

## **ABSTRACT**

*Indoor air quality, especially in offices, has potential hazards that can affect the performance of workers. In addition to affecting performance because it can trigger symptoms of Sick Building Syndrome. Procedures for assessing indoor air quality based on existing standards such as BASE-USEPA and PMP-ASHRAE are needed to be an initial benchmark for improving indoor air quality in the future. Previous research that conducted air quality assessment procedures using microsensors still had shortcomings in terms of measurement. So an experiment was carried out to develop a measurement system using a Wireless Sensor Network (WSN) and real-time Data Validation using Raspberry Pi (Rasp) and indoor air quality assessment in 3 test rooms in the Deli Telkom University building measuring PM<sub>2.5</sub> CO, and CO<sub>2</sub> concentrations. The research was conducted by selecting effective and appropriate methods such as selecting WSN components, data transmission topology methods, and selecting data validation methods. Method decisions were made by literature study and experiments on each method and testing to obtain data for analysis. Likewise, in the assessment procedure, several stages are carried out, namely profiling, measurement, survey and analysis. The results of the system development carried out. For Rasp validation, it provides insight into the data and system, although the result is not less than 75%, but it needs to improve the quality and reliability of the data to be better. As for WSN, the analysis shows that station 2 has better performance, while the performance of other stations needs attention. This information is useful in improving the data transmission system for measuring indoor air quality using the nRF24L01 module. In the assessment results in 3 test rooms, it shows that in type C rooms for PM<sub>2.5</sub> and CO<sub>2</sub> concentrations exceed the quality standards. The measurement results of the indoor air quality assessment have a relevant relationship with the results of other air quality assessment procedures, such as profiling and surveys. Sources that affect indoor air quality come from inside the room itself and also from outside the room that enter the room through ventilation holes. From the assessment, recommendations are made to improve indoor air quality.*

*Keywords: Rasp, WSN, PM<sub>2.5</sub>, CO, CO<sub>2</sub>.*