

Abstract

Virtual reality (VR) is a well known and frequently discussed tool for product development processes. In particular for virtual prototyping there are great expectations for the use of VR (Mast & Berg 1997). Information is the major item of the Design Review process. The more information the designer gets- the more solutions can be explored. Similar to the scribbling in the early design process (Suwa, Gero & Purcell (1998), during evaluation sessions the designers are supported by higher information density. Moving the virtual prototype in front of information enriched background new information can be generated. New ideas are triggered by visual perception of depictions (Suwa et al. 1999). Due to the change of viewing angle new product-scenario constellation and information are generated. This study is exploring the stimulative nature of a five sided CAVE. Ten designers evaluated a virtual prototype inside a realistic task scenario. The product has been an electronic medical-firstaid-device used for emergency situations in

future civil aviation. Performance of the participants in CAVE-environment and at CAD-workstations are compared during design review sessions. The stimulative nature of the CAVE-System has been found as far as generating of information by changing the viewing angle are considered ($T(9) = 7,723$, $\alpha = 0,0001^{***}$). In questionnaires the use of the CAVE as a tool for simulation 33%, evaluation 18% and modeling 15% were chosen by the designers (total entries, $N = 33$). For the respondents it was significantly easier to adapt to the CAVE-system than to the CAD-system ($T(9) = 2,23^*$, $\alpha = 0,05^*$). There was no evidence for engagement of subjectively perceived performance. The study indicates that VR-systems as a CAVE have great potential for virtual product development processes with focus on evaluation and simulation. Further exploration is required in the fields of psychological impact of VR like virtual sickness and the design of virtual user interface (VUI).

Keywords: virtual reality, VR, product design, industrial design, design review