How Do You Get the Information You Need? Triangulation in Usability-Testing: Two Explorative Studies

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ABSTRACT

The efficiency of multimedia environments depends on more than appropriate pedagogical frameworks: Learners must not be distracted from their initial learning task by unnecessary or inconvenient features of the screen design. A bad usability does hurt learning by increasing the extraneous cognitive load. But what would be the best way to examine the usability of e-learning-systems from the user's point of view? We are looking at the methods and the results they produce. Based on a Pilot-Study we conducted a second study exploring the outcomes of two popular assessment-techniques: Thinking-aloud and group discussion, both in a semi-structured and structured condition.

Keywords

triangulation, usability test, evaluation methods, questioning-techniques

PROBLEM

Usability problems of educational software can be one source of disturbance within the learning process by distracting attention from the learning task and consequently increasing the extraneous cognitive load (Sweller, 1999). Therefore examining the weak spots of multimedia learning environments is essential. To detect more sources of disturbance than one single method can deliver the combination of methods (triangulation) has been proposed (Denzin, 1970, 1997; Flick, 1992). Unfortunately there is a lack of evidence which combination is most appropriate.

PILOT-STUDY

In a pilot-study, three methods were investigated: questionnaires, group discussions and thinking-aloud. The results showed that triangulation is a suitable way to record the usability of multimedia learning systems. The analysis of the answers showed as well, that the data gained have different depth. The outcomes of the different methods support each other on the whole, but some answers give a more detailed description and some are more general.

DESIGN OF THE CURRENT STUDY

According to the tendency to differences in the outcomes of the various methods that was shown in the first study, we created two conditions for every method in the second study: a structured and a non-structured one. We focused on two methods: thinking-aloud and group discussions. The thinking-aloud-method was used (a) in its 'traditional way' without interfering in the process and (b) as question-asking-technique. We also used focus groups in two conditions: structured (moderated) and unstructured by asking only one initial question.

RESULTS

The goal of this systematic approach is to define on what conditions which method is useful. We want to answer the question in which part of the process of developing e-learning systems which method is most effective depending on the level of information detail needed. The results support our hypothesis of specific information from each method varying in focus and depth. They also show that the structured conditions provide far more information than the unstructured ones. Users seem to need a certain frame that marks the

focus of attention to give meaningful information about the advantages and disadvantages of the software to be evaluated.

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