



A Redesign of the DLSU Urban Concept Vehicle Cockpit

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Abstract: Drivers of the DLSU urban concept vehicle (UCV) experience pain and discomfort due to awkward postures in the current design of vehicle cockpit. This research aims to redesign the DLSU UCV cockpit by creating a design to improve the posture of the drivers by lowering their Rapid Upper Limb Assessment (RULA) score and to eliminate discomfort in the design. The trunk contributed to a high RULA score of 4 due to the lack of lumbar support and the trunk angle flexed. Drivers also experienced discomfort on their legs due to low leg clearance. Using anthropometric analysis, appropriate clearances and reaches were determined to be incorporated into the design. Through cause analysis, the factors that contributed to the high RULA score and the discomfort of the drivers were identified. A 2² factorial experiment was then conducted through CATIA with the use of manikins (body dimensions of the tallest and shortest driver) to determine the significant factors affecting the RULA score. After conducting the experiment only the backrest angle was significant. One Factor RSM was conducted through CATIA and was used to determine the optimal setting for the significant factor generated in Design Experts, the backrest angle being 104.5 degrees. A physical prototype of the cockpit was produced. Drivers were subjected to testing to validate the results of the study with the use of RULA and discomfort survey. It was evaluated by the drivers and the RULA Grand Score was decreased to 2 and eliminated drivers' discomfort. The redesigned vehicle is most suited for the middle 90 percent of the DLSU-ECT population with height ranging from 160 to 180 cm. Design guidelines were produced for the DLSU-ECT based from the dimensions acquired in the study for different ranges of height.

Key Words: urban concept vehicle; vehicle cockpit; RULA; anthropometry; DLSU Eco Car