

they must be able to design! What then exactly is this activity of design? That we must leave until the next chapter but we can already see that it involves a sophisticated mental process capable of manipulating many kinds of information, blending them all into a coherent set of ideas and finally generating some realisation of those ideas. Usually this realisation takes the form of a drawing but, as we have seen it could equally well be a new timetable. It is the process rather than the end product of design which chiefly interests us in this book.

Design as a skill

Design is a highly complex and sophisticated skill. It is not a mystical ability given only to those with recondite powers but a skill which, for many, must be learnt and practised rather like the playing of a sport or a musical instrument. Consider then the following two passages:

Flex the knees slightly and, while your upper body inclines towards the ball, keep from bending over too much at the waist. The arms are extended fully but naturally towards the ball without any great feeling of reaching out for the ball . . . start the club back with that left arm straight letting the right elbow fold itself against the body . . . the head should be held over the ball . . . the head is the fixed pivot about which the body and swing must function.

Lee Trevino (1972) *I Can Help Your Game*

Keeping the lips gently closed, extend them a little towards the corners as when half smiling, care being taken not to turn them inwards at all during the process. The 'smile', rather a sardonic one perhaps, should draw in the cheeks against the teeth at the sides and the muscular action will produce a firmness of the lips towards the corners. Now, on blowing across the embouchure towards its outer edge, the breadth will make a small opening in the middle of the lips and, when the jet of air thus formed strikes the outer edge the flute head will sound.

F. B. Chapman (1973) *Flute Technique*

These two passages come from books about skills. Both are skills which I have spent a lifetime miserably failing to perfect; playing golf and playing the flute. My well-thumbed copies of these books offer me a series of suggestions as to where I should direct my attention. Both authors concentrate on telling their readers how it feels to be doing it right. A few people may pick up a golf club and swing it naturally or make a beautiful sound on a flute. For them these books may be of little help, but for the vast majority, the

skills must be acquired initially by attention to detail. It is in the very nature of highly developed skills that we can perform them unconsciously. The expert golfer is not thinking about the golf swing but about the golf course, the weather and the opponents. To perform well the flautist must forget the techniques of embouchure and breath control and fingering systems, and concentrate on interpreting the music as the composer intended. You could not possibly give expression to music with your head full of Chapman's advice about the lips. So it is with design. We probably work best when we think least about our technique. Beginners however must first analyse and practise all the elements of their skill and we should remember that even the most talented of professional golfers or musicians still benefit from lessons all the way through their careers.

While we are used to the idea that physical skills like riding a bicycle, swimming and playing a musical instrument must be learned and practised, we are less ready to recognise that thinking might need similar attention as was suggested by the famous British philosopher Ryle (1949):

Thought is very much a matter of drills and skills.

Later the psychologist Bartlett (1958) echoed this sentiment:

Thinking should be treated as a complex and high level kind of skill.

More recently there have been many writers who have exhorted their readers to practise this skill of thinking. One of the most notable, Edward de Bono (1968) summarises the message of such writers:

On the whole, it must be more important to be skilful in thinking than to be stuffed with facts.

Before we can properly study how designers think, we need to develop a better understanding of the nature of design and the characteristics of design problems and their solutions. The first two sections of this book will explore this territory before the third main section on design thinking. The book as a whole is devoted to developing the idea that design thinking is a skill. Indeed it is a very complex and sophisticated skill, but still one which can be analysed, taken apart, developed and practised. In the end though, to get the best results, designers must perform like golfers and flautists. They should forget all the stuff they have been taught about technique and just go out and do it!