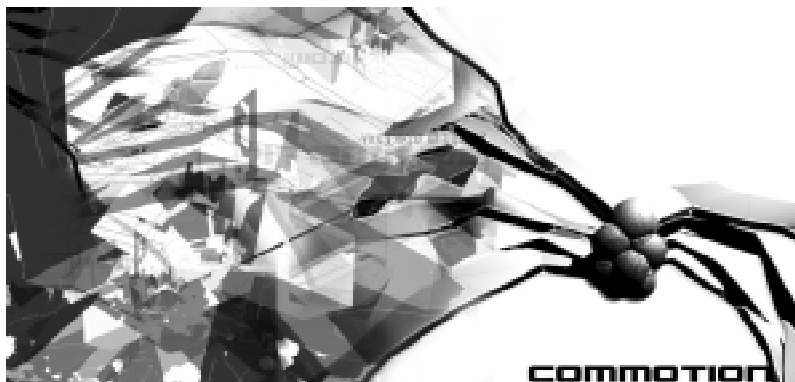


A CREATIVE CURRICULUM: PUTTING TECHNOLOGY IN ITS PLACE



Geri Cruickshank

University of Abertay Dundee

G.Cruickshank@tay.ac.uk

Inga Paterson

University of Abertay Dundee

I.Paterson@tay.ac.uk

Louis Natanson

University of Abertay Dundee

L.Natanson@tay.ac.uk

Abstract

The accessibility of 3D Modelling software presents challenges in the delivery of education aimed at developing creativity. Despite opening up innovative avenues of artistic possibility, computer technologies are essentially two-dimensional, hard to master and may restrict creativity itself. This paper describes a curriculum designed to develop creativity within an Electronic Arts programme. A student-centred, experiential learning approach was taken, which challenged students to set personal objectives within set project constraints. Formal critique sessions allowed students to develop a critical perspective. Conclusions are drawn as to the applicability of the approach to other non-artistic areas.

Background

The University of Abertay Dundee is one of Scotland's modern industrial universities. The institution, which was granted university status in 1994, was founded in 1888 to service the industrial needs of the city in engineering and textiles. In the 1990s the city and the university found itself at the centre of a burgeoning interactive computer games industry, with many of the significant figures in that business receiving their higher education at the university. In recognition of the economic significance of this sector, the university pursued initiatives to produce computer games programmers and also computer artists. The institution had no tradition of arts teaching and so this curriculum adventure represented a real challenge. The aim of the computer arts programme was to develop the artistic potential of students with talents in art, design or music using computer technology as the primary medium. It was envisaged that students would find employment in all

areas of computer mediated art; not just restricted to the computer games industry.

The first cohort of students entered the 4-year BA Honours in Computer Arts in September 1999 and was recruited by qualification only. The course had essentially been promoted along side the computer games technology courses, which caused some confusion amongst the students about the course aims. The (predominantly male) cohort anticipated careers in the computer games industry and was resistant to elements of the course that addressed a larger artistic agenda. This manifested itself in their attitude that learning was predominantly a question of acquiring software skills and that learning resources related to the quality/availability of computer laboratories and knowledge of software applications of the teaching staff.

The first year of the course focused on audio and the 2 dimensional visual world

and was successful. In the second year, the first semester course on 3D design was criticised by the students. Technical problems had occurred within the laboratories and students were concerned about the coherence of their studies: web development, moving images and sound were studied concurrently. Personality conflicts had arisen within the cohort and later, between students and staff. The 3D course was prerequisite to later courses on 3D Character Design, Virtual Environments and Animation. The student criticism stimulated much analysis and revision by staff.

The main subject of this paper deals with the approach to delivery of the 3D Character Design and Virtual Environments courses, adopted as a result of this analysis.

The vocal critics promoted a perception of the course aims and its underpinning resources which (in some ways),

underlined inherent tradition within the institution. Understanding course aims in terms of viewable products came more naturally to staff from an engineering style experience. As for the learning environment, such staff could readily understand complaints about computer equipment and laboratory arrangements since these could easily be translated into hard material facts. An extenuating factor was personal difficulties of key individuals within the social dynamic of the group. The students had an expectation that creativity would follow as a consequence of mastering the software. Their horizons had become limited and they had lost the concept of themselves as artists in formation. To pursue an agenda for creativity in such circumstances seemed an insurmountable task.

The work described in this paper sought to address these issues by adjusting the delivery technique of two courses in the semester that followed on from the course described above (amounting to about half of the total programme for that semester). The detail of these two courses is given below. Formal, tutored critique sessions held within a computer-free creative environment allowed students to learn, from staff and fellow students, the elements of a critical perspective as well as developing their discursive communication skills and learning the language of criticism.

In order to shift the learning agenda from software mastery (exhibited by the perceived quality of product) to creative and critical thinking (i.e. demonstrating the ability to contribute articulately and receive contribution in the development of ideas). It was felt that these sessions be taken by a variety of staff, both technologists and artists, not just the course tutors

OBJECTIVE: Improved delivery of Creative Education

This section of the paper describes a curriculum designed to develop and nurture creative and design skills in the

area of three-dimensional electronic art; specifically 3D Character Design and Virtual Environments. The objective was to improve the delivery of the modules and to change direction away from the inherited serialistic approach that promoted surface learning and provided minimal feedback that resulted in a low intensity of work and a cohort lacking in self-motivation.

The aforementioned problems identified in this paper resulted in a serious lack of motivation among the students, as Race¹ points out:

“Internal motivation is a highly important element in the learning process and is what makes a person want to learn something in the first place”.

It was therefore deemed necessary to implement changes immediately, beginning with the working environment. This served to emphasise the changing course. The students were removed from a computer-dominated environment and placed in a more traditional Art studio setting thus allowing them the opportunity to explore a whole range of different media. Previously they had been too focused on use of software resulting in an inhibition of their creativity; the aim was to encourage deep learning through a holistic approach.

Ultimately a level of software proficiency was needed to effect and realise the developed ideas. During the semester a software skills “clinic” was run in parallel to the modules where students could gain technical help in how to achieve the effects they sought. A 3D modelling software specialist ran the clinic and was not otherwise involved in the two modules. This served to reinforce the objectives of the two modules and separated software instruction from critical thinking.

New technologies, including computer programs for 3D modelling and rendering, provide us with the latest tools to depict solid objects on a flat surface in a way that mimics the eye’s view of the real world. One objective was to develop the

student’s spatial and anthropological observational skills. They were also encouraged to push the boundaries of their experience in order to enhance their creative potential and advance their software skills beyond the limitations of their current knowledge to realise their ideas; the output had to be digital.

The research focused on the two central modules: 3D Character Design and Virtual Environments, both by their nature providing the best opportunity for analysis. There are strong parallels in content but each required a different mode of creative thinking, 3D Character Design required more anthropological observation whereas Virtual Environments demanded a more philosophical approach. Both modules provided the opportunity to remove software teaching from the intellectual content of the course and increased the basis for students to undertake research into different areas. Within each module, evidence of research, concept and concept development was consistently monitored, tracking the creative thinking and the design process. Both modules used the same software and emphasis was put on digital output.

In order to achieve our set objectives as educators we elected to adopt a project-based, student-centered experiential learning approach and, in line with current educational theory we identified with models of learning² that could be applied to meet our objectives. Problem solving formed the basis of each project³ which encouraged students to be actively involved within their own learning process and provided a flexible structure to accommodate the learning types of individual students. The projects for the Virtual Environments module were structured in increasing levels of complexity to develop the student’s abilities to think conceptually and abstractly⁴. Projects for 3D Character Design involved group work to encourage the development of open-mindedness and willingness to listen to others’ views and for developing

transferable process skills such as communication and general interpersonal skills. Running the modules in parallel each with a slightly different emphasis on pedagogic approach catered for different learning types to excel.

Intrinsic to the teaching objective of both modules, and in line with the Race model¹ the projects were designed to stimulate and motivate. The students were encouraged to analyse and to interpret how we interact with the 3D world we inhabit. To research a diverse range of source material from the Arts, Science and Literature, and to use a variety of traditional creative media in an iterative process of concept generation and development to produce innovative digital output that emulated a 3d representation of characters and environments.

Assessment

The individual's performance was measured over the space of the module employing the critique style of assessment. The critique sessions were attended by a variety of staff, both technologists and artists, not just the course tutors. In this way the learning agenda was shifted from software mastery (exhibited by the perceived quality of product) to creative and critical thinking, demonstrated by the ability to contribute articulately and receive contribution in the development of ideas.

The critique process highlighted learner type characteristics and illustrated the need to cater for all styles when planning teaching/learning programmes. A useful way of classifying students' learning styles is in terms of the four-dimensional scheme developed by Honey & Mumford⁵ that identifies four basic learning types characterised by preference for activist, reflector, theorist and pragmatist. Although these classifications are extremes and combinations of all learner types exist, four students stood out as having the classic style of each learner type. Whereas the reflector and the pragmatist produced work that was above average it was interesting to

discover that the activist and the theorist produced the most innovative and creative work. The group dissemination offered the opportunity for students to develop the desired attitudinal traits as well as communication and interpersonal skills, to display artistic and technological sophistication, and to cultivate social and personal maturity.

Conclusions

The increased level of student motivation that resulted in work of a high calibre for second year students can measure the success of these courses. Towards the end discussions between students, and between staff and students centred on ideas and their development. Many students expressed the feeling that this modality of education should have been applied to their curriculum earlier.

The critique method also encouraged assimilation and provided a feedback mechanism where students reflected upon their personal development and vocalised their views of their learning experience. The reciprocal nature of the feedback process provided the module deliverers with both valuable insights into the learning styles of individuals and a source for future development of teaching strategy

These courses were delivered from a division that contains staff with artistic backgrounds and others with engineering or scientific backgrounds. Interestingly, this work inspired discussion amongst the divisional staff on approaches to developing critical and creative thinking in all subjects not just art and design. The consensus, from engineer to artist, is that we fail our students if we restrict ourselves to teaching them how to use technology to find solutions. The fundamental challenge is to develop the creative mind that uses technology to realise its imagination in the creation of all areas of the digital domain from computer programs to electronic conceptual art.

References

- ¹ Percival, F; Ellington, H.I.; Race, P; "[Handbook of Educational Technology](#)"; Koogan Page, 1993.
- ² Kolb, David A; "[Experiential Learning](#)"; Prentice Hall, 1984.
- ³ Gagne, R.M; Erlbaum, L; Hillsdale, N.J; "[Instructional Technology: Foundations](#)"; USA, 1987.
- ⁴ Piaget, J; "[The Psychology of Intelligence](#)"; Routledge, 2001.
- ⁵ Honey, P; Mumford, A; "[A Manual of Learning Styles](#)"; Maidenhead, 1992.