VIRTUALDRIVER INTERACTIVE™

Simulation: Proven Effective for Training Novice Drivers

"Learning is by doing. If you can't do it before you do it, expect to learn it as you do it."
- Anonymous NASA employee

History of Simulator-Based Training

There is a long list of scientific literature on simulators and their use for training that dates back to 1950s. For decades, simulation has proven to be an effective training tool for the military and first responders. Air Force, Marine Corps, the Army and Navy have trained their airmen, sailors and soldiers in the rules of engagement, judgment, combat, marksmanship and indirect fire on simulators. Before pilots fly the world's most advanced fighter jets, they fly first on simulators. Helicopter pilots benefit from simulator technology by improving their overall readiness at an earlier stage of their rotary wing training. Simulation provides for reduced costly flight hours and improved safety and training outcomes. Emergency vehicle operators use simulators to learn safe driving maneuvers in emergency response situations without endangering themselves or the public. Each is completely safe, because they can crash on a simulator, and live through it. Each is more technically proficient, safer and mission-ready.

Do Simulators Provide Effective Training for Drivers? Yes!

> *"Simulator training can prepare drivers to respond appropriately to hazardous conditions and thus avoid accidents."- NTSB Chairman Jim Hall*

Recent research has investigated the training benefits that driving simulators provide. There is compelling evidence that simulator-based instruction provides a high transfer of learning rate on new and experienced drivers. Moreover, it has been proven that **making mistakes** is a key dimension to learning. Flach et al. (2008) stated: "This is likely to be one of the values of simulators – they offer an opportunity to learn from mistakes in a forgiving environment"[1].

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[1] Flach, J.M., Dekker, S., & Stappers, PJ (2008). *Playing twenty questions with nature (the surprise version): Reflections on the dynamics of experience. Theoretical Issues in Ergonomics Science. 9. 125-154*

Key Results of Driving Simulator Research & Studies: Novice Drivers/Teens

Research Finding	Source/Study
"Simulator training can impart knowledge and skills to novice drivers that transfers to real world driving." "Simulator training can lower novice driver accident rates."	_The Effect of Driving Simulator Fidelity on Training Effectiveness._ R. Wade Allen, George D. Park, Marcia L. Cook, Dary Fiorentino. Funded by the US Centers for Disease Control and Prevention.
"Providing the right training experience at the right time, to foster cognitive development resulting in situational awareness, is thus the challenge in training program development. And this is where appropriate simulation presents unique advantages as a complement to traditional classroom and behind-the-wheel techniques to enhance novice driver training." "It is suggested that the student's early understanding of vehicle orientation and guidance will benefit significantly from interactive driving simulation, and will influence novice driver accident rates."	_The Role of Simulation in A Staged Learning Model for Novice Driver Situational Awareness Training._ Loren Staplin, Ph. D., James C. Dowdell
"Recently, Allen et al. (2007a) found that those individuals who had completed a simulator training program involving repeated exposure to critical hazards in a wide field of view instrumented cab, had a post-license crash risk that was only 1/3 of that of the general teen population." "There are several indicators that simulator training speeds up skill acquisition of unlicensed drivers as compared to on-road training (Kappe & Van Emmerik, 2005; Vlakveld, 2006b)." "Allen et al (2007a) made similar remarks: "Motor vehicle crashes are significantly higher among teen drivers in the first year of licensure, and crash risks decline with increased experience. . . This produces an interesting dilemma about how to provide young drivers with driving experience without significantly increasing their crash risk. Driving simulation may be the solution to this dilemma since exposure to hazardous driving conditions can be simulated in a controlled and repetitive way without risk." "The sheltered conditions in a simulator provide another desired effect. Results of interviews with simulator students and driving school owners indicated that reduced nervousness was regarded as one of the primary advantages to start training in a simulator instead of a real car (Van der Snee, 2005)."	Dr. Ir. Joost C. F. de Winter, Department BioMechanical Engineering, Delft University of Technology, The Netherlands.

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Research Finding	Source/Study
AAA Foundation for Traffic Safety sponsored a research program evaluating driver education programs. In the findings, they recognize that simulation is a "legitimate teaching tool".	*Large-Scale Evaluation of Driver Education view of the Literature on Driver Education Evaluation 2010 Update*. Lawrence Lonero, Northport Associates, Dan Mayhew/Traffic Injury Research Foundation for the AAA Foundation for Traffic Safety.
The **ADTSEA**, who sets the standards for novice driver education, recognizes simulation as a viable form of training by stating that behind-the-wheel instruction "should be integrated with driving simulation and/or driving instruction if available". They also state that "traditional, fixed-based driving simulators provide a valuable tool in instruction, diagnosis of driver problems, remedial instruction and, practice in perceptual and procedural skills. Additionally, interactive driving simulators provide an equally valuable tool to enhance a driver education program."	*AD T SEA's T raf f ic Saf ety Educat ion Lif e* *Long Learning Process: Recommendations on the Delivery of Driver Education*
"Studies using driving simulators and the open road have revealed that newly-licensed drivers can be trained to anticipate specific hazards, to scan more broadly within the general driving environment, to prioritize their attention, and to maneuver their vehicle more safely, all without becoming overconfident." "Driving simulators represent an important tool for evaluating the efficacy of training programs in situations that would be too unsafe to study on the open road."	*Driving Simulation Handbook.* Chapter 30 - Driving Simulators as Training and Evaluation Tools: Novice Drivers. A. Pollatsek, W. Vlakveld, Bart Kappé, A.K. Pradhan, & D.L. Fisher