

ABSTRACT

Clean air is a very important need for living things, especially humans. Previous research has assessed indoor air quality using CO, CO₂, PM_{2.5}, and air temperature and humidity as measurement parameters. This research conducted a similar study, but it added an environmental radiation measurement parameter, which was measured using a Geiger Counter and Particle Detector. In addition, this research also developed a website-based monitoring system, an IT automation system for automatically validating data on the server and sought to correlate environmental radiation with air quality. Testing was conducted at the Deli Building, Engineering Service Community (ESC) laboratory room, Telkom University, in the period from January 4-11, 2024. The results showed that the expected radiation dose from environmental radiation was 2.46 mSv/year for alpha particles and 1.814 mSv/year for beta and gamma particles. These values are close to the average global environmental radiation level of 2.4 mSv/year. The CO₂ levels measured during the study ranged from 422.27-845.14 ppm indoors and 715.44-1638.73 ppm outdoors. The indoor measurements showed values below the quality standard of 1000 ppm, indicating that the CO₂ concentration in the room was within a safe range. The PM_{2.5} levels measured indoors were 43.79-73.58 µg/m³ and 58-147 µg/m³ outdoors. The indoor measurements showed values above the quality standard of 25 µg/m³, indicating that the air in the room would be unhealthy if exposed to occupants for long periods of time. This was caused by workshop activities in the laboratory, such as drilling, cutting building materials, and so on. A Spearman correlation test between radiation dose data and air quality data concluded that there was no correlation between the two parameters. This was due to the lack of a significant radiation source in the room that was measured, the lack of direct influence from outdoor air, and the absence of activities that generated radioactive radiation. Overall, this research successfully assessed indoor air quality. In addition, it also developed a website-based monitoring system and an IT automation system that can be used to improve the efficiency and effectiveness of air quality monitoring.

Keywords: *air quality, asesment, IT Automation, environmental radiation, website monitoring*