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A NEW PARADIGM IN CROSS-DISCIPLINARY UNDERGRADUATE ART AND DESIGN EDUCATION

Paul WILGEROTH
Cardiff Metropolitan University, United Kingdom

ABSTRACT
In 2010, against a background of rising student complaints, the staff at Cardiff School of Art & Design (CSAD) decided to review its undergraduate provision. The findings of that review revealed that the school had inadvertently developed a 'silo mentality' where each subject area was perceived to be closed to students from other subject areas. This was frustrating the students as they found it difficult to access specialist materials and workshop equipment, hence the rise in student complaints.
The school resolved to address these issues by radically redesigning the entire undergraduate provision and to validate a new scheme that actively encouraged openness, transparency and cross disciplinarily.
The first part of this paper describes the structure of this radical new undergraduate scheme and explains how it has transformed the student experience at CSAD into a true cross disciplinary learning environment.
The second part is a case study of the success of a student studying under this scheme and illustrates how they have crossed traditional subject boundaries and used materials and techniques that the previous scheme inhibited.

Keywords: Design Education, Practice, Collaboration, Creativity, New Paradigms, Cross-disciplinarily, Collaborative Design.

1 INTRODUCTION

In 2010 the Bachelor of Arts undergraduate provision in CSAD consisted of six subject areas including Artist Designer Maker, Ceramics, Fine Art, Graphic Communication, Illustration, Product Design and Textiles. The staffrooms, workshops and studios for each of these six subject areas were located near to each other and each subject occupied a different floor of a building. While this was generally very convenient for the staff and students when focussing on the core learning within each subject, it had also inadvertently created 'academic silos' [1] within the minds of the staff and students. These silos effectively constrained them physically within their own subject area due to the desire not to stray into unknown territory. This had two main disadvantages. Firstly, it effectively discouraged cross-subject collaboration in research and learning and teaching between staff teams. Secondly, it created a barrier for students wishing to explore the possibilities of using workshop facilities, processes or methods of making used by other subject areas. This increasingly caused frustration for both staff and students, which unfortunately was expressed in falling levels of student satisfaction and an associated increase in student complaints.

2 CURRICULUM REDESIGN

The school management resolved to address this situation by radically redesigning the entire undergraduate provision to create a new scheme that actively encouraged openness, transparency and cross-disciplinary co-operation. The Learning and Teaching (L&T) methodology developed for the scheme was largely based on the adult educational theory of Andragogy developed by Knowles [2] to address the specific needs in the education of adults as opposed Pedagogy which addresses the specific needs of the education of children.
With all the subjects in the school being predominantly practice-focused the L&T strategy also relies heavily on the theory of 'Experiential Learning' [3] integrated together with the strategies of 'Autonomous Learning' [4] and 'Peer Learning' [5].

The main ambition of the new L&T methodology was the provision of a rich and diverse learning experience in a supportive learning environment, whilst also facilitating experimentation beyond the traditional boundaries of each subject area. Another important feature of the design of the scheme was to allow students from any subject area to tailor their learning to more closely meet their own needs.

2.1 Modular Structure

The new school-wide scheme adopted a simple structure of 3 modules of learning per year. Each module has a value of 20 credits (European Credit Transfer System) and is equivalent to 400 hours of student learning for an average student. This is in contrast to the previous programme structures where there were typically around ten or more much smaller credit value modules per year. This change to larger value modules is supported by earlier research that had demonstrated that the greater integration of the curriculum into larger units of learning was shown to have significant L&T benefits [6]. The basic structure of the new scheme for all subjects is shown in Table 1.

Table 1. Modular structure of all undergraduate courses in the school

Study level	Study level		
Level 4 (1st Year)	Subject 1	Field 1	Constellation 1
Level 5 (2nd Year)	Subject 2	Field 2	Constellation 2
Level 6 (3rd Year)	Subject 3	Field 3	Constellation 3

The Subject module as the name suggests is subject-specific and this is where the core subject-related lectures and practice take place. The Field and Constellation modules however offer a great deal more choice particularly at levels five and six. Table 2 gives an overview of the Product Design Programme modules.

Table 2. BA (Hons) Product Design Modules

Study level	Module Name		
Level 4 (1st Year)	Subject 1 (21st Century product designer)	Field 1 (Cross-disciplinary project)	Constellation 1 (Concept)
Level 5 (2nd Year)	Subject 2 (The practicing product designer)	Field 2 (Choice of cross-disciplinary projects)	Constellation 2 (Critique)
Level 6 (3rd Year)	Subject 3 (The professional product designer)	Field 3 (Exhibition)	Constellation 3 (Contribution)

2.2 Modular Content of the BA (Hons) Product Design

Level 4

Subject 1: The 21st Century product designer

In this module the emphasis is placed upon the delivery and learning of subject-related skills and concepts. This is therefore very much a product design practice based module supported by key lectures and is consequently based on the L&T theory of 'Experiential Learning' theory [3].

Field 1: Cross-disciplinary project

During this module the emphasis is placed upon the expertise in a student's Subject set against a wider field of creative practice. It involves cross-disciplinary teams made up of one student from each discipline within the school working as a team, and reacting to a fairly open brief. The L&T approach to this module is therefore very much aligned with the L&T theory of 'Peer Learning' [5] as the students learn a great deal from each other and how the various disciplines approach problem solving in very different ways.

Constellation 1: Concept
Here the emphasis is placed upon the establishment of conceptual and contextual frameworks. The module is designed to help develop the students' academic research skills and broaden their knowledge of Art or Design related study. As it is primarily focussed on individual academic research it consequently relies on the students developing good 'Autonomous Learning' skills [4] .

Level 5

Subject 2: The practicing product designer
The emphasis of this module is placed upon higher levels of critical practice in product design. It focuses on developing and enhancing the subject related knowledge, skills and understanding of the students. It is predominantly practice based and experimentation and small (formative) failures are actively encouraged which is very much in line with the L&T theory of 'Experiential Learning' theory [3] .

Field 2: Choice of projects
Here the emphasis is placed upon a diverse experience where students choose from a menu of 'projects' that are aligned with the academic staffs' research and/or professional expertise. By way of example this year's level 5 Field project titles included: Magical Objects, Play & Creativity, Understanding Colour, 'Engineers of the Imagination', Publish!, Rajasthan, Work Experience, Fo[u]r Rooms, Are You Sitting Comfortably, Global Perspectives: South Korea, Riverscapes & Sequence, Fab Field, Interaction Design, Things Behind the Sun, Figurative Modelling, Making Work for the Public Realm, Morocco, Faking It, Information is Beautiful, Virtual Collaboration, Physical Computing, and Tipping Point: Change Agent. These projects are then undertaken by multi-disciplinary teams of students, each team working together to solve an assignment brief. Once again significant levels of interdisciplinary 'Peer Learning' [5] takes place as the students work together, learning about each other's approach to a problem, and how the varied skills associated with the different disciplines can contribute to a group project.

Constellation 2: Critique
Here the emphasis is placed upon 'Critical Practice' [7] in relation to theoretical positions. Each student selects a theoretical topic of interest and sets out a plan of academic research in order to develop a deeper understanding of that topic. Much of this research is student led and consequently relies on the development of enhanced 'Autonomous Learning' skills [4] .

Level 6

Subject 3: The professional product designer
The emphasis here is placed upon the development of an advanced level of critical practice situated within research informed design process. It is called 'The professional product designer' as that is the level of skills knowledge and understanding the students will need at the end of their degree. The design project undertaken in this module is very much student led and the focus of the project is student selected, thus requiring high levels of 'Autonomous Learning' skills [4]. However much of the tutorial support for these projects is conducted in small peer groups of about six students which leads to significant levels of 'Peer Learning' [5] taking place.

Field 3: Exhibition
The emphasis is placed upon the testing and exhibiting of skills and concepts through the development of a personal body of work. This requires the development of a high level of communication skills using a wide range of communication media including 2D flat work, 3D facsimile models, 3D CAD imagery and video as appropriate. Once again much of the tutorial support for these projects is conducted in peer groups of about six students which once again leads to significant levels of 'Peer Learning' [5] occurring.

Constellation 3: Contribution
Here the emphasis is placed upon the development of advanced scholarship by means of a sophisticated and creative argument through the production of an appropriate form of dissertation.

This module is predominantly student led and a dissertation proposal at the start of the year is considered as a 'Learning Contract' [8]. The topic or theme of the proposal is entirely the student's choice and the programme of academic research is the student's responsibility thus relying heavily on highly developed academic research and 'Autonomous Learning' skills [5].

2.3 Outcomes

2.3.1 Positives

Students have much more choice to align their learning with their own interests. Student satisfaction has increased significantly since the introduction of the new undergraduate scheme. Consequently, student complains have dramatically reduced. In the years leading up to the introduction of the new undergraduate scheme there were between 20 and 40 formal student complains per year. During the academic year that the new scheme was introduced only 2 student complaints were received and there were no complaints at all for the next three years.

In addition, as academic staff from different subject areas had been co-teaching during the cross-disciplinary Field projects they have increasing take the opportunity to develop cross-disciplinary research co-operation. The new scheme has therefore broken down the staff-related and student–related academic silos [1].

2.3.2 Negatives

There is a possibility that a student may make a series of learning choices that results in their studies straying quite far from their core subject area and as a result may therefore become less expert in their core subject area. So for example a product design student may become more general artist / designer than a traditional product designer. However the likelihood of ill-advised choices is greatly reduced via the advice and guidance offered by the student's personal tutor. It is also worth noting that although the emphasis on the core Product Design Teaching and Learning (T&L) is in the Subject module, there is also the opportunity for subject focused T&L inside the Field and Constellation modules, so model shown in Table 2 is correct, but not the whole story.

3 CASE STUDY

This case study follows one particular BA (Hons) Product Design student through all three years of the Product Design programme. It demonstrates how he chose to explore and experiment with processes and materials that were not traditionally within the domain of the product design student in the school.

3.1 Level 4 (1st year)

During the 'Field 1' module the student, like all level 4 students across the school experienced working on a project in a cross-disciplinary group that had student representatives from each subject area in the school. During this project the product design student was exposed to the different approaches, processes and materials used by the other disciples. This piqued the student's interest in ceramics and so he started exploring clay, its properties and how it could be used to make interesting product forms.

3.2 Level 5 (2nd year)

During level 5 the student chose a Ceramics focused 'Field 2' project as part of his studies in order to develop his skills and understanding of this material. Later when he returned to subject he chose to integrate what he had learned about ceramics in to his product design work and his end of year show included a range of ceramic products in the body of work. The images in Figure 1 show two of his range of bowl designs.

3.3 Level 6 (3rd year)

During his final year studies the same student elected to develop his engagement with ceramics and explore the forms it could be used to create further. For his final project he chose to explore how ceramics could be used to design a novel and aesthetically pleasing loudspeaker, a product that is traditionally takes a largely rectangular form.

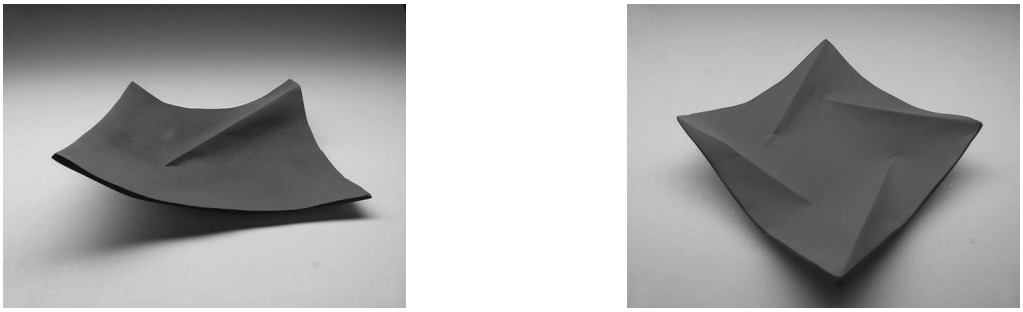

Figure 1. Examples of ceramic bowls made by the level 5 product design student

He started his design process by using paper to create soft models of a 3D form based on the concept of an 'acoustic cone' as shown in Figure 2. These were then developed into initial development prototypes in clay as shown in Figure 3.

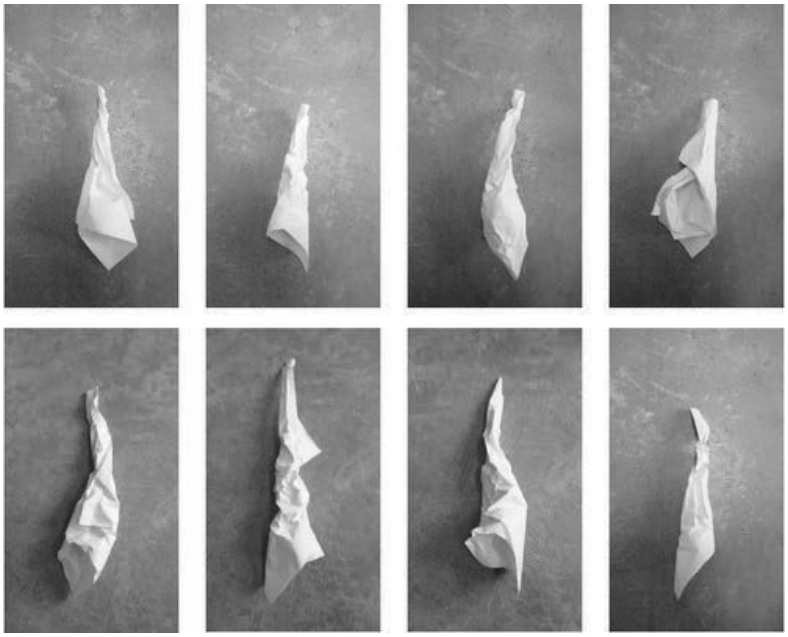

Figure 2. Examples of experimental paper prototypes

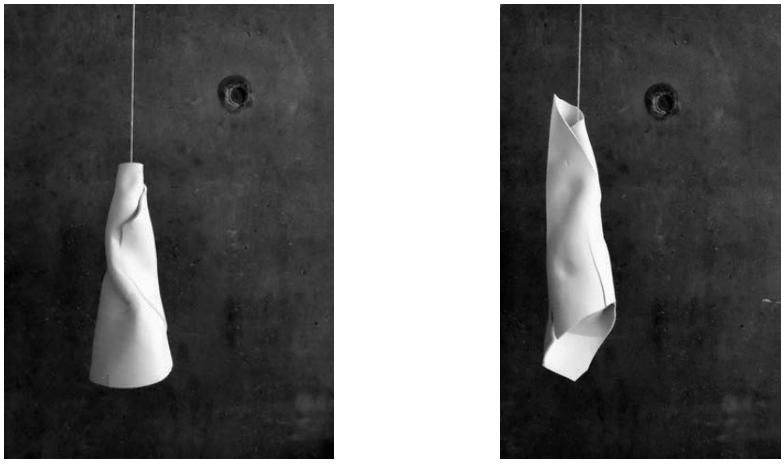

Figure 3. Example of development ceramic prototypes

His final design (Figure 4) was judged by subject specialist academic staff to be much more aesthetically pleasing than the earlier versions and has a pure, elegant, almost art like quality to it. However, it is important to note that this is a functioning product that was carefully and tested and two of them (with loudspeaker drive units installed) performed very well as stereo loudspeakers at his final

year exhibition (Figure 5). It was also refreshing to finally see a product design student in the school explore materials beyond the ubiquitous use of plastics and occasional use of aluminium that are normally considered appropriate for contemporary consumer product design.

Figure 4. Final Prototype

Figure 5. Final working prototype loudspeakers

4 CONCLUSIONS

The new scheme has successfully integrated the well-established L&T theories of 'Andragogy' [2], 'Experiential Learning' [3], 'Autonomous Learning' [4] and 'Peer Learning' [5] into a coherent and efficacious L&T strategy.

The new scheme has also met its main aim of dismantling the 'academic silos' [1] and as a consequence has facilitated high levels of cross-disciplinary working across the school with rewarding results. Since its introduction the new scheme in has also successfully increased student satisfaction and as a consequence student complaints have dramatically reduced. In addition, academic staff from different subject areas have increasing taken the opportunity to develop cross-disciplinary teaching and research co-operation. The new scheme has therefore successfully broken down both staff-related and student–related academic silos [1].

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