

Modeling Cognitive Strategies with Complex Task Performing Process

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Abstract

The purpose of this study is to examine individuals' computer based complex task performing processes and strategies in order to determine the reasons of failure by cognitive task analysis method and cued retrospective think aloud with eye movement data. Study group was five senior students from Computer Education and Instructional Technologies Department at a state university. A computer based complex task including a logical reasoning process was developed and utilized. Data was collected with cued retrospective think aloud containing a gaze video replay and eye tracking. All the retrospective protocols were transcribed for analysis then a coding schema was developed iteratively from segments. By drawing area of interest fields(AOI) of task panel, eye movement data in specific processes and fields were analyzed by using fixation duration and fixation count metrics.

None of the participants completed the task successfully within the given amount of time (max-10 min.). The findings yielded seven cognitive strategies ("*information gathering-reviewing*", "*identification well-defined instructions*", "*cue-seeking*", "*using cues*", "*assumption*", "*trial and error*" and "*crosschecking*") and their actions obtained from the task performing process. Furthermore, this process is modeled by defining sequences and the relations between the actions and cognitive strategies. It has been revealed that trial and error is the most employed strategy and participants used trial and error without reasoning. Moreover, it has been revealed out that participants mostly failed in choosing and using the right strategy.

Keywords: cognitive task analysis, retrospective think aloud, eye movements, complex task