

TASK-SPECIFIC 3D MAP READING: COGNITIVE ASPECTS

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Cartographic communication is a rather complex process: the range of activities comprehends various parameters concerning psychological aspects, especially the perception and the cognitive domain.

As soon as a 3D representation is used as information transmitter, the number of parameters increases. The latter ones do not refer to quality or even quantity, they rather refer to the variety of individual processes which effect the whole cognitive process.

Task-specific map reading is distinguished by a perception which goes beyond a "spontaneous viewing"; the respective perception process is accompanied by a specific thinking. Such tasks, where the user's consideration is needed - irrespectively of the particular representation - can be called as "cognitive tasks". For cognitive tasks the perception is to a different extent strongly influenced by individual factors like education, knowledge and experience. At this point the user's ability of cognitive perception shall be associated with the properties of the representation:

The user's way to solve a given task is to a high degree driven by the respective properties of the representation. In that connection and, moreover, in the special context of a 3D representation the so-called intellectual property of the display is a very important aspect, because these parameters (e.g attentional value, figure-ground relation) give in the first instance rise to the user's stimulus according to her/his visual expectation.

The user's way of working with different kinds of maps - such as 2D and 3D maps - has been investigated within the scope of an empirical study which has been carried out with user groups of varying experience and education.

One of the target maps which has been used for an experiment is an enlarged topographic map of a high-mountain terrain. The same map has been edited for presentation on the autostereoscopic Dresden 3D LC Display which was selected as one example of 3D visualisation techniques.

As one of the main points of the investigation the influence of the so-called "educational and personal factors" on the user's way of map reading has been investigated, besides the optimized application of the respective type of maps. The results are not only quantifiable but display also a predominant qualitative character.

It has been noticed that the behaviour of the users while solving the tasks tightly corresponds with the educational and personal factors. The understanding of these processes is essential for the understanding of the correlation with the individual aspects mentioned above.

For the cartographer it allows an great insight into the users' way of dealing with their different cartographic products, in the narrower sense with the effect of the high-mountain map's intellectual properties. As a derivative of the whole investigation the usefulness of 3D representations has

been drawn up.