

Simulator training for truck-driving: indications of learning effects

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Abstract

With new European Union regulations mandating training for passenger and freight transport, two experiments tested for conditions under which simulators efficiently develop driving skills. In Pilot Study 1, an experimental ($n = 7$) and a control group ($n = 9$) of truck drivers received initial conventional safety training together at driver's training centre. Using a simulator, both groups then drove a predefined route. The experimental group was presented with three especially dangerous situations along the route and was given constructive feedback; the control group was not. The experimental group outperformed the control group in two of the three situations. In Pilot Study 2, 15 participants were trained in fuel-efficient driving. Those in the experimental group ($n = 8$) then used a simulator to drive each of four different routes twice. Each driver received performance feedback. Each person in the control group ($n = 7$) drove the four routes twice without a simulator and without feedback. The experimental group far outperformed the control group and rated the usefulness of simulator training much higher than the control group did. The results of both studies proved independent of age, experience, attitudes, and motivation.

Introduction

Simulators are widely used in different areas in which it is essential for people to learn to cope with potentially dangerous situations. Flight simulators, for example, have been employed in military training since the end of the 1920s and in training for ground vehicles since the 1950s. Since the 1960s, simulators have had civilian uses as well (Amico & Clymer, 1984). Uhr, Felix, Williams, and Krueger (2004) outline ecological, economic, and didactic reasons for using simulators in driver's education. They point out the low physical risk to the trainee, the opportunity to repeat a situation as often as needed, reduced environmental pollution, high situational controllability, and the possibility of practicing very rare situations. Training on simulators can be effective even when the fidelity of the simulator is low. Participants for whom the simulator's low fidelity poses a problem often perform better than they do on the preceding road test. Experiencing the difficulty seems to become an advantage, much as regularly wearing a weight belt in sports workouts can enhance an athlete's performance in actual competition (the "weight-belt effect"; Dieterich, in press).

In D. de Waard, F.O. Flemisch, B. Lorenz, H. Oberheid, and K.A. Brookhuis (Eds.) (2008), *Human Factors for assistance and automation* (pp. 217 - 227). Maastricht, the Netherlands: Shaker Publishing.