Interaction with a driving simulator: involvement of users analysed by subjective judgements

Marcel B.F. Uhr, Bryn J. Williams, and Daniel Felix
Institute of Hygiene and Applied Physiology
Swiss Federal Institute of Technology Zürich
ETH Zentrum, Zürich
Switzerland

Abstract

This paper shows the results of an experiment where inexperienced drivers judged their demand of a situation immediately after each trial of a driver training test. The task involved a manoeuvre to avoid an obstacle on a road with low adhesion value (as on snow or ice). This manoeuvre was learnt by one group of participants in a driving simulator and by another group of participants on the real system. All the 42 inexperienced driving trainees first drove three manoeuvres with the real system. Afterwards the participants were divided into two groups and proceeded to train further on the two different systems: one group on the real system and the other in the driving simulator. At the end of the experiment all participants drove three manoeuvres on the real system again.

A comparison of the results between the two groups showed no difference in subjective rating. Although the used driving simulator was a very simple one, the participants who trained using the simulator judged their level of demand to be similar to those who trained on the real system.

Introduction

In general, trainers and trainees remain sceptical that simulators offer an efficient transfer of training to real world environments. A frequent comment is that the simulator and the real world situation are too dissimilar for quality transfer of training to take place. The scientific community remain divided over this subject of fidelity: how close to reality should a simulator be? What factors of a simulator influence the transfer of training?

Modern training devices like simulators are commonly used in fields where training on the real system is expensive or dangerous. For this reason checkups and further education for pilots at airlines are mostly made in high-end flight simulators. Similarly, the education and further education of military tank drivers is often made on modern and highly sophisticated tank driving simulators. Other examples of simulator use for education and further education are: gunnery training in the military; navigation training of large ships; and training of specific situations in power plants. Due to the low expense of training on the real system and the current high costs of modern driving simulators, learning to drive often occurs in a real car.