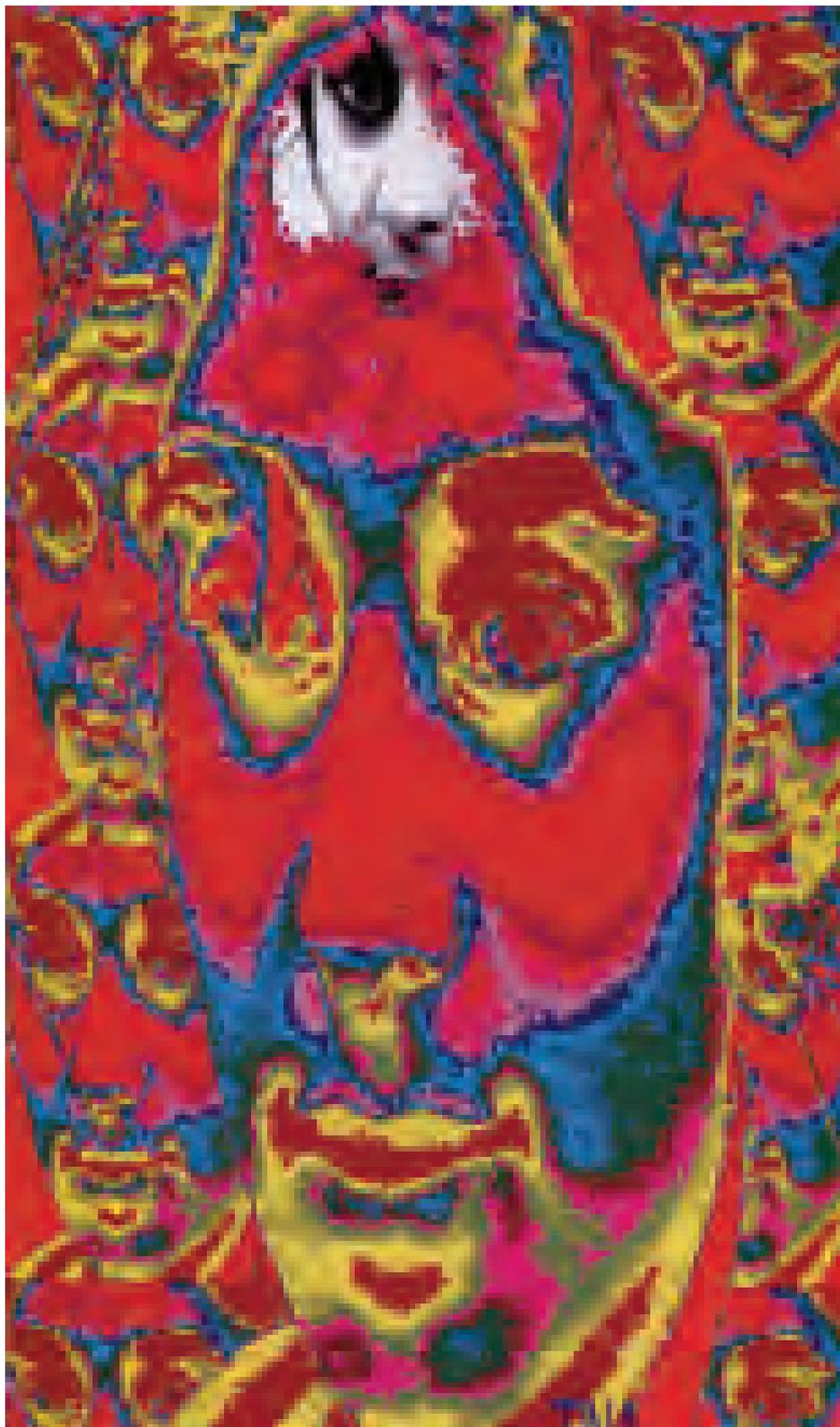
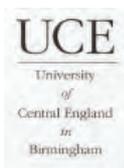


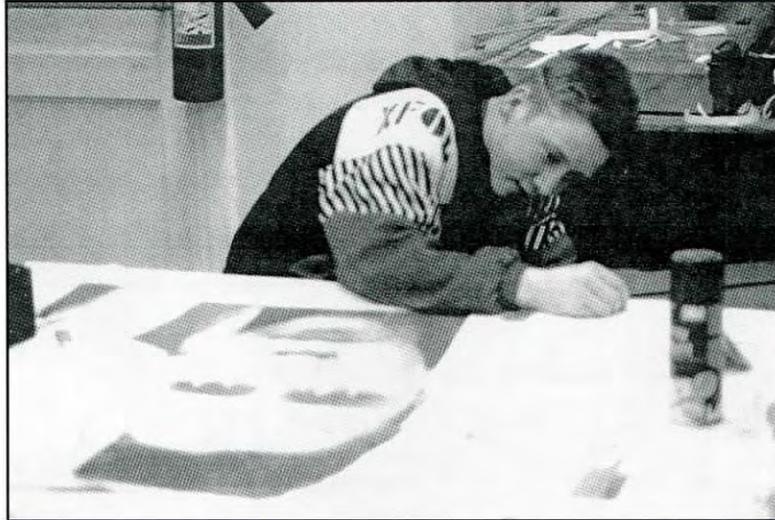
IT works in schools



Information Technology at KS3 & KS4 Developments in Art Education

By Tom Davies and Pete Worrall





Jimmy uses his computer generated printout to inform his drawing.

Whatever our area of specialism, as teachers of Art and Design our work involves extending our own experience, flexibility, open experimentation, questioning and finding new directions. We welcome you to share and build on the themes of this publication and to use the enclosed Kodak Photo CD as a reference file which will suggest developments and departures. This set of 100 high resolution images are extracted from our PGCE 'archive' of Curriculum Workshop boards and each contains annotated school-based curriculum development material.

Foreword

Information Technology (**IT**) has the status of one of the 'core/key skills' in the National Curriculum (NC) in schools and as such is seen alongside literacy and numeracy as an entitlement for all pupils. This provision is not, however, without its problems when one looks more closely at the opportunities and challenges that are presented for curriculum planners and classroom practitioners.

IT in schools has undergone significant changes over the past 10 years, moving away from being a discrete area of the curriculum to become a dimension of teaching and learning. As a component within each NC subject, **IT** capability requires a conceptual change on behalf of teachers and learners in that it questions many of the assumptions associated with the presentation of material/information for pupils use. The methodology and logistics of using computers as a means of accessing knowledge and developing understanding goes beyond most teacher's training and traditional definitions of their subjects relevance and purpose in education.

Teacher education and training is central to the process of change and while some schools struggle to comprehend innovation in **IT**, considerable movement exists in the larger promotion of Information and Communications Technology (ICT) and its likely future impact on schools.

Teachers, it is suggested, will need;

'to create new learning advances and opportunities. This will entail a major reassessment of the teachers' role. No longer will they be able to represent the font of all knowledge. Instead they will have to develop as learners alongside their students, as in learning partnerships they assist in the transformation of information into knowledge and understanding' . (1)

The huge technological advancement in digital communication systems which is taking place in society, is used in the above publication to posit the question that if action is not taken as a priority concern, then the future may see:

'two types of teachers, the IT literate and the retired'.

IT promotion, in this particular publication, relates exclusively to Art and Design and unlike the above report it is upbeat, optimistic and essentially practical, with reference to Initial Teacher Education and associated INSET opportunities which have served to create a desire for change. This publication promotes the model of shared learning, rather than the expert user.

In many Art and Design departments the will, and interest in computer generated Art and Design activity is certainly there, yet over this decade of development in **IT** many departments have grown smaller and have needed to rationalise resources to address examination requirements at KS4 and more recently testing at KS3. Firstly, Art departments have witnessed the faltering attempts to enhance Design and Technology (D&T) teaching without the recognition of the centrality of artistic, creative and aesthetic sensibility. While over 50% of those currently training as teachers of Art have initial training in design disciplines, very few see D&T in schools as representing the cutting edge of the commercial world in which '**designerly**' thinking is the essential component. Design activity in the National Curriculum subject - Design and Technology is arguably about the superficial manipulation of materials (making) rather than the broader definitions used by David Thistlewood in his advocacy of design as a 'cultural model'. (2) Secondly, computer generated art has obvious implications for assessment, which are shared with the other 'Cinderella' of the Art and Design curriculum - photography. Pupil's screen-based work can, and often does, appear sophisticated and frequently dissimilar to more modest ability in the traditional processes and practices (eg. Drawing and Painting). There is certainly a challenge in defining and applying assessment criteria, as **IT** competence is largely demonstrable through learning opportunities that involve pupil's interaction and discussion.

The **IT** programme, as part of the PGCE Art and Design course at UCE developed from the coming together of a number of interrelated factors pertaining to the training of art students on a one year course. Peter Worrall has spent five years in association with the course, actively promoting **IT** and eroding resistance to its use in school art works.



*Year 9 pupils explore digital portraiture and image manipulation assisted by contextual resource material, (Gustav Klimt).
Hodge Hill Girls' School, Birmingham 1997.*

Initial Teacher Education (ITE)

Following directives from the Department for Education, (Circular 9/92) courses have evolved significantly in the intervening years. A key development has been an increase in the amount of school-based training, with serving teachers acting as subject mentors or training co-ordinators. Partnership arrangements, while conforming to the Governments requirements, have taken many forms with models ranging from very large providers associated with major Higher Education Institutions (HEI) to consortia arrangements modelled very much on the school as the training centre. These School Centred Initial Teacher Training (SCITT) programmes, combined with well established and new providers, offered provision for 980 trainee teachers of Art and Design in 1996 and we saw the number of registered institutions for specialist training in Art and Design more than double. Currently the number of specialist subject trainees is in excess of 1,100 and the allocation of places for 1997/98 should determine the range and number of training institutions. Clearly these factors have necessitated a major change in the nature of the relationship between schools and HEI's; between specialist providers and in most cases, a complete review of the structure of the PGCE route and its representation. Consistency, coherence and quality control remain the major themes for inspection (Ofsted/TTA) and for all those concerned with maintaining teaching as a profession.

In common with other specialist courses in Art and Design, our students currently enrol for teacher training upon the successful completion of a three year B.A. course. Increasingly, many embark on this career decision following a period of employment and a break in full time education. This initial course will in the main, have been an intensely personal experience centred, almost entirely upon the student's individual creative development within the chosen sphere of activity. Few will have worked, to any depth, in theoretical studies and commence the PGCE course as predominantly visually oriented individuals. The majority will have no experience of secondary schools since their own school years, although many claim informal access through pre-course visits to schools or Artists/Designers in Residence projects during their BA studies. The one year PGCE course (36 weeks or 180 days, of which 120 days must be school focused) is, of necessity, a very full one, dealing as it does with general educational issues and the practice of art education.



*Transformations.
Frames taken from a computer generated
animation sequence,
PGCE IT Curriculum Workshop, UCE, 1994.*

The philosophy of education and specialist history of education has been drastically pared down in current models of ITE which prioritise the delivery of the National Curriculum rather than its antecedence.

At the University of Central England (UCE) the PGCE (Art and Design) course offers a range of elements that address the notion of 'competence'. These, generally, take the form of core studies (lectures, seminars and tutorials) complemented by a variety of studio/workshop activities and specialist options tailored to students strengths and interests. All students take part in six curriculum workshop areas (**IT**, Ceramics, Card/Paper, Print, Drawing and Critical/Contextual Studies) - with some, such as **IT** permeating work in all three terms. It is our experience that at the inception of the PGCE course, many students feel apprehensive about their transition from artist/designer/craftsperson to the role of the general teacher of Art and Design. Many find it difficult to see a relationship between their own work and the possible future role as teachers. Certainly there is an immediate need to broaden the repertoire of skills, concepts and appreciation of tasks that may be appropriate for the age range 11/19 years. Notions of progression, differentiation and continuity are considered against research methodology/materials that may serve to question and challenge the status quo.

Research is a dimension of teaching, and emphasis is placed upon the need to evolve a personal teaching style, based on the critical observation and study of teaching, behaviour and effectiveness of learning. This publication draws on five years of innovation and change in **IT** as part of **ITE** and much of the work has been used as exemplar material in recent conferences (NSEAD, HMI, NCET). From the 'electric studio' experience (3) to a 3D 'Design and Make' project (4) participants have benefited enormously from the author's untypical ease at working with **IT** media, clearly unfazed by the age or sophistication of the equipment or personnel! What follows should serve to generate ideas and provide encouragement to all those seeking to develop the use of **IT** in the Art and Design Curriculum.

Tom Davies, May 1997.

- 1) Networking Education. UB/BT Team, 1996.
- 2) Design Education: a Cultural Model, conference paper, David Thistlewood, 1995.
- 3) European initiative in Art Education, (Erasmus-intensive course), Birmingham, 1993.
- 4) National Council for Educational Technology NCET TV - Programme 8. Teaching and Learning with IT, BBC2, May 1996.

IT Works in Schools: Introduction

During the last five years at UCE Information Technology has been developed as a high profile core component within the PGCE course frequently resulting in exciting curriculum developments, new partnerships and technologically informed practice. It is the intention of this publication to disseminate and share a sample of these results with a wider audience.

The value of the computer as a comparatively new tool within Art and Design education is surprisingly contentious, for a range of different reasons. In the late 1980's many secondary school Art and Design departments were allocated one computer system to use. It quickly became apparent that curriculum development using these 'machines' depended on:

- the appropriation of new skills/understanding.
- the application of these skills in a practical context.

Local Education Authority (LEA) IT support for Art and Design was available in some regions, whilst others seconded enthusiastic Art/IT teachers. The lack of both a National framework for IT in schools, at that time, and coherent INSET programmes resulted in many computer systems in Art Departments being used for

word processing and administration, supplemented by the occasional ad hoc sortie into computer art with individual pupils. This interest group was inevitably male and grew out of the home use of game machines.

Two other factors further complicated this situation:

- firstly art teachers questioned the value of computer generated work as valid and worthwhile.
- software and hardware development continued to change, requiring constant skill updates.

Ofsted Inspection reports offer significant data regarding the provision and levels of confidence in IT teaching within our subject area and a random sample of 70 secondary school Art Department reports revealed that 34 schools received only a cursory mention regarding IT. Of this number favourable comments regarding the positive use of IT within the Art curriculum were restricted to just 7 while 27 received adverse comments.

This snapshot raises a number of most significant issues, why have 36 schools received no comment at all? Are IT resources unavailable or are they doing well?



Alison Fleming and Hazel Duro (PGCE students) working with Year 8 pupils using a digital camera at Small Heath GM School, Birmingham, 1997.

There are three broad positions that Art Departments appear to occupy with regard to their **IT** development.

1. **IT** is well established in certain areas of the Art curriculum, particularly with regards to textiles and graphic design.
2. **IT** is not used sufficiently by all pupils as an optional tool for learning.
3. **IT** is given little or no emphasis as a learning resource.

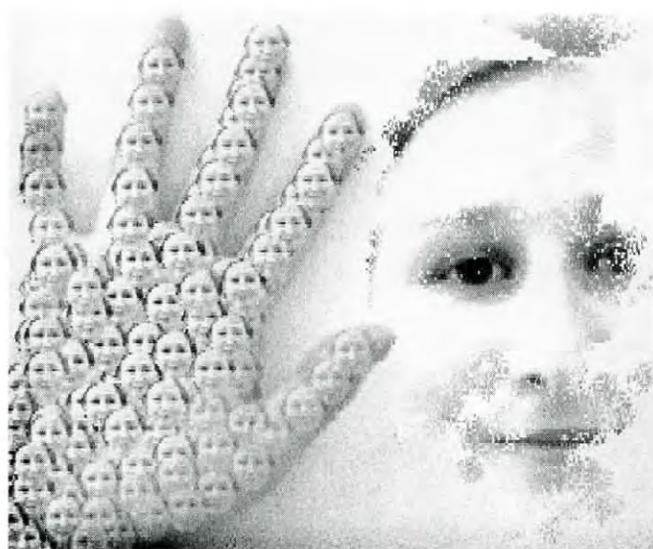
HMI have stated that:

'At secondary level we say amongst other things that the range of work in IT applications needs to be widened further to comply with NC requirements and made more responsive to pupils' backgrounds and interests and that there need to be curricular opportunities for pupils to apply the skills they have learned. There are opportunities here for well planned Art/IT projects which have for example, a social or ethical dimension'. (1)

IT training and support is the key to improving this situation, but with depleted LEA Advisory services, complete programmes of support for all curriculum areas are unlikely to occur.

Professional development in **IT** requires new approaches to learning and teaching methodologies. Art/IT development poses new challenges, in that some art teachers require proof that **IT** informs Art and Design processes/practices and that it is an exciting and creative medium to use. In this context it is particularly important that Initial Teacher Education (ITE) develops, in partnership with schools, coherent programmes for the use of **IT** as a core/key skill. Innovation in, and commitment to **IT** at UCE enables student teachers to explore, implement, document and reflect on the impact of new technology in school, the wider educational community and society in general.

- 1) 'IT in Art: An Ofsted HMI Perspective'. Peter Jones, HMI/Ofsted Art and Design. Art and Information Technology, Conference Report, NCET, 1996.



*Mini Faces.
Digitised self portrait with image manipulation
and special effects.
PGCE Coursework, 1996.*



*Your gaze hits the side of my breast.
Digitised self portrait with colour manipulation and
text.
PGCE Coursework, 1994.*

The National Curriculum



Head.
Computer manipulated scan exhibited at Derby
University and the Internet.
Submitted and selected through electronic mail, 1995.

The current National Curriculum for Art states that:

'Pupils should be given opportunities, where appropriate, to develop and apply their Information Technology (IT) capability in their study of art, craft and design'. (1)

The National Council for Educational Technology's important 'Art and IT' entitlement document states that:

'The computer is not simply another tool to use in art and design - it is a new medium through which to explore new ways of creating and experimenting with images. In the last decade, computers have revolutionised the design industry. Artists, designers and film-makers are using the computer to create images and model environments that could not be created with traditional media. In the 1990's a pupil's experience of art and design is not complete without access to the wide range of possibilities that computers offer'. (2)

The Key Stage 3, Programme of Study for **IT** states that:

'Pupils should be taught to become critical and largely autonomous users of IT, aware of the ways in which IT tools and information sources can help them in their work; understand the limitations of such tools and of the result they produce; and use the concepts associated with IT systems and software and the associated technical terms'.(3)

There are two Attainment Targets for **IT** at Key Stage 3:

1. Communicating and handling information.
2. Controlling, measuring and modelling.

It is the **Communicating and Handling Information** Attainment Target that has most relevance to Art and Design practice. Pupils should be taught to:

- (a) use a range of IT equipment and software efficiently to create good quality presentations for particular audiences, integrating several forms of information;

This might cover graphic design including newspapers and posters, digital presentations of pupil art exhibitions, multimedia, video conferencing, and HTML authoring for the Internet.

(b) select appropriate IT equipment and software to fulfil their specific purposes;

Using a video source through a digitiser to record a self portrait that can be used as a template for a mask, or merging three different digitised viewpoints based on a still life group and developing the final result using the Cubists as a starting point, or using a scanner to replicate a drawing so that colour can be applied in different ways.

(c) be systematic in their use of appropriate search methods to obtain accurate and relevant information from a range of sources;

Understand how to interrogate an Art and Design CD ROM, Kodak Photo CD or the Internet for relevant data including text, sound or video for a specific project.

(d) collect and amend quantitative and qualitative information for a particular purpose, and enter it into a data-handling package for processing and analysis;

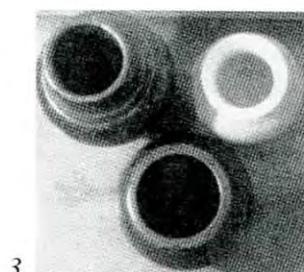
This might include using a timeline to analyse 20th century modern art movements or for a comparative analysis of artists' lives and work.

(e) interpret, analyse and display information, checking its accuracy and questioning its plausibility;

Compile a database based on artists and painting/ sculpture from a CD ROM or other sources to be used with a specific audience or present animation sequences for analysis.

There are implications for the Art teacher in the **Controlling, measuring and modelling strand (AT2)**. Modelling shares an interest with timebased activities including animation. Design activities may involve the image manipulation of sculpture and paintings allowing them to be digitised and viewed on the computer screen in different site specific situations. This important '**virtual design**' simulation activity can be applied to murals, sculpture, architecture, interior design, stage scenery, textile and fashion design.

- 1) Art in the National Curriculum, 1995.
- 2) Art and the Computer, a pupil's entitlement to IT, National Council for Educational Technology, 1996.
- 3) Information Technology in the National Curriculum, 1995.



*Series of digitised still life studies.
1-3 Different viewpoints.
4. Merged viewpoint.
5. Development using freehand drawing.*

Workshops

Background/ITE Context.

'There is an unexplored relationship between Art and New Technologies to be engaged and developed' (1)

This statement introduced Information Technology to PGCE students at UCE in 1992 and has underpinned the **IT** course philosophy ever since.

The computer offers the user a choice of outcomes and therefore naturally empowers the pupil/student/artist to make decisions, supporting independent study. In addition to the creative, challenging experience in its own right, **IT** has huge potential to assist practical work across the disciplines of Art and Design while presenting no threat to the physicality of throwing a pot or producing an etching. It is a device that can analyse, develop/recall and communicate with images and data, replacing many time-consuming activities.

The **IT** dimension of the PGCE course begins in September with 2 lectures, '**IT** in the National Curriculum' and 'New Technology Developments, an Overview'. These two keynote lectures early in the Autumn term precede the workshop programme and serve to allay doubts and suspicions regarding **IT** and its relationship to Art and Design practice.

Twilight sessions incorporate core/key **IT** skills including wordprocessing and desktop publishing and all students are expected to demonstrate this competence in course assignments and during plenary sessions. This is followed in October by 6 college based, two day Induction Curriculum Workshop experiences in Drawing, Contextual Studies, Card Construction, Ceramics, Print and Information Technology. These workshops are designed to extend subject knowledge, so that students are confident in the use of a wide range of media including **IT** in the classroom.

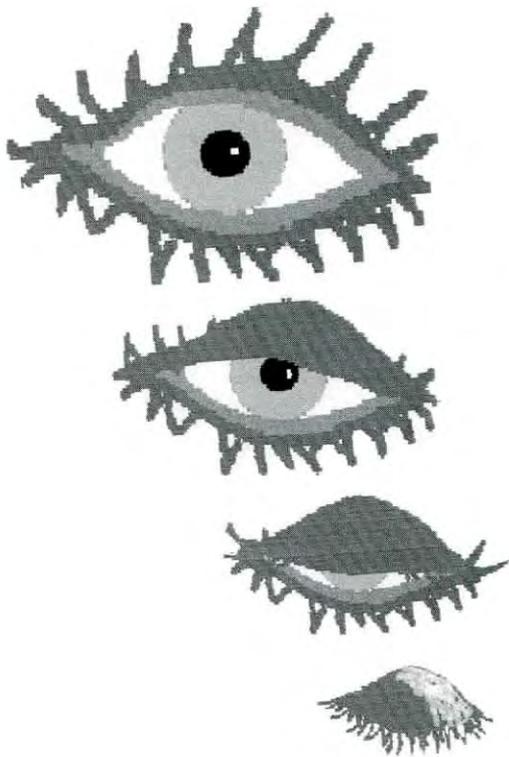
The Information Technology Curriculum Workshop is structured for **all** abilities, from absolute beginners to the more experienced. There are opportunities to explore computer graphics, including 3D design, 'image capture' using a digital camera, scanning images from source material, image manipulation, CD ROM and animation during the 2 day workshop.

All students have mixed undergraduate experiences with regards to **IT** and less than 20% have any real **IT** skills.

The resource base at UCE consists of 12 Acorn computer systems shared between 6 groups of 15 students with access to 4 Apple Macintosh systems in tutorial bases, three printers, two digital cameras, two digitisers, one genlock board and one handscanner.

In the 97/98 academic year these resources will be upgraded to include Pentium PCs and Internet access.

1) IT Guidelines PGCE Course, 1992.



*Wink.
Freehand drawn animation sequence,
PGCE Coursework, 1994.*



*The Medium is the Message ?
Scanned and digitised computer generated photo
montage,
PGCE Coursework, 1993.*

PGCE Design Briefs.

Each workshop begins with a design brief within which students can develop their **IT** skills and relate them to classroom/studio practice. Many school projects originate from these important workshop sessions and **IT** development is monitored throughout the year.

The following summarised **IT** briefs are typical of the stimuli offered to students:

1. Motion Pictures.

Everything is in a state of perpetual change and flux. Paintings and drawings contain layers of changes and decisions, (often over a period of time) and the viewer is usually left with the top layer! Computers can be used to store the incremental stages for analysis and research. Sequences can be replayed on a computer screen and edited through drawing, colour application or special effects. Try a seven frame sequence telling a story. What about birth, weathering or metamorphosis as starting points? To begin with, write down and **draw** your ideas. Consider flickbooks, zoetropes, Edward Muybridge, films, street theatre, music videos, camcorder culture, the artist as performer, dancers, kinetic art or cartoons as possible starting points.

2. The Medium is the Message ?

Information conceals hidden meanings. Consider the relationship between text and image in subliminal advertising, political propaganda, newspaper headlines and consumer promotions. Source material might be taken from billboards, posters, poetry, T.V. advertisements or graffiti. Desktop publishing, word processing and the text/image interface are the norm on computer systems today. Personal information is often stored in data banks. In addition consider hieroglyphics, street symbols, languages, alphabets, signs, communication systems, codes and letter shapes. You may consider the work of John Hartfield, Hannah Hoch and Kurt Schwitters.

3. Twisted, Torn and Decayed.

Weathering processes are continually at work in the environment causing changes to architecture, landforms and organic material. Sometimes individual people and large corporate organisations accelerate nature's destructive processes through acts of vandalism. Surface patterns, twisted forms, colours and textures produced by erosion provide rich primary source material for the artist. Another starting point might be through the work of Michael English, Andy Goldsworthy and Robert Rauchenberg.

4. Secret Biography.

A portrait conceals many stories which can be told or revealed in different ways depending on the stance of the storyteller. Consider a real or imaginary story about a friend, inspirational influence, folk hero/ine or pet hate, and try to weave a visual story through a portrait study or narrative. Another starting point might be through the work of Northern Renaissance artists such as Jan van Eyck or contemporary English artists Peter Green and David Hockney or Paula Rego.

5. Celebration.

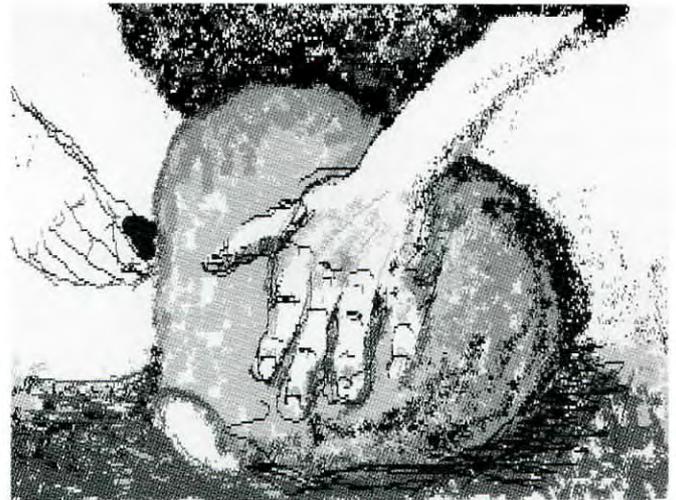
Different cultures celebrate birth, life, death through ceremony, remembrance, worship and penance. Consider 'belief' and try to compare and contrast two different spiritual outlooks through architecture, seasons and ritual. To begin with you could compare and contrast Divali and Christmas celebrations. Another starting point might be through the work of Dhruva Mistry, Russian Icons or fourteenth century Persian painting.

6. Shop Front.

The shop front mirrors our consumer interests. The visual decoration with thematic collections of clothes, food, drink, furniture, junk and technology arranged lovingly (or not) are ripe for visual studies. Consider and contrast graphics, the use of colour, window reflections, architectural detail, advertising, street furniture, people, street markets, derelict shops and corporate fronts. Another starting point might be through the work of the Peter Blake or the American Photo Realists.



*Decorating Coventry Shopping Centre.
Scanned site specific source material and freehand drawing,
Year 8 pupils Coundon Court School.
Spring Term Project co-ordinated by Michael Snodgrass
PGCE student 1997.*



*Pot.
Gill Odling, PGCE student, 1997.
Freehand computer generated drawing,
Many students reflect on their Art and Design specialist
area during the IT curriculum workshop.*

Outcomes.

Most students approach **IT** with some trepidation and it is important that the teacher/tutor is prepared to clearly demonstrate and use appropriate software and hardware in a clear and unambiguous way. The workshop and how it is taught has direct parallels with teaching and learning in general (a usable model in schools). Non-technical guides to using software, formatting discs, operating scanners and digitisers are prepared beforehand. The more confident/**IT** literate students are identified at an early stage and co-opted to assist in key areas, such as digitising, scanning and animation. Here differentiated roles/tasks are linked to evolving schemes of work. Energy, clarity, and patience plus the desire to instil confidence within the timescale are crucial prerequisites for an **IT** workshop.

Content.

Day 1 - Introduction.

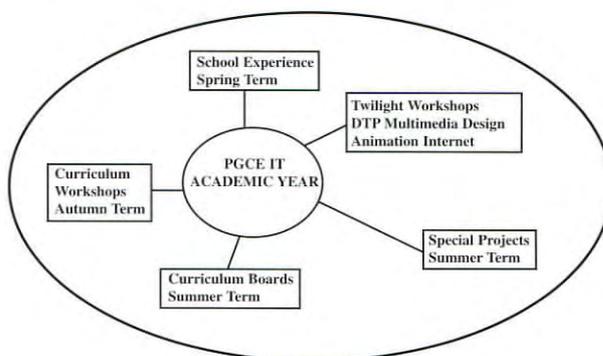
1. The Screen Environment, (Demonstration).
2. Managing Discs.
3. Using Art and Design Software.
4. Scanning / Digitising / Using a digital camera.

Day 2 - Development.

1. Issues arising, Group tutorial and demonstration.
2. Animation.
3. Group Tutorial (presentation by students).

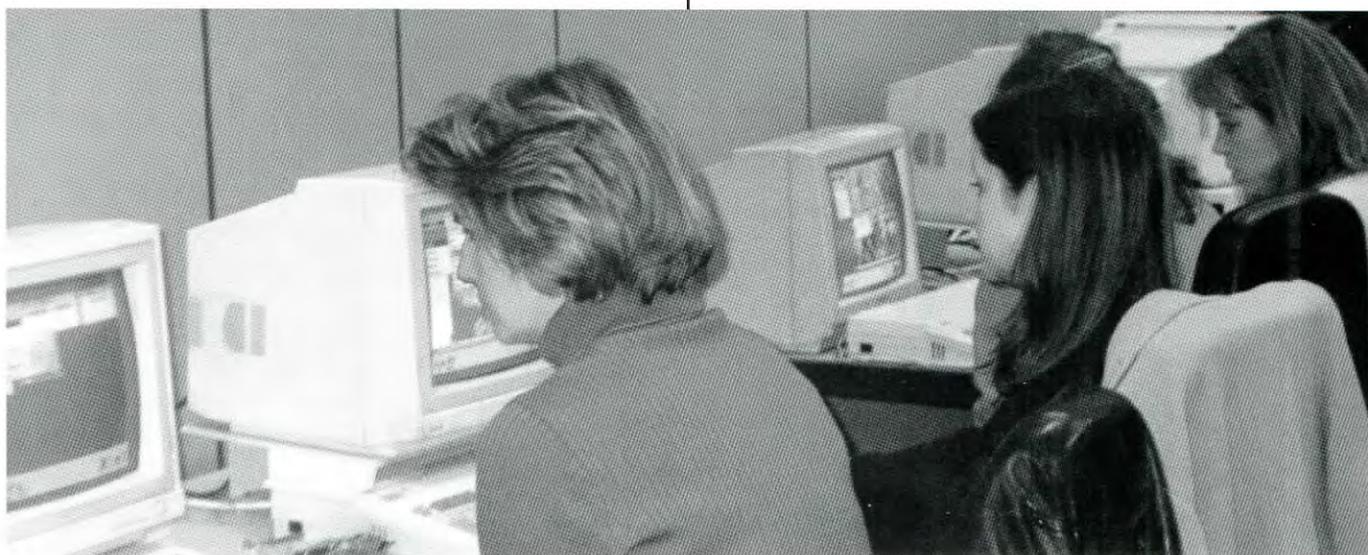
At the end of the workshop students will have produced.....

- Computer generated material stored on personal discs that can be printed out for school resource boards.
- Sketchbook ideas or larger studies related to the computer generated material.
- Explanatory notes.
- A photographic record of the experience.



Later in the year, during the school placements students are positively encouraged to develop their **IT** workshop design brief.....

- In the classroom.
- As a course assignment.



PGCE Students using Margaret Street's IT facilities, 1996/97.

All students are expected to present their **IT** outcomes using a computer in a tutorial group session. This important plenary session is reflective and personally introduces the computer as a teaching aid in order to present their images and concepts to an audience. Questions regarding how to use workshop results within 'a scheme of work' are considered and many students respond by incorporating at least one Art/IT Project in their planning. Finally, work is printed out or photographed from the computer screen. On average every student produces approximately 20 studies on 5 discs.

The following extract is taken from Postgraduate **IT** Guidelines:

'Using IT in Art and Design Projects during the Spring Term School Placement.'

So how do we begin?

If possible try to use IT in one project during the Spring Term. In some cases you may be able to use your Autumn Term Curriculum Workshop experience to help you plan your work. Consider timing/forward planning and choice of class with care, perhaps a good time to develop your Art/IT project might be after half-term, so that you can try out your ideas beforehand with a few 'friendly' pupils during an after school art club. Introduce yourself to the schools' IT Co-ordinator and explain your IT project. She/he will always provide you with useful information regarding IT within the school, for example:

- *School IT policy.*
- *The type of computers used in the school and the software used.*
- *Assessment procedures and the location of specific IT equipment i.e. scanners, digitisers and digital cameras.*

(Remember to prepare your questions beforehand and note down answers). Ask if you can observe an IT lesson in action at an early point in the term.

Giving pupils opportunities to use IT is subject to resource availability and in many cases you may have to maximise the potential of one or two computers shared between classes of 25 pupils. On the other hand you might be able to book a computer room and have access to 30 computers at an appropriate point during the term.

Be prepared to document your IT progress carefully, photograph pupils working with computers, keep a supply of discs to save their work and ask pupils to compare IT processes with more traditional methods. Note down their answers. In addition find out what they enjoy about computers. Do they use one at home?

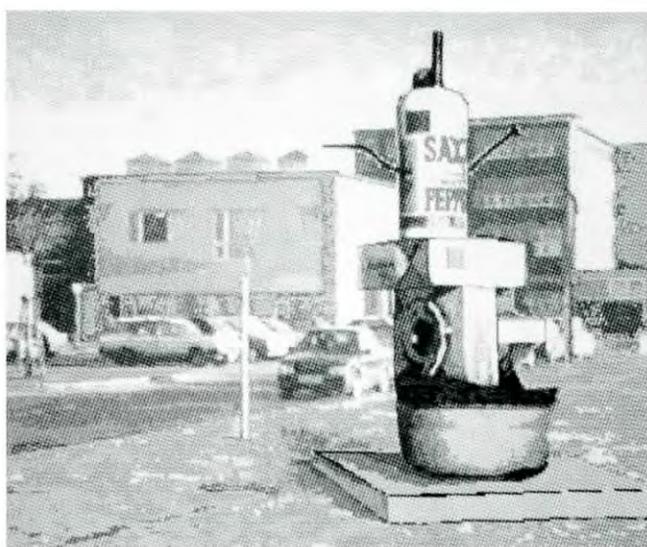
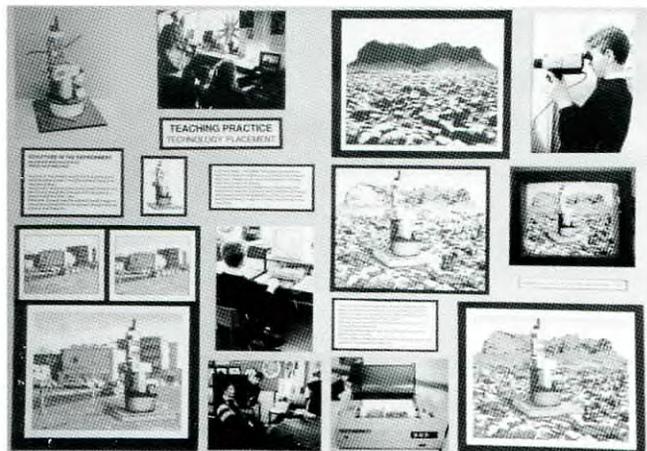
Choose an IT process you feel comfortable with and remember that IT can be used at any point during an Art project, for example:

- *At the beginning: Pupils use a digital camera to record site images around school in preparation for a site specific 3D project.*
- *In the middle: Pupils' line drawings are scanned so that they can experiment by filling different colours into specific areas.*
- *At the end: Pupils' final paintings are recorded, via a digital camera or scanner, so that they can be used as a multimedia presentation or an interactive art exhibition on the Internet.*

IT can inform and develop Art and Design work in different ways for example:

- *A computer print showing a pupil's digitised self portrait could be used as a starting point for a painting.*
- *A scanned/colour manipulated image could provide the visual element in a poster design or school prospectus.*
- *Pupils could be shown a series of computer generated animation sequences and asked to draw six related frames based on a theme for homework.*
- *General exploration of contemporary popular culture, Art history and media issues could be developed through CD ROM and the Internet.*
- *Computer Aided Design (CAD), 3D and time based design software could be used to analyse and solve problems.*
- *Computer Aided Manufacturing (CAM), peripheral devices such as embroidery machines could produce specific design solutions'.*

School IT Curriculum - Case Studies



Information Technology Curriculum Board, 'Virtual sculpture in the environment', Year 9, This is an excellent example, demonstrating how IT can be used to transfer small sculptures into site specific locations, (above). Detail from curriculum board, (below). PGCE Coursework, Willingsworth High School, 1991.

Most, if not all, employers recognise the value of Information Technology skills and it is clear that portfolio evidence reflecting **IT** experience will enhance teaching career prospects for newly qualified teachers (NQT's). To this end students are positively encouraged to document and present their work, which might represent either Autumn term curriculum workshop material or Spring term '**IT** in school experience'. Preferably both. It is always the case that the possibilities to use **IT** in Art Departments depends on access to equipment, and prevailing attitudes to **IT**, however it is pleasing to note that the majority of our ITE partnership schools positively encourage the use of **IT** within the curriculum.

In the Easter Assignment IV: Curriculum Workshops, at least 3 mounted/word processed boards are presently submitted, containing:

- Personal work.
- Critical/contextual resources.
- Pupils' work.

These boards are photographed and archived onto Kodak Photo CD discs. This is a high resolution medium for the storage of visual material. Students and visiting colleagues can view, analyse and sample material based on an archive of 800 curriculum boards using a computer system with a CD drive. In the academic year ending 1996/97, 40 students from a cohort of 84 submitted a board/s documenting workshop and school use of Information Technology. This is a significant increase on past years and it is encouraging to note that 78 students used word processing software to present their work.

An increasing number of students are producing curriculum boards of exemplary standard supporting the energetic ongoing PGCE/UCE commitment to investment in training in new technology. The PGCE 'archive' is a major resource for Tom Davies's research into changing patterns of students' reference for work in schools (1990-) and the **IT** component is a personal, parallel study.

Case Studies: Extracts.

1) Circus, Kodak Photo CD Curriculum Board.

Leger's painting 'L'Ecruyere Noire' was digitised and divided into twelve equal parts using Art and Design software. Each section was colour manipulated in different ways. This curriculum workshop experience was developed in school as a large mural project, during the Spring Term.

'In the IT Curriculum Workshop I worked on a painting by Fernand Leger and used Animator software to create a four frame animation. The idea that certain parts of the painting could be altered independently inspired a Year 9 project. In the classroom each section was drawn out in turn on approximately an A1 piece of paper using an overhead projector. The students were divided into groups of 4 and each group worked on a different section with a different medium, ranging from magazine collage and black marker pen to tissue paper and paint (using the Pointillist technique and cotton buds). Throughout the six week project the students looked at other work by Leger, especially his figure drawing and circus works. At the end of the 6 weeks each section was joined together to display the finished results'.

Lisa Willis, Archbishop Ilsley RC School, 1994/95.

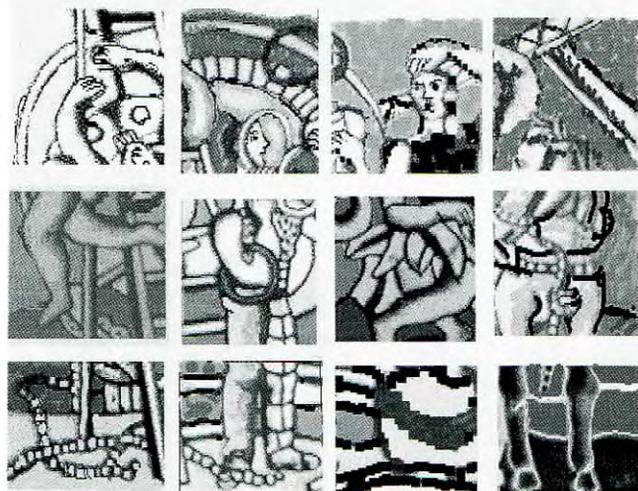


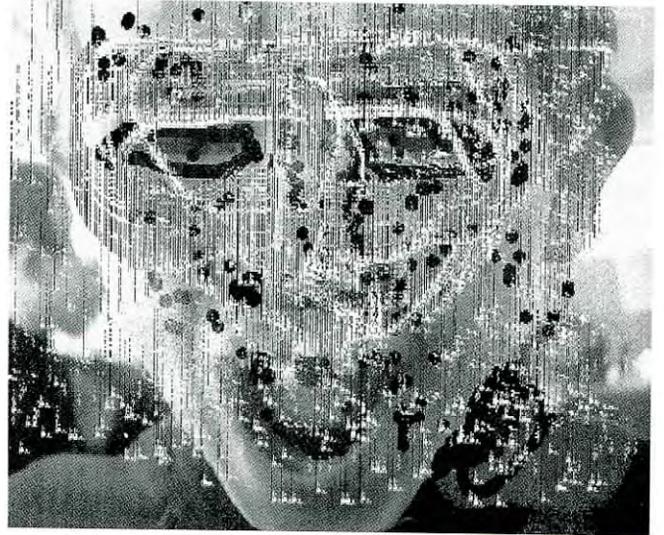
Image processed sections of Leger's painting. This is an excellent example, demonstrating how IT can be used within a group project to produce a large public site specific mural in the school. Lisa clearly developed her IT skills translating workshop practice into a school project. Image taken from Curriculum Board.

2) The Scream,
Kodak Photo CD Curriculum Board.

This project began with Year 7 exploring Edvard Munch's 'The Scream' and inspired by the painting, they re-enacted the work, which was recorded and digitised.

'The class had been working on a portrait project considering expressions. They had discussed work produced by Expressionist, and Fauve painters and their use of colour to express moods and emotions. The class showed their particular interest in 'The Scream'. Children photographed themselves screaming using a digital camera and some were able to work into their images on the computer. Pupils were more experimental and less precise about the work done on the computer. As a direct result of their computer work the children produced some very expressive and individual paintings of themselves. By using some of the children's 'Scream' drawings I was also able to produce a short animated film. Using some of the children's drawings from the project I was able to overlay images on the screen. Taking their original photographs I worked over them myself with particular emphasis on colour and brushstrokes.'

Pauline Astle, Willingsworth High School, 1994/95.



Here a Year 7 pupil develops a digitised screaming self portrait through freehand drawing. In certain situations the immediate recall from a digital source provide new stimuli for developing a theme. Whilst some pupils experimented with manipulating their portrait using art software, others were producing paintings. Image taken from Curriculum Board.

3) Self Portrait, Kodak Photo CD Curriculum Board.

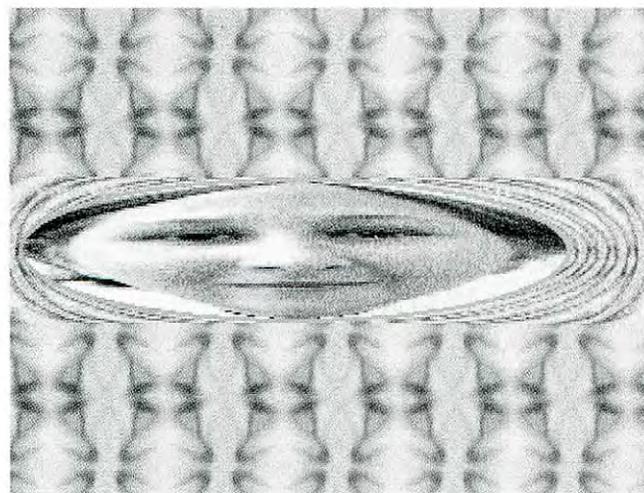
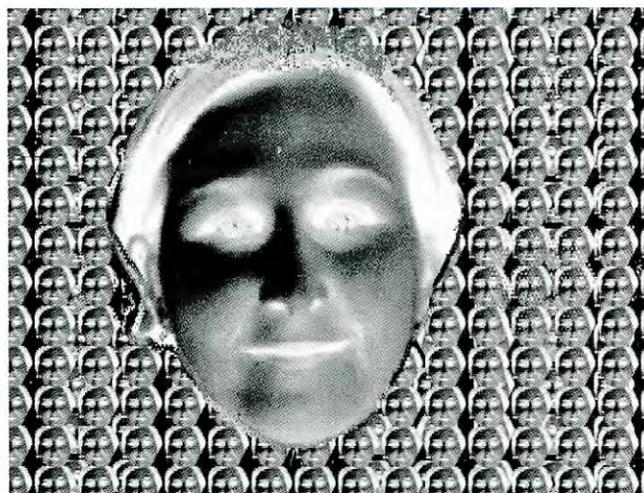
'Many pupils now have access to computer technology of some sort. Technology is increasingly moving into our everyday lives. Supermarkets, garages, hotels and even garden centres use IT of some form. People in employment will generally have some interaction with computers. We need to allow pupils more access to learning through IT as it is a medium which most already have a great interest and understanding of. Within Art we can use this medium in many ways to link up with other topic areas such as print, pattern and expressionism. The most important area I believe is the exploration of visual imagery and an increased awareness of how it can assist, create and be a valuable design tool.

Aims: All pupils should develop a capability with IT which enables them to:

- 1. Make effective use of IT to manage and support the learning process.*
- 2. Choose IT effectively and use IT appropriately to improve learning outcomes.*

What follows is a selection of ideas for using IT as a starting point for projects. These ideas are all based on images produced by me during an IT curriculum workshop. All are based on images of myself. Images were taken using an Ion camera where they are stored on a disc which can be inserted directly into your system. Alternately images can be scanned in from photographs. Pupils can then work into their images in a number of ways to gain striking visual effects otherwise unobtainable. I envisage these ideas being used as part of a portraiture project'.

Caroline Willis, 1995/96.



Caroline experimented using a range of different techniques including cut and paste, scaling, repeating, colour manipulation and distorting images using her own self portrait.

Images taken from Curriculum Board.

Methodology and Practice

Postgraduate PGCE students have a direct involvement in **IT** which has a value added dimension for a wide range of schools throughout the West Midlands. Art Departments appear to realise the potential of **IT**, but lack a clear understanding of the methodology and practical application of computers in support of learning. New entrants to the profession, in contrast, possess these new technological skills and, if encouraged, they have enormous potential for curriculum development.

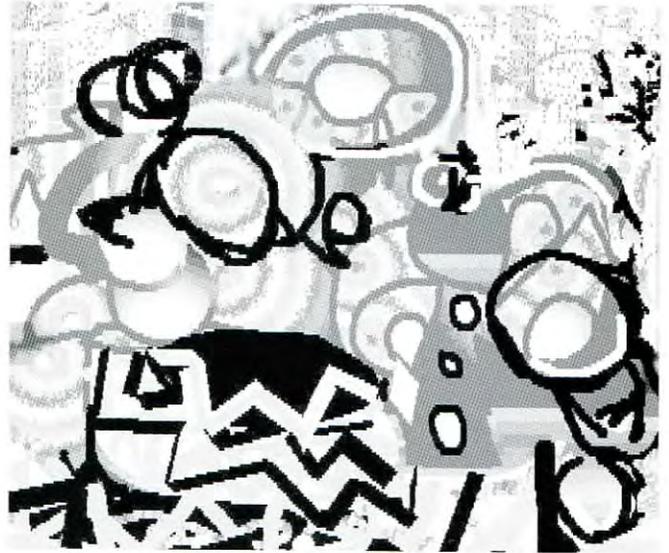
There appear to be 6 principal **IT** activities that have been identified by PGCE students during an analysis of work over recent years.

1. Freehand Drawing with the Mouse.

The mouse is not an ideal freehand drawing tool, however, it is useful for experimental combinations of different marks and textures (using paint tools such as - spraycan, paintbrush and pencil). Pattern making techniques can be explored by cutting, pasting and repeating freehand drawing marks in a range of configurations. This process may be seen to inform printmaking processes as decisions can be made on screen regarding the juxtaposition of patterned surfaces. Colour effects can also be explored and printed out. It is important to note that some schools use a graphics tablet which is a substitute for the mouse, enabling screen based drawing via a special pen.

2. Using a Scanner.

A scanner is an essential prerequisite and natural starting point for Art and **IT** development. A scanner can copy images accurately enabling observational drawings, prints and visual resources to be manipulated. Colour gradations can be applied to scanned line drawings, contextual resources can be juxtaposed and combined in different ways and images can be distorted through the use of special effects. Scanned images provide a positive starting point for developing ideas and dispenses with the difficulties of manipulating the mouse for accurate observational work.



Still Life.

*Freehand drawing with computer generated special effects,
Pete Worrall, 1991.*

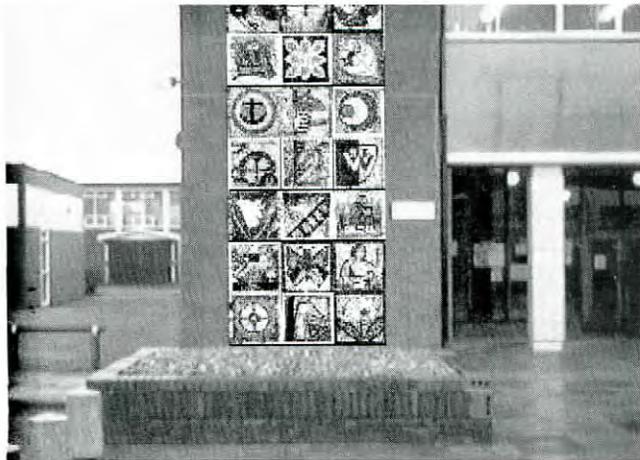


Metamorphosis.

*Scanned drawing with computer generated amendments,
Year 9, Langley High School, Sandwell, 1993.*



Digitised leaf resource images. These can be saved onto floppy disc and used for textile design.



Virtual Mosaic Design. Year 7/8/9 working with Annette Pugh, Artist in Residence, Willingsworth High School, Sandwell, 1995

You have just looked at some patterns made by nature. The Victorians liked to use flower and leaf shapes to make patterns.

There are many patterns based on natural forms to look out for at the museum.

See if you can find these.



CLICK HERE TO GET TO THE NEXT SCREEN

'Looking at Pattern in the Black Country Museum' A multimedia presentation designed for use in local Primary Schools. PGCE student, Special Placement, 1995.

3. Using a Digitiser.

A digitiser allows an image from a video source such as a camcorder, digital camera or VCR to be captured and displayed on screen. Live images can be viewed and some digitisers incorporate video editing facilities. It is particularly useful for portraiture and still life where mood, emotion and composition can be suggested through the use of applied colour. There are other applications, especially with regard to capturing digitised visual material for school newspapers, posters, multimedia and the Internet.

4. Designing.

A computer system can store and present letterforms, maps, technical drawings, graphic layouts, isometric drawings and elevations, architectural perspectives and three dimensional objects/space with complete accuracy. It is in many respects a designer's tool. In addition, design ideas can be simulated resulting in a 'virtual design' activity. For example, using cut, paste and scaling techniques, digitised or scanned site specific sculpture/images can be transferred to different locations; environments can be re-designed; we can even change our appearance and hairstyle on screen!

5. Animation.

A computer is a storage and retrieval system and is therefore a natural medium to explore timebased studies. A single image can be replicated, edited and played back on screen. The initial image may originate from a freehand, scanned or digitised source. This activity naturally addresses important issues related to process and development. It is possible to store large numbers of short animated films on one disc to replay to an audience and a series of frame sequences can be printed out for analysis which provide an additional stimulus for ideas and written work.

6. Multimedia.

Multimedia involves the combination of sound, graphics, animation, video, data and text within a series of interactive pages joined together through special 'smart' buttons. Multimedia will be a natural medium to communicate ideas and concepts in the future, although the technology is not fully developed at present. Educational resource material based on art exhibitions, promotional activities, health, safety, moral and spiritual issues can be designed, choreographed and presented through multimedia. Artists have a pivotal role to play in quality multimedia development through their innate ability to organise and compose disparate source material for a specific purpose.

Networks, Partnerships & Projects



Spaghetti Eaters.

'Funny eating habits and hats' with computer animation and 'morphing' accompanied by hilarious sound effects.



Under a Wandering Star.

'A disturbing theatrical piece with morphed angels', produced in two cuts with different soundtracks.

During the last 5 years there have been particular projects that have served to act as a focus for **IT** within the community, linking different groups and sharing practice. The following examples may serve to illustrate the excellent relationships that have been developed by students and teachers in partnership.

1. Electric Studio, (European links).

The PGCE course has European links through an Erasmus project which offers opportunities to work with graduate students from European Universities. In the summer of 1994 twelve PGCE students from UCE were paired with 12 students from the Universities of Seville, Dordrecht and Leiden. For two weeks groups of mixed nationality students explored the theme of 'New Technology'.

A special 'Electric Studio' workshop space was created, so that Art, Design and Performance related activities could be fused with new technology. Computer graphics and animation were recorded onto videotape using a genlock board, with the final objective to create several 5 minute video films, which would be premiered at the end of the two week intensive course.

PGCE students adopted a mentor role for our European guests and 5 working groups were formed to explore the technology in an exciting studio environment. Newly acquired skills for most participants included the use of video, sound mixing and computer graphics. Each group eventually selected and recorded a master tape which was screened on the final day and reproduced for each group.

2. Black Country Museum, (LEA links).

In March 1995, the Education and Microtechnology Unit (EMU) in Sandwell produced an innovative Kodak Photo CD disc containing 98 high resolution images based on the local Black Country Museum, (a reconstructed Victorian industrial village). The National Curriculum resource material contained on the disc is intended as a stimulus for multimedia work in the classroom.

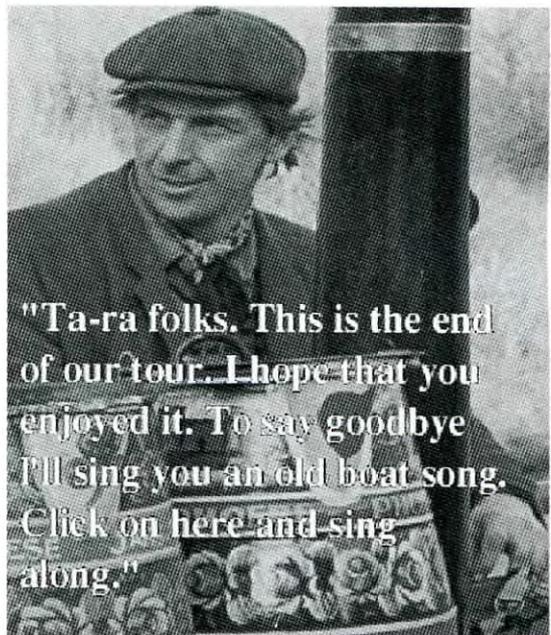
As part of a summer term special placement, seven PGCE students were involved in developing multimedia materials within the museum site using the disc as a starting point. Their objective was to combine sound, text, images and video in order to present one aspect of the museum for West Midlands teachers. The final results would be shown to visitors and school children visiting the museum.

Students' time was equally divided between gathering data in the Black Country Museum and organising the material back at EMU.

Four multimedia presentations were designed in eight weeks:

- i) Looking at pattern in the museum.
- ii) Visiting the general store in the village.
- iii) Jim's guided tour of the boatyard.
- iv) The fairground rides.

Museum visitors explored the PGCE interactive multimedia work on a computer system set up within the museum at the end of the project so that the students could evaluate their designs.



Now that you are at the end of the tour, you will know all about Jim and his boat. Why not imagine you have your own narrowboat? Your teacher will tell you how to begin.

'Jim's guided tour of the boatyard'
Click the mouse on Jim and he will sing you an old boat song!



The Black Country Museum Site, showing the boatyard, one of the 98 images available on the Black Country Museum Kodak Photo CD disc.

3. International Womens Day, (School/UCE/Community links).

An increasing number of PGCE students integrate **IT** within innovative and exciting projects in school. Supporting **IT** development is a priority at UCE and in this case, I personally assisted Cora Gartland, (PGCE student) by demonstrating how to use a digital camera with Year 9 pupils at Hodge Hill Girls' School. The objective was to record their portraits as part of a project based on identity.

These portraits were manipulated using art software and the final results were printed out. The computer images were then incorporated with found objects, other visual resources and shaped hand-made paper. **IT** played a supporting role within the mixed media work and although only one art department computer was available most of the girls included computer generated material within their work.

Cora's scheme of work for this project reflects PGCE students' awareness of **IT** as a tool to be used within a particular process. Here is an extract:

'Aims

Understanding: Pupils recognise the diverse methods and approaches used by artists/designers and how visual elements are used to deal with issues and convey emotion leading to celebration.

Investigate: How IT can be used as a tool in the art room and combined with more conventional materials.

Develop: New skills including hand made paper, hand stitching, use of Canon Ion digital camera to record portraits onto computer disc for use in Art and Design software-PaintShop Pro.

Explore: Mixed media, contemporary patchwork as a banner combining computerised images, photocopies, hand-made paper and hand stitching'.

Cora Gartland, 1997.



*International Womens' Day Images.
Mixed media work with computer graphics (above),
Computer generated work (below).
Year 9, Hodge Hill Girls' School.*



*Black Country letter 'B' embedded in stone,
Virtual image manipulation onto the new Black
Country Spine Road site,
Tividale High School, Sandwell, 1996.*

4. 3D Design and Make Project, The Changing Face of the Black Country, (EMU/UCE/School/Industry links).

The following extract is taken from guidelines sent out to Sandwell secondary schools in March 1996 describing this Project:

'What's happening?'

Fourteen Sandwell secondary schools are involved in the project with Year 9 and Year 10 students spending three days at the Education Development Centre in Sandwell working in teams to design and construct large scale sculptures to enhance the brand new Black Country Spine Road.

The Design Process.

Students will use 3D design software to generate designs which will then be translated into sculptures using a range of different materials including wood, card and wire, between up to two metres in height. These sculptures will then be digitised and sited as 'virtual' sculptures on specific sites along the new spine road using Art and Design software.

P.G.C.E Art and Design students from the University of Central England's Institute of Art will assist pupils through the project'.

The carefully documented final outcomes included A1 design boards, computer generated designs and large sculptures with themes ranging from our multi-faith society, global rainbows, coal trucks, mobile phones, and factory chimneys.

The complete project is now available on the Internet through Campus World.

This project involved partnerships with:

Vision Display - A local stage set manufacturing company.

EBP - Sandwell's Education Business Partnership.

CITB - Construction Industry Training Board.

Groundwork Black Country - Esso Greenlink.

Sandwell's Department of Environment and Development Services.

BCDC - Black Country Development Corporation.

5. Continued Professional Development, (INSET).

Birmingham Institute of Art and Design (UCE) has recently designed a range of short courses which address the professional needs of art teachers in specific areas - including **IT**.

These courses have been successfully offered in Spring 1997 with the prime purpose of demonstrating how to use and integrate **IT** in the classroom as a means of extending pupils practical skills and appreciation of Art and Design in the National Curriculum. This will build in 1997/98 under the heading of 'Working with Multimedia'. These initial 'taster' courses resulted in exciting practice and the sharing of ideas between art teachers in the West Midlands.

Content

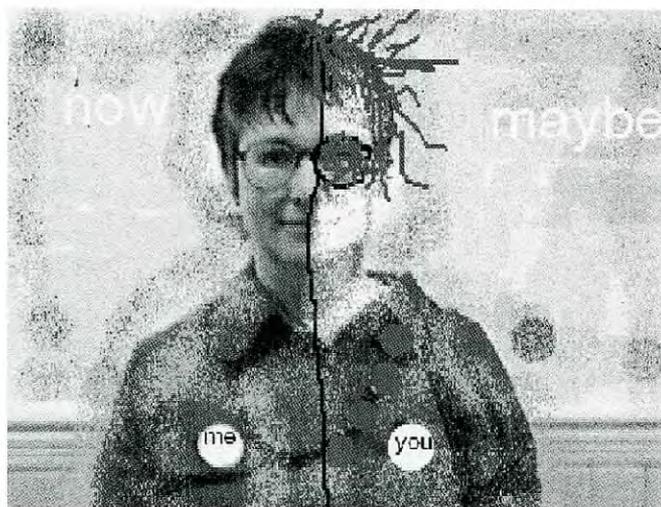
- National Curriculum requirements.
- Examples of Art/**IT** curriculum coursework, based on slide, video and portfolio material.
- Using the computer in a practical context including, developing ideas, using visual resources and animation.

Primary.

This course developed ideas through scanning drawings, digitising site specific material and animation. CD ROM, multimedia and Internet were introduced and two specialist PGCE lecturers were available to help during the day. At the end of the day most delegates requested a programme of courses addressing specific areas on their evaluation reports.

Secondary.

Here we developed a design brief based on '**Secret Biography**', using the genre of the portrait. Scanned paintings and drawings were presented on floppy disc taken (with permission) from the important West Midlands art collection at The Barber Institute of Fine Arts, (The University of Birmingham). These included works by Pablo Picasso, Käthe Kollwitz, Gwen John, Auguste Renoir and Giovanni Bellini. This theme was developed during the day by mixing scanned drawings and digitised self portraits with the original contextual resource images. An interesting combination of collaged/image manipulated self portraits were developed and printed out for the course participants.



*Now maybe.
Digitised/image manipulated self portrait,
Primary IT Course, May 1997.*



*Secret Biography.
Combination of scanned/digitised images and
Gwen John's painting.
Secondary IT Course, May 1997.*

Forward to the Electric Future

IT continues to extend the boundaries of Art and Design practice and each year heralds change. Access to the Internet will, no doubt, provide an art department with unlimited visual resources from museums around the world.

Teachers, students and pupils will experience significant change as we move towards the millennium. Flexibility will become increasingly more important in terms of access to equipment, staffing and resourcing and my own experience of multiple roles suggest possibilities for professional development. At the heart of this technological revolution, artists and teachers will develop new visual literacy and information communication/design skills and it naturally follows that students must be made aware of these changes as they impact on Art and Design education.

'The 1995 debate on the so-called Education Superhighway carried the implicit message that a new watershed is approaching: connecting the world's now-adequately-powerful computers together will certainly change how we live and equally certainly change the skills which young people need in order to thrive. Adding cheap consumer electronics into this cauldron along with growth in the power of the media and entertainment industries produces a cocktail for change the like of which has never been seen. It is thus not surprising that society as a whole expects each school to develop pupils' capability to use Information Technology and the staff's capability to use IT in teaching and management.' (1)

Over the period of my contribution to the PGCE course I have been supported by the vision of those who negotiated and balanced the following professional roles between 1992-96;

- Head of Art at Willingworth High School.
- Advisory Teacher at the Education and Microtechnology Unit in Sandwell.
- Part/time tutor at BIAD/PGCE University of Central England.

The future indicates promise for the further promotion of **IT** in schools and I hope that the enclosed CD ROM offers a trigger for the reader. Finally, I trust and hope that fruitful working arrangements supporting the use of **IT** will continue to flourish as we move towards the 21st Century.

Pete Worrall, June 1997.

- 1) National Objectives for IT in Schools, NAACE in consultation with NAHT and SHA, 1997.



Work in progress.

Glossary

Glossary of IT terms for Art Teachers.

(Taken from IT Guidelines for PGCE students)

In trying to compile this list so that it is both informative but easy to follow, I have only included essential technical 'translations'. In other words it is not 'the' definitive list, there are plenty of IT text books that will provide that sort of information. I have also tried to group this information in generic areas for ease of use.

Using the correct vocabulary in school is important for both pupils and staff, although IT terminology tends to be couched in technical language. On the other hand we should always encourage pupils to use appropriate terms in discussing and evaluating their work, for example:

'We used a digital camera to record our portraits and these were digitised and saved onto floppy discs so that we could experiment with colour changes using the colour shift option in the paint software'.

The Computer.

Usually comprises - a processor unit, monitor and keyboard often described as **hardware**. Schools use different computer systems including Acorn, PC, Apple Macintosh, Amiga, Atari ST.

Computer Desktop Environment

The mouse is an input device that controls your actions within the desktop (screen environment) and moving the mouse results in a pointer (screen arrow) moving on the computer screen. Pointing and clicking the mouse button on an appropriate icon will result in authorising action. Unless you use a graphics tablet, touchscreen, switch, or keyboard, the mouse is your only contact with the computer screen.

Icon - Graphic symbol or small picture displayed on the screen that relates to a function/feature the computer can carry out. Different computer systems use different icons to represent art software and image files.

Art Software.

Painting Software - Paint programs such as Paintshop Pro (PC) treat images as collections of dots (pixels) which are known as **Bitmap Graphics** or **Raster Graphics**, that is a pattern made up of dots.

Image Processing - Whole Images or selected areas can be processed in a range of different ways using special effects. These might include such exotic names as *solarize*, *gaussian blur* and *jaggy despeckle* whereas the more ordinary effects will lighten or darken your image. Some software will use between 50 and 100 such effects e.g. Corel Photopaint and Adobe Photoshop (software).

Drawing Software, (Object-oriented software).

Vector Graphics are constructed from individual elements such as lines circles and squares. These can be manipulated as discrete objects e.g. moved around the screen, enlarged and rotated. The characteristics of the shapes themselves (thickness of outline, fill colour or tone can also be changed). In a school context object-oriented software is often used for technical drawing, poster design and graphics.

CAD - Computer Aided Design, usually involves object-oriented software. Specialist software is available for extremely accurate work such as architectural drawing or electronic circuit design.

3D Software - Software that will create 3 dimensional objects and virtual environments on a 2D screen.

Animation Software - This software allows individually drawn images originating in a paint program, scanned or digitised to be duplicated, altered and played back as a flickbook on the computer screen for presentation purposes.

Tweening and Morphing Software - allow two different images perhaps sharing certain attributes (e.g a face and a peach) to be placed in two frames and the software will create two or more inbetween frames, so that when played back on screen one image slowly transforms into the other. Many science fiction films use this effect.

Desktop Publishing Software.

DTP- (Desktop publishing) The design and layout of printed documents incorporating text and images.

Font- A typeface in the style of a letterform for example this font is called 'Trinity', **this is called 'Trinity Bold'** and *this is called 'Trinity Italic'*.

Clip Art- Commercial line art used in graphic design, often poor quality and used with desktop published documents.

Pointsize - Size of font.

Devices used with Computers (sometimes known as peripherals).

These can increase the artistic capability of your computer:

Digital Camera - Also known as a video still camera. This camera records and stores a number of images that can be transferred to a computer system for processing in art software.

Digitiser/Video Card - Electronics adaptor that fits inside the computer and allows images from a video source to be displayed on a computer monitor prior to saving onto floppy/hard disc.

Genlock Board - Electronics adaptor that allows you to record anything that happens on the computer screen onto videotape. Can also be used to overlay computer graphics, particularly text, with video.

Graphics Tablet - Flat surface used to import artwork onto the computer screen by drawing with a pressure sensitive pen on its surface. Available in different sizes up to A2.

Scanner - Used to copy drawings, photographs, collages, etc. onto disc.

1. Hand held scanners have to be manually dragged over an image at a constant speed to produce an accurate copy of the image.

2. A Flatbed Scanner is usually an A4 size and operates in a similar way as a photocopier.

Some scanners are also capable of **Optical Character Recognition (OCR)** - so that scanned text can be converted for use in DTP documents.

Touchscreen - Computer display peripheral device that fits over the computer screen which allows the user to control actions through physically touching the screen.

CD ROM Drive - Computers can be purchased with an integral internal CD drive. This enables the user to use thematic CD ROM discs containing text images sound and video clips. Selected images and text can be downloaded onto floppy/hard disc and incorporated into documents.

CD Writer- This device can be used to author and store multimedia presentations/visual data etc. onto a CD disc, for use as an educational resource.

APS - Advanced Photo System is a new way to take and process photographs. There is a choice of three print formats: Classic 149 x 101 mm, HDTV 178 x 101 mm and Panoramic 254 x 101 mm. An APS film scanner linked to a computer will display your image on screen for processing.

Printer- Used to output images or text. Print quality can be variable and does not always match the screen image although this technology is improving. The quality of printed work depends on **dpi** (Dots per inch), which describes the resolution of printed material, i.e. a 600 dpi printer will produce a sharper image than a 300 dpi printer. Colour inkjet printers are relatively inexpensive. Computer artists often resort to photographing the computer screen for the most accurate rendition, (tripod required, slow setting, darkened room). Laser printers are fast printers used for text. Colour laser printers are high quality, but very expensive.

Storage.

Data - Information in a form the computer can understand.

Disc (floppy) - A storage medium used to hold data.

Format - To prepare a new disc so that it is compatible with the appropriate computer system.

Hard Disc - Rigid magnetic disc contained within the computer able to store large amounts of data.

Zip Drive - Computer artists and graphic designers who work with large image files often rely on these removable/portable hard discs to save their work prior to commercial printing.

Disc Drive - Slot in which you can insert floppy discs.

CD ROM - Plastic optical disc that can store large amounts of data including video, animation, images and sound.

Kodak Photo CD - CD disc that contains extremely high resolution images. Your photographs in slide/negative format can be transferred onto a CD in batches of 10. Kodak Photo CD disc capacity is 100. Most photography outlets will transfer your images onto Kodak Photo CD (1 week turnaround).

File - An item containing information stored on disc.

File format - There are different sorts of file formats for different information i.e. images, text, video etc. Different computers from Apple Macintosh to Acorn to PC use their own particular formats. It is possible to convert files from one format to another using the appropriate software.

JPEG - This is a common graphics file format developed by the Joint Photographic Experts Group.

Communications.

ICT - Information and Communications Technology.

Internet - International wide area network also known as the World Wide Web that links resources on several million computers around the world via a telephone link. Many schools are now linked to the Internet. Art students can download images from different Museums and Art Galleries.

IAP - Internet Access Provider. Your IAP provides the local link from your computer to the rest of the Internet.

World Wide Web - is a subset of the Internet.

Modem - A modem converts data from a computer that can be passed along a telephone wire.

HTML - (Hyper Text Markup Language). Special programming language used to design Web pages. Art departments can now create their own school virtual art galleries for the Internet.

E-Mail - otherwise known as 'electronic mail' which means that text and images are sent by a computer rather than the local post office.

Multimedia - Combination of sound, graphics animation, video and text within an application. Computer Multimedia consists of a series of interactive pages containing a variety of data that are linked by interactive buttons. Software such as Hyperstudio (Acorn, PC or Apple Macintosh) will organise a wide range of different data for you as a presentation.

VR - Virtual Reality. Computer technology which creates a simulated multi-dimensional environment for the user.

Video Conferencing - Linking computers that can capture and display video, so that people can talk and see each other, (live!)

Miscellaneous.

Copyright - Software is purchased by school either as a single site licence, e.g. for use on one computer system or as a site licence specifying the number of computer systems. It infringes copyright to copy software and distribute it or use it on another site other than the one specified. The Federation Against Software Theft (FAST) prosecute establishments infringing copyright.

Organisations.

NSEAD - National Society for Education in Art and Design.

NCET - National Council for Educational Technology.

NAACE - National Association of Advisers for Computers in Education.

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Ian Walden, Black Country Museum,
Nimbus Manufacturing (UK) Ltd,
Wolverley Press & Studio Limited.

IT Works Kodak Photo CD

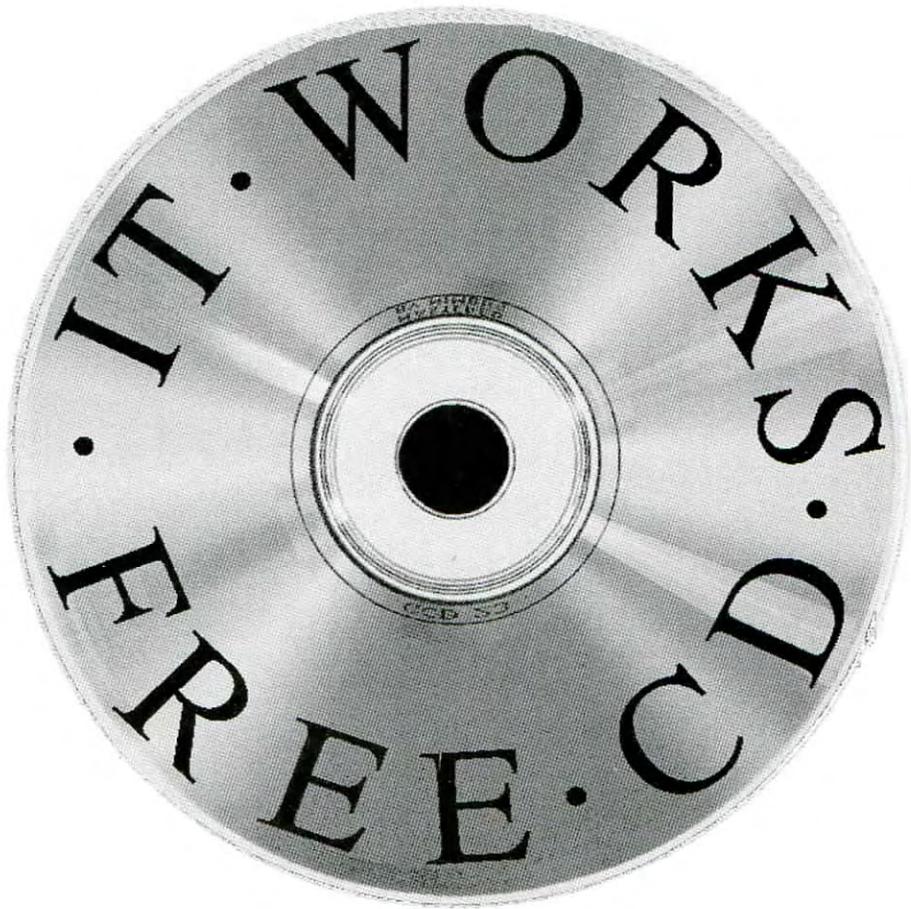
This free disc contains 100 high resolution pictures of PGCE **IT** and Art curriculum boards taken from the last 3 years. Each board contains a large number of images and contextual descriptions based on innovation in **IT**. A text file on the disc serves as an index for the user. This unique art resource can be used for education or pleasure, but hopefully both.

It is possible to view these pictures through a computer system. Users of PC, Apple Macintosh or Acorn computers require a CD-ROM drive and Kodak Photo-CD access software. It is possible to obtain prints from the pictures on the Kodak Photo CD disc via a computer by exporting the images to appropriate imaging software.

IT Works Copyright

This disc based photographic resource has been produced in partnership with West Midland schools and the University of Central England. The images on the Kodak Photo CD disc are copyright UCE. The images may be copied provided it is for the purpose of private study, criticism, review or other non commercial uses and for no other purpose. The images may not be distributed in any form, or by any means, except to students and staff within an educational institution, where the purchase has been made by that institution. The images may not be re-sold.

Further information regarding **IT Works Kodak Photo CD** can be obtained from University of Central England on 0121 331 5965.





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