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Pedagogical strategies for teaching digital media

Martin Locker Asian University

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[ASSOCIATE DEAN IN LIBERAL ARTS & PROGRAMME
LEADER IN MULTIMEDIA AT ASIAN UNIVERSITY]

The term 'computer graphics' is, on the one hand, superfluous in that in this day and age; the idea of producing anything in the graphics-related field without using a computer is almost unheard of. However the term 'computer graphics' still holds important value because this transitioning technology has not only provided a natural evolution of process but reinvented and redefined the whole communication design industry. As practitioners and educators of this new discipline, not only have we embraced this exciting new media, but we have also developed new strategies for managing the processes that come with it. Using the multimedia programme at Asian University as a case study, this paper reviews some of the opportunities brought about by the digitization of media design & production. It also looks at how this has presented us with new challenges to develop strategies to foster critical and creative thinking.

Why computer graphics?

The field of computer graphics or 'digital media' represents a fundamental change in the way we **think, communicate, and interact**, in the world around us.

Managing this transition presents new challenges to the educator and practitioner both in terms of our social & ethical responsibilities as well as our professional responsibilities in the workplace.

Thinking about information

Since we have been able to digitize media, we have begun to change the way we think about information. This shift in thinking became accelerated with the introduction of the World Wide Web (NCSA Mosaic Web Browser was released in 1993). A good illustration of how we have changed our thinking is the amazing success of *Wikipedia*. Launched on 15 January 2001 and based on the expert-written web-based *Nupedia* released the year before, *Wikipedia* quickly became an overnight success receiving over 10,000 contributions in the first 8 months and now provides several million freely accessible articles written in over one hundred languages – it is a truly global resource. What makes this website so unique is its 'wiki' collaborative aspect – essentially anyone across the world is welcome to create a new article or contribute to an existing entry. In other words, it closes the loop between reader and author – the

media consumer *is* the media creator.

However, the story does not stop there because, with *Wikipedia*, came a whole different way of thinking about information. Encyclopaedias in the past were pretty well established as the revered ultimate leather bound 32 volume reference that no good household should be without. *Wikipedia* immediately challenged this conventional approach to publishing information with its free online equivalent. But *Wikipedia* is hardly 'equivalent'; where we once had 100% 'reliable facts', we now have questionable half-believable opinions; where before we had expert writers and editors, we now have amateur 'users'; where we once had slightly dated published editions, we now have up-to-date postings that are never finished; where before we had tangible long-term permanent artefacts (books), we now have temporary and, most importantly, temporal technology that never really exists except as a moment in time. We have gone from absolute authority to a gestalt where information is stripped of value, and integrity; we have one of the most amazing information resources the world has ever known, but it is a resource which challenges our concepts about memory and reveals the fragility of the information technology age (experts can still read the cuneiform documents of 3000 year-old Mesopotamia) – One of the biggest new challenges designers and engineers face is

how to record the memories and perspectives of our fast developing but quickly fading cultures.

Digital communicates

In this new age of digital information, technology has enabled a shift in the way we think about communication. The idea of mass media – an elite few communicating to the many – is being challenged with a new paradigm in which anyone and everyone have become publishers or ‘content producers’. Internet related technologies such as wikis, blogging and podcasting have literally revolutionized content production evidenced with such sites as My Space and YouTube. This mass communication of personalised content has created a demand for shiny exciting ‘assets’ that can be used to embellish what might otherwise be a rather boring ramble of prose and snapshots. This demand is so strong that it has created new genres in content production; blinging, mash-ups, as well as the ‘creative commons’ licence, provide genuine challenges to the corporate copyright industry.

Perhaps more important than on-line communication is how the mobile telecommunications industry is changing the way we think. Here we see ‘media convergence’ at its very best – by disconnecting the phone, going mobile, a whole host of possibilities are beginning to emerge. The telephone has become a media-rich channel encoder and decoder – a ‘pod’ to jack-in to the ubiquitous. But with all this ‘freedom’ comes a price. GPS works both ways and in the wake of the post-9/11 ‘war on terror’. People are rapidly becoming the data objects of the system, be it demographic profiling for narrowcast marketing or biometric tracking in the name of national fear. Personal privacy has never been so open to ques-

tion and yet people have never been so open to publicity. Being a conscientious designer in this commercial and almost hostile industry is not an easy choice.

Inter-personal inter-action

The digital revolution is changing the way we interact with one another. On the one hand, technology has become a convenient ‘medium’ or shield. We hide behind our emails and chat pseudo identities to avoid face to face confrontation. The asynchronous backup systems of voice mail and SMS have become preferred modes of communication – direct conversation especially in the same physical space is almost a last resort. However, technology has enabled us to use more synchronous modes of exchange which, although still essentially one step away from ‘a friendly chat’, do place demands upon us both in terms of expected protocol (you must reply to an email within 24 hours) and expected connectivity (if you switch off your mobile phone, you are breaking social etiquette).

On the other hand, technology is bringing us closer together. Marshall McLuhan (1962) could not have chosen a more appropriate term than the ‘global village’. We are able to interact and collaborate on a truly international scale and at an ever increasing pace. In the social arena, we blab on anonymous bulletin boards and call it free speech, and we become totally consumed by the freedoms that virtual community and anonymity afford us. We become anyone we choose to be, and then we role play out our fantasy to the point of it becoming a new reality or hyper-reality.

Technology has provided unexpected new ways of socially interacting. On the collaborative level, we see Open Source soft-

ware presenting a very positive challenge to traditional ideas of ownership. However, on the level of entertainment, the industry is being redefined. From pornography and stranger-chat interactions to online gambling and massive multi-player games, these highly addictive modes of interaction are only encouraging our needs to avoid the social confrontations of our everyday realities.

As designers, we need to move away from the idea that interaction design is only about technology. To rephrase Kaptelinin & Nardi (2006) “Interaction Design comprises all efforts to understand human engagement with digital technology and all efforts to use that knowledge to design more useful and pleasing [human exchanges]” In an interview with Regine Debatty (March 2007) Tony Dunne sums up “I think there is a real need for design to address the public as well as industry, and to explore new ways of getting discussions going about what people really want and how industry can help us achieve it, rather than the other way around.”

Design Pedagogy

“Design pedagogy or design education may be defined as the set of practices and systems for the training in the field of design; the ways and methods of teaching for the acquisition of necessary knowledge and skills in order to practice the design profession.” (Artemis Yagou 2007)

With the emergence of computer technology, this task has become increasingly complex and challenging. Not only do we have to enable students to think about the issues mentioned above, but we are faced with the very physical and practical concerns of learning in what has become a

Elements of the form of an interaction

In the introduction to *Designing Interactions*, Gillian Crampton Smith suggests that there are four dimensions to an interaction design language.

1-D—words—which are interactions

2-D—visual representations—which include typography, diagrams, icons, and other graphics with which users interact

3-D—physical objects or space—with which or within which users interact

4-D—time—within which users interact—for example, content that changes over time such as sound, video, or animation.

Kevin Silver (2007) suggests a fifth:

5-D—behavior—including action, or operation, and presentation, or reaction

This model not only applies to interaction design but to all aspects of multimedia design

technology-centred discipline where convergence is forcing us to reevaluate our roles in this exciting and thought provoking industry.

Transcendences

“The challenge for educators today is to help designers become the masters, not the slaves, of technology.” (Ellen Lupton 2006) Today’s technology is seductive. It is as much a toy, as a serious business machine. This seductive characteristic means we are naturally inquisitive to learn, but we are easily sucked in – the technology ‘takes control’.



A typical university computer lab

It is not so much the fact that we have technology – it is the way it is presented that I have issue with. Is there any difference between this image of a ‘computer laboratory’ and the sweat shop factories of industrialised mass production? Confronting students with technology in this way forces a mode of thinking and a mode of action – sit down, switch on, and tune in. Interacting with the technology is essentially the *only* objective. But if we don’t teach students how to use technology, what chance do they have of mastering it? Is it not inevitable that to become a master you must first be a slave?

At Asian University, all multimedia students have their own laptop computers. The objectives are not technology-centred. Instead, students are encouraged to see computer technology as one possible means to an end. This completely changes the way they interact and more impor-

tantly, the way they think. The computer stops being the dominant focus of the workspace and the workspace becomes mobilised in much the same way as the low-tech high fidelity pencil & paper affords. As soon as students start thinking literally ‘outside the box’ they soon see the shortcoming of the computer – the students’ ambitions supersede the technical limitations of the technology, and that is when creative and critical thinking begins.



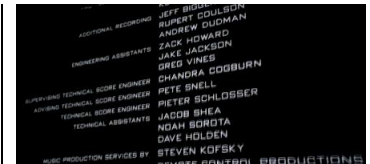
Studios not labs nurture creative minds

Converging diversity or diverging diversity?

Another challenge today’s educators face is deciding on what students need to learn. The visual communication discipline has suddenly got a lot broader and a lot deeper. With convergence, you cannot avoid the multi-dimensional nature of media – how can a student of graphic design (traditionally a 1x2-D channel) avoid learning about 3-, 4- and even 5-dimensional media if they really want to practice at the edge of their discipline? [See margin note.]

Likewise, Lupton’s idea of ‘designer as producer’ is very enticing but can we really expect students to master the multi-tasking roles and expertise conventionally shared by huge teams of creators and artisans. Just because technology allows us to be super-heroes doesn’t mean it is a good idea – we are in danger of educating generations of Jacks and Jills rather than creative geniuses.

At the end of the day, we have to ask what is important. Undergraduate programmes haven’t suddenly had a few extra years



added on to compensate for the explosive potential learning opportunities technology affords. We still have the same job to do and the same amount of time to do it in. Our job is to nurture and support new generations of designers to become creative and critical thinkers irrespective of what current technologies are at hand.

One approach we take at Asian University is to insist that many of the classroom assignments are collaborative. This is achieved by either students working together in small groups, or treating the whole class as a team with the same objectives. This methodology not only usefully imitates the professional design practice, but also allows students to find their own strengths and hone their expertise within a wider range of possibilities.

Studio practice

The traditions of using studio practice as a fundamental system for learning can be traced back to the Bauhaus (1919-1933) where, routed in the principles of the Arts and Crafts movement, fundamental principles such as ‘learn by doing’ and ‘theory is practice’ emerged. It was not until later that educators introduced interdisciplinary learning strategies with subjects such as “ergonomics, semiotics and communication theory” (Artemis Yagou 2007), with a view to establishing design as a more legitimate academic discipline. (as well as enriching the verbal and visual language of design). Studio practice, however important it is regarded, can be criticized for its intangible nature. To counter this, at Asian University, we have identified three design

models; **production, iteration** and **process**. These models are introduced to students as reference; often rejected or discussed in hindsight, rather than being counter-intuitive formulae intended to force methodologies and outcomes upon creative student minds.

The production model



The mass production line developed by Henry Ford.

This approach supports the traditional view that the division of labour creates high efficiency – It views the designer as one small role in the greater system of production for industry. This system is made up of various experts and artisans each contributing their skills to achieve the highest standards and efficiency. This approach generates differing views on 'what is a designer'. For some, design is more the humble craft of mastering the necessary technology to transform ideas into communications - designers don't think they just produce what is required. For others, the designer is the intellectual genius – the consultant who sits above menial tasks involved in production (traditionally the job of semi-skilled workers in the trade). In the classroom, a 'production' approach to design provides the pedagogically useful separation of creative thinking from the application of technology – it liberates thought. A good example of this is in a studio practice assignment called 'Kidlink' in which students are asked to design a mobile product aimed at helping parents and young children keep in touch. Though storyboarding, paper prototyping

and scaled drawings, students put forward very convincing and realistic proposals for a new type of mobile device.



Kidlink: Mobile technology for 3-8 yr children to keep in touch with parents & family.

The iterative model



Working directly in the medium enables the designer to achieve a limitless rhizome of iterations / possibilities. This is far from a new idea. It is clearly evidenced in the pre-industrial / arts & crafts philosophy seen at the turn of the 20th century – the carpenter must work directly with the idiosyncrasies of the wood in order to make good furniture. The potter produces numerous variations on a theme in order to achieve perfection. Computer technology is as much a medium as any other technology and should be treated as such. This hands-on approach encourages intuitive and accidental breakthroughs that would

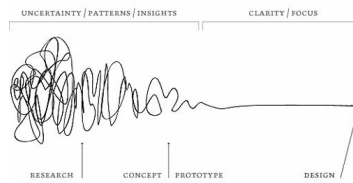
be impossible to foresee with a 'production' methodology. This approach also supports Ann Burdick's proposal that "...designers must consider themselves authors not facilitators. This shift in perspective implies responsibility, voice, action... With voice comes a more personal connection and opportunity to explore individual options".

An example of using an iterative approach can be seen in our course on Processing. "Processing is an open source programming language and environment for people who want to program images, animation, and interactions." Developed by Ben Fry and Casey Rees (2007) at MIT, it is aimed at enabling design students to achieve remarkably sophisticated and seductive results with very little formal training or knowledge of software programming. Students are encouraged to experiment in the medium creating Hendrik Werkman-style interactive 'druksels and tiksels' that are pure explorations derived through direct manipulation – the work exists with no other purpose in mind.



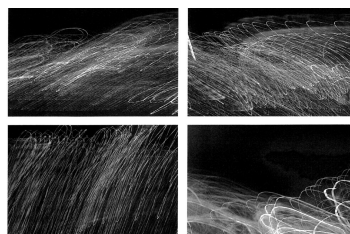
Examples of student interactive work using Processing by Ben Fry and Casey Rees

The process model

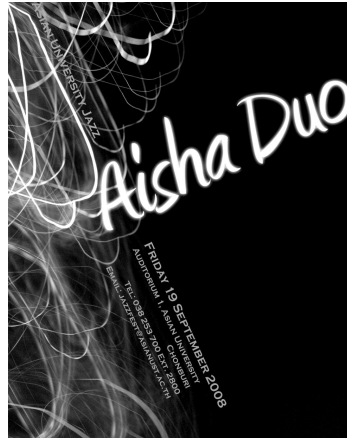


The design process from a great height
 – Central Office of Design "start each project assuming nothing, especially about what the solution to the problem might be, and embark on the process with empathy for the final consumer of the solution. Whether it be an employee, child, or mother of three."

This approach supports the viewpoint that projects should be 'managed' from start to finish. At its most creative, process almost becomes choreography. Design is not so much about outcome but about the intellectual or intuitive journeys taken. At its most practical, the process model provides students with a relatively fail-safe approach to design. It combines the best of the production and iterative models and provides a methodology very much suited to professional practice. From an educators point of view, it enables students to clearly illustrate their thinking strategy by recording every aspect of the process – it allows us to objectify or measure 'good design' more easily and so relies less on subjective opinions which often play an awkward role when providing necessary assessment.



Event poster: These students listened to music and illustrated what they could hear.



Students work within the following process:

1. Define objectives
2. Undergo research
3. Brainstorm ideas
4. Explore concepts
5. Experiment with media
6. Produce varied wide ranging iterations
7. Test and hone successful outcomes
8. Focus production on deliverables
9. Deliver/publish artefact

Multimedia at Asian University

Creating a new curriculum in Multimedia was a great opportunity to reevaluate the classic 'Graphic Design' degree and put together four years of learning that would really place graduates on the 21st century map. It prepares them not only to enter the 'Information Business' with a head start but positions them ready to select how they will continue their education at the post-graduate level.

As well as the key socio-intellectual issues of this industry, and dealing with the inherent mixed values brought on by computer technology, we have also included pedagogical strategies in the curriculum that provide students with a very unique but challenging and long lasting experience.

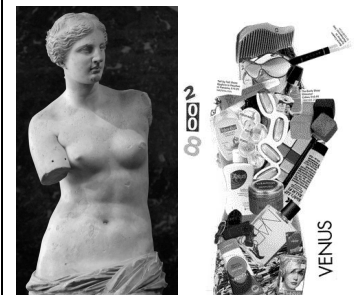
On the scheduling level, the curriculum is organised to support parallel teaching – related subjects are taught simultaneously to optimise connections between Theory, History and Practice.

On the level of content almost 50% of courses are theory-based including: philosophy,



Parallel teaching (as opposed to the prerequisite layering metaphor) makes learning an iterative and connected experience.

psychology, sociology, cultural studies, communication theory, soft skills etc as well as diverse subjects such as Art theory, Interaction design, Game theory, Collaborative environments, Film and Animation, Narrative theory and Physical computing.



Venus assignment: A good example of how students experience the integration of History, Theory and Practice. **History:** How have artists represented the female body over time? **Theory:** What values did people think were important during that time? **Practice:** What do students think about the contemporary woman?

The boundaries between art, design and engineering are deliberately blurred. Three concentrations provide students with the chance to focus their study: Multimedia Communication, Multimedia Design and Multimedia Technology. Applicants are encouraged to apply from different educational backgrounds & cultures, thus students can contribute their own values to the mix.



Identity & Freedom: A high Technology subject with a low-tech solution.



Identity & Freedom: Art and design boundaries are deliberately blurred. With an open brief, students chose to express their ideas using sculptures and installations rather than digital high-tech solutions.

To conclude, as an attempt to deal with many of the issues outlined in this paper, we have developed the following pedagogical objectives at BAM, Asian University:

Embrace technology with enthusiasm;

Focus energy on what is important: 'communication';

Develop timeless skills that transcend technology;

Aim high – educating masters not slaves, directors not robots;

Develop multidisciplinary skills: including soft skills;

Provide an academic foundation: history & theory;

Experiment with process-driven practice to develop creativity and support real world needs;

Encourage critical thinking and critical design;

Build critical awareness of industry trends and developments;

Provide hands-on iteration and experimentation;

Regard the design discipline as a subject to be learnt, not a skill you need to be born with.

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Martin Locker is a lecturer at Asian University, where as well as being the Associate Dean for the Faculty of Liberal Arts, he founded the Department of Multimedia which is now beginning its third year. Martin graduated from the Royal College of Art with an MA in Computer Related Design. He went on to work as programme leader at the RCA before moving to Thailand where he worked for 5 years in the field of EFL as a branch director for AUA Language Centre. In the UK, Martin had also taught for several years as programme leader in Communication Design at Central Saint Martin's School of Art & Design, as well as a lecturer at the University of Reading where he received his first class BA in Typography and Graphic Communication. In addition to having over 20 years of experience in education, Martin has worked for many years in the field of user interface design for international companies including Silicon Graphics Inc where he designed 'Exposure', the 3D digital composition tool used by DreamWorks in animation productions such as Prince of Egypt.

mlocker@asianust.ac.th

www.asianust.ac.th/multimedia