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Making

Introduction

Mark Gower and Paul Kerlaff - Guest Editors

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Making can be generative and experimental, investigative and analytical, or be descriptive and communicate intent. Through it we explore relationships between people, things, and spaces; without it, we would lack the means of creating places at all. The diversity of responses in this issue make a compelling argument for the relevance of making, not only to underpin practice; but also, to forge connections with others, induce critical reflection, and encourage speculation. What strikes us about these responses is the extraordinary capacity of making to talk about things beyond the made, and to bring about corresponding acceleration in pedagogical and professional development.

Our issue begins with a hymn to the seductive powers of making as a design tool for students, designers and clients. In the first pages, David Fern of Middlesex University explains the importance of models within the context of professional practice, and how this can articulate a philosophy of making within higher education that connects to the wider world. Linking academia to local and international audience also resonates in Shibboleth Shechter's three live construction projects in the Chelsea School of Art Parade Ground, fostering the collaborative and participatory skills essential to future practice in an ongoing collaboration with, amongst others, the architect Takeshi Hayatsu and the local community of Millbank.

The impacts of such projects are clearly articulated by students who describe not only increased confidence in communicating ideas to a wider audience, but also wider gains such as long lasting personal and professional friendships. These observations illustrate a recurring theme in the responses – that of making in design education eliciting benefits far beyond the act of construction or assembly. Part of these benefits derive from the sheer visibility of made things – literally, 'everybody sees', as both Shechter and David Littlefield of UWE describe. But less tangible benefits suffuse the process of creating three dimensional things; David Littlefield notes the capacity of peer presentation of making in the design studio to elicit candour and honest self-reflection in students, a learning outcome that could never be written into a module descriptor. When we make things with students it means more than the stimulation of self-reflective development. Making offers the means to analyse the interior in ways that are not possible in conceptualisation, drawing and model making - a theme explored by Mark Gower from UCA and psychologist Dr. Elaine Kasket from Regent's University London, as they analyse structural design projects which span not only physical space but cohorts, institutions, and time.

These case studies talk about the scaled-up consequences of construction – and this ramping up of scale explicitly challenges our natural tendency to try and control the process. Dr. Roger Kemp, Raphael Kilpatrick, and Dr. Anthony Fryatt of RMIT explore the potential richness in this dilemma in a photo-essay about opening up the design process to unknowns. Skills in decision-making, teamwork and 'fluid' emotional intelligence are augmented by a fundamental

shift in student role from responder to speculator. In keeping with this theme, Janette Harris of the CASS describes how developing haptic skills encourages 'speculative and divergent' ideas to emerge in the student body. Finally, Andy Milligan from DjCAD picks up this thread in describing how making strategies can explore issues of intellectual and creative ownership, act as an antidote to digital dependency, bypass anxiety about drawing capabilities and above all, provide an explicit sense of achievement.

We are astonished by the divergent but also resonant themes explored by our contributors and we hope that our readership find much of value in the pages which follow. As a window into the kaleidoscope of 'Making' in higher education, we aim for this issue to function as a roadmap for future projects that positively charge the significant art of making within the interior design studio.

Guest Editors

Paul Kerlaff

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Since 2001 his company With Kerlaff has worked with clients including SuperDry, Channel 4, Heathrow Terminal 5, and the Scottish Parliament, and his research-led design practice has been exhibited at venues including 100% Design London, MUDAC in Lausanne, Switzerland, and the Venice Architecture Biennale. Paul is currently working with the Scottish Institute for Remanufacture and Neat Living to establish strategies for design for re-use in modular furniture.

Mark Gower

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Before joining the university, Mark was Principal Lecturer and Head of the Fashion and Design Programmes at Regent's University London. Mark graduated from the Royal College of Art (RCA) in 1999 with an MA in Architecture and Interiors. While at the RCA Mark received a commendation for his dissertation entitled 'Football's hidden Architecture'.

Mark has worked with various design companies, including Imagination Ltd. and Studio db, on projects ranging from the recent redevelopment of Fenwick on Bond Street, to designing a European tour stage set for a pop band. Mark has been responsible for leading design teams for major clients in the UK and worldwide including Hong Kong and India. His clients have included Aquascutum, B&Q, Land Rover and Eureka! The museum for Children.

Designing interiors through making

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In context with an age of social media, preoccupied with the omnipotent digital image, this paper highlights the importance of sustaining haptic investigation in the pedagogic process of designing interiors. By engaging with tangible form, through the act of making, both designer and client move closer to understanding or imagining a 'real' sense of place.

"At the beginning the material stands alone"[1]

When I formed my design partnership we were required to compete against other designers for a very important project that we hoped would help to establish our practice. For the presentation I made a very simple 1:50 model of the space - a new store for Japanese fashion designer, Michiko Koshino [Figure 1]. Despite the effort that was applied to the pitch and graphic presentation, which comprised of the usual concept sketches, orthographic and perspective drawings, during the presentation, the white card and paper model was the major focus of client attention. Michiko smiled approvingly when she first saw it and couldn't resist referring to it throughout the meeting. We secured the contract to design the store, but I feel sure that we would have been successful had we only presented the model. Such was the impact of that tangible form.

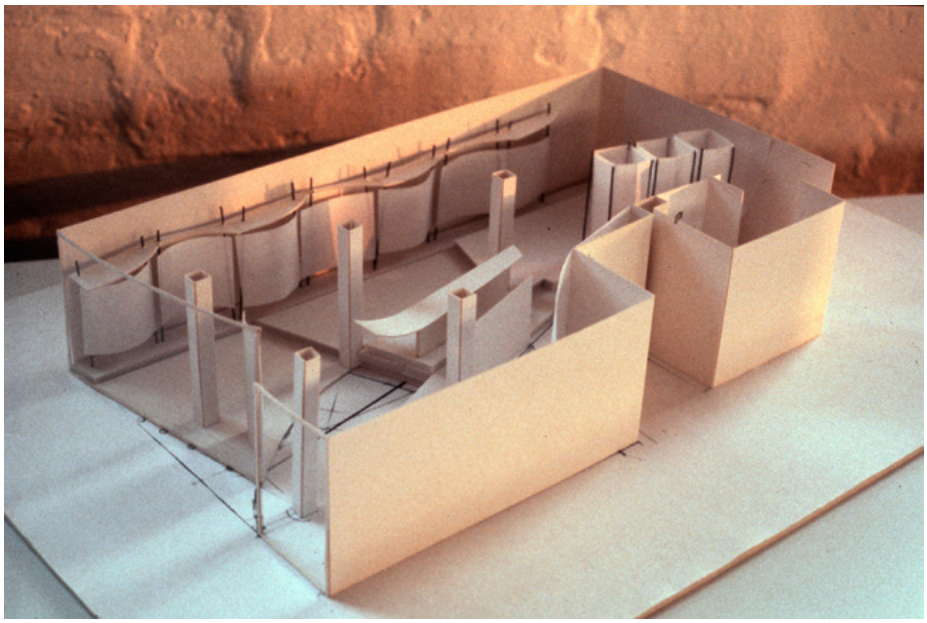

Figure 1: *Concept model for Michiko Koshino Store, Central London (Credit: David Fern)*

Why was this the case and why is it that physical models remain so seductive? What is it about a well-designed and made model that is so engaging? Is its resonance even greater today because, in this digitally dominated age of communication, encountering an actual three-dimensional manifestation of a design idea comes as a relief from the excessive demands of flat screen interaction? Or is it simply the immediate presence of the idea in three dimensions that is so appealing? Architect, Emily Abruzzo considers the physical model to be "the material embodiment of an idea, and therein lies its magic. By becoming real, it gives life and actuality to an idea in a way that two-dimensional expressions rarely can"[2].

Encouraged by the success of our first project we continued to make models for clients, not because we were sure they would be impressed with them but because the physical manipulation of forms in space, that quickly turned our ideas into three dimensions, aided our design process and helped us to make critical decisions that perhaps would not have been so obvious through sketching or other modes of drawing. There was also an attractive element of freedom that could be explored in the process of model making. But this was in the days before the digital realm had established itself as the primary means of distilling and disseminating detailed design proposals. Like most practices we embraced the advantages that computer aided design (CAD) brings, not least in terms of time efficiency, and therefore our preoccupation with the physical model eventually waned.

It is now, of course, all too easy to design and model an interior space in a variety of computer programmes. Although this technology can produce explicit representations, there are however limitations in relying on this resource alone to develop ideas within a learning environment. Through the digital medium it is difficult to understand scale. It is difficult to appreciate and learn about materiality and it is difficult to convey a multi-sensory experience of space. In my approach to teaching, therefore, I have consistently endorsed physical model making as an antidote to the addictive allure of the digital screen, advocating it as a fundamental pedagogic tool in the design process. Although designing through model making is less evident in practice today, due to obvious time constraints, I strongly believe that its benefits to the learning experience should continue to be acknowledged. It should be considered an important cognitive skill, to be deployed alongside physical sketching and digital visualisation with equal merit.

The physical model bares inherent evidence of the maker's individuality that offers an alternative to the prolific production of generically conceived digital models. Haptic interaction in the model making process evokes an experience of material, not only in the tactile sense but also relative to size, scale, weight, transparency and sometimes smell. In experiencing these qualities and characteristics when physically handling material, questions are provoked about their choice and effect on the potential design outcome under consideration that may not be raised through digital investigation. As Bob Sheil points out "making is a discipline that can instigate rather than solve ideas"[3].

In his seminal book, The Eyes of the Skin, Juhani Pallasmaa refers to the effect of peripheral vision upon our existential perception of space. "Focused vision confronts us with the world whereas peripheral vision envelops us in (to use Maurice Merleau-Ponty's evocative expression[4]) the flesh of the world". Pallasmaa expresses concern here about the impact of digital interaction and the architectural fraternity's continued obsession with on screen vision, its perspectival representation and the distance it creates between the maker and the object.[5]

Figure 2: *Getting inside the model – exploring peripheral vision. Model and image by Winson Yeung, BA Year 1*

Although still only an abstract representation of the real thing, a model when viewed, allows the peripheral vision that Pallasmaa describes to engage in addition to the attention we deploy upon a particular view, which in turn affects our emotive response. When analysing a physical model our viewpoint can change at will as our vision bathes the form, allowing us to choose when and for how long to linger upon any particular aspect of the space. Ultimately, through engagement with peripheral vision and a choice of when and where to focus upon and within the physical model, we gain a closer connection with the reality that the model emulates [Figure 2].

On our undergraduate programmes we stress the relevance of designing through making in a number of ways. This starts at the very beginning of the study, by encouraging students to think about the tangible articulation of form and space through simply folding and cutting paper to create three dimensional forms. As students become familiar with the development

necessary to arrive at any design conclusion they learn to appreciate how model making can aid the design process and sharpen their creative awareness.

Figure 3: *1:20 Sectional model by Winson Yeung. Image also by Winson Yeung, BA Year 2*

Models are made throughout the course to document the thinking process and to map design narratives, for example, by illustrating possible iterations in the organisation of a space. Models are produced to test material possibilities, to physically explore and represent design options as quick sketch process maquettes and for more detailed design representation [Figure 3]. We encourage investigation into a diverse range of materials [Figure 4 & 5] through all scales, including the production of 1:1 component parts and prototypes.

Students of interior architecture and design are typically limited to representing design outcomes merely in graphic or model scale form and although conceivers of the ideas, they are generally not exposed to the thrilling experience of being on site and witnessing their ideas come to life. This is an important part of the interior designer's role in professional practice that concludes in experiencing the inhabitation and public use of the environments designed. However, in practice, most architects and designers do not make buildings, they make information for buildings[6]. Nor do all adhere to Andrea Deplazes' ethos that "for me designing and construction is the

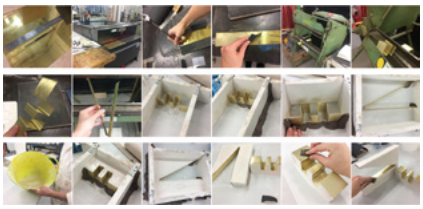

Figure 4: *Making display details, studies in brass and plaster by Monika Sowa, BA Year 3*

Figure 5: *Concept presentation model and material samples, including door handle proposal, by Monika Sowa, BA Year 3 (Credit: David Fern)*

same thing"[7]. In fact, in recent years, a proliferation of independent project managers, design and build companies and professional services, that enable sub-contracting of production drawings, has served to distance creative design from the construction process and often compromised quality. However, as a counterpoint, the emergence and sophisticated development of CAD/CAM (Computer Aided Manufacturing) interfaces is bringing back control to designers, allowing them to design directly for manufacture.

To reflect developments in industry, we also encourage our students to exploit and explore our excellent on-campus resources that integrate digital design programmes with CAM facilities such as laser cutting and 3D printing. Although, we warn of the misconceptions that can emanate from the homologous production of spatial form in a single material. We therefore tend to direct the use of these making tools towards the realisation of component parts rather than the whole.

Figure 6: *A collaboration between BA Year 1 Interior and Dance students. Designing, making and experiencing 1:1 mini environments, BA Year 1 group project (Credit: David Fern)*

In further consideration of professional practice, where possible, we make opportunities available within the course curriculum for students to design in groups and construct small interior environments at full size [Figure 6]. These projects help students to gain a greater understanding of structure, materiality, the effect of light and construction detail. Student experience is unquestionably improved through physical, material investigation and experimentation, aided also by working collaboratively in a team, as is more likely in practice [Figure 7]. During this activity of making, haptic and other sensory responses are engaged that are not evident when designing solely on a computer. The energy, enthusiasm, sense of enquiry and ultimately fun generated during these projects enhances student satisfaction and learning year on year.

Through understanding making we come closer to imagining potential human interaction with material, form and space that ultimately defines atmosphere and multi-sensory experience. The ambition of students immersed in the design of interiors through making should be to understand how places are made and how their respective component parts are brought together to create an appropriate experience for the occupier or visitor. Learning through making then is still vitally important, possibly now more than ever before. It is fundamental to the pedagogic process and an essential aid to gaining a clearer appreciation of the essence of place.

Figure 7: *Degree Show Exhibition system, designed by BA Year 2 students. Winner of Best Exhibition of Student Work Award – I.E. 2017 (Credit: David Fern)*

It is hoped that by embedding this approach to designing interiors within the learning cycle, the experience will be positively instilled in graduates who progress to influence the profession. Thus we will see growing evidence of richer, multi-modal environments in creative practice, that operate through a kind of circularity between sketching, digital drawing and physical making and back again[8]. I am convinced, through both my practice and teaching experience, that this form of praxis results in far more sensitively built environments.

Notes & Citations

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2. Megan Werner, *Model Making*, (Princeton: Architectural Press, 2011) 9.
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Making Together: Three Little Tea Rooms, Details and Spaces, Re-constructing Garden

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The following article describes and reflects on three 1:1 construction projects, undertaken between 2014-17, each with a cohort of first-year BA (Hons) Interior and Spatial Design students at Chelsea College of Arts (University of the Arts London). Three Little Tea Rooms, Details and Spaces and Re-constructing Garden are part of an ongoing collaboration between the course's staff and students, architect Takeshi Hayatsu, the College's workshop technicians, the local community of Millbank (the College's neighbourhood) and others. All three projects explore the transition between drawing and building; the importance of scale and how diverse materials and different methods of construction influence the quality of the spaces they produce. The briefs offered students, at a very early stage of their professional careers, an opportunity to be involved in 'live' construction projects, with tight budgets and timescales, working alongside architects and other professionals. Importantly, all three projects introduced first-year students to collaborative practice. Drawing on student and staff feedback, this paper considers what impact the projects had on the cohort's social dynamic, on their studio culture and on their growing understanding of the importance of skills for working with a variety of people from a wide range of backgrounds.

Making in Public

Re-constructing Garden, Details and Spaces and Three Little Tea Rooms all took place on The Rootstein Hopkins Parade Ground, a 3500 sqm. courtyard at the heart of Chelsea College of Arts. Prior to the College moving to the site in 2005, the buildings housed the Royal Army Medical Corps and the Parade Ground retains its name from this former use. The courtyard serves as a large outdoor gallery for the College, exhibiting the work of staff, students and others throughout the year. Most notably, it serves as the focus of the BA degree shows in June and the MA degree shows in September [1]. The Parade Ground is fronted on three sides by buildings that comprise the College and traversed daily by those moving between the campus' offices, studios, workshops and other provisions. The Parade Ground is also a thoroughfare for tourists, with Tate Britain sitting on its fourth frontage, and workers in nearby office buildings, providing a shortcut to and from local attractions, places of work and transport facilities.

Since 2009, the Parade Ground has been the site of a series of projects by the Chelsea-based Critical Practice Research Cluster. Their projects explore the contested topic of being in public through the idea of 'assembling in public' - '[Their methods of working] aim to embrace the disagreeable, contentious, messy, inefficient, live, improvisatory and provisional nature of Being in Public [2]. Re-constructing Garden, Details and Spaces and Three Little Tea Rooms, share this practice-based ethos, which is proving invaluable to bridging the College's graduate and post-graduate programmes. For the duration of each project the Parade Ground became our studio, with the mistakes, problems and messiness involved in full-scale construction by a large group of inexperienced first-year students put on display [Figure 1]. The extended College community and the public were 'invited' to join, passers-by stopped to ask questions and offer suggestions and became legitimate peripheral participants in the live project's 'community of practice' [3]. Passing staff and students joined in the construction process – 'because it is fun' – and stopped

daily to view and discuss progress. The projects became a point of conversation between students and others from across the College, fostering informal exchanges regarding construction, materials, sustainability, collaboration, making in public and engagement.

Figure 1: *Re-constructing Garden work in progress, The Rootstein Hopkins Parade Ground, Chelsea College of Arts (Credit: Takeshi Hayatsu)*

Making it Local

That the projects should take place locally has been a guiding principle. Re-constructing Garden, Details and Spaces and Three Little Tea Rooms exemplify my commitment to collaborate with neighbourhood stakeholders and co-produce a local, creative and resilient ecosystem in the environs of the College. With Chelsea serving as a community anchor, these projects became a space to critically explore and exhibit what the community has to offer the College and vice versa. This undertaking is situated within a renewed and growing interest by higher education institutions in the Civic University [4] and the collaborative turn taken in higher education [5]. All three briefs were live projects developed in collaboration with local stakeholders and partners. Live projects are understood here as emphasizing the invaluable role that learning plays as it connects academia and the students involved to the worlds beyond, with an emphasis on the collaborative and participatory skills essential to future practice [6].

All three projects involved between 75 and 90 first year students and were designed to mimic professional projects, with students divided into teams focused on design, management, logistics, structure, health and safety and documentation. Alongside the local community collaborators described above, students also had the opportunity to work with a series of professionals to develop the designs. All three projects were conceived and taught in collaboration with Takeshi Hayatsu Architects, which brought emerging architects on board to offer additional support during the construction process. Students and staff also worked closely on all the projects with the College's workshop technicians, external projects' team and the estates team.

Both the Royal Horticultural Society and its flagship event, the Chelsea Flower Show, are within walking distance of Chelsea College of Arts. The first of the three projects, Re-constructing Garden (spring - summer 2014) featured as part of the Chelsea Fringe [7]. This grassroots garden festival was set up to provide an affordable alternative to the RHS Chelsea Flower Show. Re-constructing Garden was a reconstruction of the Urasenke Konnich-an (今日)

tea garden (Kyoto, Japan)[8]. The garden complex comprises a series of small structures, including a tea house, a minimal space of two tatami mats (approx. 4 sqm.). Traditional tea houses in Japan are designed to visually merge with their local environments and are commonly constructed from natural, locally sourced materials. As a project that aimed to critique the Chelsea Flower Show, the choice of construction materials was important. The starting point for the construction was around 100 discarded Christmas trees collected in the local neighbourhood of Chelsea after the 2013 festive season. Our reconstructed garden was situated on the grass square that forms the centre and focal point of the Parade Ground. We 'transformed' the original garden design with the 'Mitate' concept, a kanji compound composed of the character 見, meaning 'to see' or 'to show', and the character 立, meaning 'to stand', literally 'a new point of view'. Often used to describe something that surprises a viewer, sometimes a visual metaphor or allusion, or something that is not exactly what it seems. The garden complex was represented using a 1:1 measured 'drawing' with a series of 1:1 Christmas tree constructions extruded as three-dimensional structures. With students divided into groups, each started by making 1:10 models of their part of the garden, these were then translated into scale drawings. Prototype details were developed through a series of workshops, using what was to hand because that was all we had. The trees were cut, chiseled and extended to form structural columns for the bench, toilet, gate and teahouse [figure 2].
In keeping with the importance of views and viewpoints in traditional Japanese gardens, the final orientation of the structures was carefully chosen in consideration of the sight lines enabled by The Rootstein Hopkins Parade Ground [Figure 3].

Figure 2: *Re-constructing Garden viewed from Tate Britain (Credit: Takeshi Hayatsu)*

Figure 3: *Re-constructing Garden, 'I like how you have made something with nothing', comment from family on the way to Tate Britain (Credit: Takeshi Hayatsu)*

Details and Spaces (spring - summer 2015) was a collaboration with the College's next-door neighbour, Tate Britain. As a continuation of the collaborative spirit established during the previous brief, this second project aimed to strengthen relationships between the two institutions. Tate Britain was built in 1897, with numerous extensions added over the years. Throughout this growth, it has retained its neoclassical language of architecture, including in the recent remodeling by Caruso St John Architects. The buildings that now house Chelsea College were constructed during the same period as the Tate, on the former grounds of the Millbank Penitentiary, in the style of Imperial Baroque and French Renaissance. Both sites are a treasure of subtle and beautiful details and ornaments. Students studied and surveyed these architectural details, documenting them in drawings and models, as well as imagining spaces hidden within [Figure 4].

Figure 4: *Discovering hidden spaces in details, scale models of historical details from Chelsea College of Arts and Tate Britain (Credit: Shibboleth Shechter)*

A number of details were then chosen and enlarged, using wire, wood and paper, to form two structures that were large enough to enter into. Here we explored the making techniques and skills of the traditional craftspeople of the Japanese paper festival float Nebuta in Aomori, northern Japan. The Nebuta float has a squared timber skeleton, to which wire, bent to form complex shapes, is attached and on which shoji paper is glued. During the prototyping phase of Details and Spaces, students explored how traditional Nebuta float techniques could be adapted to accommodate local material from London and the city's weather conditions. This process also involved exploring the issues and challenges of transforming scale models into full-scale structures. The students constructed 1:1 test pieces, looking at options for wood joints, joints between wire and wood, wire and wire and paper and wire. They also researched and tested a variety of traditional methods for waterproofing shoji paper. The final structures were built on the College's Parade Ground, on a sight line visually linking the two buildings [Figures 5, 6].

The project was generously funded by Kupambana, the charitable foundation of Lewis PR, another local neighbour, which also provided the opportunity for one of their staff to produce, in collaboration with the students, a short film of the process [9]. [Figure 7]

Figure 5: *Discovering hidden spaces in details, scale models of historical details from Chelsea College of Arts and Tate Britain (Credit: Shibboleth Shechter)*

Figure 6: *Students setting up the exhibition at the RMIT Design Hub, Melbourne, Australia. Photograph by Chris Cottrell.*

Figure 7: *Details and Spaces, interior view (Credit: Takehsi Hayatsu*

Three Little Tea Rooms (spring - summer 2017), the third project in the series, was conceived in collaboration with the Japan Foundation. Their support enabled Japanese Architect Shinichiro Hashiguchi to stay in the College's artist-in-residence flat, to work with the students and to bring from Japan his award-winning String Tea Room that provided the inspiration for the project. Hashiguchi's research explores contemporary uses for traditional Japanese martials and crafts, with the String Tea Room a steel frame cube structure, measuring 2 x 2 x 2m and wrapped with the traditional silk of the Kyoto region. In Three Little Tea Rooms we reconstructed the Myokian Kyoto temple Tai-An Tea Room. Designed by the sixteenth-century century tea room master Sen No Rikyu, it is a minimal space of two tatami mats, also with an internal spatial volume of approximately 8 cubic metres. The tea room is constructed from indigenous materials, such as thin timber frame, bamboo lattice and mud wall lining. The proportion and scale of the original tea room were examined by the students, using cardboard 1:1 prototypes, detailed 1:10 scale models and technical drawings. These were translated into three different materials, straw bales, plywood and brick, referencing the old English folk tale The Three Little Pigs. We wanted to test how different materials and different construction methods would influence the spatial quality of the original. Students discovered the impact of standardized material sizes on the size of the openings and the scale of the rooms; and the impact this in turn had on the quality of light and the original arrangement of openings, which had been carefully designed in relation to function and views [Figure 8].

Figure 8: *Brick Tea Room, work in progress (Credit: BA ISD students)*

Figure 9: *Three Little Tea Rooms and String Tea House (Credit: Takehsi Hayatsu)*

Three Little Tea Rooms featured in the local guide of London Crafts Week in April 2017 [Figure 9]. My long-term local collaborators, Millbank Creative Works, helped with the construction of the tea houses and after the installation all the materials were recycled locally: the bricks were used for a local community garden run by Millbank Creative Works, the straw was donated to the local city farm and the wood found a use as part of the BA fine art degree show.

Making Together

It is notable that the students' self-evaluation forms revealed that without exception, they found the project a transformative learning experience. The students described learning how to develop a project from drawing to reality. They also reflected on the large number of factors that need to be considered [10].

They talked about the importance of 1:1 testing in order to understand how materials and structures behave, the importance of accuracy [11] and the contribution experimentation made to achieving successful results. They noted their improved making skills and confidence to work with tools. The students also commented on their positive engagements with the public [12], on gaining confidence in communicating their ideas to a variety of audiences [13]. And they talked about feeling privileged and proud to work on a live project at such an early stage in their careers [14].

Something surprising across all three projects was how the students' attitude to working collaboratively shifted during the process. Initially reticent to work with others, by the end of the builds they recognized this as a vital source and site of learning [15][16]. They acknowledged the difficulty of working and communicating within a large group and, as such, the sense of achievement when an agreement was reached [17]. They described learning to compromise, learning to give constructive feedback and the opportunity to gain knowledge from peers and share ideas [18]. They further mentioned realizing that problem solving was quicker in a group [19]. Many students discussed the importance of time management and planning, to meet client deadlines but equally importantly 'because team members depended on me'. Importantly students also described the projects as fun, talked of having a great time and acknowledged the opportunity to become closer to their classmates. Students frequently described the final results of this team effort as 'amazing', 'impressive' and 'unexpected'.

Perhaps even more surprising and encouraging were the projects' impact on of the students' three years at Chelsea and beyond. As part of the 2017 graduation show, students were asked to produce a postcard with an image of their final project on one side and a reflection on the most memorable moment of their undergraduate journey on the other. For a significant number of students this was their experience of 'making together' in their first year [20]. They highlighted the sense of pride constructing a full-scale structure and the confidence this gave them moving forward; describing gaining the tools to work well with others and an understanding of how important these are to their career [21][22]. They also noted the lasting personal and professional friendships they formed [23].

As students' progress onto the second and third year of the BA (hons) Interior and Spatial Design, they engage only minimally in collaborative work, focusing instead on developing their final thesis project. As an educator and practitioner, my teaching philosophy stems from a belief that addressing the complex issues we are facing as a society is more effective when done collaboratively. This includes experts but also, and importantly, lay people: community members, groups and others. With this in mind, it is encouraging that the students' main takeaway from their three years at Chelsea was the experience of working together.

Notes & Citations

1. The Rootstein Hopkins Parade Ground can also be hired by external organizations and has been used in the past for London Fashion Week and London Festival of Architecture: http://www.arts.ac.uk/media/arts/colleges/chelsea/images/chelsea—business—innovation/chelsea—venue-hire/Rootstein-Hopkins-Parade-Ground-Chelsea-College-of-Arts.pdf

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7. Rhiannon James, "Chelsea Fringe 2014" The City Planter, May 30, 2014, http://www.cityplanter.co.uk/chelsea-fringe-2014/

8. It is not a coincidence that all three projects discussed in this text engage with Japanese culture. But neither is this consistency important to my immediate reflections on 'working together' - beyond, that is, acknowledging that Japanese culture is a touchstone in the architectural practice of Takeshi Hayatsu, and he is a long-term collaborator on my live projects for Interior and Spatial Design at Chelsea College of Arts.

9. Umang Dokey "Details and Space" filmed April / May 2015 at Chelsea College of Arts https://vimeo.com/kupambana/chelsea-details-and-spaces

10. 'I realized that, to design a space, you need to consider many things, such as, the weather' – P.

11. 'Applying the shoji paper to the structure helped me to understand the importance of accuracy and become a perfectionist' – S.

12. 'We received some lovely comments from the public about the design. They were very interested in the process' – L.

13. 'I like talking to visitors and hearing their feedback. I like the idea of engaging with visitors. By talking to visitors, I felt more confident to explain my ideas. '– G.

14. 'It built up my confidence, I realized that a first-year student can also make something amazing' – T.

15. 'This experience was amazing. I learnt so much about working in a group. It was hard to depend on people … as group leader it was hard for me to deal with all the problems … I learnt how the real-world works' – M.

16. 'I enjoyed the collaborative aspect the most, because to me it is the essence of design. Design is not about the glorification of one person's design idea, it's how people come together, how people engage, communicate to design together something that woks' – A.

17. 'Ending the year with a group project was a great idea. It brought the year closer together and enabled people to talk with others … Even though we did have days when group members clashed, I can safely say that it brought us much closer together as classmates and friends' – C.

18. 'It was interesting to see how other people design and think, as everyone comes from diverse backgrounds. To share this with one another was an amazing experience and I am so proud of the final outcome that has been produced' – A.

19. 'More people = more brain = more ideas' – R.

20. 'I really enjoyed the group project in year one since I love to work with other people … together, sharing opinions … and when all of us finished one project together we gained a sense of achievement. In my personal perspective college should be filled with opportunities to cooperate with classmates, not just to work alone on one's own project. The group projects help in making friends and in gaining teamwork skills' – Lulu

21. ‘Throughout the project I had opportunities to communicate with different people. I really enjoyed the building process because it was an interesting way to learn. The project also trains our project solving skills and improves the bonding among students’ – Joey

22. ‘My favorite memory from my course was the group project in the first year where we created large structures in the Parade Ground. Sharing ideas and working together as a unit made it fell so much more rewarding when we looked back on our final product together. The scale that we were working too was something that I had never taken on before and it made me feel a sense of accomplishment and pride. It was a creative and positive start to my course and inspired me in the projects that followed’ – Daisy

23. ‘The collaboration with other students improved our friendship, my team members became my good friends after this project’ – Yaqing

Introduction to a shared brief and papers 03 & 04

Littlefield, Gower & Kasket

Structure is good for you: exploring geodesic and tensegrity forms – Littlefield
Transforming Learning, Making Space – Gower and Kasket

David Littlefield of the University of West of England (UWE) has been investigating and constructing large-scale enclosures with Architecture, Architectural Technology and Interior Architecture students since 2012/13. Over time, the scope of these projects has become more ambitious, from desktop models to metre-cubed prototypes and, more recently, fully accessible geodesic and tensegrity structures. Mark Gower of the University for the the Creative Arts Farnham (UCA) had run similar structural projects with his Interior Architecture and Design students, but without focussing on specific structural types. What insights might be gained, they wondered, from sharing the same or similar design brief across the two institutions, which had similar programmes but significant differences in context?

In the autumn of 2017, the project commenced; UWE students undertook their six-week project and were joined by UCA students at their final critique. David Littlefield's cohort set up a Facebook page in order to capture and share their learning, which was made available to their UCA peers. Subsequently, in the spring of 2018, the UCA students tackled their own projects, in anticipation of UWE students and faculty joining for their final review. Students at both institutions needed to produce large-scale geodesic (UWE), gridshell (UCA), or tensegrity (UWE & UCA) structures that a) demonstrated an understanding of the structural principles at work, b) resulted in well-executed constructions, and c) enabled two people to enter and occupy the structures comfortably. To succeed, they would need to attend to aspects of making and planning that they had not fully utilised before, requiring considerable resourcefulness. This was not a "drawn" project, bar the need for templates, but offered students the opportunity to create a viable space through the application of a set of technical principles and a sympathy for materials.

The briefs were similar, but not identical. UWE students worked in five groups of three or four, while the UCA cohort was divided into two groups of six. While the UWE structures were for internal use, UCA students were challenged to design and prototype structures for an exterior context. UWE students were able to engage in trial and error within the comfort of the design studio and workshops, while UCA needed to consider the vicissitudes of weather and exposure. Additionally, the UCA brief incorporated not just occupation, but use; the screen-printing and textiles departments at UCA served as clients, and the finished structures needed to be fully functional as exhibition spaces.

When David and Mark conceived of this experiment, a kind of knowledge relay was envisioned, with the first group of students handing on their learning to another, instead of working in parallel in a spirit of competition or rivalry. The following two papers, taken together, examine the outcomes. David comments on the benefits of "learning by doing" and the role of the design review for the UWE students; Mark and his psychologist colleague Elaine Kasket explore how UCA students were able to find their "flow" through experiencing spaces not just as designers, but as users.

Structure is good for you: exploring geodesic and tensegrity forms

David Littlefield

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A six-week immersion into the design and making of large-scale geodesic and tensegrity forms exposes students to a double meaning – the creation of a structure in the sense of the arrangement of parts; and the structure of thinking and method that implies process. The project makes room for risk-taking, error, and even frustration - while encouraging students to have faith in underlying principles.

Introduction

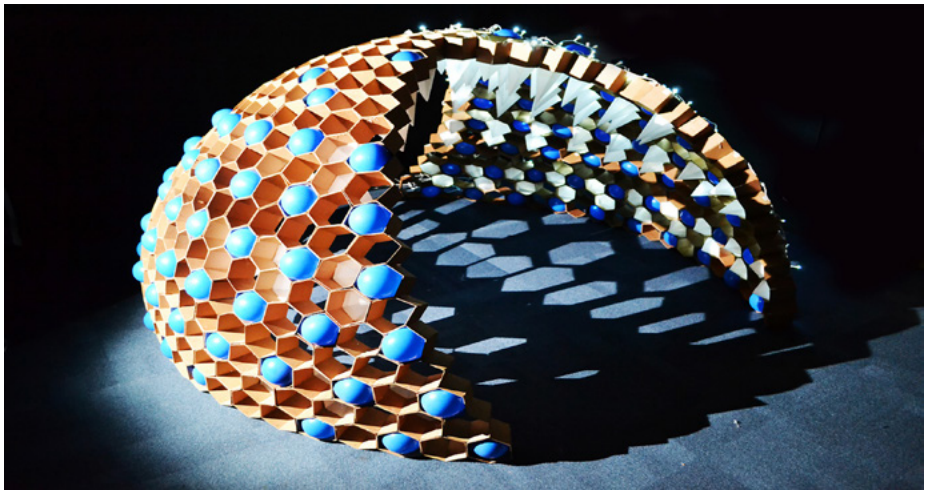

Figure 1: *Geodesic structure, partially infilled with balloons and acrylic cones, UWE Interior Architecture project, Autumn 2016. (Credit: Emma Hendrie & Tom Bentley)*

At UWE Bristol there is a strong emphasis on making within the BA (Hons) Interior Architecture programme. This emphasis comes to the fore in the six-week structures project, undertaken in year 2. This academic year (autumn 2017) students worked in four groups of three, and one group of four. Groups were given the choice of two structural types – geodesics or tensegrity. Geodesic structures, such as those famously pioneered by Richard Buckminster Fuller, enable the creation of facetted, spherical (or part spherical) surfaces through the repetition of two-dimensional shapes such as triangles, hexagons and pentagons. Tensegrity structures, also developed by Buckminster Fuller and others such as David Georges Emmerich, enable compressive elements (such as lengths of metal or timber) to be suspended independently through a tension web (such as steel cable or elastic bands). In this project, two groups opted for geodesics; three for tensegrity. Six weeks later, students were assessed against two main criteria: the demonstration of understanding of the structural type; and the elegance of the structure in terms of detailing, use and appropriateness of materials and finish.

The project offers something of a break from designing a proposal that will remain unrealised; with the structures project, forms of considerable substance do get built. The process and results are highly visible; students on other programmes witness the agonies and small triumphs of progress; and the structures stand as testament to the tenacity, skill and spatial ambition of the students. These are large structures which are designed and assembled over an extended period of time. Everybody sees.

Figure 2: *Tensegrity structure, assembled by Lucy Hubbard, Autumn 2016 (Credit: Lucy Hubbard)*

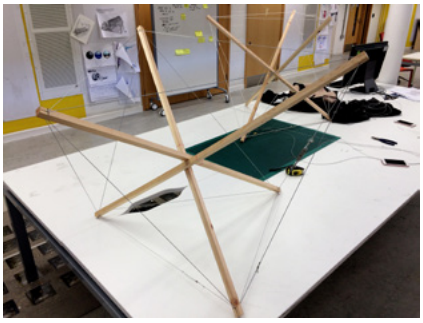

Figure 4: As the project progresses, students increase the scale of their investigations from small, hand-held maquettes to larger studies. At this middle scale, students move to more robust materials in order for the structures to retain their integrity.

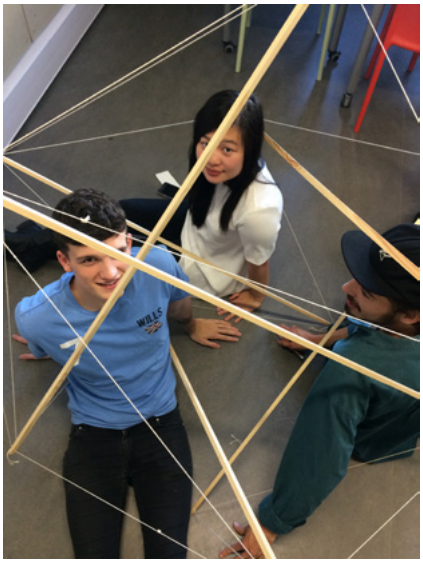

Figure 5: A large-scale tensegrity structure. This form was eventually given a fabric canopy

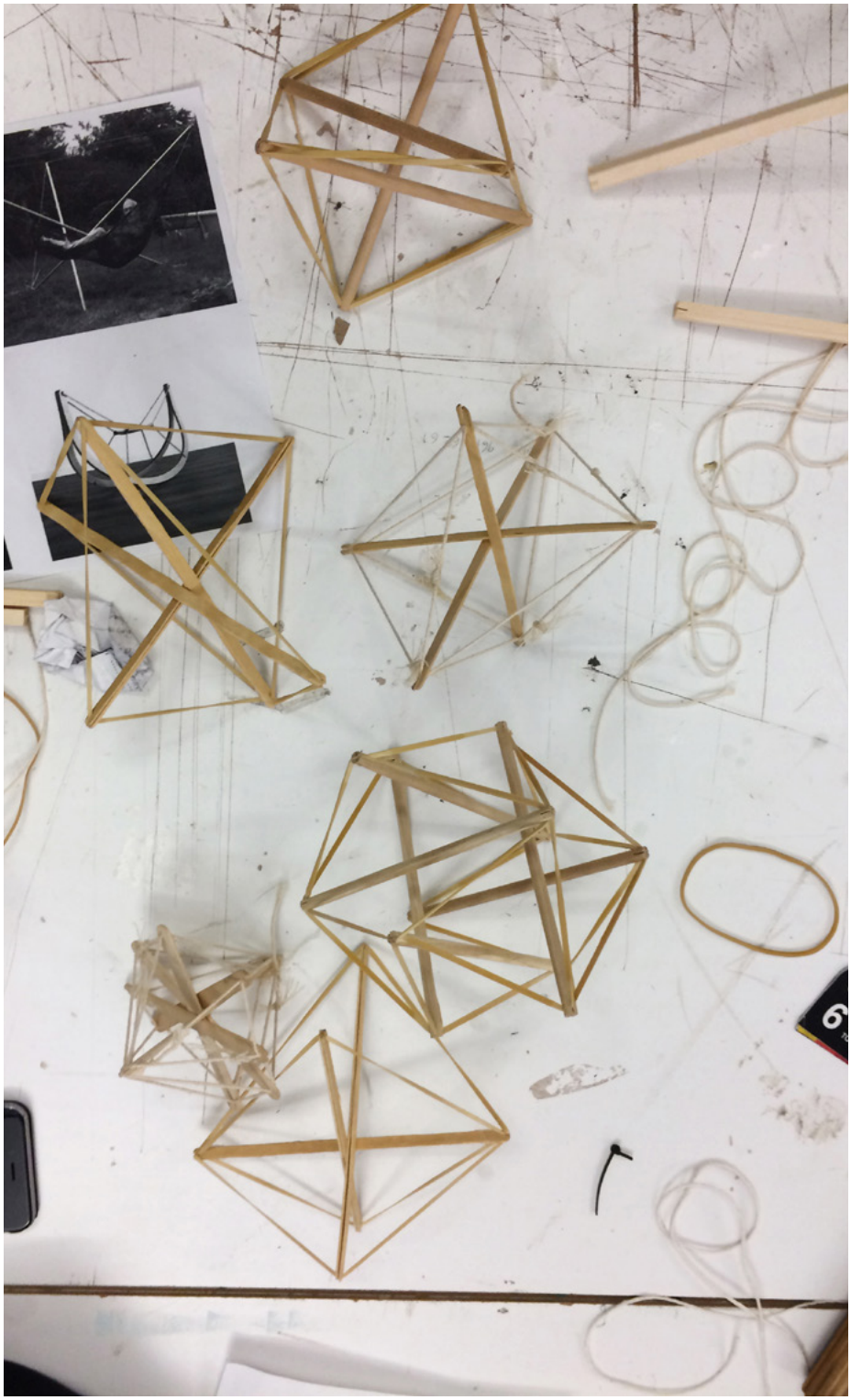

Figure 3: The structures project is progressed through model-making and prototyping. For this project, drawing is secondary

Challenges and process

As a project, it emphasises process, resourcefulness, teamwork, consequences and the many possibilities that be found within the same set of parameters [Fig. 3]. Creating geodesic or tensegrity structures is relatively straightforward at a small scale, after much practice, and if you follow the rules. However, as structures become ever larger, moving from the model to something more akin to a prototype, the consequences of scale become ever more challenging: materials need to become stiffer, heavier, and more difficult to work; junctions require greater sophistication; and accuracy becomes ever more important as even small errors compound themselves after many repetitions [Figs. 4 & 5].

Students were asked to demonstrate their understanding of the principles at work via small models, and select a particular form for manufacture at a large scale. When increasing the scale, students began to substitute dowel for toothpicks, steel cable for elastic bands, and cross-laminated card for paper [Fig. 6]. Connections shifted from knots in string and bull-dog clips to hex-nuts and heavy-duty eyelets. Having endured the process of mastering the structural type at a small scale, thus proving that the principles actually work, students would then be confronted with more practical problems such as how to prevent cables from slipping, manoeuvring a completed structure without distorting it, or realising the sheer weight of a card geodesic and therefore the challenges of suspending it [Figs 7 & 8].

This is a project which shakes up preconditioned practice in the studio. It requires little drawing, other than the creation of patterns and templates, and research is done to a practical end, rather than a theoretical one. Very able students can struggle with it, while others can present themselves in a new light – they can become the team leaders, the liaison with technicians, the problem-solvers, the communicators.

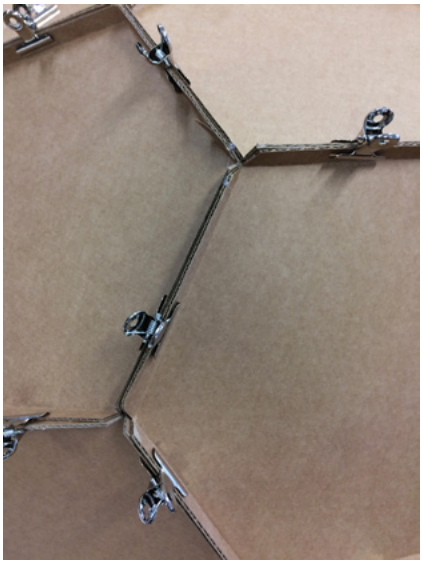

Figure 6: *Mid-sized geodesic structure, composed of card surfaces clamped along flanges with bull-dog clips. These clips were insufficient for the full-scale structure, however.*

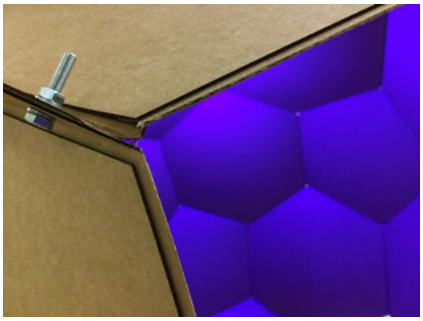

Figure 7: *Bolts, inserted through drilled holes, enable this card geodesic structure to retain its form. Phase two of this project was for students to illuminate the structure; the interior of this geodesic can be glimpsed on the right side of the image.*

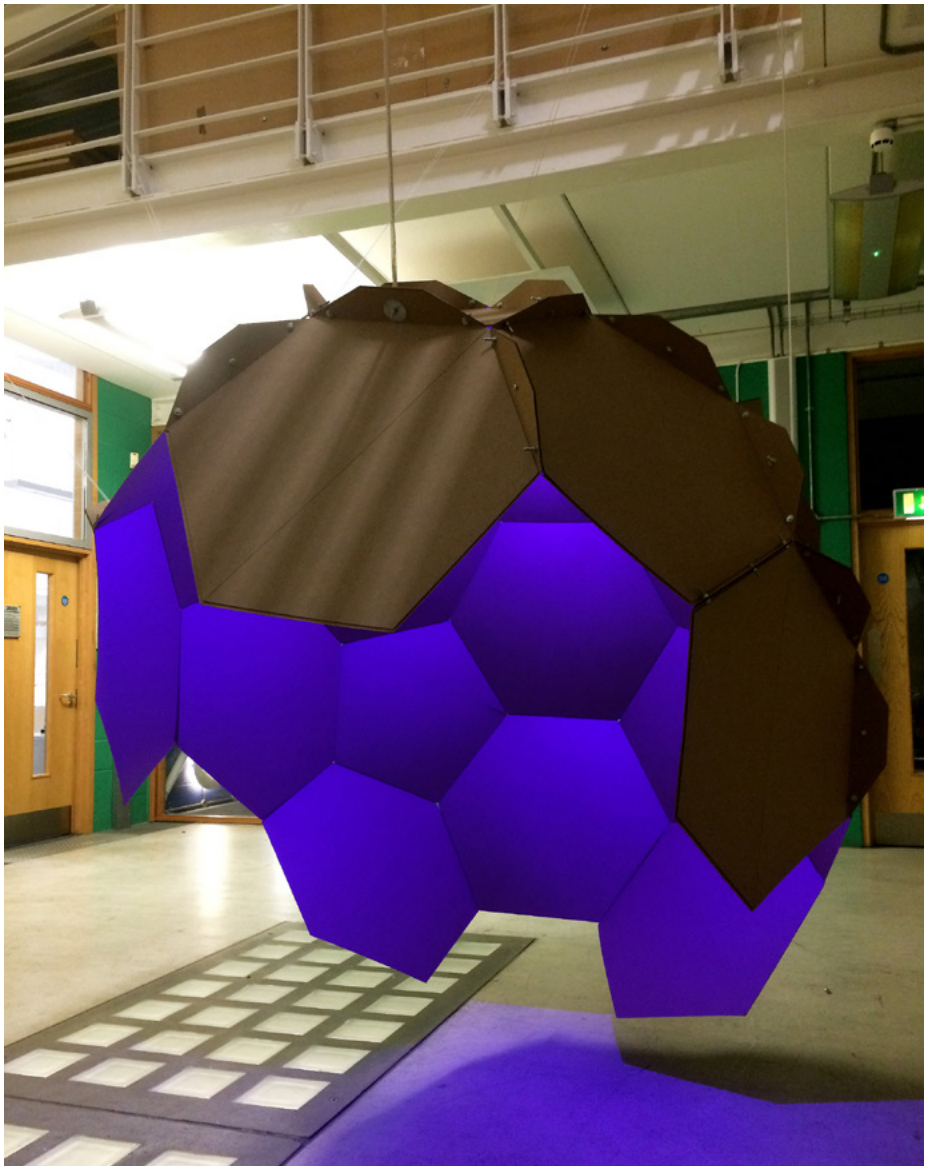

Figure 8: *Suspended, geodesic structure, made of laminated card, illuminated with a single LED colour-change lamp.*

Figure 9: Design review, 27 November 2017. UWE students present to UCA students, who embarked on the project the following semester.

Students as experts

What was especially interesting was the way that students conducted themselves during the design review, held on 27 November. During a typical review, students will present to staff and frame their work in terms designed to impress those reviewers. This review was different. Because students from UCA would be undertaking the same brief the following semester, they too were present. Without being prompted, UWE students presented directly to our visitors from UCA [Fig. 9]. Reviewing staff, seeing what was happening, retreated and merely observed. UWE students were more honest than one would expect from a design review – learning was shared; mistakes highlighted; the pros and cons of material choices were made clear; anecdotes were told. UCA students asked good questions, not out of general curiosity or good manners but because they, soon, would be undertaking the same brief; and UWE students answered with a directness one rarely sees during a process designed to present work in the best possible light.

I believe this candour originated from the confidence gained from conceiving and making such large and complex structures. The students had become the experts; and experts have the confidence to tell their story just as it happened, without the need for obfuscation, partial truths or redirecting your attention [Figs. 10- 11]. Possibly other projects might be considered in such a way, in that projects be passed on like an educational relay. It might provoke more soul-searching and honesty from those who have completed the task, and maximise interest from those who are yet to undertake it.

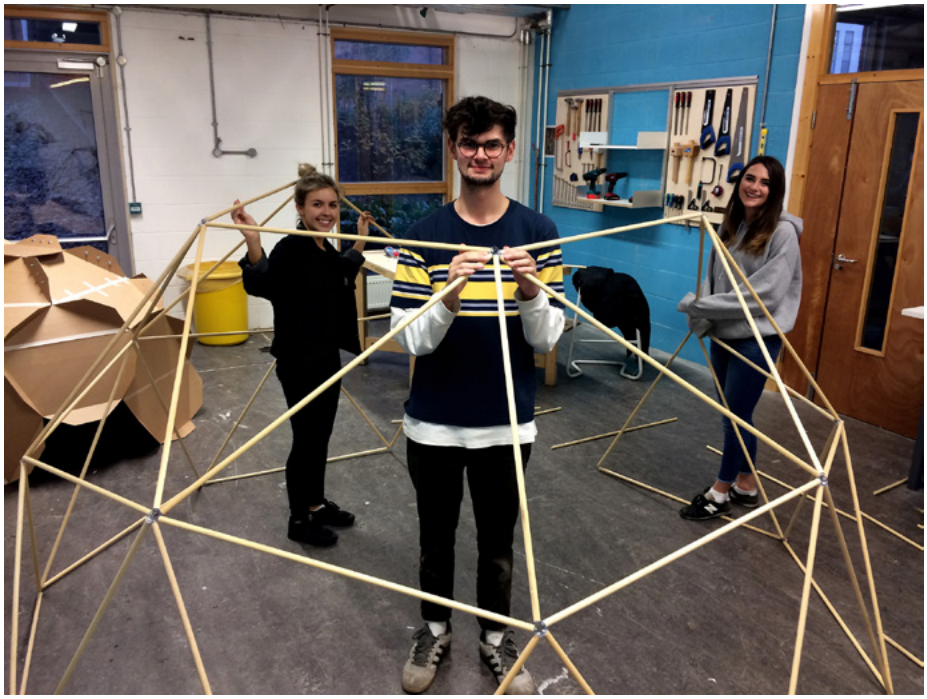

Figure 10: *Geodesic structure, prior to the installation of triangular panels.*

Figure 11: *Mark Gower, programme leader from UCA, enjoying a UWE geodesic during design review.*

Transforming Learning, Making Space

Mark Gower & Dr. Elaine Kasket

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Having introduced an emphasis on 1:1 physical making into the level 5 unit Spatial Identities on the Interior Architecture and Design course at UCA Farnham, we conducted a piece of research on students' learning experiences on the unit, using focus group data and grounded-theory-informed qualitative analysis to help isolate key elements in students' learning. The structure project set was a shared brief between level 5 students at the University for the Creative Arts and the University of the West of England. The cross-institutional learning partnership is a new learning strategy and this paper investigates how it impacted on the student learning experience.

Introduction

As two Senior Fellows of the Higher Education Academy, we initially saw the collaboration between UWE and UCA as an interesting opportunity for colleagues to share knowledge and practice in teaching and learning. However, to justify a cross-institutional exercise involving considerable planning, expense, and logistical arrangements, author 1 (Gower) needed to see and demonstrate clear benefit to the UCA students; the author 2 (Kasket), a psychologist with an interest in design education and experience in research methodology, was brought in to help shape and carry out the project.

Because the project had not been run before at UCA, there was no baseline against which to measure the impact of the UWE collaboration, and like-for-like comparison between UWE and UCA was difficult due to differences in briefs. Both sets of students needed to produce illuminated structures that could be occupied, but the UCA brief retained tensegrity and swapped geodesic for gridshell. The UCA structures also required to serve as exhibition spaces, which had to meet the requirements of clients, i.e., the textiles and screen-printing departments; and would be located outside rather than inside, in midwinter, in two external courtyards on the Farnham campus.

The aim of this research, therefore, was not to compare like with like, nor to measure these students' performance against a non-existent baseline. Instead, we decided to investigate (a) whether the learning gains for students seemed to outweigh the practical costs of the collaboration, and (b) how learning was enhanced through the exercise for both students and tutors. We used a multi-strategy approach to capture students' perceptions of how their learning was transformed through interacting with other student designers who had recently been makers.

Methodology

Participants: Participants were 13 level 5 students undertaking 'Display Part 1 – Structure' project in the Spatial Identities unit on the Interior Architecture and Design course at UCA Farnham.

Data Collection: To measure quantitative change, students used a blank 10-point radar diagram to plot pre-UWE-visit and post-UWE-visit self-ratings of their confidence (0 = no confidence, 10 = most confidence possible) on eight skills

perceived necessary for successful completion of the brief. This allowed for quick visual assessment of responses and a relatively non-hierarchical presentation of the skills. Chronologically, the order was first brief, then pre-visit data collection, then UWE visit, then post-visit data collection, then the first significant lecture of the unit, then delivery of the second, developed UCA brief, then the start of UCA students' own design process, and finally focus group.

To capture qualitative data, students wrote comments on their self-assessment about their expectations for their performance and the project overall. Kasket also conducted two 45-minute focus groups with tensegrity and gridshell groups separately, several weeks after the UWE visit. With the eight skills displayed on a whiteboard to provide focus, the researcher invited them to describe and reflect on their experiences, following students' leads in prompting for more detail, description and clarification. The focus groups were recorded, transcribed, anonymised, and shared with Gower for independent and then joint inductive analysis of self-reflections and focus group data.

Ethics: Institutional ethical approval at UCA was obtained. Students were then informed about the nature and purpose of the research, assured that their data would be anonymous and that refusal to participate would not affect their assessment, briefed on how the results would be used, and provided opportunities to ask questions before giving consent.

Findings and Discussion

Quantitative Data

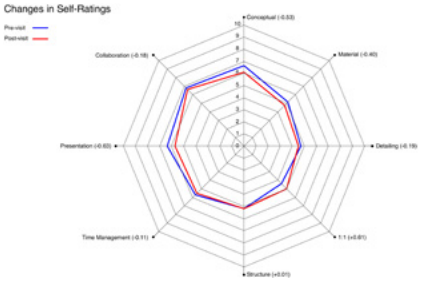

Figure 1: *10-point radar diagram pre and post visit ratings (Diagram developed by Rentaro Nishimura) (Credit: Rentaro Nishimura)*

Looking at the quantitative data in isolation, we saw that the subjective immediate impact of the visit to UWE was negligible (Figure 1). In six out of eight areas, there was a slight drop in students' ratings from pre-visit to post-visit; however, crucially for this particular project, there was a noticeable increase in students' confidence at working with 1:1 scale, which increased by 0.61 points. The largest decreases in confidence were in the areas of presentation skills and conceptual thinking, indicating that the visit slightly diminished UCA students' sense of their own current capabilities.

We hoped that the qualitative data analysis might yield further information as to whether the visit had indeed added value in terms of learning gains, despite the quantitative dip in confidence. We extracted two main themes: "finding flow" and "students as designers and users".

Qualitative Theme 1: Finding Flow

The prospect of working at 1:1 represented a significant challenge for these students, the majority of whom only had existing skills and knowledge around drawing and model making, skills that represented a form of ritual knowledge[1]: within the students' grasp and fund of existing experience, but at risk of being disconnected what happens in industry. The majority of students recalled their initial apprehension about being able to achieve the structures project independently, citing working at 1:1 as a focal point for their anxiety.

Person 1 (gridshell): I was expecting a high level of complexity…working 1:1 compared to models. I was a bit concerned, a bit worried that it would be a struggle…. without seeing UWE, and what they did, and having no prior knowledge of doing 1:1 and working with these joints, it would have been really, really scary.

Person 3 (tensegrity): I think it's just how big it is, the scale of it….it's just the fact that you're working at a very big scale in comparison to what we've been used to.

After the visit, students described how critical the UWE visit had been in addressing self-doubt and assuaging anxiety. Reassurance came in a variety of forms, one of which was simply observing that a group of similar students had achieved a successful outcome within the time scale.

Person 1 (gridshell): Obviously going to UWE, it was like, this is doable. This isn't this, like, imaginative fear of, you know, can I do this??

Person 1 (tensegrity): I think for me it's like, less scary now.… Now I feel much better. Doable. The other group did it.

Post-visit self-assessment: By being at the UWE visit, I got a much clearer understanding of how this project could be constructed.

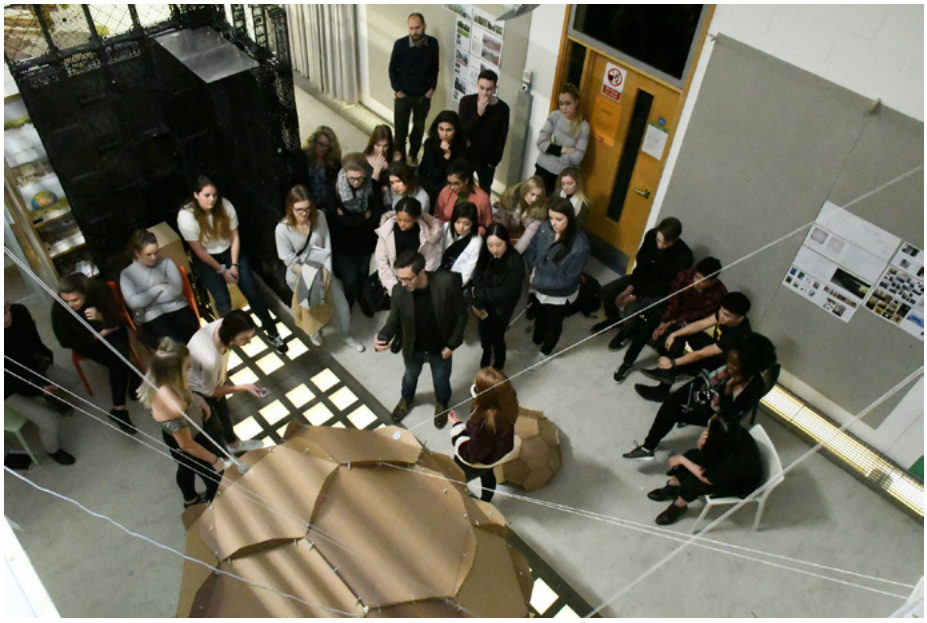

Figure 2: *UWE students present their final structures to UCA students and staff. Photograph by Elaine Kasket (Credit: Elaine Kasket)*

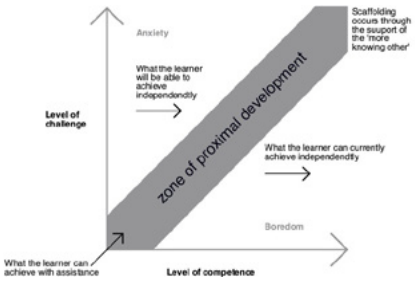

Figure 3: *Diagram showing the zone of proximal development (diagram: Mark Gower)*

Even more important than observing the outcome, however, was the opportunity to hear about the process for UWE students. UCA students described coming away from the visit with more realistic expectations, relieved that it was possible to make mistakes and still succeed in the end.

Person 3 (gridshell): So knowing that they've had troubles and they've overcome them and that's what they've ended up with, it's quite reassuring to know that they have had those problems, we're probably going to have those problems, but that's fine, then you'll get there.

Person 1 (gridshell): Personally, actually, it gave me confidence, because it was like, okay, now we can be prepared, because they're saying, this can happen, like, you can have a complete collapse a few days before, so it's like, okay, although it was kind of, oh god, now we're prepared, so we know that it might collapse a day before presentation.

Person 1 (tensegrity): [It] was nice to see…they were talking about their faults in their journey, and it was, we've done this, you shouldn't do that.

Post-visit self-assessment: Seeing and hearing the students explain their processes made me understand materials and construction of the structure much better.

The reassurance of the brief's achievability was balanced against another kind of anxiety – the pressure to do better than the UWE students. Rather than this anxiety's being crippling, however, it was expressed as a driving force to do well.

Person 4 (gridshell): Yeah, I would probably split it into, like, feeling maybe 20% reassured and 80% more pressure.

Person 3 (tensegrity): We're at a bigger advantage because we've seen theirs before we've even done ours.…I've got to either do something like that or improve on that, or do something a little bit different…[the UWE students] are probably thinking, well now [the UCA students have] seen ours, so they've got to be really good.

Person 1 (gridshell): It's a competition….You just want to achieve more, you want to do more research, you want to learn more skills to just, for your craft to become more refined, you know, this project, it's almost like working 110% just to prove a point.

The students' description of their experience maps perfectly onto the learning concepts captured in Figure 2. They were competent at model-making and drawing, potentially placing them in the "boredom" zone of skills that they could already readily achieve independently. This 1:1 structures brief, however, represented a jump into the unknown and a significant increase in challenge level; this was associated with considerable anxiety and uncertainty. Had they not received adequate scaffolding from more skilled others, the UCA students believed that they would have struggled to achieve the brief independently.

By interacting with UWE students at their critique, however, UCA students were able to bridge "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving…in collaboration with more capable peers"[2] This is the "zone of proximal development"[3] as shown in Figure 2, a "flow channel"[4] where challenges and the capacities to meet those challenges are aligned. The UWE visit was the right support at the right time to meet the needs of the UCA learners, and students' descriptions of their experience clearly matched the characteristics of flow states, for example, the "sense that one can control one's actions; that is, a sense that one can in principle deal with the situation because one knows how to respond to whatever happens next"[5]. The role of the cross-institutional collaboration in UCA students' "finding their flow" is, in and of itself, more than sufficient reason to repeat the exercise in future.

Qualitative Theme 2: Students as designers and users

Interior designers create spaces that have use and function in addition to being structurally sound. The conviction that function should be at the heart of interior designers' thinking was a driving force behind adapting the shared structures brief to incorporate use, in the form of display. Interestingly, however, we did not include use and function on the radar graph designed for this project, although it may have been implied by "conceptual thinking"; instead, both the graph and the initial project brief focused students' attention towards the more static, concrete areas of skill and knowledge such as 1:1, structure, and detailing, and other dynamic aspects of the project such as time management, presentation and collaboration (which students seemed to read as collaboration within their working groups, not as collaboration with a client). If 'use' is so key – the whole reason behind the expansion of the UCA brief – why were 'use' and 'function' neglected? Is this an illustration of educators' knowledge being so ingrained that we assumed it to be obvious to learners? That assumption – combined with the fact that explicit consideration of function/use was not modelled by the UWE projects - could have been problematic for the less experienced UCA students, already on a steep learning curve. Did the UWE visit seem to help these student designers experience and think about the spaces like users, even with few prompts to do so?

Both comparison of the pre-test and post-test questionnaires, and data from the focus groups, seem to indicate that this is the case. (NB: The post-test questionnaire was administered before a lecture on function, occupation, experience and use; the focus groups occurred after this lecture.) One student, who had expected to learn about "working better with larger scales [and] mak[ing] more models" before the UWE visit, said after the visit: "I now know first-hand how physically manifested ideas can directly affect people".

By employing the adjective "first-hand", this student refers to experiencing structures from the vantage point of the user. She describes structures as "physically manifested ideas", neatly capturing the transition from representation to realisation. The word "now" implies that the student had not fully grasped this

beforehand; also noticeable is the phrase "directly affected", contrasted with the more removed and "indirect" experience of models and drawings.

Another student briefly refers to the experience of the user in her pre-visit assessment, when describing the need to "make [the space] cosy" – underscoring the importance of users being able to inhabit or utilise spaces comfortably. After the visit, however, the student is more explicit about her desire to understand more about designing spaces that work for users:

Functioning in a structure – how to effectively use a space, that is what I want to learn more in design.

Another student begins her pre-visit comments by speaking about materials, but then rapidly moves onto function, demonstrating her awareness of the context of the structures:

Expand material knowledge, how it actually functions in real life, different weather conditions. Need to make a structure that will actually stand up on its own rather than just a model at small scale.

Figure 4: *UCA students inhabiting a UWE structure. Photograph by Elaine Kasket (Credit: Elaine Kasket)*

This student embeds her mention of material knowledge within considerations of function, showing that she is already seeing form and function as indivisible from one another. She also shows recognition that this is a step up from "just" a model – conveying that while models might be necessary things, they are not enough to capture a real experience. This can only be achieved through actually (synonymous with "really") producing something that can stand up on its own – that is, it will carry on and have a function without the designer, as other users interact with it. After the visit, this student homed in even further on the specifics of context for the UCA project.

[M]aterials…will [need to] fare well outside…in January, need to be cold- wind-, rain-resistant/proof. The structure will need to stand up on its own. Will it need to be anchored, or will it be strong enough structurally to stand up on its own? Need to also think about how the space will be used and whether the structure helps or hinders the action.

The post-visit commentary goes beyond mention of weather generically and has become specific to midwinter in the UK. The need to stand up on its own is reiterated, but the visit has prompted the student to think more about this – for example, whether it will need anchoring. The student is now speaking about the use of the space and how the structure will facilitate use, or get in

its way. The impact of the visit has been to take the student from an initial understanding to a further elaboration of the importance of thinking about how the structure will be rendered usable.

Figure 5: *UCA students building a relationship with their structure through making. Photograph by Mark Gower (Credit: Mark Gower)*

There are two occupations of interiors: the designer, and the user. In the visit, UCA students were able to hear about the UWE students' experiences of being designers, but also witnessed and shared the experience of being users.

When students move to the construction phase of their projects they build a relationship with their own structures through the experience of making, and the notion of occupation is reinforced through their own experience as users of those structures; however, the UWE visit gave UCA students a head start on this experience, allowing more focus on occupation from the outset. This was often expressed in the focus groups as new knowledge, something that still feels somewhat surprising, outside of the "normal" practice or understanding.

Person 3 (tensegrity): Normally when you're model making, you think, not I'm going to fit inside it, but potentially there's going to be someone that should be inserted. We put little people in there and we don't think about how that it is when you're actually meant to be the person standing in there until you get to the 1:1.

This student is describing a common experience. Making at smaller scales may be focused on form and volumes, and can become disconnected from the understanding that the spaces are to be experienced. The above student expresses this personal disconnection clearly, through third-person language: "there's going to be someone [i.e., not me]…inserted" and "we put little people [i.e., unlike me] in there". In models at 1:100 or 1:50, the figure being described is a passive object, only there to give scale. Making at scales smaller than 1:1 indicates, in this case, a separation between a designer and user by rendering the perception of spaces as uninhabited and unused. Other students also described how physical making of a structure at 1:1 has thrown them into the cross-current between design and use.

Person 4 (gridshell): [W]e've never done 1:1, we've only done just smaller models. So, we've never actually felt how the space feels, we've never actually seen what we've made in real life, it's always been in models, so working 1:1 you get more of a feel for what you've designed, and it may feel completely different to what you want it to be.

This student speaks repeatedly of "feel" as an apparently active ingredient in changing her perceptions, expanding her horizons beyond "just" smaller models – employing the word "just" conveys a sense that she is now thinking

about models as insufficient. “We’ve never actually felt how the space feels”, she says. “[W]orking 1:1 you get more of a feel.” This student expresses how the “feel” that she derives from using the space might be a corrective, an incentive to change design direction: “it may feel completely different to what you want it to be”. Here, she captures how making serves as the practical analysis of how something works – an analysis that is not possible during other design processes, including conceptualisation, drawing, and model making.

Figure 6: *How does space feel now? Photograph by Mark Gower (Credit: Mark Gower)*

Conclusion

We believe that the accounts of these students are evidence of how making at 1:1 on an interiors course adds value to the learning and teaching process, giving tutors insights into how and when students learn. At a time when UCA students were anxious about an imminent, significant step-change in their learning, the UWE visit not only provided appropriate scaffolding for that step, but also represented an early reinforcement of learners’ understanding of experience and occupation. The visit enabled UCA students to see and hear other students, like themselves, making strong connections between making and use, and they shared that experience with them. This already seems to have accelerated their knowledge acquisition and will likely be transformative in their current and future design practice.

Figure 7: *Tensegrity structure inhabited during final review by its designers and users (Credit: Elaine Kasket)*

Figure 8: *UCA Farnham Gridshell design team present to UWE Programme Leader David Littlefield (Credit: Elaine Kasket)*

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The Collective Network City Model

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Our inclination to control aspects of a design process and decision-making can be both helpful and limiting. Sometimes allowing 'unknowns' or less predictable processes can offer up ideas or methods that present new imaginings and opportunities. Physical making, as a method for design, can allow ways of thinking through a continual adjustment and negotiation due to requirements of materials, tools, processes or collaborative engagement. This visual essay discusses the production of a collaborative model titled the 'Collective Network City Model' which formed a site for interrogation, negotiation and exchange by a group of 20 undergraduate interior design students.

Introduction

The Collective Network City Model was a collaborative model of an imagined city/urban condition constructed by 20 students over a period of five weeks that formed a site of interrogation, negotiation and exchange that inturn, provided the basis for a set of individual design propositions titled Exchange Space.

The Collective Network City Model was employed as a bridging project, linking a six week duration competition brief relating to the Tonle Sap lake in Cambodia (responding to very specific set of issues and outcomes) to a more speculative proposition situated within an imagined urban setting which required the student to develop their own brief responding to the idea of exchange.

Given the intensity and specificity of the Tonle Sap competition and a further 6 weeks of the semester remaining, there was a unique opportunity to consider how the studio could generate a hinge from the previous work and to fold the substantial learning into a very different set of criteria and project structure whereby the student took the lead in determing the direction for the work. As tutors, we were interested in asking the students to shift their operations from one of respondent to that of the speculator.

Earlier in the year, a public discussion about graduate capabilities of university graduates, involving employer and academic groups, was aired on Radio National[1]. Employers identified desirable attributes as teamwork, initiative, enterprise and evidence of "fit to culture". The notion of "fluid intellegence" or "fluid knowledge" [2] was cited as a key attribute. Much of the debate in this discussion related to how well these attributes were embedded and indeed assessed in University degrees around Australia.

As a response to this conversation and with an attention to translation into design activity, the Collective Network City Model was designed with three key objectives:

1. To develop decision making skills through participatory process of making. (teamwork)

2. To appreciate and use making as a generative design process. (initiative and enterprise)

3. To develop collaborative processes that engage with skills of emotional intelligence - understanding "what can you bring to the table". (fluid intelligence)

Collective Collage – a collaborative making

Acting as an interloper into the initial trajectory of the design studio, the first class after the mid semester break signalled the begining of part two of the studio. This began with a request for students to bring to the class nine graphic images that responded to ideas of 'networks', 'borders' and 'differences' - key ideas and sensibilities drawn from the previous competition brief. These images were then enlarged, distorted, cut-up, collaged [Figure 1] and taped/ glued together to produce a complex set of relationships through collaged materials that could be read as a type of map of urban conditions.

Figure 1: *The collective collage in production, size 1600 mm x 2400 mm (Credit: Roger Kemp)*

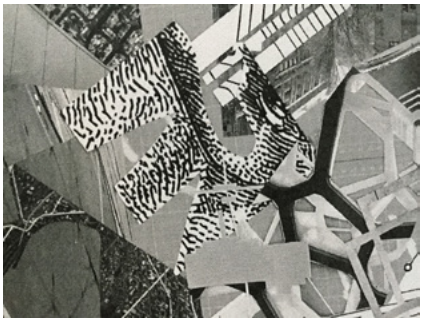


Figure 2: *A detail of the collective collage. (Credit: Roger Kemp)*

The collective collage was a tool to introduce and begin a new project quickly[3]. It was akin to making a mark on a blank piece of paper in order to simply begin. Without having a detailed sense of intended outcome, each decision required some rationalising relative to its adjacency, sensibility to other groups and agreed purpose through conversation or simply the action of location (sticking down). As a dynamic process, its form changed and shifted over the three hours that we worked on it. At some point in this indeterminate state, each individual made decisions in relation to color, scale, texture, structure and complexity [figure 2 + 3]. It was quite a literal take on what each designer (student) could "bring to the table", and then how we could tap into a collective endeavour.

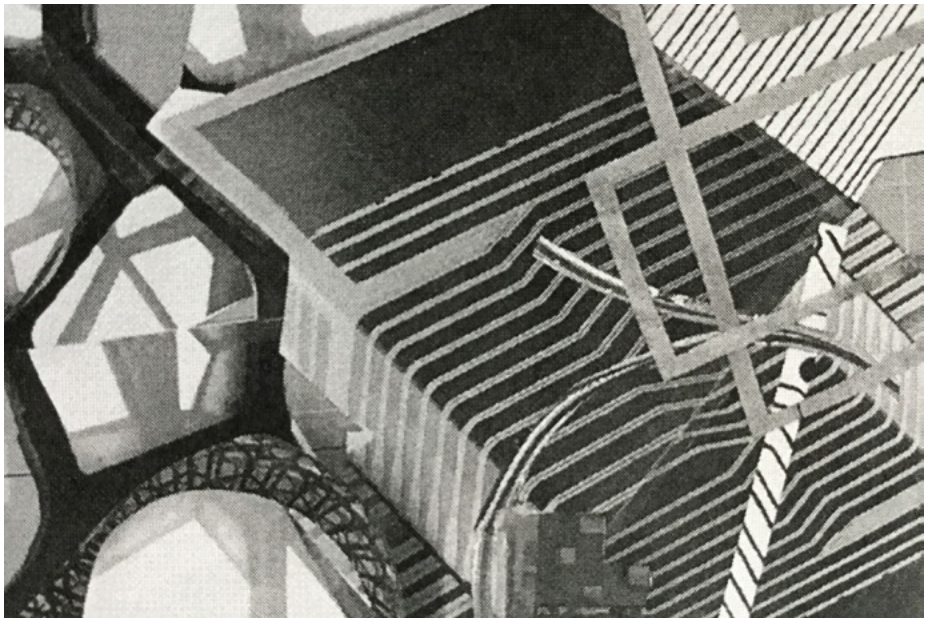


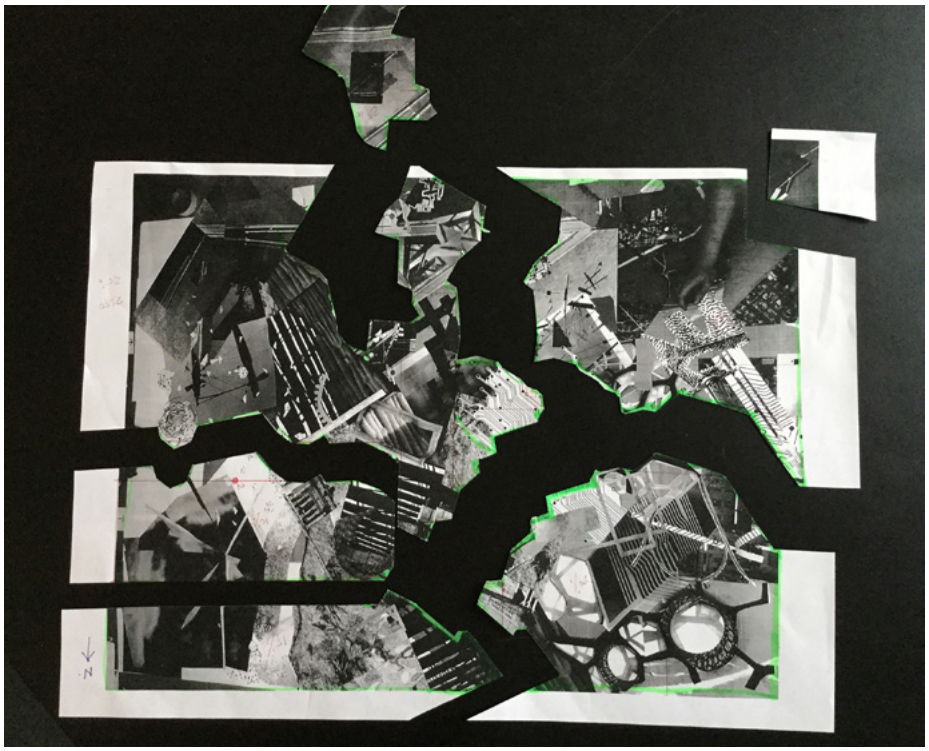
Figure 3: *A detail of the collective collage. (Credit: Roger Kemp)*

Collective Network City - making as negotiation

The collaborative collage formed the basis for the collective network city model. Students remained in the previously organised groups set up for the first half of the semester and were assigned a section of the collage [figure 4].Having been allocated a territory (portion of the collage), each group then began to determine a collective approach to a translation from the two dimensional image into a three dimensional construction. Each group was asked to determine a unique collective approach to their territory with the proviso that the model should not attempt to represent buildings[4], but instead construct 'networks', 'borders' and 'differences'[5].

A steel table with a 25mm x 25mm mesh surface was made by the tutors to provide a surface that the students could construct their territories. The mesh enabled the construction to be fixed above, below or through – providing further opportunities for decision making.

Figure 4: *A copy of the collage in the process of being divided up through the identification of borders within the image. (Credit: Roger Kemp)*



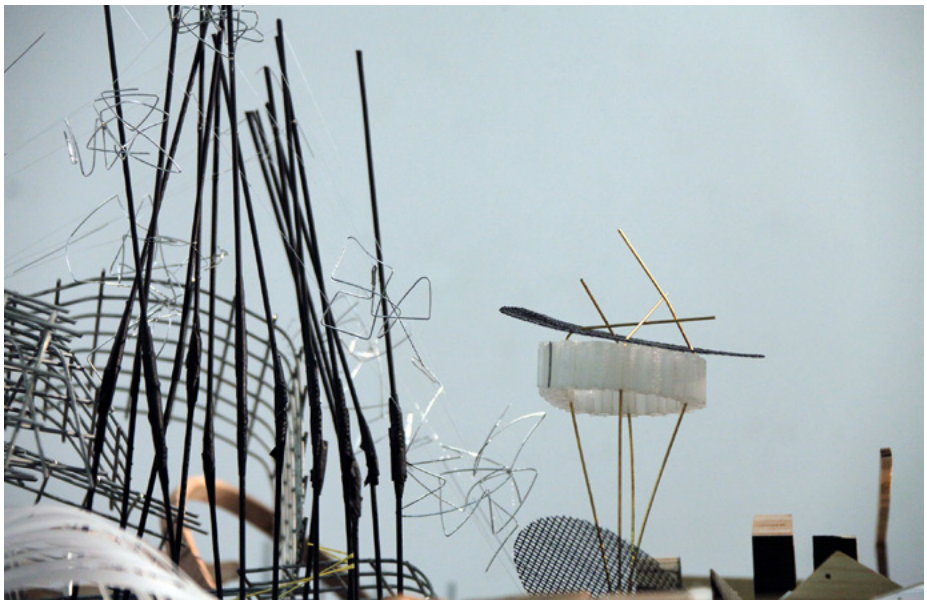


Figure 5: *Beginnings of construction as groups begin to define qualities of space through the selection of materials. (Credit: Raphael Kilpatrick)*

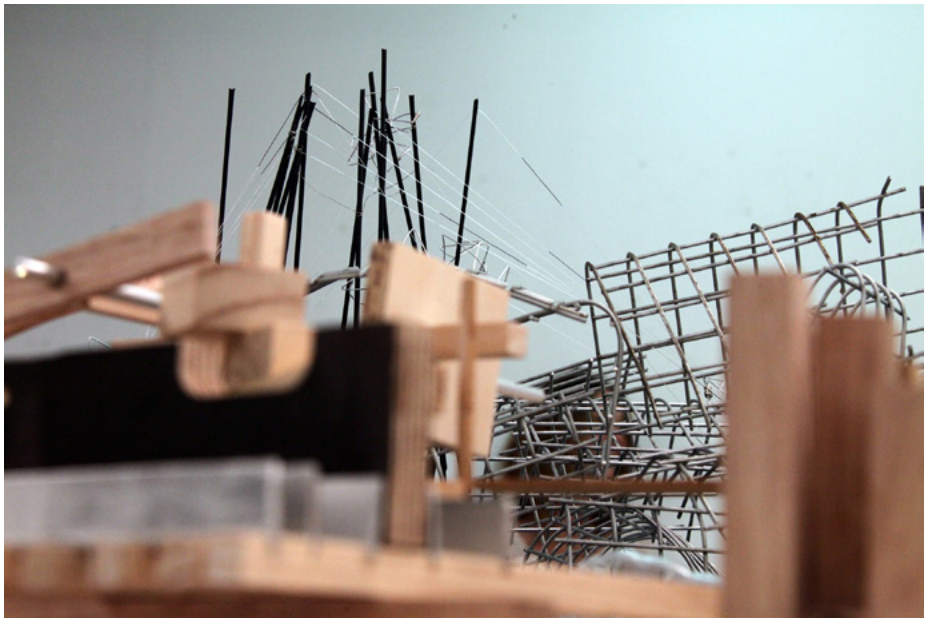


Figure 6: *A negotiation of material and form takes place between two territories. (Credit: Raphael Kilpatrick)*

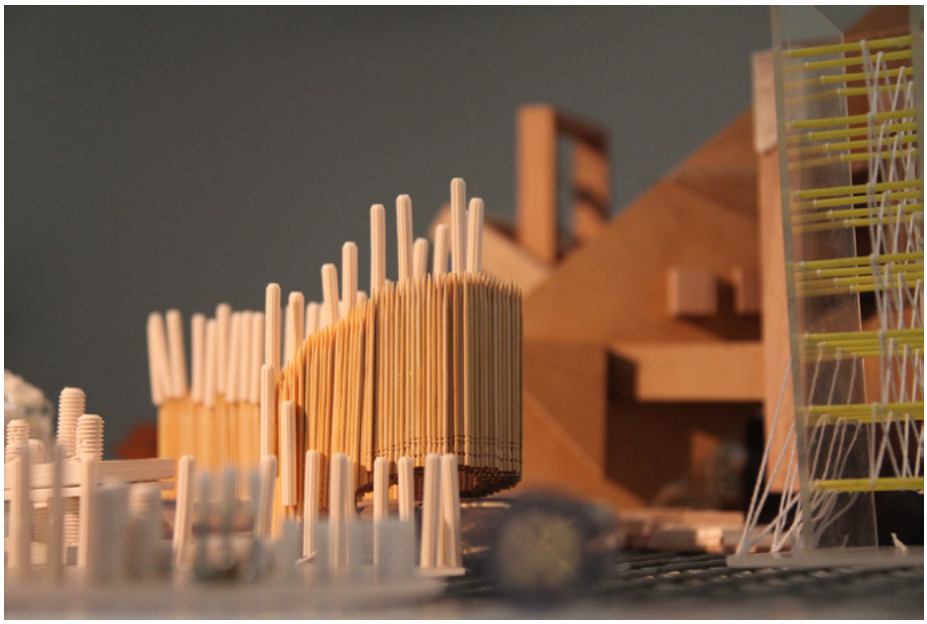


Figure 7: *There is no assigned scale, so the model can be viewed and interpreted in a number of ways. The model is therefore understood more as a generative tool than a representational object. (Credit: Raphael Kilpatrick)*

Figure 8: *The model requires a physical negotiation through the determination of specific views (Credit: Raphael Kilpatrick)*

Figure 9: *The group determined that it was important to limit the number of different materials used in the production of the model to assist in the manipulation of scale. (Credit: Raphael Kilpatrick)*

Figure 10: *Reflective surfaces are deployed to build visual depth and ambiguity (Credit: Raphael Kilpatrick)*

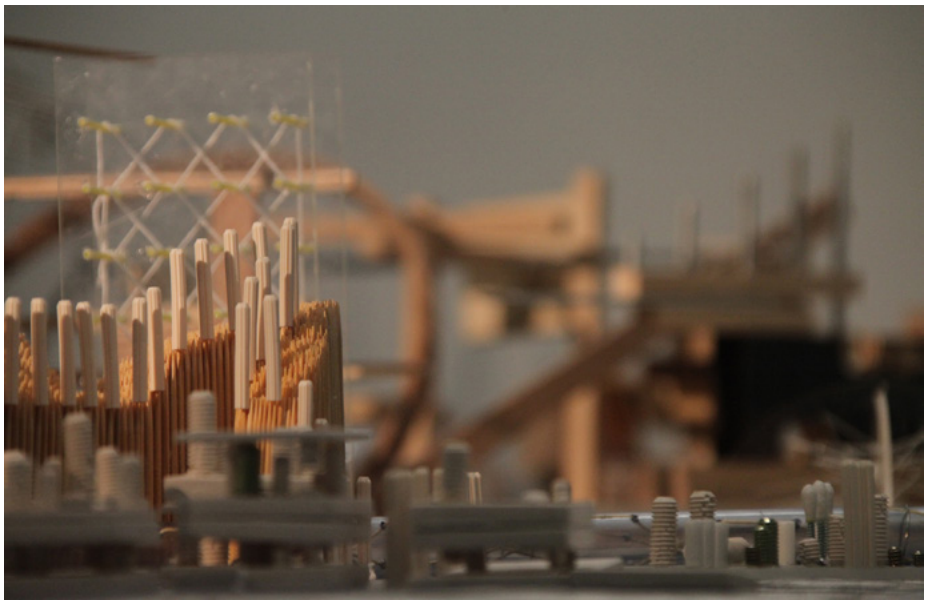


Figure 11: *There are multiple construction methods including casting, threading and reuse of everyday materials such as cotton buds. (Credit: Raphael Kilpatrick)*

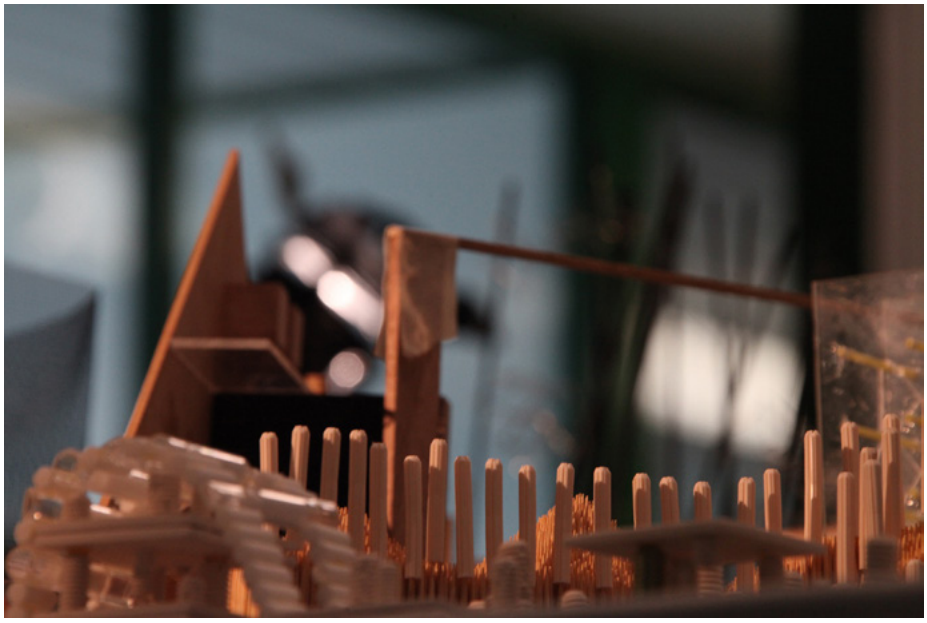


Figure 12: *The model was set on castors to be easily moved. The changing visual backdrop provided opportunities for new relationships. (Credit: Raphael Kilpatrick)*

It became a site that provided a starting point and framework for 20 individual project briefs - all speculating on ideas of cities as a space for exchange [figure 13 + 14].

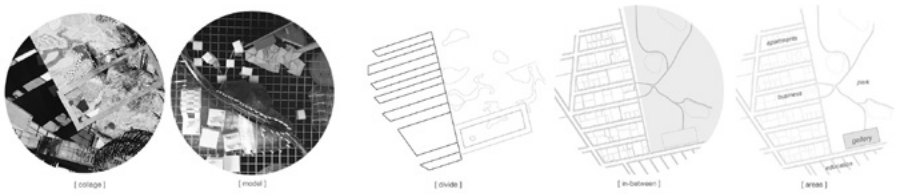


Figure 13: *An example of the development from the collage to model to individual project by 3rd year student, Tahlia Landrigan. (Credit: Tahlia Landrigan)*

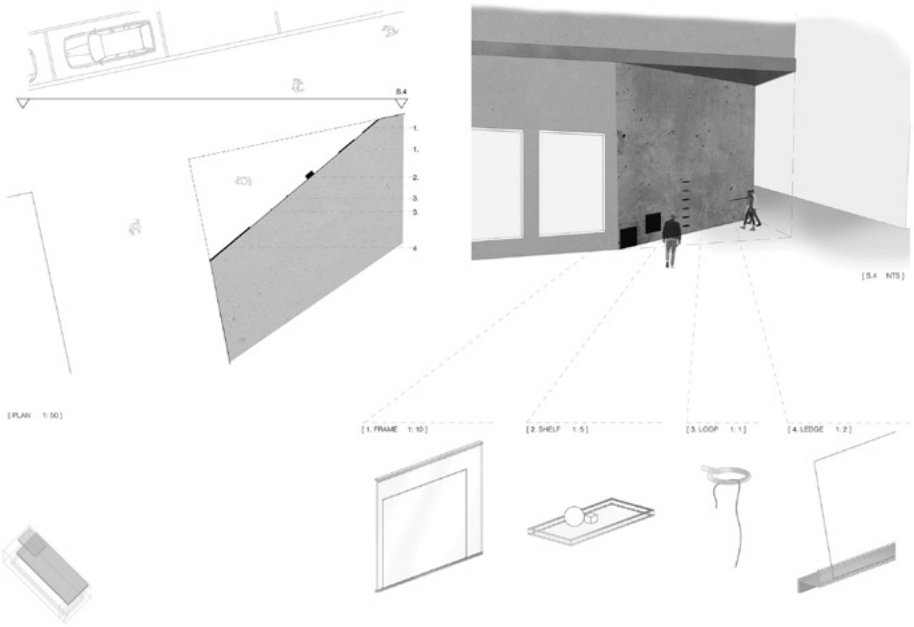


Figure 14: An extract from Tahlia Landrigan's final presentation exploring the inversion of public and private space. (Credit: Tahlia Landrigan)

Conclusion

Ultimately, the Collective Network City Model became an assembly of remembered and invented urban spatial moments [figure 5-12] drawn from reflecting on experiences of other cities (real or fictional). Its importance was that of a collaborative and generative tool, always in flux through continual adjustment, additions and negotiations.

Notes & Citations

1. http://www.abc.net.au/radionational/programs/bigideas/graduate-employment/6636664

2. Fluid intelligence - pertaining to ones ability to respond to new or novel situations and problems as distinct from the direct application of existing skills, knowledge and experience.

3. There is often a significant delay when asking students to choose their own site for a design brief due to a desire to make the 'right' decision and avoid problems. This illustrated methods of process driven approaches to support decision making and the embracing of problems as a inherent aspect of designing.

4. See Thea Brejzek and Lawrence Wallen, discussion of the autonomous model in their book titled The Model as Performance: staging space in theatre and architecture.

5. 'Networks', 'borders' and 'differences' are terms adopted from Christian Schmid's 2014 essay titled "Networks, borders, differences: towards a theory of the urban".

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Why Making Matters

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The CASS as part of London Metropolitan University runs 3 Interiors courses, side by side, Interior Design, Interior Design and Decoration and Interior Architecture and Design. As level 4 organiser, and through studios at level 5 and 6, over the past 12 years, I have observed that once students understand how to draw for new technologies, such as laser cutting and 3D printing, they develop an over reliance on this kind of output, leading to less experimentation, critical reflection and above all a lack of materiality and haptic experience. This essay reveals my pedagogical approaches to develop creative conversations through making, by providing opportunities for students to develop themselves as learners through physical three dimensional responses and how tackling community and social issues through making, aims to demonstrates 'why making matters'.

Figure 1: *Spatial experience. (Credit: Model by Lina Navickaite image by Janette Harris. Visuals and illustration by Lina Navickaite.)*

In recent years Interiors courses, have seen the relationship of qualitative critical, contextual research undertaken through testing, experimentation of materials, mixed media and technical making skills, eroded by the apparent 'accuracy' of new technologies. The Cass interiors courses teach vector digital skills such as Auto Cad from level 4. However, I have witnessed over a number of years that critical reflection and understanding through haptic development has been somewhat replaced by laser cut or rapid-prototyped models generated from digital drawings. The results are typically less developmental and lean towards a diminished material sensibility and an unresolved charred edged finality.

Higgs 2006 refers to "critical and creative conversations" to describe the process and practice of meaningful making. Therefore, implying, that in order to have a conversation and for that conversation to be transformative, the process needs to reveal an explorative, reflective and reflexive set of discussions.

This essay will demonstrate that a model or making, at a variety of scales, is not solely a representational tool, or haptic, tangible, analogous qualities of engagement with an idea, but an approach to encourage meaningful, 'speculative and divergent' discovery, with the potential to create greater paradigm shifts within personal and collective learning and above all to start 'creative conversations'.

The translation of an interior concept is often represented by scaled models, models that express the spatial experience. [Figure 1] Technologies enable the design to work towards an accurate representation but not necessarily demonstrating the materials and the experience in the space. Testing the idea and its spatial possibilities through sketch models is part of our process and practice, however, the testing of the materiality may be limited to mood boards, visuals and sometimes handmade samples, to support the outcome with the model acting in a supporting role.

Figure 2: *Subtle realistic model, Millennium Mills by Iliana Mitova. (Credit: Image by Iliana Mitova)*

There is an argument that models attempting realism can be criticised as too representational, almost lacking control, unless carefully crafted. Subtle tones, no evidence of laser burns and adhesives, work towards a successful outcome [Figure 2]. Yet students may test and experiment creating real samples but lack the skills or time needed to effectively convey a realistic representation within a scaled outcome, hence simplified white or monochrome models are widely produced.

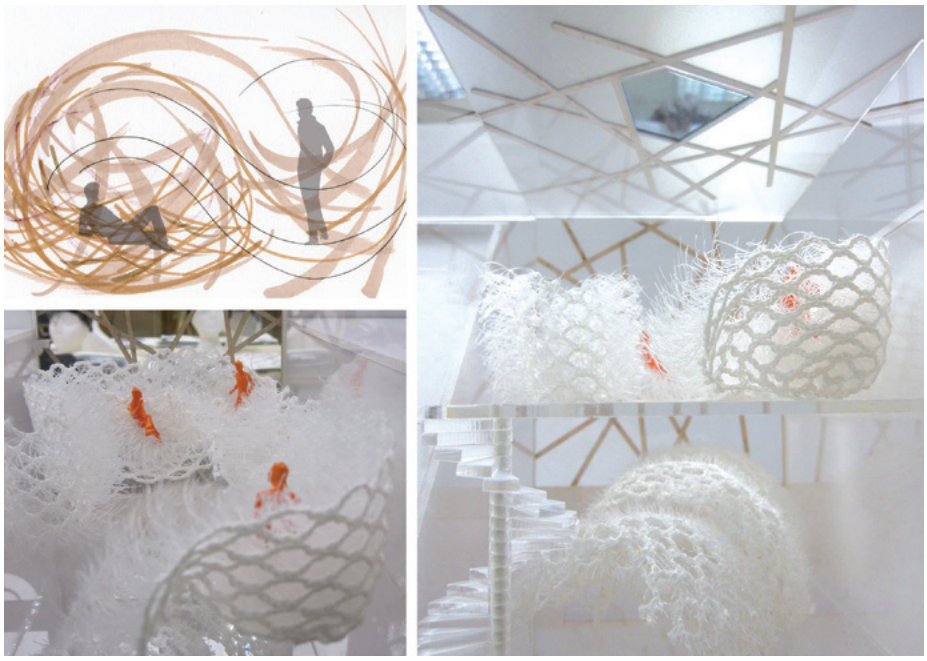

Figure 3: *Monochrome materiality. (Credit: Model by Gabriella Ramacciotti. Image Janette Harris)*

However, it is possible by using combinations of real materials, haptic skills and drawing to bring together an outcome that will be believable, with model material selection being a vital consideration. A neutral toned approach can be an excellent stratagem, encouraging the viewer, to project their own vision of the materials, colour and experience [Figure 3]. Indeed, within industry a monochrome model can be employed as a device to suggest a programme to their client, giving a starting point to negotiate or encourage a discussion. However, materiality creates the spatial experience, the texture, form, structure and kinetic quality of light and transition, there is value in exploring this through making.

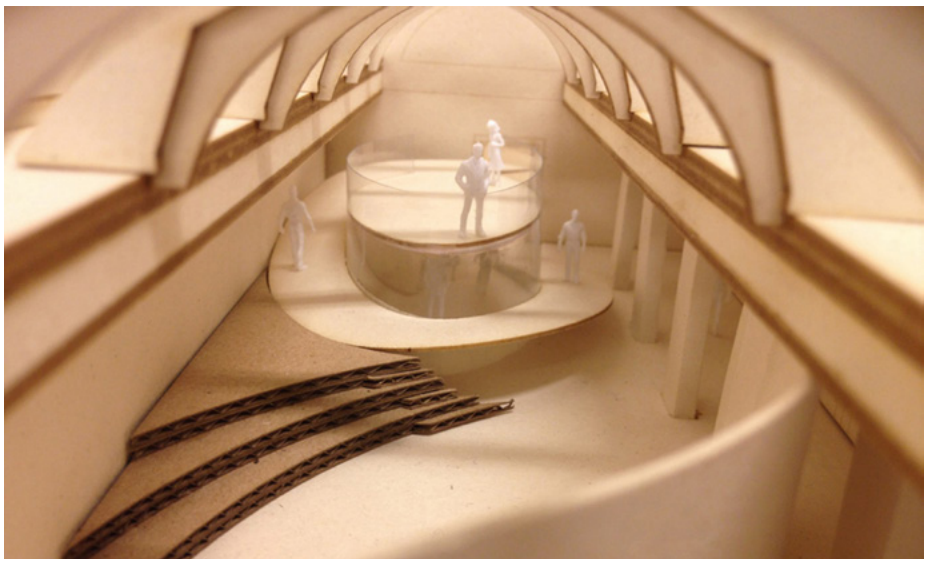

Figure 4: *Combined hand made and lasered elements Mattia Pegoraro education space. (Credit: Janette Harris)*

The Interiors cluster, within the studios I lead, have made a shift away from the reliance of technologies to enable the students to develop and engage with material experiential outputs, at scale and at 1:1. The studio at level 4, which includes a cluster of students from 3 interiors disciplines, has developed a programme of making that challenges students to consider materiality as part of the developmental stage of the initial concepts. The aim is to enable the cohort to create real experiences and interventions, often using haptic skills alone or combined with technologies. For example, in [Figure 4], the intervention into the space is handmade within an assembled laser cut structure.

Figure 5: *Materiality investigation. (Credit: Model and image by Elena Hopwood)*

Level 4 starts with fast-paced model making, utilising hand tools only, translating personal narratives into a spatial experience [Figure 5]. In turn this approach develops critical analysis and reflection, using lighting and photography, leading to further development of ideas and speculation. The students are encouraged to share their techniques and help each other to see the potential and possibilities of each of their designs. The outcomes develop a collective consciousness of the reality of the designed element and spark debate about the possible interpretations of real or representational vs imagined experience.

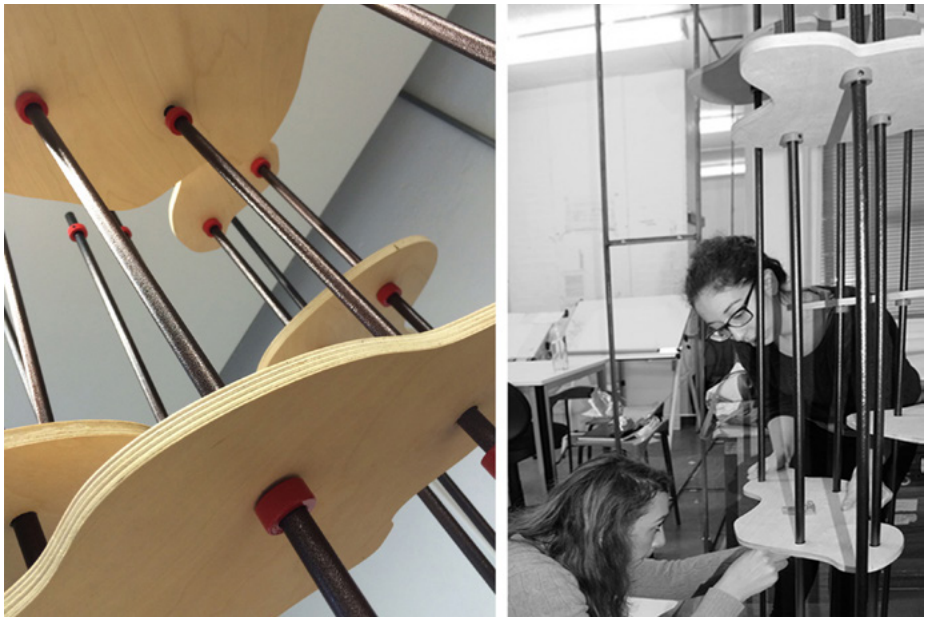

Figure 6: *Interiors project. (Credit: Image by Alex Kondor-Krupanisk, Laura Grieco, Serena Previti, Filipa Fari, Sabah Mizban and Rosalina Gadyuchkova)*

Workshop inductions are combined with a project to maximise and enable meaningful learning. Time is allowed to test and improve skills and develop an understanding of materials, which informs material choices and specification. Manufacturing, construction and finishing techniques all adding to a critical conversation [Figure 6]. An immersive experience into the workshops and 1:1 projects help students understand process and practice, while developing detailing skills.

It is quite typical at level 4 for some students to strive towards the projects end goals as soon as possible, however making helps to develop a reflective approach that challenges the students to test and evidence their conceptual journey. Group work is encouraged for the 1:1 projects, which involves problem solving, communication and patience to create a successful output. Through careful guidance and studio workshop activities we can develop critical research approaches to support academic research. Students gain confidence and realise that they can enjoy 'the process' too.

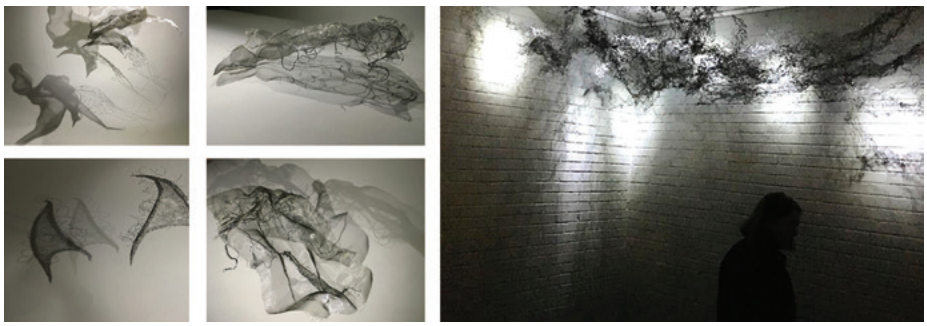

Figure 7: *Group lighting installation Woven Narratives. (Credit: Images by Janette Harris)*

One such example is a 1:1 lighting project called Woven Narratives [Figure 7], based on Gaston Bachalard's book Poetics of Space and his notion of corners and shadows encouraging dream space and therefore creativity.

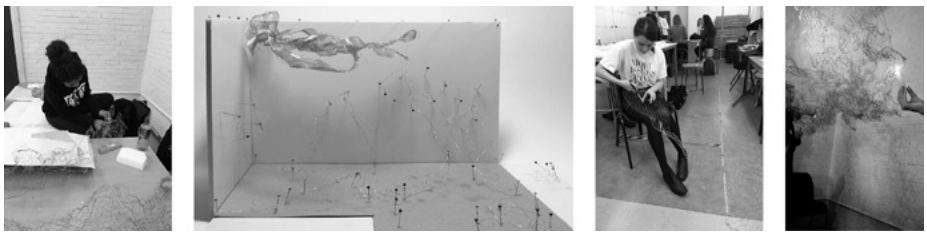

Figure 8: *Woven Narratives process of talking mapping and making. (Credit: Stephanie Payne)*

The students set themselves up in the corner of their studio and map, using a scaled model [Figure 8], their conversations while making. For instance, they talked about the making process, the challenges, attributes, themselves and their lives, this determined the various components and where they were fitted in the space. The outcome evidenced their process and practice and instilled a 'creative conversation' through materiality, light within a real setting but ultimately formed bonds between the students.

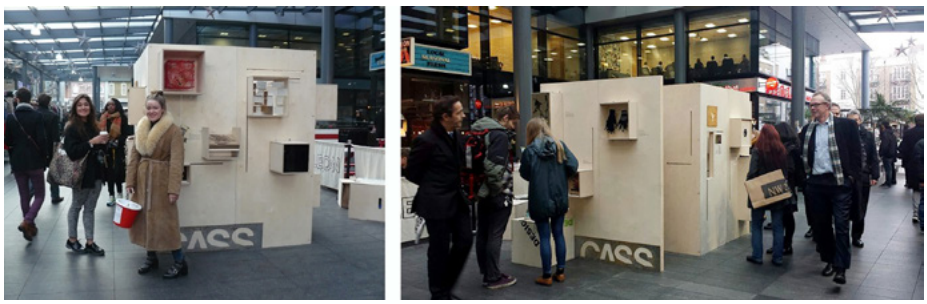

Figure 9: *Hermitage project in Spitalfields Market. (Credit: Janette Harris)*

At all levels, it is important to develop meaningful learning opportunities, through live projects, where possible. We will often tackle difficult issues to develop a social conscience and try to create a paradigm shift that impacts and encourages lifelong learning.

Projects such as the Hermitage in my studio 'Unspoken Revolution' (Level 5 and 6) highlighted the importance of understanding the issues of homelessness from the perspective of homeless people's personal narratives, through Tony Miller and the White Chapel Mission [Figure 9]. The aim was to create and make a collective outcome with individual conceptual responses that challenged the general public's perception through exhibition and presentations, while raising money for the cause. Students' experience of developing and conveying difficult narratives through making became a point of responsible design. Enticing the general public into engaging with a curious structure and its materiality, to touch, read and interpret was vital to the success of the project.

Figure 10: *Student publicising their project CASS Interiors e-vite Hermitage. (Credit: Iliana Mitova)*

The students set up the project as if they were a design company, each volunteering for roles and responsibilities, with levels 5 and 6 working together. The aim was to not only build the project but to tour it. The students were encouraged to undertake heuristic strategies to design the space and personal stories through models and drawing, testing and debating their ideas with each other. BDG, who are trustees of The White Chapel Mission acted as

our client, who critiqued and supported the students. A pitch had to be made to Spitalfields New Market and a proposal put forward to the residents of Spitalfields to request permission and a free space at in December to exhibit. At the same time promotion for the event through a blog and e-vites were set up. [Figure 10].

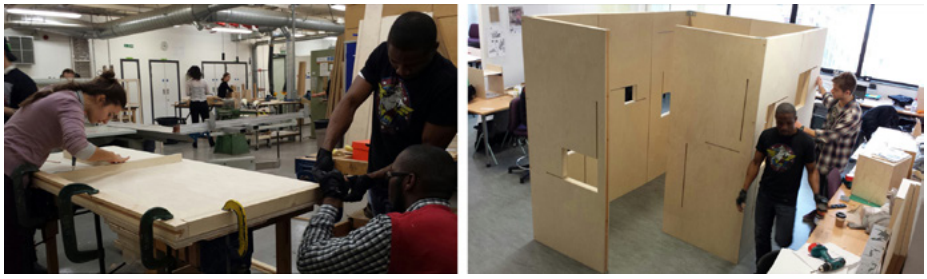

Figure 11: *Workshop and construction. (Credit: Images by Janette Harris and Iliana Mitova)*

Meanwhile the students had to consider the materiality and manufacture of the intervention. How it came apart and reassembled, the delivery and its resilience for each venue and how these considerations played a part of the design strategy. The students only used CNC for parts of the structure, the rest of the outcomes where largely hand made using general workshop tools and machinery, such as circular saws, routers and band saws [Figure 11]. This was a conscious decision by the students, in respect of the reality of the issues of the project. The materiality of the narratives, all imbuing the same personal ethos and care [Figure12] utilising largely found or thrown away materials. The outcome not only developed a conscious connection between materiality and user experience, but the power of making, its ability to move people, to start a discussion and connect to a diverse audience.

Figure 12: *Materiality concept responses. (Credit: Images by Janette Harris)*

Through making at 1:1 projects such as Woven Narratives and the Hermitage demonstrate that making can encourage ‘speculative and divergent’ ideas. Students undertake a complex journey where risks are taken, mistakes are made and testing fails but through these projects problems are solved and the process is discussed, debated and articulated to an audience beyond the confines of the university. Creating time for students to test, explore and learn while making is a vital part of their learning process. Students challenge and encourage each other to explore solutions and come to the realisation that ‘making matters’.

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Making a Scene

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This paper describes making strategies for independent, intercultural and industry making in an undergraduate interiors programme. A belief that making is central to the development of spatial, material and contextual understanding underpins this paper. The following case-studies include emotive making at the sculptural object-scale; intercultural making at the installation / place-scale and collaborative industry funded making using mise en scène principles which explore dwelling concepts.

Background

Making puts pressure on resources but far from reducing this we need to extend our making practices. However, we are also dealing with a new generation of students which Sharp describes as 'mosaic thinkers'. These are individuals who make meaning out of fragments, whose learning is non-linear and who are increasingly digitally dependent[1]. However, it is in making, in particular, where students could develop distinctive work, confidence and enrich their spatial understanding. Making is also a research method in the authors relatively recent funded research in user engagement and in larger 'allegorical' constructions used to convey research findings normally expressed in text[2].

Making, Un-Making, Re-Making

Making in interiors is somewhat paradoxical and contradictory. We are preoccupied with 'built' experiences but do not 'build' per se, rather we fabricate i.e., we invent in order to deceive, or skillfully construct from prepared components. Riley describes fabrication as an equally slippery tectonic term that shifts continuously depending on its context, and which, "… jumps between the negative sense of a falsehood and the more neutral sense of the process, or product, of making."[3] Whilst its etymological opposite implies the negative razing or destruction of something, a more positive example is our Deconstruct /Reconstruct year 1 project which reverse engineered found-objects from local waste-streams. This raised awareness of sustainability but also introduced students to adaptive re-use principles, indirectly, through the remaking of found / dysfunctional objects into new uses [4] This razing and resurrection suggests a conceptual link to Machado's scraping or over-writing palimpsest [5]; Matta-Clark's controlled demolitions [6], and Richard Meier's reanimated sculptures. Meier's intuitive making is distinct from his architectural oeuvre and has inspired emotive making in our own programme. Often using found-objects and the detritus of his architectural models, Meier uses wax resist techniques to create dark, metallic objects that are the aesthetic antithesis of his buildings. In his acts of re-animation he leaves traces of the casting process in the finished works as a "kind of artistic cannibalism [and] as a way of breathing new life into the abandoned models: recycling as reanimation."[7]. Collectively, these hint at a cyclical relationship between place-makers and maker / fabricating and fabricators'.

Whilst the scaled-model retains its prominent position across UK programmes, it is our fascination for miniaturization which is compelling and ingrained in our memories. Limbrick's 1964 open-sided doll's house expresses this fascination as a designed solution for collective play in nurseries where the form was previously exclusive and expensive [8]. Spankie and Araujo's research into the dolls-house offers an interesting conceptual template for the new interiorities and as a "…a potential 'modelling tool' for interpreting and fabricating the domestic interior [to] engage the student or designer in a process of making that is comparable to the practice of interior design." [9].

Emotive-Making at the Sculptural / Object-Scale

This project ran online for three-weeks over a three-year period. Designed to provide Year 3 students with a visceral and virtual making experience that simulated designer / client conversation, Scottish and US students were matched in teams of two and invited to enact roles as each other's proxy designer and/or pseudo client [10] changing roles repeatedly as required. Whilst making was the outcome, the process was directed by the design of questions-from designer to client. The 'clients' responses provided the creative media which influenced the scale and form of the final emotive-objects. Simple questions such as 'What is your favourite colour?'; 'Do you identify yourself as Texan / American?; 'How important is family to you?' tended to allow for more relaxed responses though quality of questions and depth of responses inevitably varied. Rules-of-engagement were agreed ensuring effective communication in light of the six-hour time difference. Only written interactions were permitted with face-to-face exchanges prohibited rather than be distracted or led by the 'appearance' of their client. The teams only met face-to-face via virtual conference suites on the last 'reveal' day of the project. Individuals were finally able to 'meet-their-(re)makers' and gauge their client's emotional reaction to their emotive objects [Figure 1].

The project explored how text and making coalesced in interesting and unexpected ways. Our aim was to expand students making expectations and capabilities, develop digital literacy, improve interpretive skills and consider alternative uses for language beyond those of site analysis or critical writing. The project exposed issues of intellectual and creative ownership; where it rested, the designer, client or both? Outcomes were particularly diverse often using improvised, traditional and digital techniques often sculptural in nature and including abstracted laser-cut cubes, pop-up books, narrative calling-cards (constructed, presented then mailed to the client recipient). Construction used analogue and digital making techniques. Student's interpretation of the client responses initially took the form of diagrams and sketches as basic simple form generators. Responses were often visualized as timelines, or as symbolic and metaphorical references. Frequently, more nuanced interpretations sought to express conflicted cultural identities, e.g. as simultaneously Scottish and British; Texan before American, or Chinese to American identity [Figure 2].

Figure 1: Examples of emotive making using found-objects (above) and workshop assembled elements (bottom) by Dundee interior students (e.g. proxy designers) in response to conversations with Texas interior students (e.g. their pseudo clients) (Credit: Andy Milligan)

Figure 2: Poetic interpretation (above) and pop-up emotive making responses by Dundee based Finnish student(Credit: Andy Milligan)

Intercultural-Making at the Installation / Place-Scale

This Year 2 example was part of Border Crossings, a two-stage research-led module delivered between 2011-16 over an eight-week period in semester two which, at its height, involved partners from Finland, Canada, USA, Slovenia, Netherlands and Scotland [11]. The brief invited students from textiles, interiors or jewellery to explore identity through their specific disciplines, initially through a short research phase, and finally in collaboration with international peers on an on-line social network (e.g. NING). Supported by an EPSRC funded project, 'IMPRINTS: Identity Management: Public Responses to Identity Technologies and Services', this set the conceptual parameters of the brief [12]. In stage-one, collaboration was localised and research focused. Students developed research approaches over the first two-weeks. In week three, disciplines shared their research insights to unearth common-ground culminating in interdisciplinary outcomes that, surprisingly, took the form of installations. [Figure 3]. In stage two the international partners joined. Earlier research outcomes were uploaded to our NING network to encourage informal peer-to-peer conversations as international partners 'met' for the first time in one of three disciplinary streams with their disciplinary counterparts. This provided opportunities for informal benchmarking as a community of learners exploring a shared identity brief.

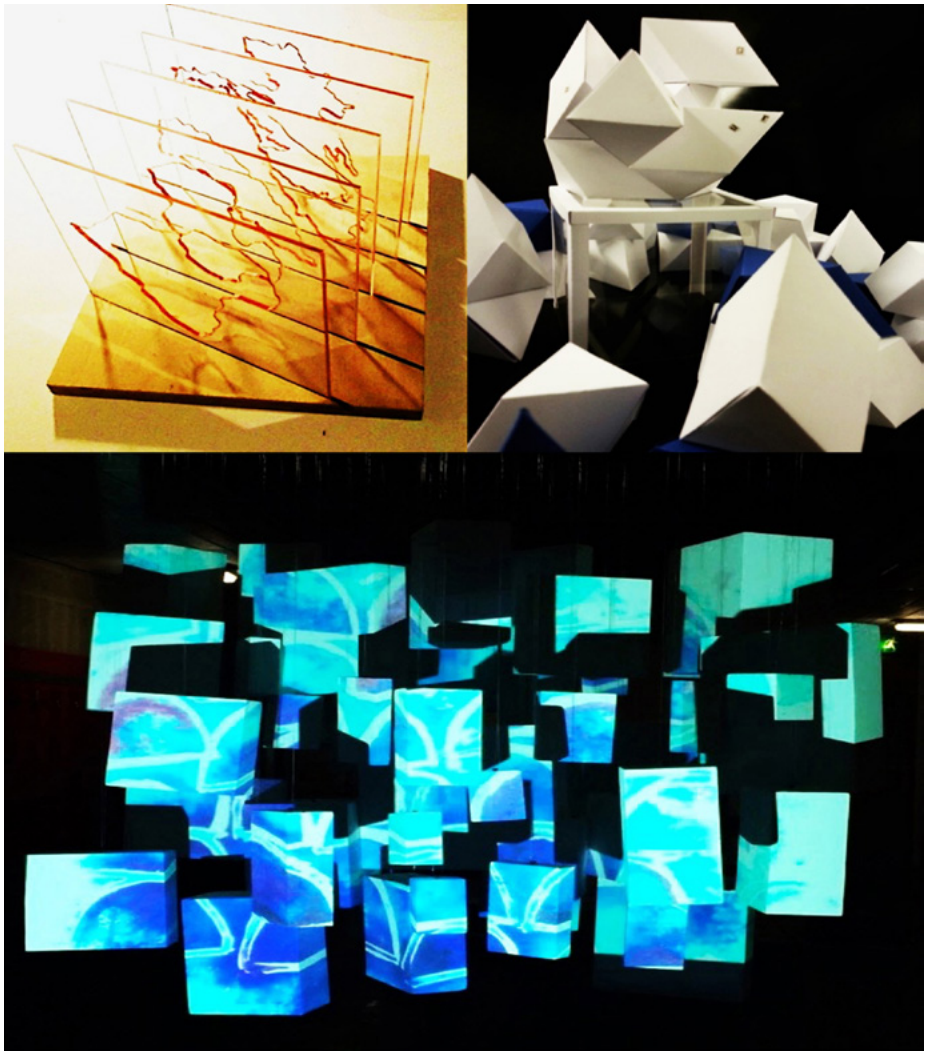

Figure 3: *Examples of sculptural objects by Interior students during the stage-one research in response to theidentity themes driving the international Border Crossings module (above). Installation was an unexpected outcome of the one-week research common ground workshop with interior, textiles and jewellery students. (Credit: Andy Milligan)*

In 2015, a new making strategy was established involving Interiors in Scotland, Netherlands, Slovenia and USA. Using installation as the outcome, it was inspired by Humberto Schwab's Socratic Dialogues methodology. This is a philosophical methodology that encourages individuals to challenge orthodox modes of [design] thinking and is predicated on dialogue, an openness to experimentation and deep-listening. This plays-out through a shared task - in this instance, expressing creative identity through an installation. As a process, it required small teams to take a leap of faith in adopting an organic line of enquiry and requires embracing risk (and risking-failure). As a methodology, it has some affinity to 'slow-design' principles and requires intrinsic motivations (experience led), rather than extrinsic motivation (grade driven) or indeed, risk-averse. However, this slow-flow of ideas required structure in the materials, assembly, dimensional and time constraints we set. Nails, screws or glue were prohibited but required improvisation of tight-fitting joints. The creative process required one school to take the lead in randomly selecting elements from the predetermined Hedjuk inspired 'kit-of-parts'.

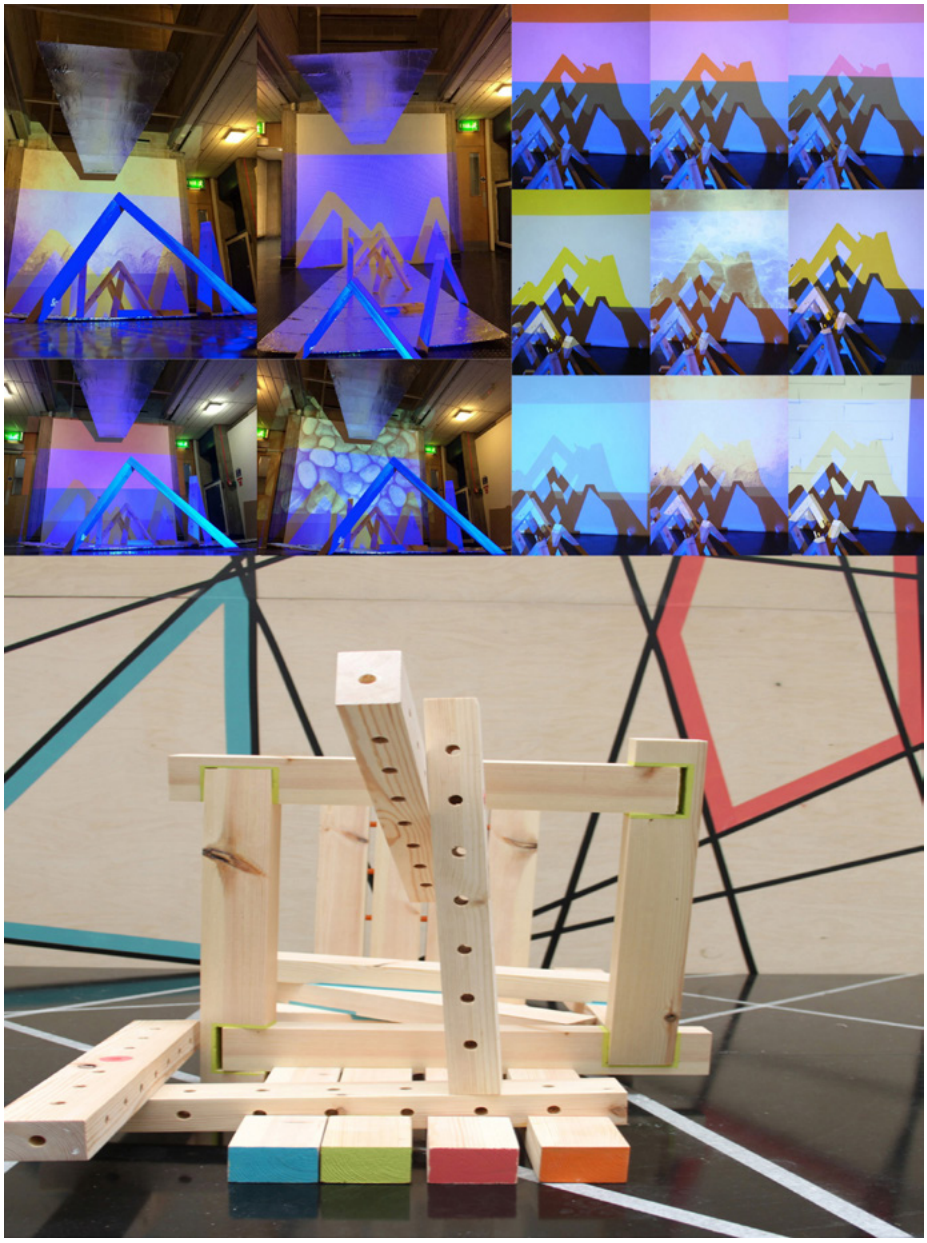

Figure 4: *Examples of the John Hedjuk inspired 'kit-of-parts' installations during the stage-two on-line exchange between Dundee, Amsterdam, Texas and Ljubljana inspired by the Socratic Dialogues methodology (Credit: Andy Milligan)*

Gradually, an arrangement took shape following numerous assemblies over one day. Once completed, the precise construction sequences were transcribed (with images/ diagrams) and communicated to all partners on-line. Those partner teams would then collectively, and concurrently, follow the instructions and attempt to replicate the arrangement exactly over a 2/3-day time-frame. This sequence would repeat with one partner taking the lead, with consecutive iterations (and subsequent partners) seeking to build empathetically upon the previous construction phase of others. At the conclusion, approximately twelve iterations had been completed across four installations. Despite the constraints there was some variability of form with intriguing structure. [Figure 4] The learning experience was dynamic and encouraged students to improvise (with materials, their assembly and also their 'bodies'). It also developed confidence in workshops, in online collaboration and on-site negotiation. Socratic Dialogues provides an intriguing philosophical route into making distinct from our current practices. As a highly iterative process, it lends itself to more instinctual and thoughtful construction that develops practical and holistic skills [Figure 5].

Industry Funded-Making at the scale Mise en Scène

Figure 5: *Dundee interior student's final installation response near the conclusion of the on-line Socratic process. Here the 'kit-of-parts' analogy was also supported by IDEO's 'body-storming' method; a physically situated and improvisational use of one's body as a prop.*

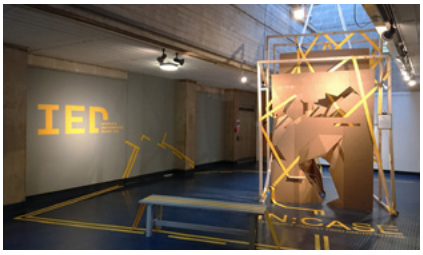

Figure 7: *The macro inspired 'IN:CASE" installation response to the RIAS industry funded making for the 2017 Festival of Architecture public programme. (Credit: Andy Milligan)*

Figure 6: *The meso inspired 'NO PLACE LIKE HOME' industry funded making by final year Interior students at Dundee as part of the RIAS'S 2017 Festival of Architecture public programme. (Credit: Andy Milligan)*

Making has also been used to energize studio practice at the start of a final year whilst also meeting institutional objectives for industry engagement, enterprise and external funding. Since 2016 we have won Partnership Grant Awards from the Royal Incorporation for Architects in Scotland's (RIAS) for their Festival of Architecture public engagement programmes [13] [14]. In 2017, the HABLab project invited three teams (of seven students) to reexamine dwelling through a micro-meso-macro line of inquiry. A mise en scène analogy helped conceptually and practically frame the project. The 'meso' team examined sofa-surfing amongst sixteen to twenty-five year-olds inspired by Shelter's user research. In 'No Place like Home?' the familiar domestic 'sofa' was disrupted to raise awareness of societies hidden homeless. This referenced the transitional realities and displacement affecting young people often missed in commercially practice [Figure 6]. 'In-Case: macro' dwelling was investigated from the perspective of student by depicting the transition from residence to residence through an enlarged and abstracted suitcase structure. The suitcase is the symbolic container students use when taking their home with them as they move to another flat; it is the itinerant motif for student living. Typically, students would occupy numerous dwellings whilst studying. Here exteriors are relative insignificant façades to the hidden interior within; the occupants; the structure or the setting for sentimental objects and rituals [Figure 7].

In 'micro', team 3 developed 'Priv(i)See-No Secret; No Walls' to explore concerns over privacy and the invasive impacts of new technology. Rather than a panacea, technology is viewed as an unwelcome guest but one that is capable of triggering new interior conditions and questions. [Figure 8]

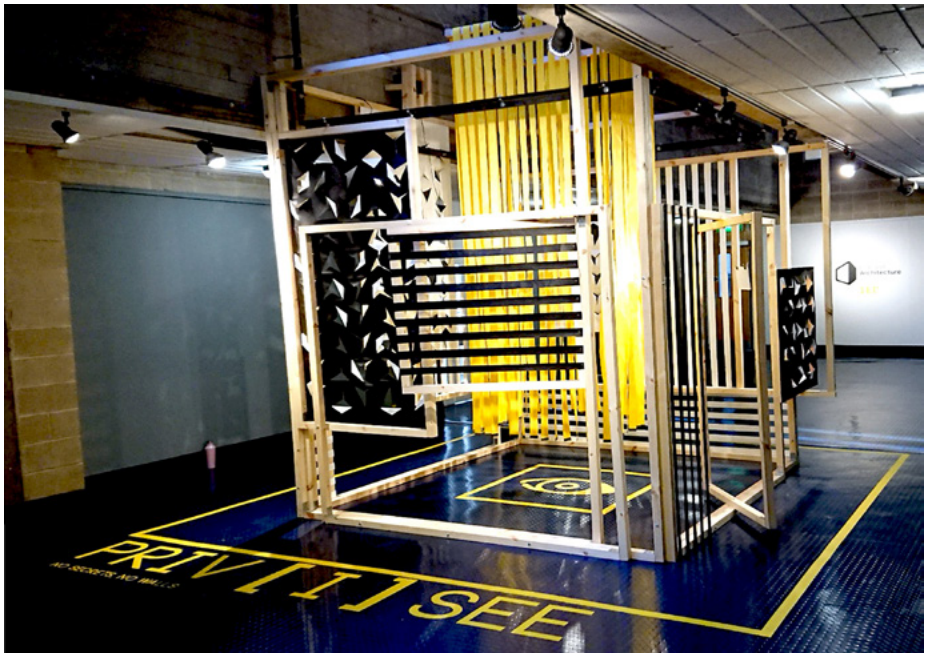

Figure 8: *The micro inspired 'Priv(i)See-No Secret; No Walls' installation response to the RIAS industry funded making for the 2017 Festival of Architecture public programme. This explored concerns over privacy and the invasive impacts of new technology. (Credit: Andy Milligan)*

Conclusions

Emotive-making exposed strengths and weaknesses. US students, though less conceptually focused, were excellent communicators. Scottish students were uncomfortable in verbalizing their making but excelled in conceptual design and were more ambitious in making. Each struggled to design thoughtful questions though their interpretive skills were encouraging. The Socratic Dialogues [15] installation study also used an on-line network. But students were resistant when they realised that their work, (like their social networked activity), would be similarly exposed. Installation outcomes were exciting nevertheless because of their unpredictability of the process. Both used conversation to inform making, whilst the industry funded HABLab energized students but allowed reasonable scope for teams to reinterpret the home/house themes whilst time and material constraints proved positive. Strategically, the micro-meso-macro themes were helpful in giving teams a creative route into the short project.

Notes

HABLab was coined by the author whilst a panel member of the British Council's 'What's the Future of Domestic Life' in discussion with Sumi Bose, Curator of Home Economics Venice Biennale.

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