

Computer-graphics and the literary construct: a learning method

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Abstract

This paper describes a third-year undergraduate module, *Text Through Images* (*TTI*; known at first as *Texts with Computers*) which ran for some years in the School of English, University of Exeter, UK. Instead of using only words, *TTI* students made their own computer graphics both to discover and to describe literary structures in texts of their choice. The results were surprising: whatever their “academic” ability, students on this course regularly produced genuinely original literary perceptions, and their natural creativity was released. The module’s innovative methods are eminently transferable to other disciplines. This paper is designed to be read in conjunction with a website: for further details, go to <http://www.blackwellpublishers.co.uk/asp/journal.asp?ref=0007-1013> presenting a selection of students’ graphics produced on the course; these appear by generous permission of their makers, who hold copyright.

The reasons for the module’s success are elusive. Perhaps students feel unfettered by the attitudes associated with traditional verbal expression, the absence of preconceptions about the new process enabling them to bypass old habits of thought. Perhaps the interplay of word and image is particularly fruitful because images and words activate different areas of the brain. It may be that the computer creates the illusion of distance between design and designer, so that the latter feels less personally exposed than when drawing on paper. Perhaps success lies in the combination of individual freedom and on-screen group work, or on the way in which students are enabled to make small but publishable original discoveries. Educational psychologists may be able to explain why the mix works (it has been suggested that it represents a “constructivist/generative learning strategy that Dave Jonassen terms ‘elaboration’”) but more importantly, teachers may find the model useful. What interests me about the module is not the structure of the teaching, but the way in which the use of diagramming apparently enables the learner productively to bypass previous mental conditioning about how literature works, and what is acceptable in analysing it.

Genesis of the module

Development of the module was in response to unusual persistence of a familiar difficulty that normally evaporated about two weeks into teaching that most challenging of medieval texts, *Piers Plowman*. The poem has no shape of the kind that students look for, no “characters” or “story” to hang on to. Some 7310 lines in eight sections and twenty-two subsections constantly create and then frustrate the expectation of clarity. That this structural obscurity embodies the very meaning of the poem (the difficulty of the search for Truth) was no help. Students, as always, tried unsuccessfully to respond to superficial, linear action instead of interrogating the complete text or examining relationships between parts and wholes. Tutors presenting *Piers Plowman* often use pictures, analogues, summaries—anything to offer a “way in”. This time, nothing worked.

In desperation we tried drawing, by hand, to explore the poem. The students were used to using crude graphics—the familiar Spider Diagram—as an aid to essay writing: the spider’s “body” is the central thesis, its “legs” the associated ideas. But the Spider only indicates crude structures, or connections between ideas: it cannot easily show the relative importance of ideas, or parallels and contrasts between them, or variations in style or mode, and it has to be laboriously redrawn during refinement. In any case, using graphics as an aid to *reading* was an unfamiliar activity. The class paired up to share ideas about the poem by drawing diagrams using line, size, shape, texture and colour. This was slow and clumsy. Drawings were also hard to present to the whole class. Yet results were surprising. Students spoke of “revelation” and “liberation”. They asked “Why haven’t we done this before?” Discussion blossomed; perceptions were subtler; group dynamics improved; recall of the text was immeasurably better. Something unusual was happening. The next step was to provide OHP transparencies on which to draw, so that we could all see all of the work. Cost inhibited creativity, but eventually we had shareable images addressing all eight sections of *Piers Plowman*, and the poem as a whole. There is no such thing as a diagram that is either “right” or comprehensive, but these designs were always enjoyed, always useful (even if by failing) and sometimes original. They became favourite aids to discussion, understanding and recall.

However, a small number of students always muttered “Can’t draw” and felt unable to co-operate. Computer graphics were the obvious answer. The idea that being “unable to draw” hinders diagramming (forgive the inelegant word) is a disabling illusion: skill in naturalistic representation is, in fact, irrelevant. But computer graphics dispel the unwelcome illusion.

The module

A class maximum of sixteen was imposed by computer laboratory limitations, but larger numbers would work just as well, given a large enough demonstration screen. The core of *TTI* was learning to use diagrams, first to discover and explore structures in a literary text, and then to describe these perceptions to each other and to their larger

audience. Their diagrams, each with a brief commentary, became the core of individual desk-top-published booklets consisting of:

- a) Cover Design
- b) Title Page (name, text-title, personal logo, etc)
- c) Survey of critics' approaches to structures in a chosen text
- d) Diagrams of new structures in the text
- e) Brief commentaries on the diagrams
- f) Student's own Report on Learning Processes
- g) Bibliography.

Students were also assessed on a Group Project (which they devised) produced in the last term.

Drawn from all the disciplines within the School, students varied greatly in literary experience and computer literacy. All were required to enter *TTI* knowing one of our two word-processing programs. They studied literature, graphic design, typography and book-design. They also learned at least four computer applications: NotaBene or Word for Windows for word-processing, NotaBene Textbase for electronic analysis of texts; for graphics CorelDraw, and for desk-top publishing, PageMaker.

Our teaching year had three terms of ten, ten and four weeks. The module had a total of 115 contact hours: five hours a week, composed of a two-hour lecture/seminar on theory and methodology (for example, in design principles and typography) and three hours "hands-on". Each hands-on session was in two parts: eighty minutes on-screen group-work, a twenty-minute tea-break and eighty minutes of guided work on individual tasks. Each week students, often in pairs, prepared either theoretical or practical input.

One problem was that literary structures, graphic design, typography, book-design and two computer applications could not be learned in sequence: all had to be running, at however low a level, at roughly the same time. Each student was therefore asked to maintain a simple Project Management bar-chart of their various tasks' start and completion dates, and their overlaps. This was a new concept for them. At this level, it was not the bar-chart itself which was of use, but the process of having to construct it.

Term 1: literary and graphic structures; computer applications

Literary structures

Term 1 began with the study of literary structures and went on to graphics. To illustrate the flexibility of the term "literary structure", students were given a long list of some basic books, followed by shorter critical approaches to assorted structures, and asked to choose an item on which to report to seminar. The list refers to many genres, periods and kinds of structure, such as those conceived in terms of devices; narrative unity; rhetoric; psychology; source modification; numerology; argument; physical sections; allegory; sound; time; contrasts; parallels; frames; objects or images; and so on. The length and variety of the list was instructive in itself. There was double danger

here. Reading criticism might reinforce the linear study methods to which we sought an alternative, and the quantity of critical material might be daunting. In interactive oral presentations to the group, students assessed articles' contents, methods and clarity, all of which helped to demystify critical material. Crucially, the group was gratifyingly irritated by articles which described structures without exploring their function.

Survey of relevant critical material

The next step was for them to find and read critical material on their chosen texts, and produce an outline critical survey of relevant material. Here is an extract (excluding bibliographical footnotes) from Philippa Wade's survey:

"Ryken selects John's Gospel, looking at narrative unity and design. He offers seven comments and observations on the structure: chronological narrative; conflict as an intensifying and recurrent theme; an overall structure of expansion and contraction of the ministry of Jesus; belief versus disbelief; event and interpretation; misunderstanding and explanation; use of number pattern using three and seven. The article is clearly set out, and not technical. It is, however, at risk of stating the obvious. Ryken concludes that the chronology and conflict intensification places importance on the crucifixion; that recurrent examples of belief and disbelief show that belief is central to the Gospel message (!); and that John shows a storyteller's instinct because he has not simply listed events as they happened. This was a disappointing conclusion to a useful introduction to the concept of structures in a Biblical text."

Electronic interrogation of chosen texts

The second stage in the study of structures was for each student electronically to explore a *machine-readable* literary text chosen from a list of those available. The texts were put into NotaBene Textbase for them. For machine-readable texts we used sources such as the Oxford Text Archive, The Rutgers/Princeton list, Project Gutenberg, The Online Book Initiative, The Georgetown Center for Text and Technology's on-line Catalogue of Projects in Electronic Text. They now performed ordinary word-searches to discover the limited kinds of structure revealed by verbal echoes and image-clusters. The program listed hits, giving book/chapter/line references and context if required. The texts chosen were as varied as The Gospel of St John, Chaucer's *Troilus and Criseyde*, Shakespeare's *Macbeth*, *Hamlet* and *Titus Andronicus*, Johnson's *Rasselas*, Eliot's *Middlemarch*, Fitzgerald's *The Great Gatsby*, and Ursula Le Guin's *The Dispossessed*. This apparently linear exercise had two advantages. First, it led to non-linear modes of thought: the contexts in which verbal echoes occur revealed balances, contrasts, patterns of style, and so on: for example, much about the architecture of *Troilus and Criseyde* is revealed by the position of its few uses of the word "ruby", and of *Middlemarch* by its many uses of "web" and associated verbs. Second, it enabled undergraduates to make small but publishable discoveries, which they presented to the actively critical Group. They *abandoned second-hand interpretation*, sensing what it means to engage in research.

Computer applications; graphic design and typography

Meanwhile, students used "How-to" books, teaching themselves CorelDraw in Term 1 (and PageMaker in Term 2). Each learned how to blend colours, enlarge shapes, modify the shape of lines, duplicate images, rotate and mirror them, use guidance grids, control footnotes, and so on, then, and then taught these techniques on-screen to the

Group. The group responded, vociferously, both to presentation content and methods (just as they had in their reading of critics and their interpretation of verbal echoes).

Meanwhile also, theory seminars presented the basic principles of graphic design and typography (or in Term 2, book design). Sometimes the tutor lectured, sometimes students reported on assignments. Word-searches, computer applications and design all formed a good bridge to the graphics stage, which required a leap of the creative imagination.

Graphic structures

Students learned basic graphic skills by creating personal logos, often based on their own initials, for their booklets' title pages. They worked directly in CorelDraw, not on paper first. This worked for two reasons. The task had a strong personal emphasis (your logo can be for life), and graphic manipulation of initials was an excellent way to learn basic CorelDraw facilities which produce powerful effects quickly. Above all, students learned that in designing with a program (as with any medium, perhaps) is important to allow serendipity to play its part in the creative process. The program will produce as many stimulating accidents as a painter could wish for. Designing with a pencil and copying the result on to the computer spells disaster. There is profound difference between the hand movements and thought-processes associated with traditional drawing and those proper to computer-graphics. The order in which forms are made, and possible transformations of them, also differ. A graphics program not only provides an automatically "steady hand" (because its drawn lines are infinitely adjustable) it also suggests its own ways of representing ideas. Computer graphics offer control of line, font, size, colour, texture, shading, angle, size, orientation, outline, position, and so on, and a user can repeat, reduce, rotate, distort and in other helpful ways modify a graphic—all functions laborious to perform by hand. Unexpected and interesting things happen when students, even those who "can't draw", work in this way.

Next came design of the black and white title-pages into which the logos were to be inserted. The arrangement of a few typographical elements (names, title, logo, module etc) on a blank page may seem simple, but by the time you have designed a title-page on which the eye is at peace, you understand a great deal about the white space necessary to eye-rest, about the significance of position, sequence, relative point-sizes and styles of type-face, and the subtle interaction between parts of a whole. Title-pages taught more about graphic design and the principles of "display" as opposed to "body-text" typography.

Full colour cover design then invited students to communicate over-arching ideas about their texts, allowing freer play of the imagination while ideally creating images both powerful and witty, catching the eye, holding the mind and illuminating the text.

The next, large, step was to diagramming of structures. Draft diagrams were presented on-screen to the Group (including the preferably silent tutor). Initially, a diagram presenter was not allowed to explain: s/he must receive in silence the group's interpretations of the graphic. It is all too easy to fudge an essay, blinding both writer and reader with verbiage, but a graphic cannot be fudged: a good graphic delivers its message,

a bad one does not. It also became clear that in graphics the difference between the dazzling and the dull may, as in human beauty, be a mere millimetre.

First attempts often failed, but failures were booklet material as long as the reasons for them were explained. Students initially found both private and group self-assessment alien and alarming, which is why both were eventually so useful to them. Here is Laura Smithson in her Report on Learning Processes:

“My whole attitude to failure changed. I used to be motivated to learn by a fear of failure either in front of the class or in my final exams. Now I realised that bringing a failure to the group was often more helpful to them than a perfect answer. We could all discuss why I had failed, and we all found it much easier to improve next time.”

It always took about three weeks for students to trust each other enough to criticise honestly. Awkward silences and apologetic observations gave way to healthy shouting matches and eventually to rational arguments. Graphics, poor at the outset, were honed sharp, and re-presented.

As Philippa said:

“Success in design requires considerable discipline. An image would be kept merely because of the hours involved in creating it. Over complication by unnecessary use of advanced graphical functions was another temptation hard to avoid. Letters were ‘extruded’ and objects given ‘fountain fills’. Clip-art was used because the possibility had been discovered, not because it was appropriate. This over-designing was complicated by a desire to include too much: excessive detail soon made the images aesthetically unpleasing, without a clear message. The skill of repeatedly refining a diagram until only essentials remained was soon learnt. Improvement of designs depended on group comment, as the designer was frequently blind to an image’s failure to communicate. Failure was an accepted part of the learning process, and the experience became a positive one.”

The tutor only had to ensure that major concepts and program functions were covered, provide training in presentation, offer bibliographies, shoot trouble, and call encouragement from the sidelines.

Diagrams varied in the degree to which they moved beyond the naive kind that merely offered a flow-chart of action or a key to arbitrarily chosen symbols or colours. Viewers of the website will readily detect faults in the work which these students have generously offered for exposure. Nevertheless, I suggest that from young people without any previous experience in design or in this way of thinking, the work is remarkable, and that student pleasure in the module, and its “learning outcomes”, are therefore of pedagogic interest.

Self-assessment

The module employed both peer-teaching and degree-affecting self-assessment (the latter, revolutionary at the time, requiring approval from our External Examiner as well as much red tape). Assessment methods in an early form of the module were briefly described by Jessica Claridge (1995). Self-assessment was of two kinds. For individual self-assessment, each student completed every week a simple form inviting them to consider their learning processes—in the library, with the group, in lectures, at the computer,

etc. These forms provided raw material for their Reports on Learning Processes. The object was self-awareness—to evaluate not information and skills acquired but their own efficiency in acquisition and in dealing with difficulty or failure. Significantly, students initially found it hard to observe and analyse their own learning methods in order to improve them. As Laura put it, in her Report:

“My first problem in filling in a form every week about my learning processes was that I was unsure of what I had to write. I found it easy to establish what computer skills I had acquired during a lesson but less easy to establish how I had learned them.”

The second form of self-assessment was group assessment of the Group Project (see Term 3 below).

Bibliography

From the outset, students were required to build up their bibliography to show the scholarly basis of their study, using the current version of MLA Style—a discipline new to most of them (Achttert and Gibaldi, 1985).

Term 2: typography and book design

Term 2 was devoted to using PageMaker to fuse words and graphics about chosen texts into desk-top-published booklets. We began by seeing how poor typography and book design adversely affect apprehension of text. Reading problems were commonly due not to student inadequacy but to poor typography—the commonest form of which is the crude, automated justification which forces eye and mind to leap irregular gaps between words like a demented grasshopper. Space is syntactic, so that “right justification” works only in the hands of a master typographer. Good book design clarifies, bad design confuses. One student observed that books were never the same again. The refinement of design already addressed in graphics was continued in terms of body-text typography and book design: a “mere millimetre” could affect both apprehension and recall of text. Each student located and described interesting examples of typography and book design—another version of the critical approach to familiar material.

Term 3: group project

The four teaching weeks of Term 3 were for the Group Project, for which students were entirely responsible. Once, for example, they gave a day-long hands-on open workshop “For Students By Students” demonstrating the universal usefulness of the skills which they had acquired. They chose the topic, distributed the labour, raised the money and ran the budget. Using computer-graphics, they produced posters; an exhibition of their work; guide-cards at each hands-on work-station for visitors’ use (thus learning how hard it is to write a good manual); a questionnaire for visitors and an analysis of it. They met and overcame the problems inherent in group self-assessment. Another time, students chose a text not so far studied on *TTI*, and mounted an exhibition of graphics exploring it.

The Project carried 20% of the module’s marks, which formed a small proportion of the overall degree result. The 20% was split into examiners’ judgement of the Group

Presentation (10%) and self-assessment of group-members' contributions (10%). Without the earlier training in honesty with each other, the latter could have been a negative experience. In the event, students gained useful insight into the difficulty of marking anything accurately, particularly where individual contributions to joint effort are concerned.

Learning outcomes

The skills acquired by this learning method include the ability to:

- think in terms of structures transcending the linear
- create diagrams to explore and communicate those literary structures which are accessible and communicable through visual descriptors
- pursue unconventional perceptions of texts
- understand that signs, symbols, conventions and functional relationships between parts and wholes are inherent in both images and literature
- recall texts and structures more easily than before
- understand how graphics can rapidly communicate several things at once, almost subliminally (which is why commercial logo-designers earn a fortune)
- run, assess and improve their own seminars, maintaining good group dynamics
- develop on-screen presentation skills
- give and receive, without embarrassment or dishonesty, criticism of designs presented to the group
- learn simple personal and group project planning
- develop a capacity for constructive self-appraisal of learning processes
- consult the tutor only when all other lines of enquiry fail
- mount an exhibition or workshop and run it
- use "How to" guides (as opposed to manuals)
- produce original ideas often worthy of publication, even if normally weak in using conventional methods of study.

At a modest but useful level the students became literary critics, graphic designers, typographers, book designers, presenters, functioning group members, project managers and competent users of several computer applications. The methods described would easily transfer to other disciplines—say to the evaluation of historical documents, or the study of linguistic changes, the context of archaeological finds, or the comparison of philosophical viewpoints.

Reading and writing are primary tools for literary exploration, students often writing in order to discover what they think. But the traditional, verbal study of literary structures is a less than perfect tool, for at least three reasons. First, it takes a long time to present analysis of literary structures verbally. Second, the words of a text may be consecutive but its internal proportions and relationships are not. Third, *perception* of such patterns is hindered by words' limitations. Yet traditional methods require students to use consecutive words to describe structural perceptions—even when the visual methods of "texts" such as plays and films very obviously transcend the linear. The use of simple diagrams as an aid to learning may be old hat, but the use of

student-generated computer graphics in literary study is not. Compared with traditional English modules this one offered a “different practice of discourse” (see Durant, 1995). There is no virtue in the mere use of non-traditional tools: what is interesting is that the study of literature through computer-diagramming encourages non-linear perception and expression, as well as fresh ways of thinking, and releases students’ enthusiasm, creativity and critical courage.

References

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