Whose Dream? A Case Study of Educational Multimedia Design and *Art Explorer*

Nicola Durbridge
Institute of Educational Technology
The Open University, UK.
N.H.Durbridge@open.ac.uk

Abstract

This paper describes some multimedia software, called *Art Explorer,* designed and developed within the Institute of Educational Technology, at the Open University, UK. The discussion focuses on the pedagogic rationale for this development. The paper is structured round two strands of a design story. First it highlights the research behind the design. The reported research is about learners' problems - most specifically about the varying conceptual, perceptual and affectual challenges learners face as they begin to study Art History. But, more broadly, it is about the problems faced by learners as they begin academic study and seek to engage with the knowledge and methods of discipline experts. Secondly, the spotlight shifts to multimedia. The discussion tracks design decisions that aim both to exploit the potential of the medium and to match pre-identified learner needs. The ingredients of *Art Explorer* are described to illustrate some of the rich potential of the medium for negotiating understanding between teacher and learner.

Keywords

affect and cognition, expertise, exploration, interactivity, learner needs, narrative.

1. Introduction

This paper describes the development of some multimedia software, called *Art Explorer*, developed at the Open University. *Art Explorer* allows users to discover some of the concepts and methods fundamental to a study of Art History. Its major aims are to foster users' personal constructs about paintings and to help them to develop a richer understanding of how their perceptions of paintings work. It does so by offering users a world of experience to work in and a variety of reflective challenges.

The focus of this paper is design issues. It looks at multimedia from a pedagogical perspective and examines the credentials of the medium in the light of pre-identified learning needs. It thus traces a process in which an educational rationale for the use of multimedia and then for this particular design for multimedia is developed. The discussion is structured to follow two strands of a design story: first, the identification of learner need; second, the unique potential of the medium.

2. Learner Need

Over the last four years I have been carrying out various studies of students' experiences of learning. These have been small-scale qualitative studies that aim to enrich our understanding of the conceptual, perceptual and affective challenges faced by learners studying at the Open University. The studies have been applied to three Humanities disciplines: Music, Art History and Literature. These

studies collect students' descriptions of their understanding of teaching points, together with their descriptions of how they had, at times, struggled to make personal sense of the teaching on offer. This focus relates to a more general interest in ways in which we seek to mediate our private perceptions one to another by sharing our more public concepts. Each study has described beginners' perceptions - that is, those of students new to a subject area and its methods. One of the principal uses of such a study is as guidance to course designers who are seeking advice about appropriate structures and media mixes for their teaching materials.

The design of *Art Explorer* is based upon this research. It seeks to address some of the problems described by beginning students in Art History. In order to understand the *Art Explorer* project better therefore, it is necessary at this point to learn a little more about students' difficulties.

2.1. Perceptual / conceptual

The first problem is common to each of the studies carried out, and will draw upon student quotations related to Music and Literature as well as Art History to broaden out the illustration. The problem is related to "beginnings". Of course it is a problem of wider relevance still, relevant across faculties as much as across disciplines.

It is crucial to fruitful discussions about phenomena like art, music and literature (or indeed phenomena at the focus of any discipline) that those party to the discussion share a perceptual and conceptual framework. While it may ultimately be quite acceptable for them to disagree about their interpretations, they can only discuss issues of form and meaning to any point, or argue their positions, if they understand what each of them is referring to. Where beginners do not see and hear what experts see and hear, in terms of formal arrangements, they can hardly be expected to understand what underpins the expert argument. But helping beginners to begin, and thus share expert understandings, is quite a problem.

From the teacher's perspective the problem is twofold. First, there is the problem of remembering how it once felt <u>not</u> to be able to see or hear what has now become "second nature". Second, how do they help beginners to discern what they (the experts) perceive? Part of the solution may lie in providing learners with a variety of experiences in which they switch readily between "top-down" and "bottom-up" approaches (Peck Macdonald, 1989). Put theoretically, this solution means helping learners to develop and articulate their own conceptual framework, one within which percepts can take on shape and form (Pope and Keen, 1981; Gombrich, 1981) **and** providing them with opportunities to probe their developing perceptions (sometimes quite literally) and thereby come to understand them more fully.

Learners will often express their angle on such problems quite simply by saying how difficult it is to know "where to start", or to "find a way-in" to a work of art. Beginners quite simply lack the resources - the knowledge and experiences - which will direct their listening, reading and their seeing in productive ways. Here is an example, a quotation from a Literature student on one of my studies:

> *They'd say "look" and I couldn't see ... And I didn't know how to work things out - and they didn't help me do it. I mean BITS of it I could see when they said, "have you thought of this?" ... <u>but not things I'd ever work out for myself.</u>*

The underlined words focus on a key issue for distance teachers: how does one support students' perceptual and conceptual experiences without being there to help negotiate individualised understanding? How useful is it, for example, to offer a few **ideas** for starters? Is it more useful to suggest a few **procedural rules**? Students vary in their needs, being both sceptical of rules and yet concerned to be steered in profitable directions. Quotations from literature beginners again illustrate these points. Student A prefers no rules:

> *Clearly any interpretation is OK if you can justify it .. (but) .. I felt they were pretending. They were going to give you a rule book. "There are these things" and "this is how you set about doing it". And there was almost the implication that there would be the right rhythm or interpretation.*

Student A's solution: throw the rule book away

> *I didn't worry about having to get one particular idea at the end, you know, and I was so relieved. And I think it was that notion that there was NOTHING. There WASN'T a right or wrong way. ... I thought 'blow it, I'm going to enjoy this', and read the play to get the story and then all the ideas you need are there in the [teaching] ... I just used what did strike home and made me think.*

Student B wants 'rules':

> *I think it is a problem of method I have with literature - if I can't instinctively just know something, I need to be given a procedure to follow to work it out. Like a pre-planned escape route from a public building - there if all else fails.*

The sorts of thing she couldn't see "instinctively" were formal arrangements, patterns of words in poems for example, or larger structures in a novel or a play. And of course, because she could not see these things, she was in a poor position to offer any interpretation of them.

My research also suggests that where students dislike a work of art, literature or music it becomes even harder for teachers to support them: it becomes harder to elicit intuitions or guiding concepts that will motivate and sustain much of an enquiry. I think this negativity - this resistance on the part of learners - is likely to be of relevance to other domains. It implicates feelings as integral to the process of learning for understanding. Indeed, the part played by affect in a well-rounded concept of understanding should not be underestimated. But teachers, especially at university level and in the West, work within an academic tradition that tends to underplay the significance of emotions for cognition. It focuses instead upon training the mind to develop its "objective" and rational capabilities. It perhaps underuses a valuable tool in the teaching repertoire as a consequence. This is an idea we shall return to when considering the special contributions that multimedia might make to education.

I mentioned earlier the particular difficulty for distant teaching of conducting a supportive dialogue with individual students - the difficulty, for example, of adapting feedback to match individual student need. I want to draw attention now to a related problem - the problem of imagining how someone is thinking, or feeling, in an attempt to draw them towards your own point of view, or response. It may help to drive home one part of the need I am describing - the perceptual gap that needs filling between expert and beginner - if we take a different discipline. Here are two examples of "non-hearing" by a beginning student in Music. First a brief quotation from a beginner describing her feelings after listening to a short piece of piano music:

> *They completely underestimate what I don't hear! When he said for example about that piece "there is clearly a tune and no less clearly, an element in the texture that is not the tune ... there is 'tune and accompaniment' .." I mean I was completely thrown! To me it was ALL a mixed sound - it was ALL 'lovely tune'.*

The second example is about identifying rhythm. The teacher asks students to listen to two short rhythmic items on audio tape and to identify which is grouped in beats of two and which in threes. If students find this difficult they are asked to beat out the answer guided by a visual representation of the beat. The advice continues:

you will find yourself forced into the right pattern, do it the other way and it will feel obviously wrong.

One student's response to this was :

This is simply just not true for me because it was hard going for me to feel how it was going at all and so I was just at sea with "right" or "wrong". I really need someone here with me, someone doing it with me, it's all hopeless. I can't hear, much less describe, the pattern of the irregular beat. Please ask them to tap it out, or to give us a lead in, or - something.

I asked this student if she really could tap the rhythm out differently - in contradiction of the expert's expectation. She was more than happy with this idea:

Absolutely - no trouble. Since I don't know where to begin I can do anything!

I want to turn now to Art History students and to mention some further needs - needs particular to a study of paintings. But to start with we have this same general "where to begin" problem. Here is a beginner commenting on her difficulty in knowing what there IS to perceive in paintings as well as in knowing how to describe her perceptions:

I really don't know where to begin. Unless there's something obvious, like it's got match-stick people in a street perhaps, I wouldn't know what to say. I'd latch onto something striking like it was very splodgy or in vivid colours perhaps ... that's my way of identifying paintings to myself. I wouldn't do more than that, I don't know how to do more than that come to that, what else to say or what else that matters.

Her experience is quite typical for those who lack expertise in front of paintings. We can usually recognise much of the content well enough - people do not find it difficult to see that there is painting of a dog, or a place, or of people having a meal, or perhaps just of squiggly lines - but then what else is there to see? And here we touch upon something that is perhaps a special problem for any deeper understanding of paintings: in one sense they are just too easily understood; their surface meaning is on display and readily seen. But the formal relationships discernible to and valued by experts are less easily grasped or put into words.

2.2. Mystique

Another problem my research revealed about studying art relates to "aura" - the mystique that surrounds those High Art products singled out by a culture as of special significance and value. There is an awe constructed about these objects which can easily distance lay people from them. High Art paintings, for example, are usually only seen in grand galleries or museums. These buildings of themselves tend to constrain critical enquiry into what is on show; they encourage instead a pose of respectful (and often silent) admiration. Learners in this context need to be encouraged to begin their studies with down-to-earth strategies: they need "to be allowed" to use everyday concepts to lead their perceptions.

2.3. Mismatch in expectations of a discipline

A further area of concern revealed by this research relates to students' expectations of a discipline. Where there is a mismatch between learners' expectations of a subject and the course teaching (the expert view of the subject matter), this clearly can impede understanding. For example, we know that Art History students expect to do quite a lot of work with pictures - directly addressing the objects themselves, learning how to enjoy them and judge them, as well as learning about the artists. Here for example, is a student talking about an Open University television programme:

> *... but that programme on Constable - a very interesting and helpful programme. It did what I wanted the units to do more of and that was to look at paintings and explain how they were put together and why. Teaching analytical skills if you will, which is what I wanted.*

Modern discipline experts, however, place the emphasis differently; they stress words rather than images when describing their practice. Here, taken from an Open University Introductory course in Art History, is one scholar's view:

> *Art history is an academic discipline conducted like other arts disciplines entirely through reading, writing and speaking, verbal discourse.*
>
> *Intellectual processes and verbal discourse are as fundamental to the study of art as is visual pleasure.*
>
> *Confronting an original work of art is not necessarily a more rewarding experience than that you would get from a book.*

Students in my study were very disconcerted by this emphasis: they hadn't expected it, and felt that in some perverse way experts were down-playing the jewel in the discipline's crown - the art objects themselves.

2.4. Abstractness

This student discomfiture just mentioned, links to the next point: the need to help students manage the abstractness of much academic discourse. The focus of modern Art History, for example, is upon abstractions and relationships between them, rather than concrete objects. A recent writer describes modern Art History as about:

> *the made image as a register of broad social, ideological and psychological structures (Fernie, 1995).*

This is a sophisticated project and, as beginning students have pointed out, very hard to get to grips with if you are unfamiliar with ways of analysing the evidence behind the discourse. Here, for example is a student voicing her concern:

> *How can people possibly do this stuff until they have learned how to look? What they need is practice. Why doesn't the OU send out nice kits for us to play with like they do in the Sciences .... Unless you do something to really make you look hard you just don't see or begin to grasp the magic that close looking can really reveal ...*

She makes it clear that asking beginners to understand highly abstract propositions about abstract relationships (relationships between "registers" and "structures" for example) is an inappropriate first step from their perspective. Discussions of this sort tend to work at a rhetorical level, but are experienced as rather empty rhetoric by beginners who have nothing more concrete to refer themselves back to.

2.5. Aridity

The last quotation brings out another common learner need. A need for fun in studying, that is, a need for experiences which are engaging and motivating and which convey a committing sense of why effort after understanding might be of long-term worth. Here is a literature student echoing her Art History colleague:

If there was more enjoyment, a sense of exploration and discovery in the beginning, it might encourage, it would have been so much more pleasurable.

2.6. Summary

In this section about the origins of *Art Explorer* I have identified a range of problems that beginning students describe as they embark on tertiary level study. I have called these difficulties "learner needs" in an attempt to focus primary attention upon the teaching tasks that need to be performed rather than upon the technologies that might be used to execute them. The next section looks at multimedia to see what this technology may have to offer in service of these needs.

3. Multimedia - design issues

The Open University has a long tradition of mixing a multiplicity of media - video, text and audio - in its courses. In this context multimedia has to justify its place on good pedagogic grounds and show itself able to make a valuable contribution to learner experience that is not readily achieved in easier or cheaper ways. This challenge became a ground rule for the design of *Art Explorer*.

3.1. Multiple learning textures

A brief review of Art History students' difficulties focused upon learners' need for a shifting texture, a variety of experiences, to support their shifting understanding. That is, beginners in the discipline need opportunities to participate in hands-on enquiries that provide crucial links between "bottom up" perceptions and "top down" language; they need a judicious mixture of guidance and free play, a mix of expert "showing", personal discovery and reflection. We also showed that learners need concrete experiences that are fun to carry out but that their fun has to have a point to it. Multimedia can offer education "multiple" learning textures - so the design should exploit this potential.

This focus on "learning textures" is a deliberate shift in emphasis; it moves the spotlight away from the technology, away from multiplicities of media per se implicated in its name - multiMEDIA - and away from the sheer capacity of the medium - for example its ability simply to deliver vast quantities of data to users. Nor is the spotlight upon the expert. Instead the design focus falls very sharply upon the user and her activities. The design task becomes one of imagining the variety of experiences one might offer, imagining how they would feel to different users and constructing a variety of means through which one might support them.

3.2. Defining the structure - a new analogy

The next problem was to decide how to structure these experiences. Multimedia does not lend itself to a strong linear design - the sense of story that underpins the meaning-structure of traditional "telling". As Stratfold (1994) has demonstrated, for example, it is inappropriate simply to port a narrative video sequence onto multimedia - the narrative gets lost in a multimedia world that is non-sequential in use.

The design solution for *Art Explorer* required a new analogy. Instead of a story we have invoked the analogy of a dream to provide an image for the way *Art Explorer works.* It is a metaphor for users' experiences of the structure. As such it is intended to capture the notion of a sequence of discrete happenings, or episodes, that are highly personal and hold intrinsic meaning. The image also refers to the way that connections between dream events can turn out to be very tenuous in logic - a fact one usually only discovers when one tries, on waking, to recount them as a story. *Art Explorer* exploits this idea too - the linearity is non-prescriptive, it is personal to each user.

3.3. Episode design: the ingredients of Art Explorer

There are four major episodes on *Art Explorer*. Within each there are differently textured experiences that aim to encourage users to look closely at paintings and to reflect on their discoveries. Note how this wording - *experiences which aim* - juxtaposes the world of private (learner) experience with expert (teacher) aim or purpose. This tension is a crucial one: it embodies the way we have exploited the educational potential of multimedia to bridge learner and teacher worlds. Reflecting on our earlier analogy, one might ask "whose dream?" - for both "sides" have a determining part to play in the understandings enactable on *Art Explorer* (Bruner, 1990). In what follows I shall briefly outline the ingredients of *Art Explorer* and thus describe some of the ways in which the teaching participates in, and nourishes learners' "dreams".

All instructions are spoken and animated: audio is supported by visual sequences which simulate the activity described. One general principle of *Art Explorer*'s design was that it should use minimal text: it is widely agreed that electronic screens are poor facilitators of reading for understanding. Nevertheless *Art Explorer* displays the occasional phrase or word where these serve a useful function, and it stores for reference a "hidden page" of text which contains the (spoken) introduction and aims for each section. There is also a Navigator - a visual aid that performs an important "narrator" function on *Art Explorer*: it shows users where they are within each episode, where they have been, and signals that there are more ingredients on offer.

Episode 1 centres on students' need to develop their own ideas, their personal constructs, as they look at paintings. Beginners in the field need concepts to lead their perceptions; moreover, they need to develop concepts to which they can relate with confidence. In academic discourse they need to be able to articulate their own viewpoint as well as use this as a basis for recognising alternative perspectives.

We use multimedia firstly to challenge or coax users into expressing their own ideas. Students are asked to look at 12 paintings and to type in single words or short phrases that describe individual features in them. Users are free to type in what they will, but often have to look quite hard if they are to produce more than a few words about any one painting. After this, the computer in the system comes into play: it has been storing users' words of description and analysing them in various ways. These data are now used to challenge users to elaborate and refine their own concepts and to re-examine the paintings. Thus as they proceed students are given various activities which push them to reflect upon their own work and to profit from their experiences (Boud, *et al*, 1985); for example, to develop more, and more robust, categories for looking at and discriminating between paintings. To vary the learning texture yet further and to offer students another point of view, previous users' words about the paintings on *Art Explorer* are also stored and are available for comparison.

Episode 2 is more dramatic. A large part of its texture consists in surprising viewers with what they can do and in encouraging them to be curious about what they can see. It thus has a strong "play" element that is designed to be fun as well as attention-grabbing. The paintings in this section are "live"; that is parts within them move or change in various ways when users touch them. Parts can be moved both within and across paintings and users can change the size and axis of various ingredients. Again, as in Episode 1, it would not have been possible for users to do these things or to be the focus of attention via traditional teaching media.

A number of thematically linked sequences build out of this free experimentation. Users are given a range of visual puzzles to solve which require them to look increasingly closely at details in paintings as they change their appearance in various ways. To solve the problems learners probably need to begin to consider the different ways artists have handled the ingredients at their disposal. Thus learners are drawn gradually towards thinking about paintings as **made** objects rather than as mysterious phenomena, and gradually serendipitous self-discovery blends with guided discovery. The emphasis throughout *Art Explorer* is on user activity, but perhaps this sequence - where learners

experiment with their visual understanding by manipulating their perceptions - is particularly vivid. It demonstrates one way in which multimedia can be exploited to act as a dynamic intermediary between expert and beginner. In this example, the mediation resides in learner activity: users receive feedback that "means" because it is intrinsic to their own activity; but the teacher viewpoint is also implicated for they invented and cosseted its happening.

Episode 3 links closely with Episode 2, but pursues its theme in a more disciplined way. Thus users continue to work with the basic idea that a painting is a made object - an idea they are familiar with from their knowledge of the everyday world - but are supported more firmly as they examine this premise. Again the emphasis is on interactive tasks, but by participating in them this time, users are guided very carefully towards an expert understanding of some of the ways in which paintings work their effects. For example, users may experiment with flat shapes and try to work out how to arrange these to suggest volume; they can manipulate a table - rendered in three dimensions and animated via quick-time video - so as to experiment with "eye-level". In each case, users' experiences are related back to particular paintings - exemplars of the perceptual point. The aim is to exploit multimedia to help users understand their perceptions more fully by "handling" them (Gregory, 1981).

Episode 4 takes students to another practical issue: the notion of function. Users are provided with various ingredients (flowers, people, some background and so on) and invited to build these into a design for their own painting. However, the painting they construct has to serve a function, and users are given a choice of commissions (e.g. an advertisement or an illustration of a proverb). This practical task re-invokes many of the "illusionary" issues raised in earlier episodes but requires also an engagement with the problem (one represented in the appearance of many paintings) of how to achieve the desired illusionary and emotional effect AND meet the demands of a commission.

4. Conclusions

The design of *Art Explorer* began and ended with students in mind and I see this as a major strength. I am convinced in sum that the most fruitful "way in" to designing for educational multimedia (indeed to designing any educational materials) is by concentrating, in the first instance, on a teaching need. The weak route in, by way of contrast, consists in seeking a design that focuses on the technology.

It was with students' needs in mind that we were able to invent the sorts opportunities we wanted to offer them. And it was with the variety of their possible interactions in mind that we developed as many ways of supporting these as we did. The potential of multimedia to "attack" one nucleus of closely interrelated problems in multiple ways has proven particularly exciting. Some of the richness of the medium is seen in *Art Explorer*. For example, in the way it offers users experiences with different moods, each of them involving and committing in different ways; so laughter and surprises nudge up against some quite serious thinking. There are also the different interactive strategies deployed for negotiating solid understandings about the experiences on offer: for example, meanings that begin and inhere in one kind of activity are elaborated through others; learners are offered the ingredients for testing out expert ideas - rather than being given them as articles of faith; learners work actively with words as well as with events and, as they do either, act in varying degrees of dependence with their teacher. Finally, one might point to the potential of the media mix to support exploratory learning: the way that audio and visual data are used together to mutual clarification and enrichment; the ways in which animations are used to supplant direct experience, to clarify abstract propositions and to attract attention; the invaluable contribution made by the computer in diagnosing learner activity and providing feedback that is personally meaningful.

It is evident that multimedia allows the world of private percept to conjoin with that of public concept in rich and varied ways; in this respect it is well-suited to many of the scenarios that interest educators in their role as negotiators of understanding.

5. References

Boud, D., Cohen, R. and Walker, D. (Eds.). (1985). *Useful experience for learning,* Kogan Page, London / Nicholson Publishing Co., New York.

Bruner, J. (1990). *Acts of meaning,* Harvard University Press, London.

Fernie, E. (1995). *Art History and its methods,* Phaidon Press, London.

Gombrich, E. H. (1983). *Art and illusion,* Phaidon Press, Oxford.

Gregory, R. (1981). *Mind in science,* London.

Peck Macdonald, S. (1989). Data driven and conceptually driven academic discourse, *Written Communication,* Vol. 6, No. 4, pp. 411-435.

Pope, M. and Keen, T. (1981). *Personal construct psychology and education,* Academic Press, London.

Stratfold, M. P. (1994) *Investigation into the design of educational multimedia: Video, interactivity and narrative,* PH. D Thesis, IET, The Open University, Milton Keynes.