VR-Based Flight Simulation for Structural Design Education

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Abstract. Nowadays, flight simulators are widely adopted in the aerospace field, with the aim of replicating real conditions and complementing the practical training on physical aircraft. The continuous growth in computer performance, along with cost reductions, enhances the possibility of building affordable flight stations, making them available to a larger audience. Consequently, flight simulators can be straightforwardly utilised also for educational purposes in specific academic courses, to make students more aware of the physics of what is theoretically taught. Hence, the present paper seeks to describe a Virtual Reality (VR)-enhanced simulation-based educational tool, developed on top of a commercial software, which allows students to experience in real time representative flight conditions within the aircraft flight envelope. The effects of the adoption of the above-mentioned tool on the learning outcomes of the Aerospace Structures course - held at the Bachelor's degree in Aerospace Engineering at the University of Bologna – are investigated. The impact of the proposed approach on students' learning outcomes is evaluated through an anonymous survey administered before and after the introduction of the tool.