Driver training in a simulator. Improved hazard perception.

This is an exhaustive report on the use of simulators in driver training in Denmark and a description of an effective hazard perception skill training procedure by the use of a simulator performed at the Technical University of Denmark (DTU) with financial support by TrygFonden. Improving road safety among young drivers is an efficient way to improve road safety due to the large over-representation of young drivers in road traffic accidents. Therefore, the development of new methods to improve driving skills among young drivers is highly relevant. Research shows that a lack of hazard perception skills (HPS) is a central element in the high risk among young drivers, and driving experience is a key factor for the acquisition of HPS. A driving simulator offers the possibility to train driving experience in a safe environment. This report presents studies aimed to map driving simulator use for driver training in Denmark and to develop a training to improve young drivers' HPS in the driving simulator. Mapping the use of a driving simulator for driver training purposes shows that driving simulators are not widely used in Denmark. However, instructors and driving coaches from institutions that have experience in driver training stated many advantages for simulator use. In Denmark, driving simulators are mainly used for regular driver training and teaching basic driving skills, such as starting and maneuvering a vehicle in different traffic situations. The use of simulator training of higher-order skills, such as HPS, is neglected.

Prior to development of the training for young drivers, a preparatory experiment was carried out. The results indicated the need for training focusing not only on the detection, but also on an adequate response to hidden pedestrian-related potential hazards that demand more advanced HPS. Based on the results, the training procedure was developed, consisting of a training drive, a video with an expert commentary and a replay of the training drive. The training aimed to improve young drivers' hazard detection and response in pedestrian-related potential hazard situations. The results demonstrated that the training had a beneficial effect on improved tactical HPS, particularly in relation to more challenging, hidden pedestrian-related potential hazards. Improvement in advanced HPS suggests that it is relevant to consider ways to include similar training procedures in basic driver training to support the development of more advanced HPS among newly licensed drivers. This type of training program in the driving simulator, further improved, could be considered as an additional tool to improve the driver learning curriculum in addition to the traditional means of driver training.