Display/Control Observation

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Objective:

An observation of the range of human choices in regard to unfamiliar controls.

Sample:

- 8 volunteers
- age range: 23-32
- male: 5, female: 3
- profession: student: 8, other:3
- average familiarity with up-to-date equipment (stereo, VCR, DVD players, computer e.t.c.): 8 (on scale 1- very unfamiliar to 10- very familiar)
- right-handed: 8, left-handed: 0

Method:

Users were informed about the purpose of the study. They were informed that all the information gathered during the test will be kept confidential and will be used only for the purposes of this study. They were encouraged to speak whole performing the test.

Volunteers were presented with Display/Control Observation form. (See: Appendix)
In addition to the form following questions were included on the back of the form:
1. Age
2. Gender
3. Profession
4. Are you left- or right-handed?
5. What did you base your answers during the test?
6. How familiar are you with up-to-date electronic equipment on scale 1 to 10 (1 being ‘very unfamiliar’ 10 being very familiar)
7. What would make the task easier to complete?

All the volunteers were given an instruction on the task. They were explained that “C” means clockwise and “CC” means counterclockwise. The observer went over each of the tasks to make sure all of them are understood correctly. Users were told they are allowed to ask questions at any time during the test.

It took about 1 minute for each user to complete the form and 1 minute to answer additional questions.

Upon completion the forms were collected and users were thanked for the participation.

Result:

The outcome of the test is presented in the table:

<table>
<thead>
<tr>
<th>Task:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Make a darker photocopy</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>2. Move the dial down</td>
<td>c</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>3. Move the dial up</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>cc</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>4. Move the dial left</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
</tr>
<tr>
<td>5. Move the dial right</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>6. Increase from one to two</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
<td>cc</td>
</tr>
</tbody>
</table>

Only two of the user (7 and 8) made the same choices for all of the tasks. For tasks number 4, 5 and 6 the same answers were received from all of the users. All of them agreed that the knob turns counterclockwise to move the dial left and clockwise to move the dial right. All of the users thought that to increase the number from one to two can be achieved by turning the knob counterclockwise.
During the test the observer was able to get both verbal and physical feedback. Users were making hand movements as they would turn the knob. Some of them made comments about the equipment in their car or at home.

None of the volunteers seemed to have any problems with completing the test. All of tasks were performed rather smoothly, without longer period of hesitation.

Discussion:

The outcome of this study shows some obvious differences in the way users interpreted the controls. The design of the controls on the knobs might be the reason of these differences. The knobs are suspended in the emptiness. In most cases there is no information what they are regarding. In all of the cases there is no information about the dial, what does it represent and what is its scale.

Differences during the task number one could have been caused by the fact that there is no description to the scale. To some users (2, 5, 6, 7 and 8) 1 meant the darkest copy, to others 1 meant lightest. Simple change in a design could solve the problem. By adding labels on both sides of the knob (one saying “Light copy” the other “Dark copy”) we would make it more understandable for the users.

Very noticeable differences took place in performing tasks number 2 and 3. One of the reasons may be a different placement of the knob in regard to the display. Half of the users simply used opposite movements for moving the dial up and down (since they are opposite activities). Maybe the two tasks would performed more accurately if they were presented next to each other instead of one below the other. Maybe having the two dials next to each other would make the different placement of the knob more visible. All the users that behaved in this way completed tasks in the following order: 1, 2, 3, 4, 5, 6.

The other half of the users completed tasks in the following order: 1, 2, 5, 3, 6 and 4. This caused similar task (2 and 3) to be separated. This would indicate that these users were able to notice the placement of the knob, since they looked at each of the tasks with no connection to the previous one.

All of the volunteers agreed on task number 4 and 5. This seems to back up the observation that placement of the knob play very important role in understanding the way control work. The knob is placed directly under the display. It is easy to associate the movement of the knob with the result it will have on the dial. For example: turning the knob to the “left” (counterclockwise) will result with the dial moving to the left and the opposite.
Another task that all of the users agreed on was task number 6. Such unity in the answered may be explained, by using the information provided in the second part of the observation (additional questions). When asked: What did you based your answers during the test? most common answer was: “analogy to the use of everyday equipment”.

Most dials including numbers are design like the face of the clock. It is also obvious choice in western cultures since we read from left to right.

The sample size used in this observation was sufficient for completing the objective of the observation. Even in such a small group it was possible to see the variety of choices people made. This is a very important fact for the designer of the controls.

Designer should be careful when designing the controls; they should not use their intuition or base their design on stereotypes. Even the fact that in some cases (tasks 4, 5 and 6) all the users understood and the control in the same way does not mean that their choice was correct. They could all be wrong.

Bad control design can result in many bad ways. Sometimes it may be something as insignificant as overdone toast, but other time in may be the cause of an injury or even death.

Keeping that in mind each control design should be well researched and tested, to make sure that there will be no confusion in how to use the control and what effects will it cause.

**Conclusion:**

The observation showed that even in such a small sample given such a small amount of tasks it is possible to see the range of choices people make.

It safe to make an assumption that the confusion was caused by the bad design of the controls presented. But to build the improved controls more in-depth study should be conducted with an increased number of volunteers.

If I was to conduct another study on the same subject I would:

- Change the objective to be able to gather the data, about how people understand the controls
- Increase sample size to at least 30 volunteers
- Include left-handed as well as right-handed people
- Present volunteers with larger number of task and larger amount of controls
- Include a section where volunteers can give their opinion on how each control can be improved