler", allowing for student's initiative to gradually take ownership of the project;

— Provide a variety of work mode settings, freely accessible to the entire cohort of students;

— Keep tasks limited in scope and time, to consolidate involvement;

— Use records to confirm ownership of work;

— Facilitate communication between all parties involved in the project, to create overlap and ensure the dynamic of progress is student driven; and

— Keep learning outcomes open ended, to stimulate a process that evolves organically.

The mode of this year's project was deliberately simplified in its scope and complexity of construction. For this reason, it was possible to extend insurance cover for the students to participate in the assembly of the exhibition in Temple Bar. This was a very positive conclusion to a difficult Term's work.

Figure 15. Exhibition installed on site.

References

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