



**Figure 6.1** Rehabilitation engineering team members gathered around the client in a typical seating clinic.

postures in association with artefacts such as commercially available seating aids and objects at hand, off-cuts of polyurethane foam, plywood and anything that offers some potential to be useful to assist designing.

Each member of the team brings particular expectations about what needs to be accomplished in the seating clinic. Their understanding of the process is influenced by their professional training. The engineer understands the processes as one of design and manufacture invested with all the connotations that these terms have for an engineer. Team members might expect to propose design concepts and to document them in the form of drawings, or at least sketches and associated lists of relevant information which is sufficient to manufacture the seat. On the other hand, a therapist might approach the task from the perspective of diagnosis and prescription. The therapist's expectation is of an investigation with limited amounts of documentation of the prescription. The technician is likely to be focused on the practicalities of making a seating system.

This contrasting set of traditions and the consequential lack of common ground in how they do their work, makes the rehabilitation engineering team a very interesting one to study. The rehabilitation engineering team relies heavily on talk and physical interactions or artefacting for communication. Information is gathered intermittently throughout the clinic session and recorded separately by the different professionals involved. There is no commonly agreed method for systematically analyzing this information when generating a design for the seating system. This behaviour is similar to what might be expected of any cross-discipline team that does not share a common heritage of work patterns and means of documentation. Thus, the results of the study presented in this chapter may be generalized, with caution, to other product development settings that involve cross-discipline teams.

## Methods

### Data gathering

Video provides a means to record accurate detail of human interaction and the capability to scrutinize repeatedly the detail for social action and activity. Numerous studies of naturalistic human activity have sourced data for analysis from video recordings of the activity (Goodwin and Goodwin 1996; Kleifgen and Frenz-Belkin 1997; Heath 1997). The cross-discipline, rehabilitation engineering team was videotaped performing assessments of clients, during which information is gathered about the client and his or her specific equipment issues. The investigation of potential design solutions occurs by experimentation and considerable discussion (prototyping of customized devices occurs concurrently with the experimentation in the adjacent workshop). Assessment involved examining existing equipment, asking questions, and discussing experiences to elicit specific information about the client that was relevant to developing the appropriate assistive devices. A prepared set of forms guided the assessment by prompting for the information to be sought from the client and care-providers.

Video recordings were made using a video camera with a wide-angle lens mounted high in the corner of the assessment room and focused on the location where the participants tended to group. A flat plate microphone fixed to a wall provided the sound input to the video camera. Clients and care-providers were asked in advance if they would participate in the video recording and signed informed consent documents. All participants were made aware of the presence of the video camera before the assessment commenced. No further reference to the video camera was made during an assessment session. Video recordings were made of 24 assessment sessions, selected randomly, during a three-year period. Work practices did change during that time due to the normal events that occur in a work place. Staff reflected on work practice and implemented changes to improve the process, such as the prompts in the client files. Staff changes occurred with therapy staff rotating through this clinic; however, the rehabilitation engineer and technician were constant team members across the recordings. No intervention was attempted to limit change or to control practice. While this may be seen to limit the reliability and validity of the data (Peräkylä 1997), this was a study of the practice of a rehabilitation engineering team, and the normal processes that affect a work group prevailed. Each client and care-provider group was different and presented with different issues to be resolved and there was large variation in the amount of investigation performed and the development of design solutions.

After the first year of the project, a small video camera was made available to the team members to use if they wished. Team members had experienced direct benefit from video recording as they found specific information that had not been documented. Video was also embraced by team members as a useful tool for recording specific information about clients. The hand-held camera close-up data supplemented the wall-mounted camera recordings that recorded the whole workgroup and showed most of the detail (verbal and non-verbal behaviour) of the participants. Occasionally, data was lost because the view-field was obscured by a participant moving between camera and the