Hopeless Without a Key

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Research Motivation

Traditional classrooms use manual switches, paper roll calls, and key management, leading to resource waste. Indoor CO_2 levels above 1,000 ppm affect health, so regulations require it to stay below this limit.

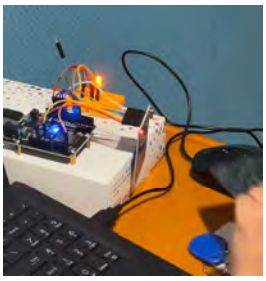
Research Purpose

- Smart classroom adjusts lights and AC by Auto lights and AC by people and temp. Off when no one is there.
- RFID takes attendance fast and easy.
- Checks CO_2 to keep air clean and save energy.

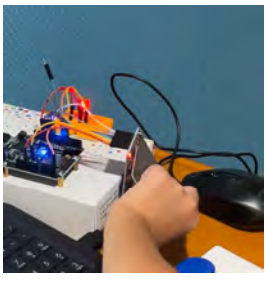
Research Process

We use the 8735 Ultra and ESP32 for human detection and RFID attendance, with classroom sensors monitoring temperature and CO_2. When CO_2 exceeds 700 ppm, the system alerts for ventilation. AI and relays enable smart lighting and AC control. Aligned with UN SDGs 7 and 11, the design boosts energy efficiency and fosters a healthy, smart classroom.

Implementation Results



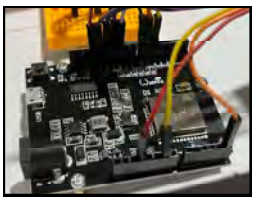
Standby Screen (Orange Light)



Error Card Screen (Red Light)

Success Card Screen (Green Light)

8735 Ultra



ESP32 Development Board

Carbon Dioxide Detector

Conclusion and Future Direction

We leverage AI and IoT to reduce resource waste and streamline personnel management, enhancing efficiency, security, comfort, and energy use. The system addresses key management issues and supports smart campus development.