

Task descriptions in usability tests: A source of split-attention

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Summary

Having to switch between task descriptions and the interface during a usability test induces cognitive load for participants and increases time on task. An explorative study is reported, showing a large individual variability in how often and for how long participants returned to task descriptions. They returned to descriptions at least once in 80% of all cases (Max=13, Median=2), spending up to 147s re-reading the description (Median=7s). This constituted up to 67% of the total time on task. Practical implications regarding the design of task descriptions and for summative usability testing are sketched.

1 Introduction

In usability tests, participants read task instructions and then work on these tasks with a software program or prototype. While doing so, their feedback as well as specific measures such as completion rates or times on task are gathered (Rubin & Chisnell, 2008). Often, participants do not only read a task description once before working on the task, but they may have to switch back and forth between the task description and working with the interface several times, in order to integrate information from the task description and information on the interface.

Having to mentally integrate separate sources of information has been extensively studied in educational psychology (Ginns, 2006). It has been shown that learners who have to split their attention between separate sources of information require more time for learning and perform worse in subsequent test tasks, compared to learners who study integrated information. According to these findings, it can be assumed that having to switch between task description and the user interface of a software application or prototype in a usability test causes cognitive load, and might affect measures such as task times.

In the following, a study is presented that explored how often and for how long participants actually do return to task descriptions during a usability test. Based on the results, practical implications for usability testing are sketched, related to the design of usability test tasks and to the measurement of task times, as well as for future research in this area.

2 Re-reading task descriptions: an explorative study

The data reported in the following originated from an experimental study that investigated how different task orders in a usability test would impact measures such as success rate, completion times and satisfaction ratings (Li, Hollender, & Held, submitted). The study comprised 6 tasks related to modeling a software prototype in CogTool version 1.2.1.0 (John, Prevas, Salvucci, & Koedinger, 2004). 20 participants (all user experience professionals) took part in the study. Participants were told to complete each task on their own without thinking out loud. Two of the tasks were always presented in the same position: a practice task in the beginning and a control task in the middle. For the four other tasks, the position was varied, in order to investigate sequencing effects (which are not investigated in the present study). Time on task, as well as the time participants spent returning to a task description during the completion of a task and after reading the description for the first time were measured. This was done by presenting the task description in a browser on a second monitor, as an extension to the primary monitor that displayed the software interface to be worked on. The task description was only visible if participants moved the mouse cursor from the primary monitor to the secondary monitor and clicked once. When they moved the mouse cursor back to the primary monitor to work on a task, the task description became invisible again. Whenever a participant turned the task description visible or moved back to the primary monitor, a time stamp was recorded. Based on this data, the present study aimed to investigate how often and for how long participants return to task descriptions, and how the time spent re-reading the task relates to the overall task time.

2.1 Results

Participants differed largely in the way how they handled reading the task descriptions. While some participants spent more time reading the tasks very thoroughly in the beginning, others spent less time for the initial reading, but then returned to the task description after a first look at the interface. It was observed that participants returned to the task description because they did not remember a specific information element, struggled with a task, or because they wanted to double-check that they had correctly completed a task.

The observed varying strategies were also mirrored quantitatively. From the 20 participants, only one participant did not return at all to any task description. Participants returned at least once to the task description in 80% of all 120 cases (Max=13, Median=2). The median for the time spent re-reading the task description was 7s (Max=147s). Figure 1 displays the frequency distribution for the reading time.

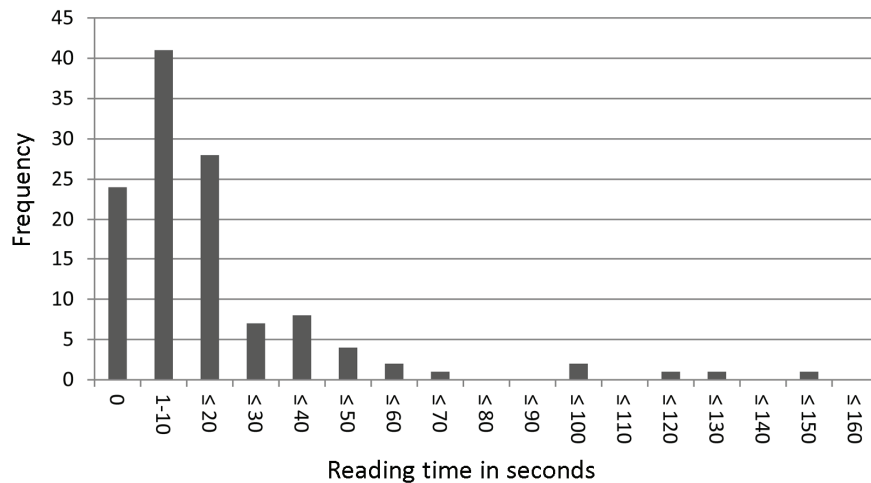


Figure 1: Frequency distribution for the time spent re-reading the task description for 6 tasks and 20 participants (120 cases)

The time for re-reading a description constituted up to 67% of the overall time per task for a specific case (Median = 6%).

3 Discussion and Outlook

In the explorative study presented above, it was shown that the large majority of participants returned to task descriptions while working on a task. There is a large variation with regard to how often participants return to the task descriptions, and also, how much time they spend re-reading them. In most cases, participants returned to task descriptions 2 times, and spent up to 10s for reading it again. Furthermore, there are a few extreme cases where participants returned to a single task description up to 13 times and spent up to 67% of the total task time re-reading it.

This has several practical implications for usability testing. A general implication is that we should aim to design task descriptions that reduce the necessity to return to them while completing a task. Furthermore, if returning to a task description is necessary, for example, if a form needs to be filled in, task descriptions should be designed in a way that supports participants in easily finding this information. Research in the context of Cognitive Load Theory and learning with multimedia could offer several design principles for this (Mayer, 2005):

- Leaving out any irrelevant or redundant information,
- Structuring and highlighting, thus pointing out important information elements.

Such guidelines for the design of task descriptions need to be gathered and tested systematically in future studies, in order to examine whether task descriptions designed according to these guidelines really support test participants, for example by decreasing the need to switch back to them.

Furthermore, the results also have implications for quantitative (summative) usability testing, where the time on task is measured and compared with expert task times: Usually, switching back to task descriptions is not taken into consideration, when measuring or modeling expert task times. As shown above, there is a large variability across participants regarding the re-reading of task descriptions. This makes the interpretation of test results regarding the time on task more difficult. Therefore, we suggest that times for re-reading a task description in summative tests should be recorded and excluded from total task times. In our study, recording times for returning to task descriptions was achieved by recording time stamps with java script whenever the participant made a task description visible by clicking on it. While this is a low-cost method, it has the draw-back that it is quite obtrusive. Eye-tracking in future studies would have the advantage of being less disturbing, and would also provide detailed insight in the way how participants switch between the application to be tested and the task description. With the trend of eye-tracking technologies in mobile devices (Han, Yang, Kim & Gerla, 2012), displaying the task description on a tablet PC and recording the reading times might become a generally available option.

Literature

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