Abstract

In this paper I examine some of the ways that multimedia impacts upon the design studio. I show how multimedia affects design products and processes in so far as it is caught up in the metaphors we use in structuring design tasks. But this influence is far from deterministic. Metaphors entail various oppositions, the resolution of which sets the problems for the designer in the particular design situation. The article describes two cases of using multimedia in a design studio teaching situation. The first explores how multimedia brings to light the opposition between the design and the presentation of the design. I explore how students cope with the tensions that arise when using multimedia. The second case study looks at the conventional privileging of the visual over the other senses in architectural design. I describe a design studio in which we deliberately privileged the audile sense over the visual. This was established through the way we set the brief, but also through the use of multimedia technology. Students used sound recorded from the site in conjunction with MIDI keyboard and sound processing technology to analyse and synthesise sound pertinent to the design of a pavilion at the Circular Quay area on the busy Sydney foreshore. We examine what difference this emphasis upon the audile made to the design process and to the design product, and how multimedia affects design.

Introduction

The first studio experience was an elective design studio for second and third year undergraduate architecture students for the design of a "cyberhouse." The studio was run over six weeks, and there were twelve students, relatively inexperienced in design, but amongst the most successful and enthusiastic in the course. The brief was to design a house that takes account of teleworking (working
from home) and that utilises the latest in video and communications technologies. As well as designing a house that takes account of the technology, students were also to make use of the technology in the design and presentation of their work. The aim of the studio was to allow students to see how far they could take the current multimedia technology in design development and presentation. Students were exposed to, and used, a range of technologies including video conferencing and multimedia. Similar studios are being reported with increasing frequency.

The second studio explored the application of musical theory to the design of a temporary pavilion for the celebration of music and sound to be located in the forecourt of the Museum of Contemporary Art at Sydney’s Circular Quay. The project involved audio visual computers, a MIDI (Musical Instrument Digital Interface) keyboard, and multimedia, MIDI sequencing and audio analysis software. The studios were held one year apart. Some students were involved in both studios. The two studios constitute case studies for a consideration of the influence of multimedia in design.

Following Donald Schön (1963) we can say that the metaphors we adopt influence how we see a design task. Design involves a process of "seeing as." As the design develops we see the design, the context, and the brief as different things. The design tools influence this "seeing as." New tools, such as the computer hardware and software described above, suggest new metaphors and set new problems. This account of design accepts the "materiality" of the design process (giving priority to design media), an aspect of design all but lost in the rarefied understanding presented by the design methods school. Understood in terms of metaphor, design problems are not merely there to be solved. They constitute the pre-occupations of the designer in a particular situation (Coyne 1992, 1994, 1995; Snodgrass and Coyne 1992).

The following account of the studio case studies is structured by an understanding of the role of metaphor in design thinking. Metaphors entail oppositions, tensions, and a wrestling between metaphorical truth and literal falsity. Metaphor provides access to a substantial body of theory from literary and linguistic studies, notably that of Ricoeur (1977), Derrida (1982), Black (1979), Lakoff (1987), and many others. Metaphor also provides helpful explanations of the vagaries of design, and of design studio teaching. It also provides pointers to effective studio teaching.

Amongst other effects, multimedia tools give prominence to notions of the mass media and mass communication (Brand 1987; Mitchell and McCullough 1992). These influences are sustained by the way the tools are designed (exploiting metaphors of the stage, cast, scripts and so on), the way they support the appropriation and distribution of material from a wide range of sources, and the culture within which these tools are discussed and promoted. The tools promote the media metaphor of design. How do such metaphors affect the design process? One aspect of the media metaphor is an emphasis on presentation. So, in their problem-setting, students saw the project in terms initially of preparing a slide show, but then in terms of television production conventions which are in turn largely based around narrative. There were titles announcing the presentation, an attempt at spectacular visual effects, a narrative progression leading up to the design, attempts to involve the "audience" with "walkthroughs," leading up to some kind of climax, followed by a resolution, and frequently by the words "the end." So the presentation task was set into a problem regime pertaining to television production and story telling: how do I involve the client (audience)? in what order should I present the material? what do I animate? how do I set the mood? what music shall I use? This is a simple illustration of the way the multimedia metaphor is implicated in the design process.

**Oppositions in design**

Reinforced through the technology, the media metaphor seemed to feed back into the design process in several ways. One understanding of design is that it appears to be driven by tensions between opposites (Coyne et al 1994). In metaphorical terms every design metaphor is in fact a tension between metaphorical truth and literal falsity, or simply between a proposition and its opposite. So the intelligence metaphor of computing is never far from its opposite of unintelligent, "mindless," or mechanical computing, against which it rebels, defines itself or asserts itself. The discussion of such tensions is a common feature of any design studio. The design process is a working out of such tensions – how does one reconcile the public versus the private, the inside and the outside, the site and the building, parents and children, image and reality, ornament and function? The media metaphor is
defined by the theoreticians who have written about it in terms of its opposition to something, and this opposition also emerges in the practices of the design studio. What is the media metaphor posited against, and what are the tensions that the metaphor entails and which impel the design process? The media metaphor entails not one opposition but several. It highlights the notion of presentation set in opposition to a message or information content to be conveyed by the presentation, or in design terms the presentation of the design versus the design itself. Marshall McLuhan’s (1962) famous aphorism, "the medium is the message," and the various interpretations people have placed on it indicates the tension inherent in the media metaphor. Perhaps the presentation is indistinguishable from the design, the computer system is the design, or the proposal for the house is really just information. Certainly in some cases the designs appeared as vehicles for the designers to show off their dexterity with multimedia – the design was a servant of the presentation. Other oppositions include that between depth versus superficiality, a common consideration brought to light by the mass media’s propensity for hyperbole and sensationalism. There is a widespread suspicion of multimedia as a means of promoting superficialities. Whether or not this was the case with the student’s designs, the opposition and its resolution were never far from their considerations. In a similar manner there is the tension between precision and approximation. 3D CAD modelling fosters an eye for painstaking detail and precision whereas multimedia, capturing video images, and scanning hand drawings produces rougher images, and, one may suppose, a more cavalier approach to the intricacies of the design. There was an obvious tension in the case of the students’ work, particularly where they were using 3D models as well as the other multimedia tools. Another tension was between representation and experience. Manual presentation techniques commonly focus on the notion that something is being represented, whereas multimedia assumes the role of presenting an experience to an audience. This emphasis on experience, which invoked the use of walkthroughs, music and special visual effects appeared to promote a greater emphasis upon the experience of living in or moving through the house design. This was in contrast to other studios that use manual presentation techniques in which the medium encourages the designer to focus upon a design that can be readily represented, as opposed to one that can be readily experienced using the media. In this studio plans and elevations were less important than perspective views. Of course, some students did treat the multimedia environment as a means of reproducing and displaying scanned hand-drafted plans and elevations, but they also tended to treat the presentation as a slide show rather than an engaging experience. The designs also appeared to have more formal as opposed to immediate and experiential qualities.

The multimedia tools also influenced the design process in that they facilitated a particular kind of working together. Even though several students had their own computers at home, they did not necessarily have access to the same software, or video processing capabilities. As they worked in the computer room students were therefore constantly sharing their rapidly developing expertise in multimedia, and inevitably they were influencing one another in their designing.

But the idea of working together is also an entailment of the media metaphor, or at least it brings the tension between notions of the individual and the group into sharp relief. Ayne Rand’s novel "The Fountainhead" (Rand 1972) which is a book often read by architecture students shows this tension in its characterisation of the individual and the public, working alone and working together. The book is about both the mass media and about architectural design. In the novel the public is deluded and swayed by the people who control the mass media, whereas the architect is the archetypal hero who retains his personal integrity and stands against the rule of the crowd. The metaphor of the mass media serves to bring this tension to light. Whereas Rand favoured the individual in her lessons about design and the media, Marshall McLuhan points to a new world order being ushered in by the electronic age. This order is one in which we are returning to a tribal culture, where we are thoroughly engaged in the lives of others around us, and an age where "we wear all mankind as our skin" (McLuhan 1962, p.47). The individual becomes less important under this regime. If we take McLuhan’s view to heart then the electronic mass media and computerisation offer a challenge to notions of individual authorship (also through the fact that images can be reproduced endlessly) and presents design as a communal activity. Indeed, those who advocate the media metaphor of computing (Kay 1987) also present political opinions, and views on education, that could be construed as liberal and egalitarian. Irrespective of one’s conclusion, reflections upon the mass media appear to bring these tensions to the fore.
Metaphor and the senses

In the second studio we decided to explore aspects of a particular opposition inherent in certain approaches to design. The opposition of presentation versus content is another form of the opposition between the visual and the aural sense. Influenced by McLuhan’s essays on the social impact of print media we may conclude that design media typically favour the visual over the aural sense. Design media involve the manipulation of shapes and colours across a spatial field that is appreciated visually. As a legacy in part of the picturesque and painterly traditions, designs are assessed in terms of how they look compositionally from certain vantage points. Multimedia and 3D modelling tools clearly reinforce the importance of the visual sense, but, through their invitation to explore movement, also promote the importance of the kinaesthetic sense (for McLuhan a sense close to the audile sense). Animated walkthroughs of building models exemplify this invitation to explore. Multimedia tools also invite the use of sound in presentation. It is possible to record and digitise sounds from the site, verbal explanations of some aspect of the design, sound effects and background music. In the second studio we extended the sound processing capabilities of the multimedia tools to embrace MIDI and audio technology, and created a brief for a pavilion that amplified, re-presented or in some way responded to the sounds of a busy public promenade on the waterfront at the tourist centre of Sydney.

Placing architecture together with sound brings to light a long tradition that relates architecture and music. Alberti, Palladio and Bruneleschi designed buildings on the basis of proportional relations derived from musical harmonics. The Chinese Emperor’s palace, the Hall of Light, was similarly configured in accordance with musical relationships. Le Corbusier and others worked out measures to create musical analogues of their buildings. The confluence between architecture and music also brings to light Goethe’s famous metaphor, architecture as frozen music, and the metaphor of the building as musical instrument. Such metaphors inevitably pervaded this studio and were instrumental in the problems that students set themselves – giving spatial form to sounds, and facilitating an experience for the visitors to the pavilion that was both spatially and aurally exciting. Such problems presented themselves as a resolution of a series of oppositions not normally encountered in a design studio, some of which I summarise here.

One theme that pervaded the studio was the opposition between transmission and reception. Several designs focussed on the receipt of sounds from the environment and its subsequent transmission in some other form. There were three formal implications of this process. First, certain building elements were designed to receive sounds – shell- shaped building elements, enormous spherical receptors floating above the building, or even just some ill-defined notion of sound being received by a surface of the building. Second, certain elements were designed to transmit sound, so there were large hollow tubes, transmitting cones, or simply points at which one stood to receive transmitted sound. Third, the building served as a sound modifier in some way, perhaps by its shape or some concealed electronic circuitry. The opposition between receipt and transmission is clearly similar to other metaphors of buildings as a means of receiving and dispatching people, machinery, goods or information, but here the in-out dialectic generated new forms and new means of spatial organisation appropriate to sound.

A further opposition was between performer and audience. Was the building simply to present sounds to its visitors, much as inert billboards present pictures to people, or was the building to require the visitor to be active in some way? Most of the designs required active participation. The aural sense is far less amenable to voluntary control than the visual sense. (There are no ear lids.) Many sound generating artefacts, such as juke boxes, CD players, musical instruments, are highly interactive. This choice element was taken up in most of the designs. Visitors had to move around to appreciate the various adventures in sound presented by the pavilion, or to interact with panels, buttons, floor or wall surfaces. The studio therefore brought out the idea of the building as a tactile environment with which a person is actively engaged.

Another distinction focussed around the problematic of the material versus the ephemeral. Buildings are made of matter, which carries load, provides visual and acoustic privacy, and keeps out the elements. Sound is ephemeral, changing, and insubstantial. One cannot make a building out of sound, and yet sound has spatial properties. For many of the designs the dialectic between the material and the ephemeral was realised as an attempt to capture sound and render it material in some way. One of the
designs translated the spectral distribution of particular sounds around the site into physical forms using various formulae: natural sounds are based on the sphere, mechanical sounds are based on the cube, high frequencies fragment a shape, low frequencies add to it. The design therefore consisted of a series of fragmented pavilions representing the sound of a train at the nearby railway station, the click of a camera shutter and the sound of the "walk" indicator at a pedestrian crossing. The material versus ephemeral dialectic also clearly borrowed from the idea of musical notation, which is commonly understood as a way of translating sound into form – marks on paper, but the use of the sound analysis software, and the MIDI system reinforced the possibility of translation between the aural and the visual. Architecture also commonly seeks to render tangible and visible an experience of the other senses. This studio brought such processes to the fore. The students also wrestled with the opposition between theory and form. Here the teachers intervened by introducing various theories linking music and architecture. In certain pre-modern times music and architecture were inextricably linked. That certain musical ratios conform to whole number divisions along a length of string, or the relative lengths of musical pipes, and are pleasant to the ear, proved the harmonious nature of the universe. Buildings based on similar ratios were equally appealing, grounding architecture in the harmony of the cosmos. With Enlightenment and post-Enlightenment sensibilities we have difficulty in regarding such traditions and practices other than as historical oddities and arbitrary theories. The students were under no illusions that they were entering into a music/architecture tradition as practiced by Palladio and Alberti. Rather, they had to choose from among competing traditions. The quest for a theory or tradition occupied a considerable amount of the students’ time: should the design be based on harmonic ratios in the manner of a Palladian villa, should the design be based on some scientific conception of the behaviour of sound, or should the design flaunt such conventions and theories? In keeping with late modernist (or postmodernist) conceptions of architecture, the designs were mostly reflections or commentaries on such theories, rather than their simple implementation. There were no beautifully harmonised Palladian villas. Rather, the designs stretched, unseated or parodied the rules of the theories on which they were based. In the case of sound and architecture it is obvious that designers have to choose their theories, but choice also forms part of architectural practice. The reflective practitioner is constantly presented by choice, though architectural discourse commonly hides behind the facade of immutable principles and certainties. The sound studio brought the nature of this dilemma to the fore. The studio brought to light many other oppositions. Some were esoteric, such as the intrigue with the discrepancy between the natural and the tempered musical scales. Others focussed on the opposition between geometry and form, harmony and discord, space and time, sign and referent. Most of the oppositions were not discussed in the studio with students but emerged during the course of the studio. There are other opportunities for students to reflect on what happened, and other philosophical schemas within which to discuss it. Independently of the kind of reflection that accompanies such as studio, its value lies in the way the studio renders what we commonly take for granted as strange in some way – education as a process of setting up a distance. Even though the students may never be called on to design such a building in the future, they have at their disposal new metaphors and new ways of seeing buildings that will be useful in other practice contexts.

Conclusion

Multimedia technologies do influence the design process and design products, not only directly, but through the metaphors that they are caught up in. Then it is not through the imposition of a single metaphor and its entailments but many metaphors, and the oppositions that they set up. Any metaphor is never far from its negation. If the media metaphor implies a superficial approach to design then it also implies profundity. The consideration of superficiality brings the issues of seriousness, rigour and profundity to light. So the media metaphor does not purvey its influence in rendering the design process superficial, rather it presents certain oppositions for resolution. There is a privileging, but the resolution of an opposition depends largely on the situation in which it is operating, and we cannot foreclose on one outcome over another. This oppositional character of metaphors provides another way of understanding their problem-setting entailments. The design situation is structured in terms of the problems posed by the oppositions inherent in the metaphors that are in play at any moment.
What are the implications of this investigation for the use of computer systems in the design studio? We commonly justify the use of a computer technology in design on the grounds that the technology meets some need: designers need a means of accessing and processing the vast array of information necessary for good design; they need new and enabling environments so that they can better express their intentions; they need to be able to explore more options more quickly; they require sophisticated tools to address the increasing complexity of design problems; they need to be able to simulate the behaviour of their designs prior to construction to obviate problems that arise when the artefact is in use; and designers need the computer as a means of communication so that they can collaborate across distances. This rhetoric of needs implies that we use computers to produce better designs more efficiently. Various studies suggest that the question of whether computers improve design products or the efficiency of the process is far from decided (Gutman 1988; Radford 1988; Cuff 1991; Coyne et al 1995). Some even suggest that computers are unprofitable for the firm in the long run. Yet we continue to use computers and explore new ways of using them. This suggests that there is a technological imperative at work that exceeds the consideration of needs. Where we are able to identify a need then it is often because the technology pre-exists as a means of meeting that need. In other words computerised multimedia has created the need that it sets out to address.

According to Martin Heidegger (1977) and many other twentieth century thinkers (Borgman 1987) we are technologically enframed, and cannot help ourselves from inventing and using more and more sophisticated technologies. This technological imperative is impressed into the human condition. The imperative to invent and adopt technologies is partly addressed by the idea of metaphor. We are always party to a field of metaphors, promoted in part by the technologies, systems and institutions of which we are a part. These metaphors set the problems through which we invent needs and through which we invent further technologies to address those needs. We primarily use multimedia in the design studio because it is there, not because design is deficient without it. Computers certainly make a difference. If that difference is not simply better and more efficient design then what is the difference? I have attempted to address this difference in the body of this article.

The study of metaphor, or any other device of contemporary thought that seeks to break out of logical formalism (still prevalent in some quarters of design studies), does not necessarily result in new and spectacular insights into the design process. Rather, as is the nature with any metaphorical re-orientation (in this case to the metaphor of metaphor), a re-orientation primarily results in an adjustment of the system of priorities of a discourse. Formalist views of design emphasise rule, order, and a disembodied form of geometry, and marginalise a great deal of what goes on in the design studio. On the other hand, the metaphorical and other views of design consign rule to the nether reaches of the discourse on design. Where they are successful such contemporary discourses align the rhetoric of design theory more with that of the studio itself, in which rule is rarely mentioned. For our purposes here, talk of metaphor elevates technology to a formative position. Technologies are implicated in the way we think and the way we design. Metaphor also elevates the role of discourse itself in design, and the nature of shared experience. There is nothing new in these observations. It is just that some systems of research, notably formal studies, do not make these issue the centre of their discourse. The intellectual tools of those discourses are insufficient to address them.

It is a commonplace to remark that computer technologies pertinent to design are developing at such a rate that it is impossible to keep up, to monitor the performance of various systems, to know what are the best systems to adopt, and so on. This is a further reminder that technologies are not there to meet needs, and that no one is in control of the situation. There are many competing factors generating new technologies and new configurations of technologies. The World Wide Web (WWW) is a potent example of the seemingly capricious and unplanned arrival of a technology on a field such as design. No one said three years ago that designers needed such a technology. Even now design researchers are not sure what it is and how to use it. At the moment the WWW has the appearance of a ubiquitous interactive multimedia environment tied to massive worldwide communications. There are educational and practice experiments tying it to the idea of a global design studio. Designers are able to display their work and to exchange drawings in a form for all the world to see. This making public of the design process presents new metaphors and new conceptions of the design process still to be explored. A final observation about multimedia in the design studio is attested to by many school teachers as well
as design educators. Multimedia proves very engaging for students and practitioners alike. In a room full of students with computers there is movement, excitement, the animated exchange of ideas, information and materials. There is the compelling activity of creating and assembling an impressive presentation, there is pride in the product as students compete to produce spectacular effects, and there is lively interaction through the medium itself as students send and receive messages, and explore on-line repositories of pictures and sounds. Whether or not the information collected is useful, or the activity is central or peripheral to design is another question, but there is no doubt that the medium engenders a certain enthusiasm that the educational setting can capitalised on. This is the main lesson for multimedia in design. Multimedia creates an exciting and engaging work environment, it takes on the excitement and ephemerality of aspects of the mass media. The challenge for educators is to capitalise on this excitement in setting worthwhile educational programs.

Acknowledgments

This work is supported by an Australian Research Council Grant. The design studios were a collaboration with Adrian Snodgrass. The following assisted: Sidney Newton, James Rutherford and Brad Miller.

References


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