DEVELOPMENT OF DETACHABLE SLEEP DETECTION DEVICE FOR SAFETY AMONG VEHICLE DRIVERS

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ABSTRACT

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The study about the development of detachable sleep detection device for safety among vehicle drivers was completed from August 2017 to April 2018. It was conducted in selected municipalities in the province of Cavite. This study generally aimed to develop a detachable sleep detection device that inhibits drivers from sleeping. Specifically, it aimed to: (a) determine the needs of the users through define, measure, analyze, design and verify (DMADV) methodology; (b) design the sleep detection device based on the user's needs; (c) develop a user friendly sleep detection device; (d) provide evaluation about the detachable sleep detection device; and (e) provide recommendations to further improve the device.

The participants of this study were small truck drivers from different trucking companies to provide data about the device. It was gathered from the record of Department of Trade and Industry about the registered trucking companies in Cavite. The researchers chose drivers from 18 years old and above since they are the non-professional and professional license drivers. In order to measure the effectiveness of the device, an evaluation was made. The method that the researchers used was stratified random sampling of drivers in the entire Cavite to prevent biased choices of respondents. The researchers also used Slovin's formula to determine the required number of samples needed for the study.

According to the result, the type of sleep detection device that the truck drivers preferred was the three small devices over one big device, plastic material over aluminum and fiberglass, suction cups as a way on how to attach the sleep detection device inside the truck and sound as a type of warning or signal.

There were also nine characteristics of the device identified and five of them – comfortability, easy to operate, safety, effectiveness and adjustment – were ranked as the highest. These were the basis of the technical requirements that were used for the Quality Function Deployment (QFD), also known as House of Quality (HOQ). The chosen factors for deployment were safety feature function as intended, mechanism and ease of use. The researchers also presented the flow process chart and block diagram of the device. The overall design of the sleep detection device was discussed in design phase. It consists of different parts like ultrasonic sensors, arduino, buzzer, LED light, 9v battery, breadboard and switch.

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