Table 6.4. Occurrences identified in segment 8 of videotape "Nicholas"

Tape Time	Occurrence
20:37	Mother takes the wedge from under the computer and places it on the left rear of the netting backrest after Nicholas asks for some extra support in the backrest.
20:56	Question and answer about a "tight" muscle in Nicholas' back.
21:52	Engineer decides to make the backrest for the wheelchair, then copy it for the computer.
22:10	Engineer establishes the angle Nicholas wants the computer tilted at.
22:22	Nicholas requests his old backrest to lean against which mother sets up for him.
23:00	Nicholas says he likes the support of this backrest but it is hard to type.
23:17	Physio shows that the lateral wings get in Nicholas' way. Nicholas says no, he likes their side support.
23:50	Engineer suggests trying a modular-style backrest. Uses tape measure to check Nicholas' trunk width to select backrest size.
24:00	Engineer measures dimensions of the assembled prototype and talks about base size.
24:41	Modular backrest replaces the unit Nicholas has been resting against.
24:54	Nicholas requests that backrest be on an "X" and rotates his trunk around vertical axis.
25:02	Engr mimics Nicholas' movement with a backrest he is holding.
25:22	Physio suggests that it is on a spring so it won't just flip.
25:54	Discussion about the shape of the backrest.
26:55	Engineer measures the angle of foam wedge.
28:00	Backrest is tried for fit in the wheelchair.
28:23	Decisions made about how to proceed with manufacture.

for driving and working on tasks. The REC team is investigating seating to assist Nicholas to access his laptop computer (Figure 6.3). This analysis is of the final segment of eight design segments in the Nicholas videotape. In the previous segments basic parameters have been established for the seating. As Table 6.4 shows, this segment contains the following occurrences; unexpected design ideas are revealed.

Commentary on Nicholas, segment 8

Segment 8 contains significant artefact and talk and action features. The flexibility of the simple artefacts is demonstrated by the multiple uses of the wedge section polyurethane foam block, first as an angle support under the laptop computer, then as extra support behind Nicholas' back. The latter use of the foam block starts a line of enquiry, providing new information about Nicholas' back support needs. Testing another type of backrest provides data on the shape that Nicholas considers offers good support. While using his computer in an assembly of artefacts mocking up a proposed seat, Nicholas suddenly executes some trunk twists and suggests of the backrest, "Wouldn't that be good if it was on like a like a like an X sort of thing like it can like tilt." Later the engineer is able to verify the backrest motion that Nicholas

Figure 6.3 Client demonstrating a new feature of a backrest: "Wouldn't that be good if it was on like a like a like an X sort of thing like it can like tilt." Engineer in the background holding a sample backrest immediately uses the artefact to feedback forward and back rotational movements around horizontal and vertical centrelines of the backrest to the client to test if the information has been interpreted properly.

desires by mimicking his movements using a backrest he is holding. This segment illustrates the value of artefacts in assisting design through (1) demonstrating, testing, and verifying physical information relating to shape, size, and orientation of design elements; (2) introducing a new feature or idea to encourage physical or observational participation and interaction; and (3) inducing a state of curiosity in participants, so encouraging questions, answers, comments and experience-based ideas and opinion.

Results

The total number of events recorded was 882. This comprised 319 events in which only talk was used, 41 events in which action occurred without talk and 522 events combining action with talk, hereafter labelled Talk & Action. Nearly 60% of the communication work was performed using Talk & Action. In events in which the Talk was developing or relating a design idea, the use of Talk & Action rose to 86%. Table 6.5 lists the number of events that contained Talk, or Talk & Action according to the talk-type.

The occurrence of each action-type for the events containing action (i.e., Talk & Action and Action performed in silence events) is shown in Table 6.6. Sequences containing two or more actions performed by a speaker occurred in 40.5% (228) of the Talk & Action events. Actions in sequence were separable as discrete entities. Actions in sequence often showed a smooth flow from one to the next. Some 59.5% of events had a single action and 84% of events had one or two actions. The number of events with more than three