"Exploring the relationship between teaching and learning through practice"

REPORT MARCH 2008

Alma Boyes, Cynthia Cousens, Helen Stuart
With the students MDes Materials Practice
University of Brighton

www.brighton.ac.uk/design/cetld

INTRODUCTION

This project was funded by the Centre for Excellence in Teaching and Learning Through Design, CETLD, at the University of Brighton. The CETLD is addressing the development and advancement of academic practice in order to increase and deepen its impact across the Higher Education community and deliver benefits to students and staff. The project involved collaboration with CETLD partners the Royal College of Art, Ceramics and Glass Department through Felicity Aylief senior tutor, and the Victoria and Albert Museum.

Tanya Gomez ceramic vessel

Background

This project has grown out of our practical experience as makers, and our role as teachers and demonstrators on the MDes Materials Practice at the University of Brighton. It is a joint project involving academic staff, technical staff and students working together. Alma Boyes is Area Leader for Ceramics, Cynthia Cousens is Area Leader for Metal and Helen Stuart is Workshop Manager for the Academic Programme in 3D and Demonstrator Technician in Metal. This is a craft based course where creativity is expressed through object making.

Seainin Passi ‘glue’ neck piece

The Crafts are characterised by the **object's physical presence and materiality.** Historically the Crafts have been taught by the apprenticeship system, which includes emulation and where practical teaching is foremost. We are exploring teaching in a more practical way through the use of example, the three dimensional object and the process of making and creativity. This would sit alongside existing teaching methods centred on **the student's practical experience.**

Phil Harding Wood Form

This part of our project looks at how the discipline is currently taught through practice: chiefly through technical demonstration; and secondly through handling sessions of 3D artefacts in museum collections (findings not included in this report). It was envisaged that the project would also include research of students observing professionals creating and making, but due to time limitations this will be moved to a further stage 2 application.

Welding Demonstration

Demonstrations, where a student is physically shown how to do a process, technique or how to use a piece of equipment, are the chief way that technical knowledge is acquired and therefore hold a fundamental place in the delivery of a 3D materials practice course.

Reading a demonstration, identifying what is critical to enable emulation and then applying the information, is a complex process for students. Techniques, equipment and processes can be sophisticated, they are often used in combination, and employing them involves the whole body and all its senses.

Plaster Profiling

Aims
The overarching aim of the project is to explore the relationship between teaching and learning through practice, in order to develop innovative modes of delivery to enhance teaching practice.

The aims of this the project are to research how we teach and students learn through demonstration including observation, emulation and how they use this as part of the creative process. The project looks at more effective methods of teaching techniques, the role of new technologies to support teaching by demonstration and evaluates the role of live performance.

Our research questions are:

- How do we teach and students learn through demonstration?
- How does this inform the creative process?
- How effective is live demonstration and what is its relevance?

Expected outcomes are:

- to research the current practice and ascertain the importance of demonstrating technical processes within the craft disciplines at undergraduate, post graduate levels and within the museum context.

- to compare the role and delivery of demonstrations within craft and practice based disciplines.

- to understand how students learn through observation, emulation and how they use this as part of the creative process

- to improve and develop innovative modes of teaching in Higher Education which are practically based.
- to contribute to the quality of teaching and learning in craft based subjects nationally and internationally.

Methodology
The research is primarily qualitative; the main method used has been case studies of a series of demonstrations. We collected data by observation; both as participant observers working as demonstrators, and taking part in the demonstration itself, and as detached observers present at the demonstration. Information was recorded by video and audio and we have also interviewed and used questionnaires with students and examined 3D work made.

We observed, recorded and analysed 12 demonstrations, predominantly in the creative practice-based subjects of Ceramics and Metals. We have also researched demonstrations in other practice-based courses of Culinary Arts and Pharmaceutical and Chemical Sciences to give comparison. The intention was to research 2 further demonstrations in Sports Science and Physiotherapy. These will now be taken forward into a future project.

Demonstrations Observed

Demonstration	Level	Course
Hand Building	1	MDes Materials Practices & 3DDesign
Soldering	1	MDes Materials Practices & 3DDesign
Raku Firing	1	MDes Materials Practices & 3DDesign
Welding	2	MDes Materials Practices
Whirler	2	MDes Materials Practices
Machine Shop	2	MDes Materials Practices
Bread Making	1	BA (Hons) Marketing, Food and Drink
Pharmaceutical Analysis	2	BSc Pharmaceutical and Chemical Sciences
Plaster Profiling	Post grad	MA Ceramics and Glass - RCA
Laminated Wood	-	Forum drawn from students, researchers administrators, educators and practitioners in the arts
Choreography/ Dance	-	Forum as above
Pinch Pot	-	Forum as above

The six demonstrations observed from the MDes Materials Practice course showed the techniques *Soldering*, *Welding* and the *Introduction to the Machine Workshop* within Metals; and *Hand Building*, *Raku Firing* and *Turning on the Whirler* within Ceramics. We selected these demonstrations specifically because they covered a range of student levels, group size, technical processes and formats of delivery. Four of the demonstrations were delivered to level 1 in the Autumn Term as their first introduction to the material areas, and two were to level 2 at a more advanced level at the beginning of their material specialisms. *Soldering* and *Welding* are similar joining techniques but are at a different scale. *Raku Firing* has a parallel in the use of a flame and heat as an essential part of the process but relies on group participation. The *Introduction to the Machine Workshops* is a lecture style delivery without practical involvement from the students. In *Hand Building* the students were interactive with the process and in *Welding* they all took a turn in demonstrating the process. The *Whirler* was demonstrated to a larger group of students with restricted viewing.

We also observed a post graduate level (MA level 1) demonstration *Plaster Profiling* at the Royal College of Art. Three further demonstrations, *Laminated Wood, Pinch Pot Ceramics, Dance/Choreography,* were observed at the forum attended by 12 participants including students, professional makers, educators, arts administrators and researchers. *Pharmaceutical Analysis* was a level 2 demonstration and *Bread-making* level 1.

Data from each demonstration was collected by:

- observation recorded by taking notes
- video recording from the point of view of the audience
- questionnaires to the students
- interviewing selected students
- looking at work samples

Data was analysed by comparison between demonstrations and categorised as follows:

How do we teach and students learn through demonstration?

- <u>communication and delivery of the demonstration</u>: spoken language **–** gesture **–** tactile and other sensory communication - timing rhythm and pace of delivery
- <u>student involvement and interaction</u>: importance of student trying the process **–** use of expert and novice demonstrators **–** collective work **–** investment of learners interest - tasks given **–** learning through mistakes
- <u>environment</u> - physical - contextual
- <u>learning support</u>

How does the student's experience of the demonstration inform the creative process?

- <u>the role of prescriptive and interpretative demonstration</u>
- <u>student led demonstration</u>
- <u>demonstration set within a creative project</u>

How effective is live demonstration and what is its relevance?

- <u>dramatic value</u>: risk - role of danger
- <u>adapting to audience needs</u>: pace of demonstration **–** individual learning needs **–** development of content - building a rapport - quality of performance
- <u>conveying real time and rhythm of making</u>

<u>How do we teach and students learn through demonstration?</u>

<u>COMMUNICATION AND DELIVERY</u>

This section concentrates on the communication and delivery of the demonstration and its effects on the learning experience of the students. Simone ten Hompel (Silversmith and Reader, London Metropolitan University) made a key comment about the student learner at the forum:

“How much information do you need in order to be independent at the end?”

Felicity Aylief (Ceramist and Senior Tutor RCA) also commented on the information given at a demonstration:

> **“Its quite important with demonstrations, that you know exactly what you want to** put across whether its purely information about skill, or whether its broader about an expression or an attitude because that means that you deal with the demonstration in a different way and I think that today we saw different approaches, some were very much about a process,[...] and some where it was dealt with to inform **a way of thinking and a way forward. It’s very important to be clear when we are dealing with students, […] what route you are going down and** how much information you want to put across, sometimes there is too much or **too little”**

Such an observation asks the question, how much explanation is given around the physical demonstration and how is this communicated?

In order to analyse the differing forms of communication we have broken it down into the following sections

- Spoken language
- Role of gesture in the delivery of demonstration
- Tactile and other sensory communication, sound, smell and touch
- Control of timing, rhythm and pace of the demonstration

SPOKEN LANGUAGE

This section is divided into four areas of concern:

- Spoken delivery
- Specialist Language
- Comparison to other techniques / Use of analogy
- Colloquial and informal language

Spoken Delivery

This was the main explanatory method used alongside the physical performance of the demonstration. From the interviews with the students, the main observation they made was the importance of the direct, concise, clear, fluent spoken language. The fluency came from being experienced in and familiar with the process and well rehearsed. For example in *Hand Building,* the demonstrator had given this demonstration more than 60 times.

Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/Spoken-delivery

In *Dance,* held at the forum, Anna Carlisle (Choreographer and Educator) made a reference to specific explicit language being important for a deeper level of understanding. She told the students what she wanted them to do and why:

> **“Why am I being so specific? You are learning also to observe your own** movement. We could do this just as an enjoyable improvisation. If you want to **build your movement skills that’s why I am insisting you register what’s the** r**hythm of this thing, where is it in space, how many revolutions I am doing”**

When it was important that the information was understood and absorbed by the students, for example health and safety information given in *Machine Shop*, the demonstrator slowed and repeated to stress the important information.

Key words or phrases were repeated to emphasise important procedures, for example, **"soft soap" in** *Whirler* was repeated several times.

Sentences were often broken, for example in *Soldering* **"flux is going clear", like a verbal** equivalent of written bullet points.

Specialist Language

There are specialist words that have grown up around each material and its processes, **which need to be learnt in order to communicate with fellow practitioners e.g. "Paillions"** in metal which means small squares of solder. Awareness of these was also part of **understanding the character of the subject, for example "plasticity" and "leather hard" in connection with clay and "malleability" and "ductility" in relation metal. U**nexplained this became jargon.

Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/specialist-language

Below two interviewed students discussed their interest in learning the language makers used to talk about their processes and materials, and acknowledge the importance of repetition and clarity of delivery:

> *"The way she kept going back and saying the clay was plastic I think that's great."*
>
> *"I think not only her language was clear but also she repeated it and you do have to get to know what the material is and she is very clear at putting those words onto the material."*
>
> *"I love hearing that."*
>
> *"Its really important to have that vocabulary."*

This indicates that, although it might be tempting to bring a generic style to giving demonstrations across discipline area, the language style and even character of the demonstrator might be indicative of the material and area they have chosen to work within. A generic style might destroy the essential nature of a subject.

In Level 1 demonstrations we observed use of description first, followed by the introduction of the specialist term. In Level 2, this was reversed with the specialist language used first and the explanation given second, assuming a more advanced level of understanding.

Comparison to other techniques / Use of analogy

In this section we look at the use of a familiar process to describe an unknown one. In *Dance* **the process was likened to sculpting and drawing i.e. "carving in space" not "scribbling" or "writing" a movement. This implied using a deeper action with more** bodily movement and weight behind it.

Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/carving-space

This could lead to a breakthrough in understanding, a transformation moment. For example in *Dance,* once the demonstrator had used the analogy to describe the action, Alma Boyes as a student said:

> "I immediately understood what was required as I could relate the action to carving large scale sculptures using the whole body, a process I am completely in tune with".

Other examples were the comparison in ceramics and clay to baking. For example, wedging clay to kneading dough, mixing glazes to baking recipes and the first firing in ceramics is called 'biscuit' firing.

The way metal compressed and moved under the hammer in the technique of raising was compared to the movement of clay or dough when pushed with the hand. The consistency of liquid flux in *Soldering* was described as being "like single cream", and in *Bread Making* the dough being "as smooth as a babies bottom". The critical factor is the choice of the parallel example, which needs to be firmly within the student experience.

The comparison of one technique to another, especially one that has already been learned in comparison to a new process, could aid the learners understanding and ability to use the process, e.g. the combination of using both hands together in throwing and similarly on the whirler.

Colloquial - informal language

The use of colloquial or informal language was often employed to help learners relate to new things they are being shown. For example, in *Machine Workshop* when the demonstrator was showing the automatic snips, which could be intimidating to use, she reassuringly likened them to hand snips that are used in previously in level 1: "There's daddy versions of things you've used before." This accessible, simple language also helped to build a rapport with the learners.

Onomatopoeic language

The use of onomatopoeic language, making the sound of the action the formation of a word, was widely used to explain more complex happenings. For example, in *Whirler* the demonstrator described the sound of the air being trapped in plaster as it was being poured: "plop, plop, plop". In *Soldering*, the solder running in a spurt was described by sound and gesture: "it will usually go in a quick phfwuuurt" (wet fart sound) accompanied by a flick of closed to open fingers and thumb away from the body. In the following clip of *Machine Shop* the action of the teeth of the snips are described onomatopoeically.

Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/onomatopoeic-language

THE ROLE OF GESTURE IN THE DELIVERY OF THE DEMONSTRATION

Gesture was heavily used as a parallel language to communicate in the delivery of the demonstration. We found that it was used in three ways: to reinforce spoken word, as compensation for physical action, and as a connector to the haptic process of making.

Gesture instead of or to reinforce spoken word

Gesture was used throughout the observed demonstrations instead of speech or to reinforce verbal instruction. Almost all verbal instructions were accompanied by gesture, e.g. in *Whirler*, words momentarily failed the demonstrator when describing the "horizontal" and "vertical" planes, and gestures replaced the words. Later, the same gestures were used again to accompany the now remembered words, implying that gesture has been used specifically, with precise meanings and has become a language.

Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/gesture-to-reinforce-spoken-word

Gesture was also used significantly to support the spoken word when concepts were complex or difficult to explain.

Gesture as compensation for action
Gesture was used most extensively to accompany a verbal description of a process when it could not include the actual physical process i.e. as compensatory movement. This was most evident in *Soldering*, which was highly restricted visually, spatially, audibly and through the short time scale of the process. Here the process had to be described before and after the physical demonstration and the actions were also emphasized and exaggerated by gesture to make the small-scale more visible. In the clip, the physical movements of the torch and the process e.g. the bubbling up of the flux as it heats, which could potentially cause the solder to ping off, are both mimed alongside the verbal description.

Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/gesture-as-compensation

Anna Carlisle, (choreographer), observing *Hand Building* commented further:

"Watching Alma [demonstrating]. You make a lot of spontaneous compensatory movements because when you are working very small like this, whenever you actually put your tool down and talk to the students, your movements get much bigger and so **there's a great rhythm, from a movement observation point of view, that you see naturally."**

She emphasises the mime quality of the compensatory movement, enlarged and exaggerated in order to emphasize and make visible small-scale action. She also makes a link between the rhythm of the gesture and the natural rhythm of the making process.

Gesture forming a link to the haptic process of making
The paralleling of the spoken explanation in the demonstration with a physical gestural language, could be seen as taking the instruction a step closer to the physical action of making. It served to connect the learner to the haptic process of making, touching and handling of 3 dimensional objects. The movements relating to the processes are strongly ingrained in any experienced practitioners vocabulary. They were often repetitive movements within a process and therefore acquire rhythm and fluidity.

The use of gesture alongside spoken word offered a parallel form of communication allowing learners to access information in a variety of ways, which helped to support a diverse range of learning styles.

This led us to question whether the 3D/Craft/Materials Practice students were kinaesthetic or haptic learners? We used the standard VAK questionnaire on a group of students, (RCA postgraduate ceramics at *Plaster Profiling*), which indicated a wide range of learning preferences. However the standard VAK test does not allow for the high percentage of dyslexic students in this field (25% of the students on Materials Practices are dyslexia – University of Brighton statistics, *Progression/achievement by Gender & Disability 2006/7*, Robert Haynes). It did not differentiate between types of visual learning: between observation and reading. This is a point for further research with a more specific questionnaire.

TACTILE & OTHER SENSORY COMMUNICATION

The other senses, such as sound, touch and smell, also played an important part in the delivery of the demonstration.

Touch

Touch was one of most important senses, playing a fundamental role in demonstration; it was primarily used to collect information and as a connector to the process of making.

Gathering information by touch

There were numerous examples, within our observations, of using touch to gather information. The *Whirler* demonstrator explained how to test when the plaster was ready to turn: "you touch it and its cheesy" and poked it with the finger to test the consistency. Later the correct consistency of plaster for pouring was also demonstrated by touch and likened to double cream, with each student feeling this in turn.
Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/gathering-information-by-touch

In ceramics, the hand is the predominant tool, working directly with the clay and therefore direct touch is very important. Metal is rarely worked directly by hand but 'felt' through tools: often hand held tools such as hammers, files, and saws. A close relationship develops between craftspeople and their tools, seen as extensions of their body, they are often specially made, customised and passed down through generations.

Connection with the work through touch

Knowledge is acquired by the craftsperson holding the object while informing the creative process. This clip shows the demonstrator touching the turned plaster form as she speaks, reflecting on the information she is gathering on its form and surface. It emphasises the constant tacit connection a maker has with the piece while working on it. There is a contrast in handling styles between the demonstrator and the students. The demonstrator, who is familiar with touching the mould while working, does so with confidence and deftness, understanding and reading the form. The students explore with their hands but in a more hesitant way, poking and tentative in manner.
Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/connection-through-touch

The mould was then passed around the students for them to explore and feel the form and surface.

Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/explore-the-form

The inter-relationship between hand making and the individual body's physique

There was a close inter-relationship between hand making and the individual body's physique and how one affected the other. For instance, in *Hand Building* the students showed their surprise in discovering by touch how warm or cool their pot had become as a result of the heat of their hands as they worked and how it affected the clay.

Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/inter-relationships

Other senses

We found numerous examples of direct instruction to use the senses: in *Bread Making* students were asked to go outside into the fresh air to prevent "smell fatigue"; and in the

Machine Workshop the sound of a saw changed in pitch in the last few strokes before cutting through a metal rod. Sound was constantly referred to throughout the demonstrations to aid learning. "If you listen, you can hear the noise of the tool changing as it touches 'the head' - the old plaster" (*Whirler*)

CONTROL OF TIMING, RHYTHM AND PACE OF DELIVERY

There were examples where the demonstrator influenced the pace of the demonstration for specific reasons.

In *Whirler* the pace was purposely increased so that three things happen at the same time: the mould was passed around for students to touch; the demonstrator mixed another batch of plaster and explained what to do if the plaster form came off the head. This served to keep the students attention in the last part of the demonstration and while some processes were repeated.

> "I speeded it up to hold their attention, and because they had seen it before they could take in more information at the same time" (Alma Boyes, demonstrator).

In *Dance*, the pace was altered by the demonstrator, who clapped her hands sharply to punctuate the session, gain attention and end a phase. In contrast, before the final performance of the sequence created by the students, she slowed the demonstration asking for a still reflective time.

<u>STUDENT INVOLVEMENT AND INTERACTION</u>

IMPORTANCE OF STUDENT TRYING THE PROCESS

Machine Shop was a lecture style demonstration of approximately 2 hours, where the machines and equipment were explained but not used. In questionnaires, when asked if they felt they could use the techniques demonstrated: several students commented that they needed to try the processes in order to learn them, or use the machines in order to be confident with them.

Experiential learning was important to the students. This chart shows a fall off in the students' perception of whether they felt able to use the process directly after the demonstration in relation to whether they have had the opportunity to practice.

Demonstration	**Practice included**	**Question to students:** Did you feel equipped to use the process shown?	**Sample size**
Hand building	yes	81% yes 18% partially/with help	11
Welding	yes	83% yes 17% partially	12
Raku	yes	80% yes 20% partially	4
Soldering	no	78% yes 22% partially	9

Whirler	no	64% yes 36% partially	14
Machine Shop	no	30% yes 50% yes with practice 20% partially	10

In the forum, one of the demonstrators, Patrick Letschka made a comment about the necessity of experiential learning:

> **"It can also be like trying to describe the taste of an orange, it's very difficult to get that information across without tasting an orange."**

Kinaesthetic learning
Students felt that during *Hand Building* their attention was more focused when they could see and touch the clay**.** Not even doing the process, just being in touch with material placed them in an interactive and responsive frame of mind. A student interviewed after the demonstration said:

> **"even holding a piece of clay in the hand helped focus and identify with what was being shown".**

USE OF EXPERT AND NOVICE DEMONSTRATORS
The variation of whether the expert or the student led the demonstration also impacted on the learning experience.

Expert led
Predominantly, the demonstrations were led by the expert showing the process first, for example, in *Bread Making* and *Whirler*. This set up high technical standards with the quality and fluency of the demonstrator's expertise engaging the students. The expert's passion of the subject and the quality of the demonstrator's skills engendered respect and inspiration. For example in *Whirler* the demonstrator says:

> **"what I love….and…one of the beauty's of working with the whirler is…"**

Demonstrations are sometimes given as master classes, for example at the RCA, where an international professional comes in as a "perceived" expert. Does this perception alter the way students learn?

Where the expert leads, there needs to be a balance of expertise and inspiration and yet still remain achievable. Making it look easy and doing it well got people engaged but the challenge must be attainable in order not to intimidate the learners so they feel it's not beyond them.

> **"You make it look so easy and when you try it for yourself its much harder then you think"**
> (Student using the whirler)

The quality of the performance of the demonstration appeared to affect the student's learning. In the forum the demonstrator Helen Stuart noted the comparison between repeated demonstrations. In the less fluent version, the students didn't engage so well indicating the need for a good performance.

The question is how to bridge the gap, and create learning paths, between this expert performance and the student's initial inexperienced attempts, so that it remains an attainable challenge.

In the forum Nicola Woods commented:

> "What you have got is a knowledge gap, that once the novice gets up there a little bit they can communicate with the expert but when they first start they have this gap between their own knowledge and the expert and just observation is not enough and they need something to give them a handle on what they are seeing – and I call these things bridges. Little bridges that give them access to the tacit knowledge of the expert".

She went on to write in her Phd thesis *Transmitting Craft Knowledge: designing interactive media to support tacit skills learning* (Sheffield Hallam University 2006):

> "These bridges are not necessarily the way to undertake a task, but a way that the expert feels to be helpful at that time".

Expert first, student next
This was the format used in the Level 2 *Welding* where the expert demonstrated to a group of 4/5 students, before the students took turns individually to try the process in front of the rest of the group. A student commented:

> "actually doing it means you remember it more that just being shown it".

Discussing the repetition of the process within the group, a student commented:

> "I thought it was really useful because watching someone else doing it you learnt how you were doing".

A similar method was used in *Bread Making*, see below in pairing students.

Novice first, expert last
The reverse was shown in *Dance*, where the participants, as novices, explored and created movement in response to a given script. Once the novices had experimented with the movement, the expert took the script and made a series of movements to show advanced interpretation and skill. This technique of novice first, expert last allowed more room for individual interpretation rather than copying but still gave the learner something to aspire to.

In *Laminated Wood* the expert merely guided the process not demonstrating at all, with the novice trying it out for themselves, which resulted in a high level of ownership of knowledge by the students.

Exploration of the process by the student first is not always possible: it might be limited by the complexity and difficulty of the process or restricted through health and safety regulations of the equipment, for example *Welding.*

Novice and expert working alongside each other
Working alongside each other allowed for easy comparison between the expert and student performance and was the most immediate employment of knowledge with less time for memory to erode the information. It was exampled in *Hand Building,* where the process of making pinch pots was explored by the students at the same time as the demonstrator. This also allowed for immediate comparative feedback on the work produced. However it relied on the student looking, listening and doing simultaneously, which may become difficult if applied to a complex process.

Hand Building

COLLECTIVE WORK

Although traditionally many of the disciplines within crafts and applied arts consist of individuals working separately on processes, some disciplines use teamwork. For example, glass blowing uses this extensively, whilst silversmithing is predominantly solo work. There were several variations of collective working observed in the demonstrations.

Novice and expert working together

In some demonstrations, the expert and student worked together in shared activity, which allowed the latter to employ a more intuitive and tacit approach to learning, where it was physically 'felt' whilst taking part in the process. An example was the guiding hand over the students own to direct the torch while welding.

In *Raku Firing,* the expert and novice worked together a number of times, carefully lifting the lid of the kiln over the pack or removing the shelves from the red-hot kiln using the tongs. The precise action was transmitted from the expert to the learner to avoid knocking the work.

Raku Firing

Team work
In *Raku Firing,* all the students and the demonstrator worked together. When the kiln is unloaded they all had shared chores working as a unit or team. This created a community spirit and responsibility for each other's work and also promoted joint ownership of knowledge giving the learner equal responsibility.
Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/team-work

A student comments on the value of experiential learning and group work after *Raku Firing:*

> "I felt this exercise was much more hands on and more practical based then other demonstrations we have had. And I think that's very useful because when you're doing it you actually know what you are doing and you're taken through it step by step, yeah, and so then you'll know for future how to do it where as in demonstrations where you don't actually get to try the things for yourself often you're quite forgetful of what was shown to you and then you need to be shown again later but with it the facts being that we all did it as a group and actually did it together I thought that was very useful."

Pairing students of different abilities
Pairing students of differing abilities to practice techniques extended the expert and student working together approach.

In *Plaster Profiling* glass and ceramics students of mixed ability were paired together to copy the demonstration. In this way they gained confidence and support from each other.

Plaster Profiling

Bread Making

Throughout *Bread Making* a number of similar teaching and learning initiatives were employed. The expert first demonstrated, then chose one student to re-demonstrate the process to the remaining group. This student chose the next student to demonstrate the process again whilst the initial student moved onto the next task. In this task students **who were at an equal level were paired to support each other's learning. This gradually** built confidence stage by stage. It also created a relaxed but busy atmosphere where the students were actively engaged. Initially they learnt through the demonstration itself and secondly this was embedded by teaching and helping each other.
Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/bread-making

Likewise in *Dance,* Anna Carlisle, the demonstrator, spoke about pairing the students to help them to understand and analyse the phrase they initially created individually. She instructed her students to:

"go away and practice your phrase so that you can repeat it exactly and then teach it, share it with your partner, the differences i.e. pulling out and analysing what would amount to a variation on the same theme".

All these examples reinforced the notion of learning from each other, learning by comparison and learning by teaching.

INVESTMENT OF LEARNERS INTEREST

In the *Raku* demonstration, the students spent 2 weeks making pieces, which were used in the firing, therefore they had a strong vested interest in the demonstration. This emotional attachment sharpened their attention, which is shown in the following clip by their gasps when the shelf wobbled and they think their work might be broken.

Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/learners-interest

Despite the length of this 3 hours demonstration, which took place on a cold winter's day, the students were thoroughly engaged and prepared to take turns to watch the kiln and were all there at the end to work together.

Examples of students' raku fired work

TASKS GIVEN

Tasks given to the learners during the demonstration kept the students involved and physically alert, practicing the things they had learnt. This interactive teaching forced the group to be on their toes in case they were asked to do something and also encouraged peer group support, getting them to help each other and share information. This in turn avoided secrecy and promoted joint ownership of knowledge giving responsibility to the learner to perform. This can be seen in the clip from *Whirler* when a student was asked to mix the next batch of plaster for the mould. Another student came over excitedly to help the first creating energy and involvement.
Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/tasks-given

LEARNING THROUGH MISTAKES

Using mistakes to learn by corrections

The student's role in demonstrating the technique, whether at the outset, alongside, or after the expert, gave the opportunity to learn through mistakes. This could be seen as acting as a bridge between the expert and learner in two ways. Firstly, it formed examples of how the student could develop their performance and build skills through mistakes and corrections, and secondly when the expert made mistakes it served to build empathy between them.

For example, in *Whirler*, a mistake was made and identified by the demonstrator. Whilst pouring the plaster into the cottling "it went plop, plop, plop which is not what you want" as this created air bubbles. The mistake was then used to show proper practice: rectifying the mistake by pushing down with the back of the hand to get the air bubbles out of the plaster. Strategic mistakes also built empathy between the expert and the learner, for example, students laughed and were at ease, but too many mistakes could put the learner off.

Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/using-mistakes

Use of samples – Criting the samples

Soldering

Samples were used to point out mistakes or defects in *Soldering*. At the end of the demonstration samples were critiqued to explain the process further and to show good and bad practice. The students then made their own samples directly after the demonstration before using it again creatively in context of their project.

Example of a student soldering project, showing samples of soldering and finished pieces

ENVIRONMENT

PHYSICAL ENVIRONMENT

This research indicates that the environment is a contributing factor in how the demonstration is conducted and received by the learners. Visibility was a key problem in many cases given the layout of the workshops including the placement of machines. The layout of the course workshops on the Academic Programme in 3D and Materials Practice have been organised according to the space and furniture available and not necessarily specifically for demonstration as seen in the Culinary Arts Studio.

Constructed set

In *Hand Building* the layout of the workshop was set up specifically for the demonstration. The tables were organised so the demonstrator could walk in the centre giving good visibility to all, taking the demonstration to the audience. The use of a constructed set for demonstration purposes rather than for other criteria (such as, aesthetic reasons, comfort or practicality or efficiency as in a commercial workshop) is ideal. However the environment, which is set out for teaching and learning purposes may conflict with a professional workshop layout.

Hand Building

Another example of a very efficient constructed set could be seen in *Bread Making* at the Culinary Arts Studio. There the state of the art facilities were purpose built for teaching, demonstrating and also doubled as a professional kitchen and restaurant. The long counter divided the kitchen from the restaurant allowing the students to stand on one side and see clearly what was being demonstrated to them. The overhead cameras projected large-scale close up pictures of the demonstration in real time, giving students an alternative view-point.

Bread Making

A theatrical example of a constructed set or arena was the French bistro on the stage at the Albert Hall where Fanny Craddock performed her legendary cookery programmes in **the 1950's, many recorded** for TV. Similarly very early medical demonstrations were presented in an auditorium with a stepped audience around the central platform and operating table.

Existing set
Demonstrating within an existing set was often difficult. Contributing factors to the difficulties were awkward scale, shape of rooms and the size of the group. The *Whirler* and *Soldering* were prime examples of difficult sets, due to the given placement of the machine or equipment.

Visibility issues
In *Whirler* the detailed work was small scale and hard to see, the machine was in the corner of a long, narrow room and had a partition next to it, and there were about 20 students observing. In part of the demonstration one student was clearly on the wrong side of the partition in order to see the process and another stood on a table to gain a clear view. This could have been improved by the use of a transparent acrylic partition and mirrors placed behind and over the top. It could also be aided by short films to show details of the turning.
Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/visability-issues

Visibility particularly affected techniques and processes around small-scale objects, for example *Soldering*, where the environment created limited visibility. The shape and size of the hearth and booth was governed by health and safety regulations. The demonstrator had to work with her back to the students who subsequently only one angle to view from. The process was also noisy, forcing the demonstrator to spend more time explaining the process than actually doing it.

The breakdown of the activities in *Soldering* were:

Explaining what was going to happen	1.5 mins
Doing the process	2 mins
Explaining what had happened after the process	1.5 mins
Showing samples of the process	1 mins
Total time	**6 mins**

Static demonstrations and getting students to move
Two examples of very long static demonstrations where the students stood and moved minimally were *Machine Workshop*, which took about an hour and a half and *Whirler*, which took about one hour. In *Hand Building* the students were mainly stationary but were working sitting down.

The students may need to move around so they can see or hear better and stay alert. Anna Carlisle in the dance forum said:

> **"the quickest way to activate the brain is to move".**

Machine Shop

Through observation of the demonstrations we identified a number of initiatives demonstrators adopted to encourage the students to move around.

In *Whirler,* the demonstrator gave explicit instruction to the students permitting movement if they wished or in other instances telling the students to move accompanied by generous arm signals.
Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/student-movements

A more covert way to get them to move through vested interest, was shown effectively in *Soldering,* which linked what they were going to do next in the project with what they had to move to look at. The demonstrator said "you will have to do this, so look" and they all responded by coming in to look closely.
Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/coming-to-look

CONTEXTUAL ENVIRONMENT
As we have explored earlier it is not just the spoken and written language associated with the subject but also the layout of tools, workshop environment and the way of working, which gives the context around the discipline and the materials. One student commented:

> "My first induction in clay in ceramics I don't know if I remember the technique if you asked me to write it down what you did it might come back to me it was much more because I haven't been in a workshop for a while….it was much more about the ethos of that material, that's what I got much more."

The Culinary Arts Studio was laid out and ran as a public restaurant in which the students operated as chefs, managers, waiters etc. This gave the students a professional context through the environment in which they learnt.

LEARNING SUPPORT

Technical Notes

On the MDes 3D Materials Practice Course, where we observed half the demonstrations, written and diagrammatic handouts were the main form of support for technical demonstrations. These were given to the students at the time of the demonstration and collectively form a student technical handbook. The demonstrators recommended the students to have these with them when they work independently in the studio.

The students also made their own notes at the time of the demonstration. Some demonstrations were unaccompanied by technical notes and students also customised their technical notes, personalising the information. Note taking at the same time as a demonstration also raised the question of whether the act of writing notes put the information into a deeper level of memory and learning or whether it interfered with the visual understanding of the demonstration. This is an area, which requires further research.

Whirler

The technical hand-outs could also be accessed electronically on the University network **'Student Central'. It is questionable whether written notes are the most effective teaching** tool for arts students, in respect of the high proportion of dyslexia in Art Faculties in Higher Education. In Pharmaceutical and Chemical Sciences, photographic images, key **notes and information on the demonstration were also posted on 'Student Central'.** We have recently started to look into alternative methods of support for live demonstration, using short video clips on MP3 players to support live demonstrations. which are referred to at the end of this report (page 31).

In the newly designed Culinary Arts Studio, media equipment such as video linked overhead projection and internet facilities, were placed alongside traditional equipment. In particular live video projection was used to enlarge small-scale details in live demonstration.

Preparing students for learning at the demonstration

We have identified that in some cases more could be done to prepare the students prior to the demonstration. In *Pharmaceutical Analysis* they had a lecture first exploring the process within the analytical context.

This preparation could be particularly useful as a result of a difficult environment i.e. poor visibility or a noisy space. In *Soldering*, where both these difficulties were evident a preparatory video with samples could prepare the students better for what they were about to see.

How does the students experience of the demonstration inform the creative process?

One of the aims of our research is to look at the role of demonstration and how it is used as part of the creative process. We have looked at a series of demonstrations within the creative courses of MDes 3D Materials Practice & Design and MA Ceramics & Glass and for comparison BA (Hons) Marketing Food & Drink and BSc Pharmaceutical & Chemical Sciences.

The Craft demonstrations were not isolated activities but were set within wider creative frameworks. The courses they were placed in were part of a creative community within the Faculty of Arts and Architecture at the University of Brighton and the Royal College of Art. Here the course developed the students' creativity through parallel activities such as visual research, contextual research and material studies. Setting the demonstration within a creative project established a connection to creative interpretation of materials and processes.
We also observed a differing approach to the demonstration ranging from prescriptive to interpretative and the links these have to the creative process. Interpretative teaching of the demonstration allowed building of creativity or individuality to be introduced in connection with technique. The use of expert and novice demonstrators working in different combinations also had an effect on the creative process.

Prescriptive & Interpretative demonstrations
Interpretative teaching of the demonstration allowed creativity or individuality to be introduced in connection with technique. These were generally delivered by the academic staff and involved the student heavily. For example, in *Hand Building,* the students and demonstrator were all making pinch pots at the same time, and the differences and interpretations of the forms were celebrated, emphasising the individual and interpretive nature of the process. The important point to note here is the emphasis that there is no wrong or right way to do the process, it depends on whether you are achieving your desired outcomes and qualities. This could be seen in the range of forms of the pots, which were cut in half to show the cross section and identify making qualities.

Hand Building

In *Dance* the demonstrator asked for individual interpretations on a given theme, and **stated "a choreographer would look at the subtle dynamics that you bring as an individual to the phrase that you are going to make". She gave the participants a "spatial script" in order for each individual to create "phrases of movement, recognisably the same but variations on a theme". She asked them to work in pairs in order to "share it** [the phrase] with your partner, the differences i.e. pulling out and analysing what would **amount to a variation on the same theme".**

There appeared to be a correlation between the level of student involvement and the potential interpretation of the demonstration. The most self-exploratory demonstration - laminating wood, was highly student-led, allowing discovery of the technique through **'play'. It was merely guided by a** member of academic staff and consequently, it resulted in a high level of ownership of knowledge by the students. In contrast, *Pharmaceutical Analysis* was the most prescriptive due to the exacting requirements of the discipline where students copied the demonstrator accurately and precisely.

Interpretation and exploration by the student was not always possible or desirable: it might be limited by health and safety regulations of the equipment, for example *Welding;* or through the need for precision and accuracy for example in *Soldering* and *Pharmaceutical Analysis.*

Pharmaceutical Analysis

The demonstrations that we observed fell into both these categories:

Demonstration	**Style**	**Demonstrator Role**
Hand Building	interpretive	tutor
Whirler	interpretive	tutor
Raku	interpretive	demonstrating technician
Welding	prescriptive	demonstrating technician
Soldering	prescriptive	demonstrating technician
Machine Workshop	prescriptive	demonstrating technician
Pharmaceutical Analysis	prescriptive	tutor
Plaster Profiling	interpretive	tutor
Bread Making	prescriptive	tutor

How effective is live demonstration and what is its relevance?

LIVE PERFORMANCE

What difference does live performance make? There were several aspects to live performance that cannot be represented by video or virtual presentation. For example the sensory communication that we have been discussing can only be interactive and fully effective in live performance. Other examples included the sense of drama and danger, adapting the demonstration to the audience needs and conveying real time and the rhythm of making in the demonstration.

DRAMATIC VALUE

Live demonstration can border on theatrical performance: Fanny and Johnny Craddock, innovators of TV cooking, took their demonstrations into the world of entertainment, performing to an audience of 7,000 in the Albert Hall in 1957.

Risk

In *Raku Firing* the unpredictability and risk of a one-off performance heightened the **demonstrator's performance and learner'**s attention. This was illustrated by the collective gasp when the kiln shelf wobbled. The moment of anxiety was integral to the live performance. The tension and expectation was built up throughout the process. There was shouting and chattering and the delighted noises of involvement and excitement at the end of the long process of firing.
Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/risk

This clip also shows how humour and exchange between the demonstrator and student helped to create a relaxed and supportive learning environment.

Role of danger

The *Raku Firing, Welding* and *Machine Workshop* demonstrations had the potential for danger if not handled correctly. In *Raku Firing* **–** all the senses were employed taking in smoke, fire, heat and inevitably registering the danger. Learners experienced the social interaction of community alongside the primitive experience of standing around a bonfire. They also experienced this through working as a team and the inter-dependence it brought.

Raku Firing

In *Welding* similar senses were engaged through the sparks, flames, heat, smoke, smell, connected with the process. From the questionnaires the students said they were "Interested because there was fire" and from the taped interviews: "I like it because its dangerous".

ADAPTING THE DEMONSTRATION TO THE AUDIENCE NEEDS

Through live demonstration, the demonstrator had the potential to connect to the learners and respond to their individual needs. This allowed the demonstration to be adapted to suit the learner's needs in the following ways:

- The pace of the demonstration could be changed (see *Whirler* page 12).
- The content and delivery could change through the questions asked by the students or as a result of the work produced by the students during the demonstration.
- Individual learning needs of the student group.

For example in *Welding* there was a profoundly deaf student in the group who relied on lip reading. When the students took turns to try out the welding for themselves, the demonstrator normally gave a running commentary to 'talk' the learner through the process. In this instance the demonstrator adapted the demonstration by stopping to speak face to face with the learner. The demonstrator also explained process by drawing onto the table and physically guiding the learner's hand. The turn took much longer than for the hearing students but in the end the learner achieved the weld. After the end of the demonstration in discussion the demonstrator learnt that the learner's ability to see was affected by the goggles, which in turn affected her balance, so pointing the flame in the wrong place. This understanding of the individual needs could only have been accommodated through live demonstration.
Click on or go to this web address to view a video example of the above
http://cetld.brighton.ac.uk/projects/completed-projects/through-practice/final-report/Adapting-the-demonstration

There is the flexibility to constantly up-date, develop and improve the demonstration content and delivery over successive performances so that it remains current and of high quality. Future research could track the evolution of a demonstration over several performances.

Conveying real time and rhythm of making in the demonstration

In the delivery of demonstrations, the real time a process took often had to be abbreviated either because it was lengthy and repetitive or because nothing much happened for the majority of the time. Other contributing factors were the need to repeat the process or because part of the process could not be seen clearly.

We observed demonstrations, which ranged from a quick action such as *Soldering* measured in seconds, *Raku* which happened in the real time of approximately 3 hours and *Plaster Profiling* which was an all day event. The difficulty of conveying real time particularly affected demonstrations of lengthy or of ultra short techniques, and In *Soldering* the demonstration was lengthened and slowed in order for the information to be put across.

The earlier preparation of parts of the demonstration helped shorten demonstrations but also at times confused the learner's understanding of the real time needed to do the process. In the past the *Whirler* demonstrator reported cutting the time of the demonstration by earlier preparation of the soft soap section and just talking about the process rather than showing them. When the students went on to use the process they missed this part indicating they didn't take this in from the verbal instruction only.

The demonstration often broke up the natural rhythm of working, which involves the body and the state of mind in the process of making and creating. In *Hand Building* only part of a pot is coiled not a whole form. The students comment on their evaluation forms at the end of the project that they were surprised how long the process took.

Also the movement of the demonstrator sometimes became unnatural in order to allow the students to see. For example, in *Soldering,* the distortion of the stance of the demonstrator can be clearly seen. She would naturally be working in a balanced position with her back to the audience but moves sideways, twisting her body, to allow the audience to see the process in the restricted space of the soldering booth.

Soldering

CONCLUSION

At the onset of this project we aimed to: **Research teaching and learning through demonstration in order to assess the importance of practice based teaching and ascertain effective ways to deliver teaching through practice.**

We have studied a series of demonstrations, making observations on how they are delivered and how students learn through them in creative practice-based disciplines. The initial research began within the Academic Programme in 3D and Material Practice and latterly explored other practice-based subjects in order to compare the role of delivery of demonstrations in practice based disciplines.

Effective delivery of the demonstration involved clarity of information. **Spoken language** was the main method used alongside the physical performance but within this area there were many contributing elements. For example: the use of repetition to emphasise important procedures, the use of specialist language, the use metaphor using a familiar process to describe an unknown one, colloquial and onomatopoeic language. The fluency and familiarity with the process comes with experience.

Gesture was used as a compensatory movement to accompany a verbal description and played an important role as a connecting language between spoken explanation or instruction and the haptic process of making 3 Dimensional objects. The use of **touch** and other sensory communication such as **sound** and **smell** played an important role in the collection of information and as a connector to the process of making. **The control**

of timing, rhythm and pace of delivery served to maintain the attention of the learner and to punctuate the session.

Experimental learning through the **students involvement and interaction** with the demonstration was a key factor in the students confidence to work with the processes and techniques shown. We found a variety of approaches to delivering the demonstration: with examples of different combinations of the expert and student leading the demonstration; a correlation between student involvement in demonstrating the process and individual interpretation; and a difference between prescriptive and interpretative styles of delivery in relation to developing creativity. Mistakes and corrections acted as bridges between the student and expert, creating learning paths for the student.

Findings from our research indicated that the **environment** was a contributing factor as to how the demonstration was conducted and received by the learners. A **constructed set** where the demonstrator was central to the audience giving clear visibility was the most effective situation for teaching but this may conflict with a professional workshop layout. **Visibility** and **hearing** were key problems with the effectiveness of a demonstration in an existing set, which could not be moved. **Getting students to move around** and **investment of interest** in all cases proved key to maintaining the learners engagement and attention.

We asked the question: **How students learn through observation, emulation and how this informs the creative process?**

The students employed several methods of learning: imitation, emulation, tacit learning through observation and employment of the other senses; intuition through sharing work with the demonstrator; theoretical through verbal instruction, experiential through practice, analysis and the process of application.

We observed varying approaches to demonstration, ranging from prescriptive to interpretive. Interpretive teaching allowed creativity and individuality to be introduced in connection with the technique. This was more likely to be delivered within the academic staff role. There appeared to be a correlation between the level of student involvement and the potential for interpretation. A more individual interpretation and a sense of self-discovery was observed where the student explored the process first and the expert last. Linking the demonstration directly into what they are going to do within a project enabled a creative response to the processes and techniques.

Finally we asked the question: **How effective is live demonstration and what is its relevance?** Live demonstration has positive benefits. Live demonstration involved all sensory communication seeing, listening, hearing, touching and smell. Its flexibility potentially allowed for continual evolution and to be instantly tailored to the differing needs of the learner. It's inherent sense of risk and unpredictability heightened performance and engaged student attention. Conveying the real time of lengthy processes and the rhythm of making within a restricted timetable and fractured structure remains a challenge in any form of presentation.

One of the aims of the research was to **improve and develop innovative modes of teaching** in Higher Education, which are practically based. This has been done locally by improving our own practice and through dissemination internationally and nationally at conferences. As Area Leaders and Workshop Manager the findings from this research has changed our practice in teaching and demonstrating. This also informs sharing knowledge about teaching and demonstrating with our colleagues. The **Design Scholarship Seminar** held in June 2007 at the University of Brighton was another opportunity to create debate on the subject among staff from across the CETLD partner institutions.

We delivered a two-hour workshop at the **European League of Institutes for the Arts (ELIA) Teachers' Academy,** hosted by CETLD and The Art and Design Media Subject Centre of the Higher Education Academy (ADM HEA), held at the University of Brighton in July 2007. This was a two-day conference attended by 180 delegates drawn from teaching institutions worldwide. Our workshop questioned, through practical activity, presentation and discussion, how we teach and students learn by demonstration. The delegates participated in the techniques of hand building in clay and welding steel. We were particularly interested in an inter-disciplinary approach and participants were from a broad range of disciplines. The practical experience of demonstrations formed the basis for the presentation/discussion on teaching and learning through demonstration. Themes, which we explored included: effectiveness of student involvement in demonstrations, roles of expert and novice demonstrators, learning through mistakes, the role of sensory understanding, the effect of live performance, and communication methods.

Further to this we gave a presentation at the **CLTAD 4th International Conference held in New York in April 2008. The conference was titled "Enhancing Curricula: using research and enquiry to inform student learning in the disciplines". It focused on the** enhancement and redefinition of traditional disciplines in art and design as a result of the outcomes of research and enquiry. We gave a showcase presentation, which was exampled with visual clips and images from our observations of the demonstrations and will be included in the conference publication.

We presented a paper on at the **CLT Conference at University of Brighton, "Underpinning learning, teaching and assessment with pedagogic research",** in October 2007. The paper explored the following questions: how do we teach through demonstrations and what parallels can be drawn for learning in other disciplines? How effective is live demonstration and what is its relevance? What are the most effective ways to deliver demonstration on practice-based courses in Higher Education?

To inform our research we attended the CLIP CETL Conference at the University of the Arts titled 'Unspoken Interactions', which explored emotions and social interactions in art, design and communication in higher education. Papers of a particular relevance were concerned with the themes of engagement with the artefact in learning, embodiment – tactility, movement, gesture and their role in learning and the role of the senses in practice based learning.

In conclusion, our research project has explored the subject in general, forming baseline research, however many of the areas identified merit further detailed investigation. For example: the use of gesture as a connecting language between spoken explanation and the haptic process of making, the effect of prescriptive and interpretive styles of delivery in relation to developing creativity and the challenge of conveying the real time and rhythm of making.

Our findings indicate that there is not a total replacement for live demonstration and there is value in teaching by example alongside the student's practical experience. Video has an important role in supporting live demonstration but it could be explored further and needs to be brought closer to the student's experience of making in the workshop.

We are currently building on this research by developing the process of using short video clips on MP3 players to support live demonstrations. We have identified a number of key areas where video could be a very positive addition, not replacing the live demonstration but supporting it and aiding learning. These could be placed on Student Central, the University of Brighton's Virtual Learning Environment, and could be down-loaded onto mp3 players for use in the workshops at a point where it is needed alongside the making process. Identified areas are for example:

- small-scale or detailed work that is difficult to see in a group situation i.e. *Whirler*
- where noise prevents the spoken commentary i.e. soldering
- health and safety procedure how to open close oxy-acetylene bottles i.e. *Welding*

We have further joint funding from CETLD and Learn Higher CETL to develop prototypes of these learning tools in 2008.

This project relates to other projects, funded by CETLD, which explore materials practice **within Crafts and Design, such as 'See What Happens!** - The value of creative experimentation **through materials' Cousens, Letschka, Stofer & Wilson**

Bibliography

- Biggs, J. (2003), *Teaching for Quality Learning at University,* Open University Press.
- Darden, G.F. *Demonstrating motor skills – rethinking that expert demonstration (teaching motor skills)* The Journal of Physical Education, Recreation and Dance v68 n6 August 1997 pp13(5)
- Gray C. and Malins, J. (2004), *Visualising Research a guide to the research process in Art and Design,* Ashgate.
- Horn, R. R., Williams, A. M. & Scott M.A. *Learning from demonstrations : the role of visual search during observational learning from video and point-light models*. Journal of Sports Sciences 20.3 March 2002 p253(17)
- Robson, C. (2002), *Real World Research,* Blackwell.
- Straits, W. J. and Russell Wilke, R. *Interactive demonstrations: examples from biology lectures;* Journal of College Science Teaching 35.4 Jan –Feb 2006 p58(2) from Expanded Academic ASAP
- Woods, N (Phd thesis 2006),*Transmitting Craft Knowledge: designing interactive media to support tacit skills learning,* Sheffield Hallam University

Alma Boyes
Cynthia Cousens
Helen Stuart

May 2008

www.brighton.ac.uk/design/cetld