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**Measuring the effect of Classroom Condition on Student
performance: A Case study from Egypt**

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Abstract:

Student performance is an important factor for the graduate career. Many conditions can affect the student performance in the university such as the classroom, university infrastructure, the curriculum and the relationship between the teachers. This research paper aims to measure the effecting of classroom condition variables represented by noise, air quality, lighting, classroom weather, classroom size, and cleanness. A questionnaire was designed for this purpose and it has been distributed on one of the international universities settled in Egypt, a number of 274 students answered this questionnaire. The researchers used the Structured Equation modeling tests to examine the responses. The results demonstrate that noise, classroom weather, classroom size and cleanness are significant in student performance, however air quality and lightning is not significant for the student performance.

Keywords: Student performance, classroom condition, Egypt.

1- Introduction:

Education is one of the main concerns in most countries as it is continuous function of managing the knowledge transformation between students and teachers. Therefore, studies related to education and its quality has risen decades ago. In this research, the researches try to investigate the effect of class conditions on students' performance.

On the other hand, the success level of the student is tested using exams or projects, and the results can be affected by factors such as student's motivation, previous education, university condition, colleagues, teacher relationship and curriculum (Merritt, et al., 2022).

This article consists of six sections. Section two briefly describes the literature review that focuses on classroom conditions and student performance. The third section, defines the proposed research hypotheses. The fourth section determines the methodology. The fifth section describes the statistical analysis details. Finally, section six discusses the conclusion of and future research points.

2- Literature Review:

Several studies discussed the effect of school facilities on students' performance, Sánchez and Govindarajulu, 2023 addresses the effect of classroom condition and university facilities in the student performance. Student performance is assisted by factors, like excellent tutoring, recent materials, and a pleasant educational environment (Drljević, et al., 2022). Presence of active students can be affected by the surrounding environmental (Wong & Hughes, 2022).

Educational environment can affect the learning and the performance of the student. A positive educational environment wide enhances student belonging, student support, and student engagement to lead to better academic performance. Meanwhile,



if it is negative, it can have effect negatively on student's physical and mental health (Yangambi, 2023; Krasny, 2020).

In addition, (Rahmatulloh, 2022) mention the impact of green Environment and green infrastructure represented in the connection of areas, such as parks, that assist the student with social, and community beliefs that provide benefits to students. (Yusuf, et al., 2022) stress on the impact of positive educational environment and the necessity of resources to support students' success. It has been concluded by (Bayer and Cui, 2023) that education environment and green infrastructure have a significant impact positively on student satisfaction.

Sani and Peter (2022), examined the effects of environmental detriments on Students educational performance in Nigeria Public schools. Using a descriptive survey, they concluded that there was a significant effect on student's environment, school services, school geographical location and the condition of class on student's academic performance. Shami and Hussain in 2005, argued that the surrounding atmosphere has a significant effect on students learning and performance (Teixeira et al., 2017) and Yangambi, 2023, considered the importance of infrastructure on learners' and its impact on their academic outcomes also they recommend that continuous improvement of school infrastructure to optimize student achievement and teacher delivery. This cannot be achieved without the development of information technology facilities and using the concept of "Smart campuses " that provide a technological environment to assist the students and the teachers to use the automated campus facility easier and more efficient (Mostafa, 2023).

These studies could lead the researchers to investigate the effect of classroom conditions on the student performance level.

Many researchers such as Rahmatulloh (2022), (Umar, and Ko, 2022, Evans et al, 2022) motivated the education institution managers to emphasis on classroom capabilities. As positive educational environment enhances the students' performance and support the evolution of the student in the university campus.

Educational institution can enhance its facilities by creating a safe and complete space (Yusuf, et al., 2022). Student performance can be affected also by noise levels, poor lighting, inadequate ventilation, overcrowded classrooms can save their lives from the diseases. Modern classrooms, must include enough lighting level, and technology availability, which can provide better academic performance (Woodruff et al.,2022). Evans et al, 2022; Hamel and Tan,2022 emphasize on the importance of good school infrastructure for the learning environment while assisting students with tools to reach and effective educational process.

The following table can illustrate the different class conditions discussed in literature in the last couple of years:

Table 1: Summary of variables from the previous studies.

Variable Researcher	Noisy	Air quality	Lighting	Class	Class size	Cleanness
Yangambi, (2023).	√	√	√	√	√	√
Bayer and Cui, 2023						
Teixeira et al., 2017						
Rahmatulloh, 2022	√	√	√	√	√	√
Umar, and Ko, 2022).	√	√	√	√	√	√
Yusuf, et al., 2022	√	√	√	√	√	√
Staccione, et al., 2022	√	√	√	√	√	√
(Hamel and Tan,2022).		√				√
Woodruff et al.,2022		√	√			

Student can feel that he/she belongs to the environment when the environment surrounding them is positive and stable it can enhance their skills and learning path (Yusuf, et al., 2022). Academic performance in the university is the tool that will develop their future life, for this reason it is important for the educational institutions to work on enhancing and developing the student academic performance (Rahmatulloh, 2022). Education



quality can be measured by the various institutions facilities that the university provides and the student performance in this university (Li & Wang, 2022; Lam, et al. 2022; Li & Wang, 2022). In addition, the university rank can be affected by both the facilities and performance.

3- Research Methodology:

The importance of class conditions raises the necessity of investigating the impact of these factors on the student performance in Egypt. Therefore, in this section the researchers are going to explore the proposed model, developing their hypotheses, the sample used and data collection and the measures.

3.1 Proposed Model:

After discussing the previous and recent literature in this scope the researcher can propose the following model illustrated in Figure 1 which shows the relation between the student performance and the class conditions as main variable represented by the noise, air quality, lighting, class weather, class size and cleanness.

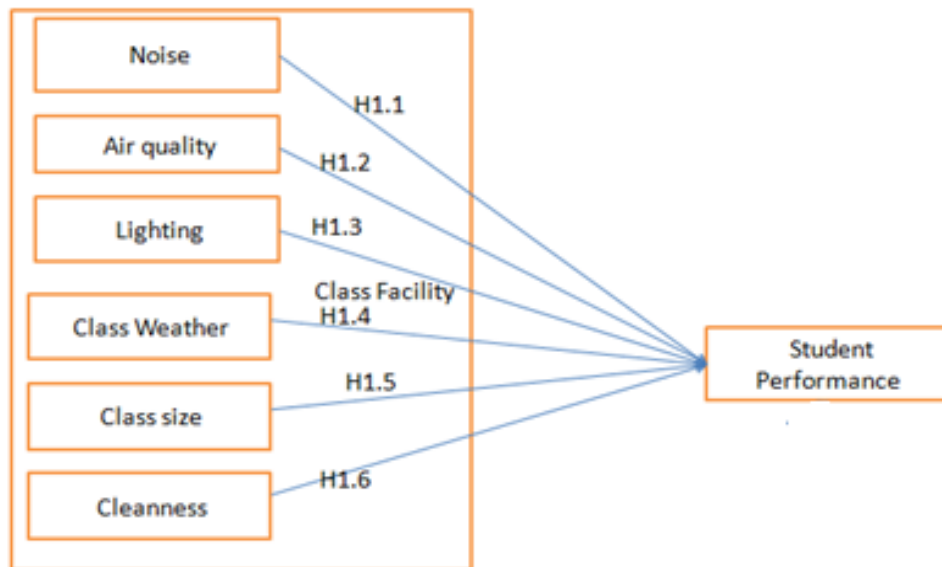


Figure 1: The Proposed Model

3.2 Research hypotheses:

A main hypothesis can be developed here to examine the relation between the student's performance as a dependent variable and the class conditions as in dependent variable.

H1. Classroom Condition has a significant effect on student performance

From this main hypothesis six sub-hypotheses can be developed:

H1.1 Noise has a significant effect on student performance.

H1.2 Air quality has a significant effect on student performance.

H1.3 Lighting has a significant effect on student performance.

H1.4 Weather has a significant effect on student performance.

H1.5 Class Size has a significant effect on student performance.

H1.6 Cleanness has a significant effect on student performance.

3.3 Sampling and Data collection:

This research uses a quantitative research method to measure the factors affecting the student performance. To test these hypotheses an online questionnaire has been developed and adapted from different questionnaires.

The target population is undergraduate and postgraduate students in one of the international universities working in Egypt with about 25 thousand students in the different branches. The questionnaire link was distributed via the student's portal for different four schools who are studying business, engineering, computer science and English literature in the university headquarter these schools has been selected because they have the same grading system. A response of 274 students has been received.



The questionnaire consists of class condition questions in addition to the demographic data section. all questions used the five level Likert scales. The options for each question use points from 1 to 5 to represent; strongly disagree, disagree, neutral, agree, and strongly agree, respectively, demographic data includes college name, program, age and gender. SPSS25.0 and AMOS23.0 are the statistical packages used to examine the relationship between the model's variables.

A reliability analysis and factor Analysis have been run on the questionnaire with acceptable values.

4- Data analysis:

In this section the researches will define the results of the survey, the responses demographic were analyzed which are school name, program, age and gender. The majority of the students were business school, about 200 students were post graduates, 128 males and 145 females and about 160 students were between 35 and 45 years, about 247 of the sample obtain a GPA good and above.

Model fitness in SEM analysis supports the empirical variables validity used for anticipating the fitness model. SEM is also used to measure error level in the model and describes the link among the variables (Baron & Kenny, 1986).

Table 2 shows the fitness indexes where we study results have achieved the minimum cutoff values:

Table 2: Confirmatory Factor Analysis Model Fit

Model Fitting Index	Value	Accepted Value
Chi-square/df	4.102	<5.0
Comparative fit index (CFI)	0.921	>0.90
Root mean residual (RMR)	0.033	<0.08
Goodness of fit index (GFI)	0.896	>0.90
Adjusted goodness of fit index (AGFI)	0.932	>0.85

Model Fitting Index	Value	Accepted Value
Root mean square error of approximation	0.051	<0.08
Standardized means square residual	0.062	<0.08

All variables have positive impacts except the Noise. The highest significant value is the Class Cleanness with value 0.831 (Yangambi, 2023; Bayer and Cui, 2023; Teixeira et al., 2017) followed by the following: Class size value is 0.763, class weather value is 0.728, Lighting value is 0.713, air quality value is 0.631 and finally the noise value is -0.627.

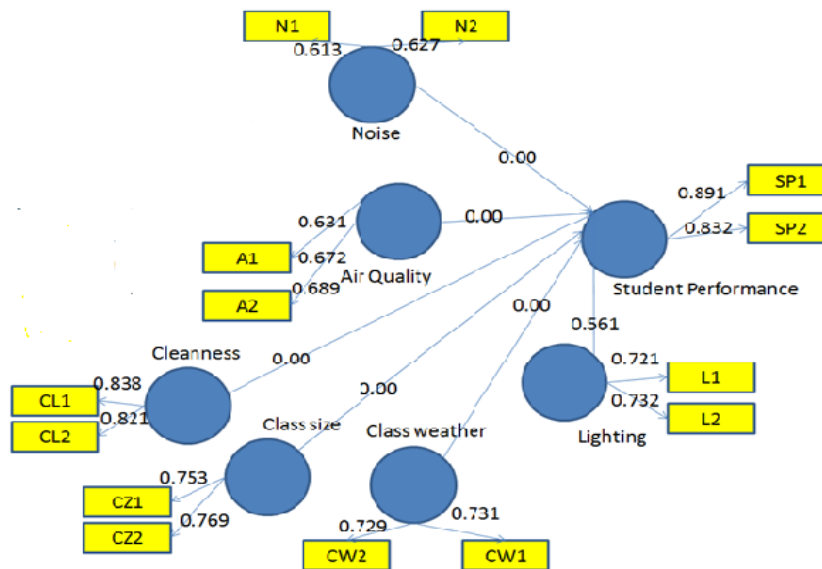


Figure 2: SmartPLS output of the bootstrapping approach

Hypothesis of air quality and lighting are not supported which agrees with the previous researchers (Rahmatulloh, 2022; Umar, &Ko, 2022; Yusuf, et al., 2022; Staccione, et al., 2022) who did not consider these variables in their model to measure the student performance. Hypotheses (1.1),(1.4) and (1.5),(1.6) affect the student performance which is proved also previously by (Yangambi, (2023)., Rahmatulloh, 2022; Umar, &Ko, 2022; Yusuf, et al., 2022; Staccione, et al., 2022).



Table 3: Hypothesis Acceptance and Rejection

Hypothesis	Path Coefficient	Significance	Status
H1.1: Noise-> SP	-0.627	0.000	Accepted
H1.2: Air quality-> SP	0.631	0.393	Not accepted
H1.3: Lighting-> SP	0.713	0.561	Not accepted
H1.4: Class Weather->SP	0.728	0.000	Accepted
H1.5: Class Size-> SP	0.763	0.000	Accepted
H1.6: Cleanness -> SP	0.831	0.000	Accepted

5- Conclusion:

The aim of the study is to explore the factors that affect the student performance of university students in a private university in Egypt. First, classroom condition is key in getting students to enhance the performance and enjoy staying in college. Moreover, student performance is affected by noise and class size, and class cleanness. Educational institutions management must work on enhancing the classroom conditions to be able to enhance student performance and enlarge the student engagement in the university.

Restriction of data in Egypt is one of the limitations of this study. Gulf countries can be the next participants to understand the gulf student's opinion too. Furthermore, the research sample only consisted of 274 participated that must be expanded in the future research.

Based on the literature review, there are some factors that were selected which are class condition. Future work must include other factors such as teacher student relationship, university facilities, teacher skills and capabilities, colleague's relationship, background including family and the curriculum level.

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