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CROSSING OVER, INTO AND BACK: DESIGN DISCIPLINES AND IDENTITIES

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ABSTRACT
Increasingly design education is taking place within a *Krauss-ion* 'expanded field' of cross disciplinary practice. This explorative nature of design, when set against notions of traditional disciplines, will ask graduates to participate with certainty and confidence in this 'expanded field'. We argue that developing disciplinary identity, when reinforced by actively working across disciplines, demonstrates the value of creative solutions arising from a collaborative project space.
This paper outlines a strategy to engage students in negotiating this expanded design identity through wide ranging partnerships, which purposefully inform the collaborative, and cross-disciplinary nature of this approach. Key to each project is the collaborative interaction between external partners and mixed design groups from Fashion & Textiles, 3D Design and Communication Design. The overview and analysis of this longitudinal cross-disciplinary initiative provides insights that support a clear and positive impact on student's engagement with interdisciplinary experience and onward professional attributes (transferable skills). Findings are informed by student questionnaires, stakeholder feedback, staff interviews, and small group discussions. This paper shares perspectives on cross-disciplinary working strategies in design education and notions of design identity at a time when disciplinary identity is blurring for a future generation of design practitioners.

Keywords: Design Education, Cross Disciplinary, Collaboration, Identity.

1 INTRODUCTION

A key skill for any young designer is negotiating or contextualising complex and multifaceted problems, almost always situated in rapidly changing, unfamiliar technological or societal landscapes. Whilst E&PDE specifically addresses Product Design and Engineering Education, this paper deliberately explores design education in its widest context in order to deepen our understanding within this constantly changing 21st Century creative industries context, at the societal, environmental, and technological level.
Increasingly the currency of contemporary design education is to widen the scope and engagement of students to collaborative working, entrepreneurial encounters, and embedding life skills [1,2]. For the purposes of this paper, collaborative working refers to a process that involves subtle encounters and exchanges taking place at multiple points in a project; exchanges, shared activities, and shared spaces (virtual or real). Key to working with others is clearly the potential for negotiating shared outcomes, shared responses to creative frictions or synergies, leading to innovative ideas, or potential new challenges. The projects described in this paper attempt to convey this collaborative and layered process: between design students, with professionals from other disciplines, and with the public at large. Of particular interest are the collaborative 'threads' identified from working both between and outwith designated design specialisms. In considering nomenclature, the terms cross-disciplinary, multidisciplinary, are most relevant and for this we turned to Stember [3], who offers the former needing viewing one's discipline from the perspective of another, while the latter, involves several disciplines each contributing/bringing a different perspective. At times the projects discussed hover between cross and multi-disciplinarity, as a function of internal and external partners, but in each case outlined here, the challenge of acknowledging one's disciplinary boundaries and design identity, or understanding the impact of moving across disciplines, is key.
The features and styles that differentiate one person from another convey identity. American Philosopher Amelie Rorty [4] edited collection of essays on identities wrote "*...the integrity of our identity requires a locus of agency that is honoured by the collective but cultivated in solitude.*" This

notion of apportioning themselves when working collectively, or knowing how to parcel themselves or their skills when working in different contexts, is key skill in mitigating the risk of graduating without a clear sense of how to present ones' self, their design skills or evidence this in their work. Similarly, in his essay "What is the architect doing in the jungle", Jens Badura [5] writes of the importance of explorative practices at the interface of disciplines; specifically drawing attention to 'different approach to creation, design and exploration', that collectively allow for 'mutual transformation of evidence based on different perspectives.' Badura describes the 'new insights and forms of expressions' as '*disciplinary boundary setting*'. While his essay specifically references the crossovers between science, art and design sectors, his comments resonate further, as he identifies boundaries being most differentiated in areas of methods and practices, whereby the different forms of exploration complement each other and will ideally lead to the '*creative interplay of perspectives'* – towards a rich landscape for enhancing creativity.

Design education and the design industry is undergoing something of a 're-setting', as designers find themselves dealing with emergent creative methods and skill sets that necessarily represent a hybrid or an entirely new set of disciplines, such as Designer/Maker, UX Designer, Design Ethnographer, Embodied Interactions Designer, Nanotech Designer, and Product Artist, among others [4]. This expanded field, resulting in new skill sets and tools, it follows has given rise to new interdisciplinary or transdisciplinary post-graduate programmes [6], that evidently push at these disciplinary boundaries. Badura [7] draws attention to these changing roles for artists and designers who are working in these spaces between disciplines. Boundaries that are increasingly informing definitions, but might the blurring of boundaries also blur identities?

This paper explores the premise that disciplinary boundaries, and their relationship to a designer's own identity, are necessarily being challenged through cross and multi disciplinary collaborations. Gulari and Fairburn [8] highlighted the oxymoron facing designers, resulting tensions between 'generalist' design and the value of specialisation in the design field. Perhaps designers are generalists by nature and what they offer is a unique point of view and approach to problem solving, yet individual design disciplines provide opportunity for deeper knowledge and skills within a given area. How do students make sense of their designer intentions and how can we support and encourage skills and awareness needed to inform future more 'expanded' practices? How can educators encourage them to link these experiences to their Personal Professional Development (PPD) to help them become more confident and articulate in the skills they are developing. While collaborative initiatives across disciplines are now a frequent occurrence in undergraduate education, there still remains resistance and scepticism to students working together with students from other programmes [9]. University faculties and design programmes offer ideal platforms for introducing students to collaborations across disciplines, both within the institution, across institutions and between academia and professional spheres. The case studies described seek to highlight this landscape of cross-disciplinary working, not as a means to an end, but as a key part within the learning ecology of their professional development.

2 METHODOLOGY

The projects reflected in this paper sit within a third year (level 9) design module, within a four-year honours degree at a Scottish (post-92) University. The curriculum at this level is based on blended self-directed and team-based project work, live projects, and PPD. The project's core aim is to encourage students to examine their disciplinary nature, beyond just making things, and beyond their own subject disciplines. Students from Three Dimensional Design (Product Design, Ceramic, Glass and Metal), Communication Design (Illustration, Digital Media, Graphic Design) and Fashion and Textile Design work in mixed teams (numbers ranging from 120-135 each year). Students are randomly assigned groups, comprising at least one student from each design program (with some cohorts of students larger than others), hence the group mix and dynamics fluctuate. Table 1 provides an overview of the projects. The projects have been critically examined and analysed through a range of feedback sources, including student questionnaires, a survey, semi-structured interviews and small group discussions.

Student feedback from the first year of the project was gathered through a survey delivered by the external partner - post project. Feedback for subsequent years was drawn from annual Student Evaluation Questionnaires (SEQ) and most recently through a project questionnaire developed to gather perspectives across the programs and previous years of the project. The project questionnaire was distributed to eighteen students; staff were asked to identify two students, for each of the three

programmes, for each of the three years (2student x 3programmes x 3years). Students were asked to rate; the context of the brief, project timing, group mix and size, the key project events and the working spaces. We used a five-point scale (Poor=1 to Excellent=5, and Not Applicable). Students were asked the degree to which the project provided them with 'New Knowledge', 'New Skills', and 'New Contacts', again using 5-points: Strongly Disagreed, Disagreed, Neither, Agreed, Strongly Agreed). There was also a number of open questions on collaboration and one on identity and practice. There are three accompanying case studies, one per project, with integrated feedback from the students that provides first-hand accounts of their observations and experiences.
The underlying research question was: *How can a design education project encourage students to work collaboratively; to expand their disciplinary skill set, inform their design identity, and enable them to build teamwork experience?*

Table 1. Cross Disciplinary Projects

Year	2013	2014	2015
Partners	External: University Public Engagement with Research Unit, and Department of Chemistry	External: City Council and local communities	Internal: Knowledge Exchange Hub for Design-Led Business Support - Food Sector
Project	Design *speaks* Science	C*ommunity by Design*	*#GraniteCrumbs*
Context	Design as a medium for communication and translation across disciplines: the topic was Liquid Crystal Chemistry.	Design and community as a means to explore their own identity, design's identity, and community identity	Design as an enterprise generator using design methods to conceive of future culinary enterprises.
Group Size	10 (with 2x subgroups of 5)	5-7	4-6
Discipline Mix	Chemistry, Public Engagement and Design Programmes	City Communities, Design Programmes	Design-Led Business Support, Food Designers, and Design Programmes
Project structure	4 weeks at end of semester, timetabled group sessions	Distributed over 12 weeks. Student led.	3 weeks at start of semester. Student-led
Output	An off-site Exhibition Design OR A Design for Public Engagement	Final Presentations. Internal Panel	Competition. Expert, External judging panel

3 FINDINGS AND CASE STUDIES

To address the research question, we drew on both qualitative and quantitative data. The main elements of evidence are the project questionnaire undertaken in 2016, the survey from the first year of the project (2013), and staff interviews. Students were not offered any incentives to complete the survey or questionnaire. Note that all authors of this paper have been involved in the delivery of the projects and the academic/educational perspective might be perceived to be dominant.

3.1 Findings

A total of 16 students completed the questionnaire (89% completion rate), across all three years (2013, 2014, and 2015) and all three design programmes were represented (Fashion & Textiles, Communication Design and 3DDesign). Analysis of the results revealed some findings of significance (95% confidence level) and therefore of note. While the context of the cross-disciplinary briefs changed each year, responses for the multipart Question *1:"How would you rate the Cross Disciplinary Project?"* revealed that year on year, the students rated the context of the brief as 'Good' (63%) overall, with 13% citing is as 'Excellent' and no responses below the 'Average' rating (25%). Group size was consistently 4-6, and a significant number of students rated this as 'Good' (62%). The two key events for each project were the launch and the finale, which were rated as 'Good' (56% Briefing event, 53% Final Event). In terms of working spaces, a significant number of students rated the large event working space as 'Good' (67%). There was no significant difference between the response ratings for the following project factors: the timing of the project in the semester, or in the degree, the length of the project, the mix of the student groups or the small group working spaces. Question 7 asked students to describe themselves and their practice using three keywords. While

intended to elicit descriptors of design identity, the question wasn't posed appropriately and therefore the responses were not included. Figure 1 shows the findings for Question 2: *"The cross disciplinary project provided me with: New knowledge; New skills; New contacts."* The findings show that 56% of students 'Agreed or Strongly Agreed' that the project provided them with new knowledge. The finding for new skills wasn't significant, but over 50% 'Agreed/Strongly Agreed' that they attained new skills. Finally, 69% Agreed/Strongly Agreed that the projects provided them with new contacts/connections. The findings for New Knowledge and New Contacts are significant at the 95% confidence level (dark blue and yellow). The remaining questions yielded qualitative findings that are integrated into the case studies.

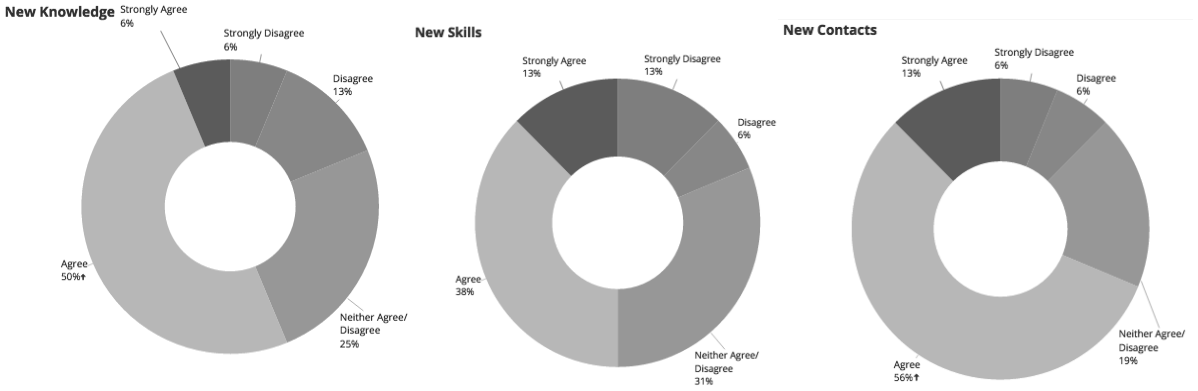

Figure 1. Questionnaire results for: "The cross-disciplinary project provided me with: _____." New Knowledge, New Skills, New Contacts (from left to right).

3.2 Design *Speaks* Science

"This was the first big project where I worked in a team of people that didn't consist of only Communication Designers. I loved seeing how differently the project was tackled by people taking different courses. Though it was a challenge to get my head around the difficult science, I became very interested in it. I feel it was important to design something based in an area I wasn't confident in." Third Year Design Student

Design as a means of translating and communicating concepts requires students to apply their skills in observation, analysis, synthesis and 2D/3D visual communication. In November 2013, chemistry researchers partnered with groups of design students to produce an exhibition on the visualization of liquid crystals. This 3-week project opened with a lecture by the lead Scientist. While collaboration wasn't directly presented or defined, an icebreaker was used to encourage student interaction by exploring what they had in common (homogeneity) and in what ways they differed (heterogeneity). Feedback revealed that initially students struggled to understand the science, or how a Scientist informed their design practice, but this quite 'fixed' position was quickly transformed by sharing 'user' reflections on the ubiquitous nature of LCD technology and translated into designed outputs. The aspects of the process students found beneficial included: "*interactions with new people*", "*working as a team, problem-solving, leading and communicating*", and "*…identifying each others' strengths and talents to find an effective way to utilize all our skills and channel them into one final outcome."* Communication challenges arose for many groups as they learned the importance of mixed approaches: face-to-face and social media. The project experiences led them to acquire valuable collaboration skills, or as one student described them as skills in '*coping and adapting to collaborating with varying personalities ranging from quite-strong, outspoken characters to more timid individuals or some who rarely participated or were lacking work ethic."* At mid-project, students attended a lecture by a Design Consultant, specializing in cross-disciplinary working between Designers and Science Researchers, who offered feedback on their interim ideas. The final exhibition evoked good engagement and the quality of the outputs was evidenced by their exhibition at a follow-on Science Festival. Feedback from staff and students highlighted the exhibition format as a social and positive approach for viewing the breadth of approaches and outcomes, with the main benefits being exposure to new knowledge, and new workshops and materials across the various design disciplines.

3.3 Community *by* Design

Design as a means of community engagement is positioned as a central aspect of the 'collaborative economy' described by Tonkinwise [10]. This project's objective was to encourage an understanding of professional identity though active engagement within proprietary community situations, thus considering the potential of placing design in a community context. Each group was assigned a geographic local in the city. The project was not positioned as social design or socially-engaged, rather as reflective and discursive. Students were encouraged to "find a way into community" by immersion into events, conversations or 'on foot', thereby drawing on user-design methods and referencing points around community and visualization. The project opened with a lecture highlighting research by the School's PhD students, who propose that an understanding of community is founded an understanding of the mesh and mechanics of individual identity and group interactions. Student Groups were required to self-organize and manage their process, thus providing an opportunity to develop skills in conversation and listening as the core skills essential to build community connections over the 12-week project. Final works were presented to internal staff. The project feedback revealed that students tended to focus on outputs that conform to their prior expectations and this proved frustrating for many - *"...If there had been a tangible, end result, involving collaboration with the group, I think it would have been more valuable."* While this offered insights into student perspectives on the value of process versus outcomes, the community engagement aspect clearly resonated with some students based on their feedback: *"It gave the chance to learn how to approach people out with…and discuss art and design"* and *"I am more aware that design has a place within community…"*

3.4 #GraniteCrumbs

Art and design schools acknowledge the growing interest in food and the most recent project invited students to create their vision for food culture through the design of culinary experience concepts. #GraniteCrumbs was a partnership with 'Design in Action' (DinA), an AHRC-funded Knowledge Exchange Hub across six institutions to explore design as a strategy for economic growth in Scotland. There was no mention of design in the project's title to encourage a focus on food and the use of social media to capture and share processes. The project's objective was to explore how design could inform and innovate food culture within their city/region through the themes of: Food History, Remaking the 'old and new', Technology, and Mapping Food Culture. Outcomes had to demonstrate their potential as an exhibition or of commercial or social enterprise viability. The launch day featured DinA design-led approaches: lighting talks by Food experts, a knowledge exchange event, and a session using the NESTA fast-idea generator [11]. Mid-project activities included a guest lecture on "Food & Design in Italy" by a transdisciplinary design duo [A+B Design] and a Skills Exchange where students rotated through peer-driven demonstration workshops to use food as a basis for material and process experimentation in assigned studio spaces. Student feedback supported that the most notable aspects of the project were multiple points for small and large group mixing, the skills exchange, and the use of an external panel of judges who attended final presentations. Feedback also confirmed the growing interest in food and culinary experiences, with the project highlighting expertise in our University environment and regionally: *"I got to know people in different specialties in the university which helps with cross-disciplinary connections. I am now working with a graphic designer, chef and mixologist on a food/design event." (Design Alumni)*

4 DISCUSSION

A key aspect of collaborative working is learning to work with individuals with differing personalities, interests and design approaches. While students and staff welcome this, there is inevitably tension as well, or as one student noted: *"As adults we should be given the opportunity to work along side other practices, but the force acts as an uncomfortable link."* Students and staff need to learn to anticipate the tensions of group work, and develop skills to navigate the early moments of working together, and 'icebreakers' can be an effective way of facilitating interactions. Understanding of self and professional design identity is a graduate attribute and one of the underlying strategies of the project. Two years post-project one student evolved their insights into cross disciplinary working and offered that "*…there needs to be more understanding of skills from each other, so everyone knows each others abilities and aesthetics …in my own work since leaving, I connect the most collaboratively when I know the style and skills of others."*

The questionnaire data and feedback clearly showed that the students rated new contacts as the most notable outcome, followed by new knowledge, and then new skills. Students confirmed their realisation that cross-disciplinary mixing, via a project-based mechanism, facilitated new knowledge of unknown disciplines (e.g. Chemistry), lesser-known aspects of design theory (e.g. Community), and skills exchange (materials and processes). The findings supported the importance of facilitating new contacts at a time in their degree when students tend to be myopic in their interactions, or as one student described the project's impact - "*it allowed me to form close, lasting and beneficial connections with students from across the disciplines. It allowed me to better understand perspectives, traits, methods and contexts from other areas of design."* While this project brought some of those intentions, students also developed and demonstrated their own ways to: negotiate power relationships; promote the exchange of tacit knowledge; manage time and expectations, and balance risk and trust. Thus, it could be said that PPD was informed by developing measurable skills e.g. creative or technical capability, presentation of self and work, realisation of projects goals, as well as more intangible attributes such as building confidence and an understanding of their own motivations.

5 CONCLUSIONS

Collaborative working raises the need to reconcile the individual and the collective contribution of individuals. In his work exploring the notion of how culture developed in the west, Williams [12] wrote of the concept of community and cultural society and emphasized - "the realization of individual potential always occurs in relation to others." While this paper offers findings on collaborative working and a cross-platform mode of delivery, what is clear is that the students also developed their own approaches. In exposure to different clients and disciplines, they reflected on their independent thinking and problem solving skills and they generated approaches to; information gathering, collaborative working in different spaces (studios and workshops), communication, and to skills exchange leading to design development and a resolved, group-designed final outcome. In fact, the project is being used to develop some professional and pedagogical programmes within the school, which is actively informing student personal awareness, critical reflection, and more.

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