for materials, forms, shapes or colours; it requires a wide range of skills. Today then professional designers are highly educated and trained.

Design education

Design education in the form we know it today is a relatively recent phenomenon. That a designer needs formal instruction and periods of academic study and that this should be conducted in an educational institution are now commonly accepted ideas. The history of design education shows a progressive move from the workplace into the college and university studio. In a recent attempt to interpret the history of architectural education linked to establishment of the Prince of Wales Institute of Architecture, this change is interpreted as a series of political conspiracies (Crinson and Lubbock 1994). Certainly it is possible to argue that academically based design education lacks contact with the makers of things, but then as we shall see in the next chapter this reflects practice. The designers of today can no longer be trained to follow a set of procedures since the rate of change of the world in which they must work would soon leave them behind. We can no longer afford to immerse the student of architecture or product design in a few traditional crafts. Rather they must learn to appreciate and exploit new technology as it develops.

We are also seeing quite new design domains springing up as a result of technology. I have been lucky enough to spend some time working in the design faculty of a university entirely devoted to multi-media. Designers there learn to animate, to create web-sites, to design virtual worlds and to create new ways for people to relate to, and use, highly complex technology. Such design domains were unimaginable when the first edition of this book was published and yet today they are extremely popular with students. Even further along the spectrum of design fields we find the system designers and software designers who create the applications that we all use to write books, manipulate images and give lectures. Many contemporary products have in them hardware and software that are combined and integrated in a manner that makes the distinction increasingly irrelevant. Mobile phones, MP3 players and handheld personal computers are not only appearing, but converging and transforming into new kinds of devices. Such areas of design are changing our lives not only physically but socially. Until recently we would have thought of software and system designers as lying

outside the scope of a book like this. However increasingly I am finding that people who work in those fields are seeing relevance in the ideas here and as a consequence are beginning to question the traditional ways in which such designers have been educated.

In the twentieth century technology began to develop so quickly that, for the first time in our history, the change was palpable within a single lifetime. Design has always been connected with our contemporary intellectual endeavour including art, science and philosophy. During that period we saw a change in design that was at the time thought to be more profound and fundamental than any of the stylistic periods that had preceded it. It was even known by its direct connection to the contemporary, 'modernism'. This name implied that it provided a full stop at the end of design history and I was taught by tutors who genuinely believed that. This set of ideas has so profoundly influenced the way that we think about design that sometimes it is hard to disentangle. Only now are we beginning to see that it is possible for design to move on from modernism. We shall not here be primarily concerned with design as style, but nor can we think about process in isolation.

Design education has recently emerged from a period of treating history as deserving academic study but making little connection with the present. Thankfully those notions of modernism as the last word in design have been largely rejected and the design student of today is expected not only to appreciate historical work in its own right but to use it to inform contemporary design.

Design education has some very common features that transcend countries and design domains. Design schools characteristically use both the physical and conceptual studio as their central educational device. Conceptually the studio is a process of learning by doing, in which students are set a series of design problems to solve. They thus learn how to design largely by doing it, rather than by studying it or analysing it. It seems almost impossible to learn design without actually doing it. However the ideas in this book may offer a complementary resource. One of the weaknesses of the traditional studio is that students, in paying so much attention to the end product of their labours, fail to reflect sufficiently on their process. Physically the studio is a place where students gather and work under the supervision of their tutors. The studio is often assumed to replicate the offices of professional designers in the domain. However, one of the perennial problems here is that so much of the real professional world is very difficult to replicate in the college or university. In particular there is usually an absence of clients with real problems, doubts, budgets and time constraints.