Research-Informed Teaching (RiT) Project Report.

Development of a Cross-Faculty Centre for Creative Design and Technology

April 2009

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Development of a Cross-Faculty Centre for Creative Design and Technology

2: Project Team:

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And numerous staff who contributed to the workshops described in section 6. Participants across the workshops included:

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3: Project Aims:

Design, innovation and creativity are hallmarks of a significant part of the provision in Arts and Technology. Equally, creative technologies are very successfully being used to unlock transformative uses of visualisation, modelling and simulation which reach from undergraduate and postgraduate education through to research and into industrial and business practice. Particularly successful exemplars of this are seen in i-DAT (Institute for Digital Arts & Technology) and in INNOVATE (Centre for Creative Industries).

The area of creative design and technology has many strands existent in the two Faculties of Arts and Technology, ranging from genetic and mimetic algorithms in engineering through a substantial body of 3D design and modelling in both Faculties, to creative arts of many types. This duplication of concepts and, often technology, exists in two different (but potentially closely linked) domains with different

interpretive views of design processes. A massive opportunity exists for synergy between parts of these activities in a transformational trans-disciplinary way. Part of the excitement of this potential lies in the burgeoning career options in the area of creative design and technology and part in the transformational advances in ways of modelling, visualising and rendering in virtual reality that are offered in a synergetic collaborative partnership.

It will be possible to develop an exciting new strand of degree programmes, perhaps commencing with a Masters programme (taken as either an MA or MSc) with international draw to embed leading research concepts. This can extend down to include the existing new developments such as DSGN143 (Integrated Systems Design) in UG taught programmes. The really novel part of this proposal is that as well as embedding the various forms of discipline research within the teaching of UG and PG programmes, there is an associated development of new transformational research areas and a synergy from the body of research and research methods in two different disciplines. Virtually by definition, the developments in research informed teaching will be cutting edge in themselves.

The project was received funding for 3 years in the form of 50% support for a new lecturer position to lead integration in this area. The Faculties of Arts and Technology would each commit 25% of the cost, and guaranteed permanent employment for a successful appointee. The person would have a joint appointment in both Faculties to ensure that this activity remains straddling the interface, even though it is certain that some of the developments will be more heavily weighted towards one Faculty or the other.

4: Methods:

Shaun Murray was appointed to the position described above following a cross faculty working group which defined the job specification and participated in the selection and interview processes. Shaun Murray has successfully operated across the Faculties of Art and Technology to develop strategies where commonalities and differences could be identified, framed and articulated. This was achieved through:

• A series of meetings and presentations between staff in i-DAT and Design and Architecture.

• Development of new undergraduate programmes.

• The development of new modules.

• Cross faculty teaching and student project support.

• The development and delivery of transdisciplinary workshops.

• Development of research projects and publications.

 The outcomes and impact of these activities are extensively described in section 6.

5: Students:

The embedding of the project activities through the workshops and modules (described in section 6) has enabled the project to reach a large and diverse range of students from several backgrounds, including:

BA/BSc Digital Arts and Technology: http://b.i-dat.org/ : 10
BA Fine Art: 4
BSc Multimedia Production & Technology: 5
MA/MSc/MRes Digital Art & Technology: http://m.i-dat.org/ : 10
MA Performance Practice : 2
MA Spatial Design: 5
MA Design : 2
MRes Design Thinking: 2
MA Contemporary Designer Maker http://www.3ddesign.org.uk/ : 2

Advanced Architectural Design, AHO Oslo School of Architecture and Design, Norway: http://www.aho.no/en/ : 18
A.V.A.T.A.R, Bartlett School of Architecture, University College London, UK: http://www.avatarlondon.org/ : 20

Module delivery through IDAT106: 70
Module delivery through IDAT306: 17

Cross Faculty student Project support: 40

6: Impact:

New Programmes:

As part of the strategic intention of the project to bridge the disciplinary gap between the domains of 'technology and design' and 'art and design', the existing hybrid territory occupied by the BA/BSc (Hons) Digital Art and Technology programme was identified as offering a potential bridge. The programme had emerged from an initiative put in place in 1992 through the formation of the BSc (Hons) MediaLab Arts degree. This programme embraced both the creative and technical opportunities offered by the 'multimedia' or 'New Media' 'revolution' and successfully brought together technical computing and creative media activities.

The programme has evolved through its established discipline of interaction and interface design to embrace increased online and 'backend' server-based activity. In parallel to these activities there has been an increasing tendency for students to develop 'physical' mobile and 'ubiquitous' or 'pervasive' computing projects that require the development of physical, haptic, object/device, installation/environment based systems. Consequently staff are supporting student projects which require the manufacture of objects/devices with embedded technologies that operate as interfaces to interactive physical, and 'virtual' environments. These projects engage with emergent industry practices and changing cultural relationships to information technologies.

The project set about reviewing the practices and pedagogies employed to deliver the existing programme. This led to a restructuring of the programme, the

development of new modules and two new named programmes which allow students to enhance and focus on aspects of their practice framed within the ambitions of the CCDT. The intention was to develop a strong substrate upon which to build the CCDT activities.

BA/BSc Design Ecologies and BA/BSc Design for Visualisation are intended to operate as cross-discipline (currently within Arts and Technology, but from August 2009 to be within Arts and Science & Technology) initiatives from the Centre for Creative Design and Technology, a trans-disciplinary catalyst for innovation to influence the evolution of new creative design practices and strategies.

In providing a catalyst for innovation across the areas of interest represented by the two faculties this programme will:

• Attract students interested in exploiting new potentials offered by these technologies.

• Influence the evolution of new creative design practices and strategies previously restricted by interdisciplinary disciplines.

BA/BSc Design Ecologies and BA/BSc Design for Visualisation are intended to operate as cross-discipline initiatives from the Centre for Creative Design and Technology, a trans-disciplinary catalyst for innovation to influence the evolution of new creative design practices and strategies.

BA/BSc (Hons) Design Ecologies:

BA/BSc Design Ecologies is a trans-disciplinary programme that operates across social, environmental and technological design practices. Through digital and analogue processes students will explore cutting edge technologies of bio-engineering, nanotechnology and interaction design. In an age when process replaces product, industry requires individuals who understand a wider web of relationships to develop strategic ecological design solutions. By exploring the potential of digital technologies to model, visualise and simulate this programme actively and critically engages in the territory that lies between the disciplines of creative design and applied engineering.

BA/BSc (Hons) Design for Visualisation:

BA/BSc Design for Visualisation provides a timely opportunity for students to engage with a range of cutting edge technologies and processes used for the manifestation of micro, macro, material, immaterial and imaginary worlds. The contemporary technologies of visualisation and simulation transform our understanding of the world by revealing the invisible and immaterial. This programme offers a rich potential for artists, designers and engineers to explore digital animated media, immersive Dome environments and scientific imaging technologies. Students engage in a wide range of creative and technological areas that ultimately enables them to develop and design innovative forms for audio/visual manifestation in a range of environments and audiences.

New Modules:

The restructuring builds on several innovations and modifications to existing programmes and modules. This suite of Programmes includes; the well established BA/BSc (Hons) Digital Art & Technology and BSc (Hons) Multimedia Production and

Technology and the new BA/BSc Design Ecologies and BA/BSc Design for Visualisation Programmes.

These Programmes are indented to provide a strong trans-disciplinary foundation for the future growth of the Centre for Creative Design and Technology by providing critical interfaces for inter-Faculty and School interactions.

To achieve this, the Programme Planning Team have streamlined the modules offered to these Programmes to provide a core of modules common to all four, with increased specialisation in the Final Stage. The result is:

• The spine of new 'Workspaces' (20 credit) modules in Stage 1 and 2, which are linked to IDAT101 'Strategies for Digital Art & Technology' and the new Stage 2 'Strategies for Digital Art & Technology 2' module (20 credit). These collectively provide a rich mix of theory and practice and will operate on a series problem based student centred projects, as is currently the case with IDAT101.

• The new Reflexive Design Module (20 credit) in Stage 2, common to all Programmes, which effectively This module compresses several over lapping modules (Trans-Spatial Design, e-Learning and HCI) and provides a mix of practice, theory and trans-disciplinary design methods.

• The new Visualisation Module (20 credit) which provides an intensive experience of modelling, animation and visualisation drawn from a range of disciplines and effectively builds on the activities of the Immersive Vision Theatre.

• New Project Modules (40 credit) based on the existing and well proven model of student centred negotiated self initiated projects employed by BA/BSc Digital Art & Technology.

• The standard 20 credit Dissertation module is employed across all the above programmes to support a strong critical, historical and theoretical articulation of the project work.

Pedagogy:

Generally the learning environment employs an embedded approach to theory and practice based on creative problem solving supported by a critical and technical scaffold. Based on existing practice this focuses on the delivery of enabling practical and technical skills in the Stage 1. This is an essential requirement considering the Industrial Placement requirements for Stage 3.

However, these pragmatic technical skills are framed within speculative and experimental projects with the outcomes defined through a process of negotiation with tutors. This is often problematic for many students who generally have limited experience of both the subject (interactive media is simply not encountered to any useful extend within the curriculum) and creative practice (processes which appear to be increasingly erased from the curriculum).

In the context of these programmes it is important to remember that students tend to come from a variety of A Level backgrounds and few will have creative/art/design experience other than pre-A Level. Often those equipped with a creative arts educational background struggle with the digital aspects of the programme.

The new modules enhance activities touched on by existing modules by providing

students with practical technical and creative skills for the production of digital art and design. Through lectures and workshops students are introduced to the technical attributes of a range of digital systems and supported in their development of practical and creative strategies for solving specific problems across a wide range of media. Students are introduction to contemporary design processes from conception through development, to realisation.

Supported by a critical examination of cultural artefacts, modules require students to synthesise a design practice with an understanding of historical, human-centred, environmental and educational principles. Modules provide students with a range of practical experiences for design and manufacturing processes which explore the evolution of making processes from traditional techniques such as casting and moulding, to contemporary technologies such as rapid prototyping, reverse engineering, composites and CAT/PET scans.

Modules develop audio and visual production skills with a specific application to the manifestation of information drawn from a variety of sources, disciplines and media. Students will develop techniques for rendering visual and acoustic representations across a range of resolutions through animation, illustration, dynamic data, and immersive dome environments.

Workshop model:

Central to these processes and learning experiences is the workshop module developed through the project. The workshops delivered through the project can be found in Appendix E.

The four workshops were delivered outside of the normal modular structure and incorporated a mix of undergraduate, masters and PhD students drawn form across the fields of architecture, 3D design, communications design, performance, CAD, digital art and technology, multimedia production, programming and engineering, but also brought students from different Higher Education Institutions from the UK and Norway.

Workshop 1: Sliding Scales

Sliding Scales presents a view of our relationship with the peculiar landscapes of digital technology as an 'ecology'. In exploring these landscapes we navigate through a territory that is disturbed, moist, blurred and vacillating. .We are forced to focus on the 'relationships between' where process replaces product in importance, just as systems supersede structure. The tools that form these landscapes are harbinger's for a meaningful ecological (both machinic and natural) audit of specific sites and processes. They demand the development of new strategies and protocols for their users (designers, engineers, architects and artists) and require that the sites, agents, provocateurs, disparate observers and drifters that consume and influence their output critically engage with them. Modern architecture has currently failed to provide architects with the necessary tools to create architectures that are fully in tune with the wide gamut of artificial and natural ecological conditions. For those of us interested in the development of architectures for the post-biological inhabitants of the twenty-first century this 'Sliding Scale' represents a beacon in a still dark landscape.

The aim of the workshop is to explore, polemicise and develop architectural ideas and solutions that engage with this digital ecology. These include the impact of the

advanced technologies of reproduction, new techniques in communication and issues of sustainability.

"When art is a form of behaviour, software predominates over hardware in the creative sphere. Process replaces product in importance, just as system supersedes structure."
(Roy Ascott, 1968)

Context
In May 2004, i-DAT organised a project and exhibition for Architecture Week in which architects were invited to submit an object to be scanned by an Electron Microscope. The scanned images were blown up to A0 size and exhibited in the Out of Scale show at the Plymouth Arts Centre. Out of Scale explored architecture's relationship with image, digital technology, structure and materials, by focusing upon microscopic detail. The show reveals the unusual relationship that architects have with scale; how the digital systems and measuring tools transform models of actuality, from the precision of the scalpel blade used to make a model to the materials used to construct the finished building. As demonstrated, when faced with such a decision, the architects made some very unusual choices, all of which point towards larger issues fundamental to architecture.

Workshop 2: Revisioning the Library

Introduction
The RFID workshop over two days was a chance to speculate on the future of the library. The library is undergoing self-reflection on the relation between its physical and electronic resources, spaces and systems. The starting point for rethinking these relations was to introduce technologies that can store and transmit data, and to begin to imagine scenarios where the physical and digital objects collapse onto each other. Might agency extend not only to readers but to the books themselves in such a scenario?

Francis Hunger, 'How I Learned to Love RFID', HWKV 2006, http://www.hmkv.de/dyn/e_program_events/detail.php?nr=1239 - as for many other technologies, which are used in the civil sector, the basics of RFID were commissioned and developed in the frame of military research. In late WW II the British Royal Airforce used "tags" on their planes to decide whether it was a "friend or foe" signal that was reflected by radio waves, used in radar technology. 1RFID uses a similar basic concept. A radio wave is sent to a transponder – more commonly called "RFID tag" – which then wakes up, consumes the energy of the initial radio wave and sends back data to the sender/receiver unit. Through the 1950s to 1960s, this concept was developed into electronic anti-theft devices that were in fact 1bit RFID tags. They could be set either on or off and would signal ifa person has paid and the cashier did subsequently deactivated the tag. So the theft alarm devices that are positioned on each entrance/exit of shops are very basic RFID readers. In the 1970s several patents for RFID applications where issued and passive and active tags were developed in the private sector and in military research. Today they are intended and used basically for supply chain optimization in logistics.

Context
Bruce Sterling, 'The Internet of Things: What is a Spime and Why is it Useful?' http://video.google.com/videoplay?docid=-3857739359956666768 In the future we

may be able to find lost keys with a simple Google search. Science fiction writer Bruce Sterling imagines how physical objects will be part of the internet as they become trackable in space and time. Bruce discusses the theoretical and technical challenges that we face as we try and think about and develop the Internet of Things. From 'Spimes' to 'Thing Links' to 'Blogjects', the terminology and verbal framing devices currently being used are pulled apart in this keynote address from the 2006 O'Reilly Emerging Technology Conference. Duncan Shingleton, 'RFID and the Internet of Things: You are part of the Global Network', 2007, http://www.shingleton.org/?page_id=142 Objects tagged with a Radio Frequency Identification (RFID) chip have a unique digital identity and play a pivotal role in joining the physical world with the digital. A resulting 'Internet of Things' emerges, consisting of networked objects that are capable of communicating what they are, and what is going on in the space around them. This is the moment where the real world and the Internet become inseparably linked, occupying the same space, becoming the same reality: a merging of 1st and 2nd Life. Current theory surrounding the Internet of Things maintains the viewpoint we are outside the network and in control of the agency we have over our objects. The tagged object's role in the Internet is to streamline economic practice and make our lives more convenient. However I propose and alternative hypothesis for addressing the theory that RFID now means we are included within the Internet of Things, and not spectators of this new digital age. There is a resulting transfer of agency as objects become active members of society, contributing to social debate, as we see what can only be defined as a truly ubiquitous network environment emerging, where the real is intrinsically bound with the digital. Wikipedia definition of RFID, http://en.wikipedia.org/wiki/RFID

Workshop 3: Outside/Inside

Introduction
Touch is our bridge with architecture and the world. All of our senses are extensions of touch, since ears, nose, mouth and eyes are specializations of the skin, the most sensitive of our organs. As Pallasmaa's puts it; "touch is the unconscious of vision, and this hidden tactile experience determines the sensuous quality of the perceived object, and mediates messages of invitation or rejection, courtesy, or hostility.". Digital technologies are allowing us to 'touch' different spaces that are both inside us and outside us, and close to us and far away from us. This two day workshop will encourage students to consider the design space that is found between the GPS satellites that orbit the Earth at a height of 12,600 miles, and the 20cm sensing depth of Ultrasound that can reveal the organs beneath our skin. The first day will involve a day trip into the wide open spaces of Dartmoor National Park to explore the idiosyncrasies of recording movement, form and location through the correlation of data gathered from the satellites and space vehicles that are circling the Earth. In contrast the second day involves a short workshop at The Peninsula Radiology Academy where students will have to opportunity to use ultrasound technology to scan the insides of a live human body. Punctuated by a dinner on the evening of the first day, students will work toward creative design propositions for exhibition at the Bartlett School of Architecture later in the year.

Context
The sense of touch obviously plays a unique and important role in human interaction. Touching is not only closely linked to sexual activity and to notions of closeness and intimacy, but, as evidenced in our language, is often used as a metaphor for

emotional impact (i.e., "I was really touched by her story"). Furthermore, as evidenced in the research on social touch, touching plays a role, albeit sometimes subliminal, in a much wider variety of social transactions than is ordinarily appreciated. In general, it seems clear that the inclusion of touching in shared virtual environments will strongly increase the sense of togetherness. Durlach, N. & Slater, M. (1998). Presence in shared virtual environments and virtual togetherness. Cambridge: MIT Press. When technologies facilitate communication they are in a sense amplifying our natural senses and perception. It is as if our eyes, ears, and mouths were extended beyond their normal reach and capability. But technologies extend our perceptions asymmetrically. Phones improve our hearing but do little for our vision. Email is used for conversation, but of a kind that lacks the tone and expressiveness of the voice. Thus it makes sense to ask how a technology extends or amplifies the sense, in what mode, and with what kind of results. (2003) Chan, A., (2003) Materiality and amplification: design, functions, features, and the interface to the human face. Web ref Touch is the sensory mode that integrates our experience of the world with that of ourselves. Even visual perceptions are fused and integrated into the haptic continuum of the self; my body remembers who I am and where I am located in the world. My body is truly the navel of my world, not in the sense of the viewing point of the central perspective, but as the very locus of reference, memory, imagination and integration. Pallasmaa, J. (2005) The Eyes of the Skin – Touching the World. Chichester : Wiley.

Workshop 4: International workshop: AHO+BARTLETT= i-DAT

Introduction
Architectural ecologies: from aesthetics to behaviour, an interdisciplinary approach to affecting the relationships and interactions between inhabitants and their architectural environment. This workshop will experiment with and forecast potential future use, impact and value of using 'data' generated by a building and its inhabitants, to recursively influence behaviour, creating a symbiotic ecology with a potential greater environmental awareness. Through an interdisciplinary approach it will encourage the development of an organic list of solutions or potential methodologies for building design based on the study of the main factors: behaviour, data and interaction. The resultant hybrid construct has the potential to expand and evolve our physical and conceptual space, and behaviours and interaction within these. The word "building" contains the double reality. It means both the "action of the verb BUILD" and "that which is built" – both verb and noun, both the action and the result. Whereas architecture may strive to be permanent, a building is always building and rebuilding. In such a state the space boundaries and thresholds maintain a dynamic pluralism between contemporary tectonic architecture and abstract environmentally generated data. Buildings have often been studied whole in space, but never before have they been studied whole in time. The interests reside in a synthesis that proposes that buildings adapt best when constantly refined and reshaped by their occupants, and that architects can mature from being artists of space to becoming artists of time.

Context
The workshop will use the Arch-OS system (www.arch-os.com) as a starting point for this investigation. Current literature on Intelligent Buildings suggests an ideal of a building as an autonomous system that controls its internal and external environments. The model, whose origin lies with early models of artificial intelligence, effectively treats the building as a slave to human needs, and appears to vest more intelligence in the building than its occupants. Arch-OS exemplifies an approach of

seeing environments as extensions of human sense, by increasing building occupant's consciousness of their environment. With this ecological model of Intelligent Building we can now question the autonomy of the building from its users. Sensors within the building yielded data for processing by the system, which in turn actuated equipment that affected the environment. The Arch-OS project was created to enable a greater transparency and understanding of the complexity of modern buildings and the relationship between its inhabitants and their behaviour. The system enables building occupants to reflect on the environmental impact of their interactions, both physically and through the extended social interactions enabled by communications technologies. Through the acoustic and visual representation of their social activity combined with live representations of data generated by the electro-mechanical and environmental activities of the building, occupants are able to better understand the complex relationships that exist between each other and their environment.

Vertical Teaching:

Apart from the interdisciplinary mix of staff and students a critical practice which had a significant impact on student experience was the incorporation of vertical teaching, especially in the final workshop. This is being employed as a strategy in the Workspaces 1 & 2 modules in September 2009. Students in Stage 1 and 2 will operate as mixed production groups. We see the process as supporting:

1: An accelerated understanding of the aspirations of speculative projects. Stage 1 students will learn rapidly from students who previously experienced the mix of pragmatic technical skills and experimental negotiated projects.

2: A reflexive understanding of the learning process. Stage 2 students will learn from the experience of seeing students going through a similar process as they previously experienced. A critical aspect of this is the understanding that we often forget that we have learned something.

3: The collegiate feelings across stages of the programme will enhance the proactive engagement with and ownership of a course.

Publications:

During the project staff have produced a range of publications and outputs, two have particular relevance to the aspirations of the CCDT.

1: Intellect Journal Agreement

An outcome of the project has been the formation of a journal, now accepted for publication in 2011 by Intellect. A draft descriptor is included in Appendix E.

The proposed journal addresses a growing need for a cross disciplinary approach to develop strategies and articulate complex problems that impact on the theory and practice of artists, designers, architects, engineers, earth scientists and ecologists. Environmental Art and Architecture focuses upon the juncture of man, environment and technology. The fusion has had a dramatic impact upon the scope of a variety of disciplines, which range from bioengineering and nanotechnology to interaction design and citizen science. This interdisciplinary approach is radically affecting relationships and interactions between inhabitants and their environment through the use of technology. This stimulates new methods to support and develop theory and

practice, in particular a distributed network approach through which the ethics of ecological sustainability can to be realised, in society as well as in the ecosystem. In this context projects and initiatives are not the property of the individual but the property of an entire web of relationships.

2: INTERNATIONAL SYMPOSIUM ON ELECTRONIC ART 2008 (ISEA 2008)

25 July to 03 August 2008, SINGAPORE. http://www.isea2008singapore.org/

Intelligent Architecture - Complex Environmental Networks

In this panel session the authors explore the potential of 'Intelligent Architecture' as a critical, reflexive and enabling tool to support social interaction, trans-disciplinary research and ecological strategies.

The panel uses the various iterations of the Arch-OS system (http://www.arch-os.com/) as a critical model for the manifestation of dynamic data (social, temporal, ecological and digital/electro/mechanical). The authors critique the role of these technologies and their ability to effectively model, communicate and modify human behaviour. Arch-OS explores the potential generated by the translation of dynamic data from physical and social interactions within a building into volatile and evolving interactive art interventions. The conceptual underpinning of this panel centres on the opportunities offered by dynamic generative data that would otherwise be invisible. With this approach we aim to convey the sense that a more meaningful 'architecture' is physically revealed by peeling back its skin and architectural surfaces and giving the feeling that the occupant is an integral part of the building.

The agenda is to create interventions that perform vital and integral roles in the development of trans-disciplinary research (for example; nanochemistry, applied chemistry, environmental science, biotechnology, and forensic science), ecological monitoring, visualisation and awareness (collaborations with the Centre for Sustainable Futures and the English National Opera) and the development of new architectural strategies. The artworks potential is to represent the visualisation of quantitative scientific research as a qualitative experience within the fabric of the architectural environment. Through large-scale visual projections, 'personal computing', intimate mobile interactions, and the multiple auditory experiences, these systems reveal subtle dialogues between the behaviour of the buildings inhabitants and their environment.

These strategies are demonstrated in two significant applications: The original Arch-OS installation (http://www.arch-os.com/) in the University of Plymouth and Peninsula Medical School, Plymouth UK and the i-500 installation (http://i-500.org/) working with Woods Bagot Architects in Curtin University's new Minerals and Chemistry Research and Education Buildings, Perth Western Australia.

The panelists are:

Shaun Murray - Lecturer in Digital Art & Technology appointed to develop the CCDT.

Mike Phillips - Reader in Digital Art & Technology, director of i-DAT.

Dr Chris Speed - Reader in Digital Architecture in the Schools of Architecture and Landscape Architecture at Edinburgh College of Art.

Dr Paul Thomas - currently a Senior Lecturer, Curtin University of Technology, Department of Art, he is coordinator of the Studio Electronic Arts (SEA) at Curtin University of Technology and is the founding Director of the Biennale of Electronic Arts Perth (BEAP).

7: Summary

The grant holders therefore believe that this project has achieved an impressive and sustained effect on the learning environment and experience of a number of students working in interdisciplinary and transdisciplinary areas that are a key component of the national agenda in creative arts and the underpinning creative technologies. The project has achieved its intention of initiating a powerful, new, and timely interface between technology, digital resources, design, architecture and art.

This project has met its intention of contributing to the themes of:

Knowledge Transfer
- Working with professionals
- Researching practice
- Employability
- Problem- based Learning

Knowledge Management
- Databases and data-mining
- Managing creativity
- Peer Review
- Blended Learning

Knowledge Sharing
- Case studies – Expertise-based case studies
- Web-based packages for student support

Equally, the dissemination of its findings has been successfully achieved both within and outwith the University of Plymouth. These processes of dissemination and embedding of innovative learning and teaching are ongoing and a case is in the process of being prepared for the University to recognise a Centre of Creative Design and Technology housed in the Faculty of Science & Technology but with powerful links into Arts.