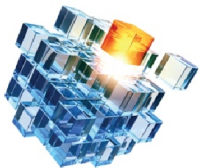


Teaching Technique Support System Based on Classroom Indoor Air Quality (IAQ) Analysis

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Highlights: This project is about to help the teacher to identify their student performance inside the school classroom. The system will tell the teacher about student performance or condition. It will help the teacher to take an action to prevent their student learning in the low performance. This system is beneficial to the teacher. To develop this system, we need to use sensors to detect the presence of carbon monoxide, carbon dioxide, dust, and mold. With the presence of all particle and gas, it will give bad impact toward the indoor air quality (IAQ) inside the school classroom. It will affect student performance. The system will calculate the rate of particle and gas and compare with the standard of indoor air quality that have been set by the Department of Occupational Safety and Health (DOSH). With using production rules, this system will manipulate knowledge to interpret student condition. The constraints that have been faced are problems to take the reading of indoor air quality and limited time. This system can be tested in the classroom at the school. The future development of this project is system can automatically fixing the problem of indoor air quality. An example as followed : when the carbon dioxide in the classroom is high, another system provides oxygen automatically.



Key words: *Indoor Air Quality, Teaching Technique, Classroom Monitoring,*

Introduction

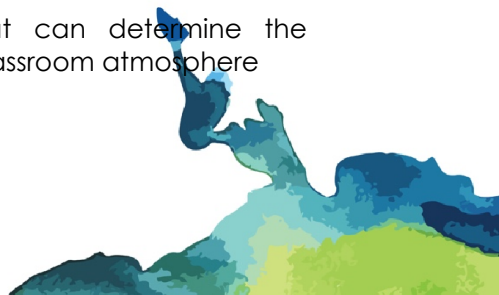
This teaching technique support system is a system that can provide the suitable teaching method that can be used by the lecturer to teach their student. The primary user of this system is a lecturer. This system will get the reading of indoor air quality from the sensor. After the system holds the reading of indoor air quality, they need to insert the performance of student and type of classroom. The system will verify the data entered by the lecturer then system will provide the result of teaching technique.

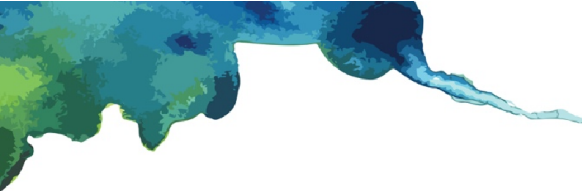
Problem Statements

1. Lecturer didn't have any idea to detect whether the student is sleepy or not
2. Difficulty to know the exact condition of classroom atmosphere - to change the teaching style
3. The instructor was not sure the proper state of indoor air quality for the student to perform consistently inside the classroom
4. Lecturer did not know how to measure the student acceptance on his/her teaching.

Objectives

1. To help lecturer knows about student's condition either them sleepy or not
2. To develop system that can determine the accuracy condition of classroom atmosphere



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3. To develop system that knows the proper state of indoor air quality for classroom and to develop system that can measure student acceptance inside the classroom.

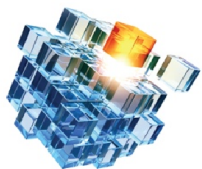
Development Framework

This system consists of four module which is log in, register, analysis, and report module. **Figure 1** shows the use case of this project.

Product Development

Some technique involves in the elaboration of this system. The first method used in this system is the rule-based reasoning. This rule comes from the table of data. Three tables embed inside this system which is indoor air quality versus symptoms, symptoms versus types of student, and the last table is data between types of student and teaching technique. These three tables have a relation between each other. The relationship between first and the second table is the symptom while the relation of the second and third table is types of student. All the data inside the table is getting from the expert person and also inside the journal.

For the first table which is table indoor air quality against the symptom, the data gathered from Dr. Hidayah which is an expert person in the OSHA (Occupational Safety and Health Administration) field and also from the several journals about indoor air quality. The second table which is symptom against types of student, the data is getting from the medical expert person. For the last table which is a type of the student against teaching technique is getting from Professor Abdullah which is a specialist person for the teaching method field. **Table 1**



shows the example of table one. This table shows the air temperature which is below 23 degree Celcius; people often suffer from a headache, fatigue, drowsiness and hoarse symptom. The data that provided below is the only example for clearer by the reviewer.

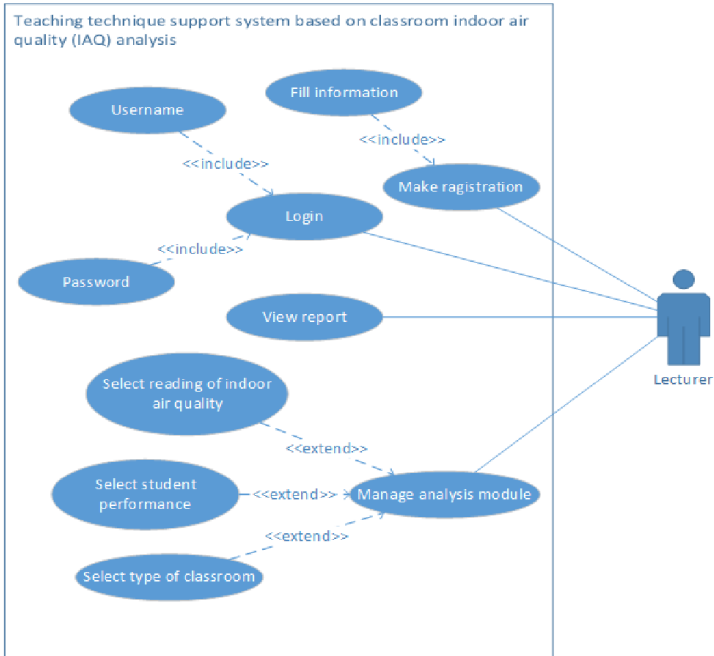


Figure 1 : Use-Case Diagram



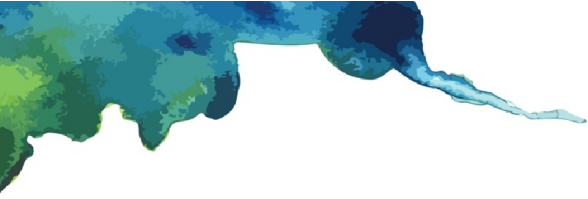


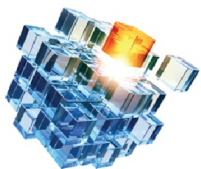
Table 1 : Decision Table

	1	2	3	4	5	6	7	8	9	10	11
Air Temperature (23°C below)	Y		Y				Y		Y		
Air Temperature (26°C above)	Y		Y	Y	Y	Y	Y		Y	Y	Y
Relative Humidity (40% below)	Y	Y	Y	Y		Y	Y	Y	Y	Y	
Relative Humidity (70% above)				Y		Y				Y	

- | | |
|-------------------------|-------------------------|
| 1. Headache | 8. Stuffy nose |
| 2. Feeling heavy headed | 9. Hoarse |
| 3. Fatigue/lethargy | 10. Dry throat |
| 4. Dizziness | 11. Skin rash/itchiness |
| 5. Nausea/vomiting | |
| 6. Cough | |
| 7. Drowsiness | |

Usefulness

This project is suitable to help the lecturer to find the best way to teach the student. Nowadays, we can see more student cannot pass the exam with the excellent result. We only can say that the student fails because they do not study well or they do not make revision before entering the exam hall. But we do not know the exact reason of the student get fail. Maybe the student cannot focus on the class with the idea of poor indoor air quality that makes their performance were decline. There are many journals said that the performance of student decline because of the poor indoor air quality. The



performance depends on the indoor air quality. Lecturer also has the responsibility to make sure the student get knowledge while coming to the class.

The best way to avoid the problem of indoor air quality is with using this system. This system will take the reading of indoor air quality inside the classroom. Then lecturer will select the several options of student performance, and the system will provide the suitable teaching technique that can be used by the teacher to teach their student. The proper teaching technique can make the student pleasing to the subject. For example, if the student becomes passive, the lecturer can use the technology such as video to make them feel better. It will help to reduce the number of failing student.

Advantages

The advantage of these changes towards computing future is this system able to make a decision, and the system speed can upgrade, and the accuracy could be reach. The advantages of this system towards the community are this system can help lecturer to find the suitable teaching technique and can reduce the number of student fail.

Conclusion

This system is appropriate for the community and can provide benefit towards the community. It's could help the lecturer with providing the proper teaching technique. Adopting this system will help the student to improve their study with using the suitable teaching method that their instructor uses to teach them.





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