Indoor Carbon Dioxide Monitoring System to Manage Spread of COVID-19 with Eco Feedback

Ahmad Uzair Azuka[1], Romiza Md Nor[2], Huzaifah A Hamid[3]
[1]*ahmaduzair642@gmail.com*
[2]*romiza@uitm.edu.my*
[3]*huzaifahhamid@uitm.edu.my*

ABSTRACT

Due to the COVID-19 pandemic that is plaguing the world, breathing clean air has become the top priority in protecting oneself against the deadly virus. However, high concentration of Carbon Dioxide (CO_2) and temperature level in indoor spaces increases the risk of spreading the virus, especially if the spaces have poor ventilation. Therefore, in this study, indoor carbon dioxide monitoring system was developed to monitor the concentration of CO_2 and temperature level using sensor to manage the spread of COVID-19 in indoor spaces such as rooms, classrooms and office via mobile application. When CO_2 and temperature level is high, this application visualizes and notifies users using eco feedback principles design. Eco feedback is a technique that provides feedback on individual or group activities to lessen the harmful impact on the environment. The eco feedback principles used in designing this mobile application user interface are attractiveness, clear information, object metaphor and living creatures. The sensor and mobile application that developed was tested using functionality testing and usability testing based on eco feedback evaluation principles which are clarity, emotion, effectiveness and preference. The evaluation was conducted using two types of evaluation which are online evaluation and field trial testing. It was found that the application is successfully able to visualize the data value of carbon dioxide, temperature and trend of gas in mobile application is achieved. It encourages user to change behavior to release concentration of CO_2 by opening fan and windows also physical distance from the warning displayed of notification sent to their mobile application.

Keywords: Carbon Dioxide (CO_2), Eco feedback principles, Concentration, Visualize, Notification, Change behavior