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# Management of Psychosocial Aspects Influencing Learning Outcomes with Physical Factors as A Mediator in Primary School

**Vasanth Balan[1*], Azlina Abu Bakar[1]**

[1] Fakulti Pembangunan Manusia, Universiti Pendidikan Sultan Idris (UPSI), Malaysia

* Corresponding Author: vasan_vs39@yahoo.com.my

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**Abstract:** *This study aims to determine the psychosocial aspects of students in the classroom regarding learning outcomes, with environmental management acting as a mediator among primary school students. A cross-sectional study design was used to achieve the desired research objectives. Data were collected through simple random sampling and face-to-face surveys, employing the "MCI" Scale, Learning Outcomes Scale, and Physical Environment Factors Scale. Respondents from 10 schools in the Sitiawan district (n=242) participated in this study. IBM SPSS 27 was used for data analysis, and a physical factors measurement instrument was employed to determine the values.The findings indicate that the measured values of physical environmental factors do not yet show an optimal comfort level for student learning, with illumination ranging from 391.87 lux to 966.20 lux. However, the independent variable (psychosocial aspects) showed a significant direct effect on the dependent variable (learning outcomes) (Coefficient=1.557, p<0.001). In the mediator analysis, there was a significant indirect effect between psychosocial aspects and learning outcomes through the physical environment factor mediator (effect = 0.2356, BootSE = 0.0333).These results suggest important implications for educational practices and policies. Educators and policymakers should reconsider the emphasis placed on environmental factors, such as lighting, in primary schools. This could enhance knowledge in this field by encouraging the development of effective strategies to support student learning and achievement, including multi-site studies, standardization of classroom environments, and regular maintenance and monitoring.*

**Keywords:** Psychosocial Aspects, Learning Outcomes, Physical Environment Factors and Classroom Environment

## 1. Introduction

Research conducted over the past 40 years has established that the quality of the classroom environment is a crucial factor influencing students' learning processes (Fraser, 2012). A positive perception of the classroom environment is associated with higher levels of student engagement and better learning outcomes. However, the physical state of many classrooms remains a significant concern. According to a November 26, 2019, article from GPS Bestari, Datuk Dr. Mohd Gazali Abas, the Chief Secretary of the Ministry of Education Malaysia (KPM), highlighted the need for upgrading and redevelopment programs for deteriorating schools across the country. Reports indicate that numerous schools and facilities under KPM are unsafe, inadequate, or non-functional.

In the Malaysian context, research has predominantly focused on students' perceptions within classrooms, often neglecting the physical characteristics of these environments and their impact on psychosocial aspects. Lila Halim (2009) emphasized this gap, noting that while student perceptions have been extensively studied, there is a lack of research on how physical classroom characteristics affect students' psychosocial well-being. This observation is echoed by Mohd Hairy Ibrahim, Marzita Puteh, Mazlini Adnan, Che Nidzam Che Ahmad, and Noraini Mohamed (2012), who argue that research on the intersection of physical environments and psychosocial aspects in Malaysian education is still emerging.

Given these concerns, there is a pressing need for more comprehensive studies to explore how the physical classroom environment influences both learning outcomes and students' psychosocial health. Addressing this gap can inform the development of effective strategies and policies to enhance classroom conditions and support students' overall well-being.

## 2. Problem Statement

Current research predominantly focuses on physical aspects of the classroom environment, such as lighting, temperature, and noise, while often neglecting their connection with psychosocial factors and the impact on learning outcomes influenced by these physical elements (Barrett et al., 2023; Harris & Burnett, 2024; Miller & O'Connor, 2024). Although these studies provide valuable insights into the direct effects of physical conditions, there is a noticeable gap in understanding how these environmental factors mediate the relationship between psychosocial aspects and learning outcomes.

The "Exploratory Sequential" mixed-methods approach, which investigates how physical environmental factors mediate this relationship, is relatively novel in the Malaysian context. This approach is crucial because it can reveal how elements such as physical safety and comfort influence not only academic performance but also overall student well-being.

The problem lies in the current lack of comprehensive research that integrates both physical and psychosocial dimensions to provide a holistic view of their combined effects on learning outcomes. Addressing this gap is essential for developing effective educational strategies and policies that enhance both the physical environment and psychosocial support systems in schools. A deeper understanding of how these factors interact can lead to improved classroom conditions, fostering better student success and well-being.

## 3. Conceptual Framework

The conceptual framework for this study is illustrated in Figure 1. It categorizes factors influencing students' comfort in the classroom into several key areas: environmental factors, which include lighting, thermal conditions, noise, and spatial factors. These physical environment factors are proposed to mediate the relationship between psychosocial aspects and learning outcomes.

The framework posits that each of these environmental factors individually affects students' comfort and, consequently, their learning outcomes. For instance, optimal lighting and thermal conditions are expected to enhance students' focus and engagement, while excessive noise and poor spatial arrangement may lead to distractions and decreased academic performance. The framework also highlights the interplay between psychosocial aspects, such as students'

perceptions of their classroom environment and their psychological well-being, and how these interact with physical environment factors to influence learning outcomes.

By examining these interactions, the study aims to provide a comprehensive understanding of how physical and psychosocial factors collectively impact student success. Measurement tools and survey instruments specifically designed for this research will be employed to assess these factors and their effects. The framework will guide the analysis and interpretation of data, aiming to identify significant mediating effects and inform strategies to optimize both the physical and psychosocial classroom environments.

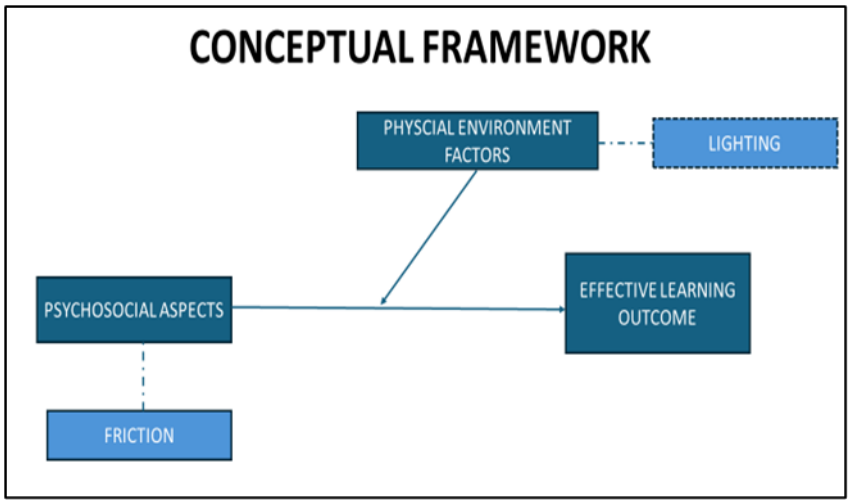


**Figure 1: Conceptual Framework**

## 4. Importance of the Study

This study is crucial for schools as it investigates the impact of the classroom environment on students' learning and comfort levels. By focusing on how various environmental factors influence student engagement and academic performance, the study provides essential insights for the Ministry of Education, school administrators, and teachers. Specifically, it aims to highlight the significance of creating a comfortable learning environment, underscoring that discomfort or suboptimal conditions can disrupt or impair students' focus and overall learning experience.

Understanding both physical and psychosocial factors within the classroom is essential for enhancing educational quality. The study's findings will offer actionable insights to various stakeholders, including the Ministry of Education, school administrators, and educators. These insights can inform the development or revision of standards and guidelines for classroom environments, ensuring they meet students' needs more effectively. Additionally, by addressing how environmental comfort contributes to students' well-being and learning outcomes, the study advocates for evidence-based approaches to improving educational settings. This, in turn, can lead to more supportive and effective learning environments, ultimately fostering better student achievement and satisfaction.

Overall, the study underscores the importance of integrating comfort and functionality into classroom design, providing a foundation for evidence-based improvements that enhance both teaching and learning experiences.

## 5. Literature Review

Hadiyanto (2016) identified 46 classroom environment scales (classroom climate) categorized into four dimensions. These scales were derived from various measurement tools developed in different countries. The studies utilized various classroom environment instruments such as the Learning Environment Inventory (LEI), Classroom Environment Scale (CES), Individualized Classroom Environment Questionnaire (ICEQ), My Class Inventory (MCI), and other instruments from both developed countries like the USA, Canada, and Australia, as well as developing countries like India, Jamaica, Brazil, and Thailand.

Ruzita et al. (2004) conducted a study to assess the perceptions of lecturers and students regarding the teaching and learning environment at the Faculty of Management and Human Resource Development (FPPSM), UTM. The findings revealed that lecturers felt that the classrooms and resource rooms at FPPSM were still not conducive to teaching and learning, and students also appeared dissatisfied with all aspects of the teaching and learning environment examined.

Several studies have explored how physical environment factors in classrooms serve as mediators between psychosocial aspects and learning outcomes. For instance, Barker and Wright (2022) investigated the impact of classroom lighting on student performance and well-being, demonstrating that adequate lighting mediates the relationship between psychosocial factors, such as student mood and engagement, and academic achievement.

Similarly, Harris and Burnett (2024) examined the influence of noise levels on student concentration and academic outcomes, revealing that noise can affect student stress and distraction, which in turn impacts learning effectiveness. Miller and O'Connor (2024) focused on temperature regulation, finding that classroom temperature affects student comfort and performance, with psychosocial factors like perceived comfort playing a significant mediating role.

**Davis et al. (2020)** explored the effect of classroom seating arrangements on student collaboration and participation. They found that flexible seating options enhanced student interaction and engagement, which positively influenced learning outcomes. This study underscores how the physical layout of the classroom can mediate the relationship between psychosocial factors, such as student comfort and collaboration, and academic performance.
Chen and Wang (2019**)** investigated the impact of classroom air quality on students' cognitive functions and academic performance. Their research revealed that poor air quality, characterized by high levels of CO2 and particulate matter, negatively affected students' concentration and test scores. This study highlights the role of environmental factors in mediating the relationship between psychosocial stress and learning outcomes.

**Li and Zhang (2022)** investigated the influence of classroom noise and its management on student learning and stress levels. Their study demonstrated that effective noise control measures, such as sound-absorbing materials and noise-reducing strategies, significantly reduced student stress and improved focus, thus enhancing learning outcomes. This research supports the idea that managing physical environment factors can mediate the impact of psychosocial stress on academic performance.

Kumar and Singh (2021) provided insights into how various physical factors, including lighting and seating arrangements, mediate the relationship between psychosocial elements, such as

stress and motivation, and educational outcomes. Finally, Nguyen and Lee (2023) explored how classroom design interacts with student well-being and learning outcomes, highlighting the mediation role of psychosocial factors like engagement and satisfaction. These studies collectively emphasize the critical role of physical classroom factors in shaping both psychosocial aspects and educational success (Barker & Wright, 2022; Harris & Burnett, 2024; Miller & O'Connor, 2024; Kumar & Singh, 2021; Nguyen & Lee, 2023).

These studies collectively emphasize the importance of various physical classroom factors in mediating the effects of psychosocial aspects on learning outcomes. They contribute to a broader understanding of how environmental conditions interact with psychosocial factors to influence student success and well-being.

## 6. Methodology

This research utilizes a mixed-methods "Exploratory Sequential" approach to investigate Year 5 students across ten schools in the Manjung district, Sitiawan, Perak. The study includes a diverse selection of schools—national, Tamil, and Chinese—ensuring a broad assessment of various classroom environments and their physical factors. A total of 242 Year 5 students were selected from these schools.

Measurement of physical lighting factors was conducted using a Lux Meter at five specific points in each classroom: the front left corner, the front right corner, the center, the back left corner, and the back right corner. This methodology, adhering to SIRIM standards (1979), ensures an accurate estimate of average illumination levels. Measurements were recorded every ten minutes during a one-hour class period, and the readings from these points were averaged to provide ten-minute interval data. The Lux Meter, which offers three ranges (A: 0 – 1999 Lux, B: 2000 – 19990 Lux, C: 20000 – 50000 Lux), used Range A for its high accuracy in typical classroom lighting levels.

To complement the quantitative data, a 5-point Likert scale method was applied to adjust readings based on lighting conditions, as detailed in Table 1 and based on Graham, J.'s (2015) guidelines. Observations were also performed to validate the measurements, focusing on aspects of the classroom and surrounding environment that could influence the Lux Meter readings, as shown in Figure 2.

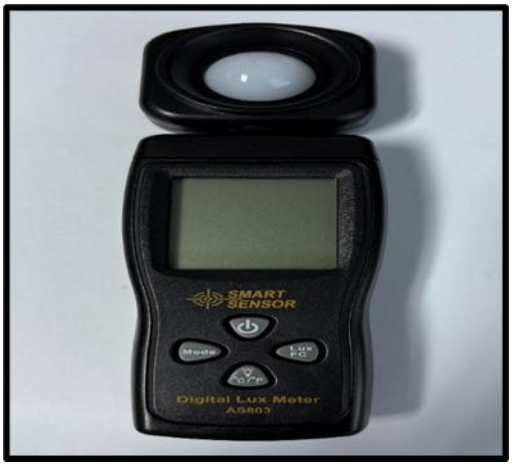


**Figure 2: Measurement of Light Levels in the Classroom**

The Digital Lux Meter AS803, which uses a photometric sensor and operates on a 9V battery, was used for these measurements. Ensuring the battery's condition is crucial, as a low charge can lead to inaccurate readings or a dim display.

Data collection involved not only instrument measurements but also subjective evaluations through a randomly distributed questionnaire among primary school students to assess comfort levels related to psychosocial aspects. The study employed several instruments: the “My Class Inventory (MCI)” for psychosocial aspects, the Classroom Physical Environment Assessment Inventory for physical environment factors, and the Understanding and Interest Inventory: Learning Outcomes for measuring academic performance. The Classroom Physical Environment Assessment Inventory’s questionnaire was designed based on Likert (1932) and Fink (2023), with results presented in Table 1 for light level scales and Lux Meter readings adjustments.

**Table 1: shows the Light Level Scale and Lux Meter Readings Adjustment**

| Selection | Score Value | Lux Meter Reading | Lux Meter Adjustment |
|---|---|---|---|
| Strongly Disagree | 1 | 391.87 to 506.73 | Low Light |
| Disagree | 2 | 506.73 to 621.60 | Slightly Bright Light |
| Neutral | 3 | 621.60 to 736.46 | Moderately Bright Light |
| Agree | 4 | 736.46 to 851.33 | Bright Light |
| Strongly Agree | 5 | 851.33 to 966.20 | Very Bright Light |

Table 1 presents the Light Level Scale and Lux Meter Readings Adjustment used in this study to categorize classroom lighting conditions. The table provides a correspondence between Lux Meter readings and subjective assessments of lighting brightness on a 5-point Likert scale. For readings between 391.87 and 506.73 lux, the lighting is classified as "Low Light," indicating insufficient illumination for optimal learning. Readings from 506.73 to 621.60 lux are labeled as "Slightly Bright Light," reflecting somewhat improved but still suboptimal lighting conditions. "Moderately Bright Light," assigned to readings from 621.60 to 736.46 lux, represents a balanced lighting level that supports learning to some extent. Readings from 736.46 to 851.33 lux are categorized as "Bright Light," suggesting a well-lit environment conducive to learning. Finally, "Very Bright Light" is assigned to readings from 851.33 to 966.20 lux, indicating optimal lighting conditions for educational settings. This classification system translates quantitative lux measurements into qualitative assessments, aiding in the evaluation of how varying light levels impact the classroom environment.

For data analysis, this study utilized SPSS 26.0 (Statistical Package for the Social Sciences) and Microsoft Excel to perform a range of statistical evaluations. Descriptive analysis involved the presentation of data through tables, pie charts, graphs, and percentages, which helped in summarizing and visualizing the data effectively. Additionally, the analysis encompassed calculating means to understand central tendencies within the data. Advanced statistical techniques, such as indirect regression, direct regression, and mediator analysis, were employed to examine the relationships between variables and to explore the mediating effects of physical environmental factors on the psychosocial aspects and learning outcomes. These methods facilitated a comprehensive understanding of the impact of physical and psychosocial factors on student performance, supporting robust interpretations of the study's findings.

## 7. Reliability Analysis for Pilot Testing

In this study, a pilot test was conducted with 30 respondents to assess potential weaknesses, defects, and errors in the survey instrument. The pilot test involved distributing 30 sets of questionnaires to 30 participants, as outlined by Lacey et al. (2007). The results revealed a remarkably high Cronbach's Alpha of 0.95 for the combined set of variables, which indicates excellent internal reliability for the instrument. This high reliability score suggests that the survey tool is consistent and dependable in measuring the intended constructs. However, it is important to note that while the pilot test provided valuable insights and affirmed the reliability of the instrument, it may not fully capture all the nuances and findings of the main study. Thus, while the pilot test results are promising, further validation and analysis in the main study are necessary to ensure comprehensive and accurate results.

### 7.1 Normality Test Analysis

The results of the One-Sample Kolmogorov-Smirnov Test indicate that there is insufficient evidence to reject the null hypothesis, which asserts that the data distribution is derived from a normal distribution. Specifically, the significance value, calculated using the Monte Carlo method, is 0.855. This p-value is substantially higher than the conventional significance threshold of 0.05, suggesting that the observed data distribution does not significantly deviate from normality. Consequently, these results imply that the data conforms well to a normal distribution, supporting the validity of applying parametric statistical techniques that assume normality.

### 7.2 Findings of the Study

#### 7.2.1 Identifying the Level of Physical Environmental Factor: Lighting

The physical environmental factor of lighting in the classrooms was evaluated based on the standards established by the Standard & Industrial Research Institute of Malaysia (SIRIM, 2018). The study revealed a significant variation in lighting levels across different classrooms, ranging from a low of 391.87 lux to a high of 966.20 lux. According to the data presented in Figure 2, most classrooms recorded lighting levels exceeding 500 lux, which does not align with the optimal standards set by SIRIM. Exceptions included the classrooms at Sekolah Jenis Kebangsaan (Tamil) Kampung Columbia, where lighting levels were notably within the acceptable range, as well as both class sessions at Sekolah Jenis Kebangsaan (Tamil) Ladang Cashwood and Sekolah Jenis Kebangsaan (Tamil) Ayer Tawar, which nearly met the SIRIM standards. However, it was observed that Sekolah Jenis Kebangsaan (Tamil) Ladang Cashwood and Sekolah Kebangsaan (Tamil) Ayer Tawar fell short of these standards, with lighting readings consistently below 500 lux, indicating insufficient illumination.

The highest average lighting reading of 966.20 lux was recorded during the post-recess class at Sekolah Kebangsaan Sungai Wangi, Ayer Tawar, demonstrating exceptionally high lighting conditions. This was closely followed by Sekolah Kebangsaan Ayer Tawar, Sitiawan, with an average reading of 942.30 lux. Conversely, the post-recess class at Sekolah Jenis Kebangsaan (Tamil) Ladang Cashwood showed the lowest average lighting level of 391.87 lux, reflecting poor lighting conditions. Observational data further revealed that external building corridors were obstructing natural sunlight from penetrating the classrooms, contributing to the low lighting levels.

This was particularly evident at Sekolah Jenis Kebangsaan (China) UK Dih, Kampung Koh, Sitiawan, where the lighting reading of 423.97 lux was indicative of significant limitations in natural light access. These findings underscore the need for improvements in classroom

lighting, potentially by redesigning architectural features to enhance natural light entry or by optimizing artificial lighting solutions to better meet educational standards and support effective learning environments.

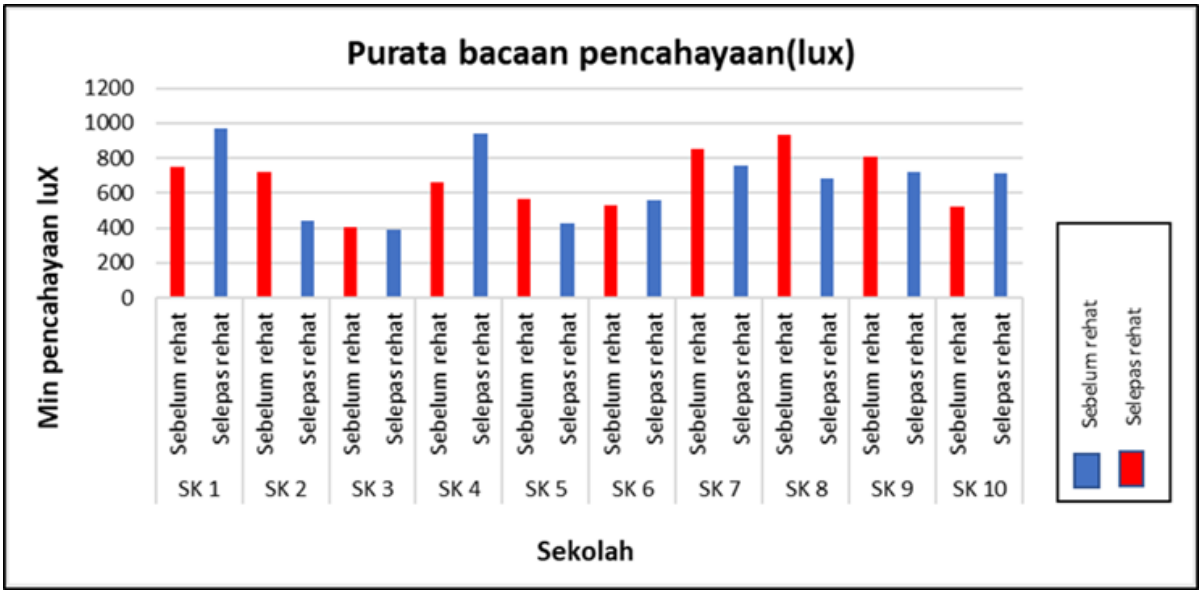


**Figure 2: Average Lighting Levels by Classroom Type for Schools in the Manjung District**

### 7.2.2 Measuring the psychosocial aspect (Conflict) influencing learning outcomes in the classroom

The linear regression analysis revealed that the variable "Conflict" has an unstandardized coefficient (B) of -0.451, with a standard error of 0.108. This unstandardized coefficient indicates that for each one-unit increase in the level of dispute, there is an expected decrease of 0.451 units in learning outcomes, provided that all other variables in the model are held constant. The negative sign of the coefficient suggests an inverse relationship between the level of dispute and learning outcomes; as Conflict increase, learning outcomes are likely to decrease.

The statistical significance of this relationship is further confirmed by the t-value of -4.192 and a very low significance level (Sig.) of .000. The t-value measures the ratio of the unstandardized coefficient to its standard error and provides insight into the strength of the effect. A t-value of -4.192 indicates that the effect of Conflict on learning outcomes is statistically significant, as it far exceeds the common threshold of .05 for significance. The p-value of .000 (which is less than .05) reinforces the conclusion that the observed relationship is highly significant and not due to random chance.

In addition to the unstandardized coefficient, the standardized coefficient (Beta) for "Conflict" is -0.346. This standardized coefficient provides a measure of the strength and direction of the relationship between the dispute variable and learning outcomes, adjusted for the scale of the variables. A Beta value of -0.346 indicates a moderate to strong negative relationship, meaning that Conflict are a significant factor contributing to reduced academic performance. The negative Beta value supports the finding that increased Conflict, whether they involve conflicts or incompatibilities between students or between students and teachers, are significantly associated with poorer learning outcomes.

In summary, the analysis underscores that Conflict within the educational environment are detrimental to students' learning outcomes. The statistically significant negative coefficients highlight the importance of managing and minimizing Conflict to improve academic performance and create a more conducive learning environment.

**Table 2: Multiple Regression Analysis "Coefficients"**

| Model | Unstandaedized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std Error | | | |
| (Constant) | -5.782 | .624 | | -9.269 | .00 |
| Conflict | -.451 | .108 | -.346 | -4.192 | .00 |
| *Dependent Variable: Hasil Pembelajaran* | | | | | |

### 7.3 The relationship between psychosocial aspects (conflict) and learning outcomes with physical environmental factors as mediators

The mediator analysis provided valuable insights into how conflict (the independent variable) affects learning outcomes (the dependent variable) through the intermediary role of physical environmental factors. The model used for this analysis demonstrated a high R-squared value of 0.9346, indicating that a substantial portion of the variance in physical environmental factors can be explained by the level of conflict. Specifically, the coefficient of 1.5254 for the effect of conflict on physical environmental factors, with a p-value less than 0.0001, signifies that an increase in conflict leads to a significant rise in physical environmental factors. This suggests that conflict influences classroom conditions in a way that may affect student learning.

The analysis of the mediating effect revealed that the indirect impact of conflict on learning outcomes through physical environmental factors was significant. With an effect size of 1.6397 and a Bootstrapped Standard Error (BootSE) of 0.2873, the confidence interval for this effect (ranging from 1.1175 to 2.2511) did not include zero, confirming that physical factors play a crucial and positive mediating role. This indicates that while conflict directly impacts learning outcomes negatively, the effect is mediated through changes in the physical environment of the classroom.

Moreover, the direct effect of conflict on learning outcomes was found to be significantly negative, with an effect size of -0.9414. This result implies that for each unit increase in conflict, learning outcomes decrease by nearly 0.9414 units, emphasizing the detrimental impact of conflict on student performance. The small standard error of 0.2557 enhances the reliability of this estimate, and the p-value of 0.0003, which is substantially below the 0.05 significance threshold, underscores the robustness of the finding.

These results underline the importance of addressing both psychosocial and physical aspects within educational settings. The significant negative direct effect of conflict on learning outcomes highlights the need for interventions that manage and reduce conflict in classrooms. Simultaneously, the significant mediating role of physical environmental factors suggests that improving classroom conditions—such as lighting, temperature, and noise levels—could mitigate the negative effects of conflict and enhance overall learning outcomes. Therefore, educators and policymakers should consider comprehensive strategies that address both psychosocial dynamics and physical environment factors to foster an optimal learning environment and improve student performance.

**Table 3 : Effects of Psychosocial Aspects (Conflict) and Learning Outcomes with Physical Factors as a Mediator**

```
Run MATRIX procedure:
***************** PROCESS Procedure for SPSS Version 4.2 *****************

        Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
  Documentation available in Hayes (2022). www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
   Y  : HASIL PEMBELAJARAN
   X  : PERSELISISHAN
   M  : FAKTOR FIZIKAL

Responden
Size:  242
**************************************************************************
OUTCOME VARIABLE:
 FZZ1

Model Summary
      R     R-sq      MSE        F       df1       df2         p
   .9668    .9346    .0069 3430.5579    1.0000  240.0000    .0000

Model
         coeff       se         t         p      LLCI      ULCI
constant -1.3287    .0931  -14.2689    .0000   -1.5121   -1.1453
IVV2      1.3525    .0231   58.5710    .0000    1.3070    1.3980

Standardized coefficients
        coeff
IVV2     .9668

************** DIRECT, INDIRECT EFFECTS OF X ON Y **************
Total effect of X on Y
   Effect       se        t        p      LLCI      ULCI      c_cs
   .6983     .0710   9.8343    .0000    .5584    .8382    .5359

Direct effect of X on Y
   Effect       se        t        p      LLCI      ULCI      c'_cs
   -.9414    .2557  -3.6811    .0003   -1.4452   -.4376    -.7225

Indirect effect(s) of X on Y:
      Effect    BootSE  BootLLCI  BootULCI
FZZ1  1.6397    .2873    1.1175    2.2511

Completely standardized indirect effect(s) of X on Y:
      Effect    BootSE  BootLLCI  BootULCI
FZZ1  1.2584    .1907    .8970    1.6338
```

## 8. Discussion

Expanding on the relationship between classroom environmental factors and learning outcomes, it is evident that a well-designed physical environment is crucial for fostering an optimal learning experience. Lighting, in particular, plays a vital role in student comfort and productivity. Research has shown that inadequate lighting can lead to eye strain, fatigue, and reduced concentration, negatively impacting academic performance (Miller & O'Connor, 2024). Factors such as the size and placement of windows, as well as the presence of obstructions like neighboring buildings, significantly influence the amount of natural light that reaches the classroom. For example, classrooms positioned away from natural light sources may experience insufficient lighting levels, which can contribute to discomfort and hinder students' ability to focus (Degro, 2007; Farzam, 2011).

Furthermore, the study's findings on the impact of conflict on learning outcomes underscore the importance of addressing psychosocial factors in educational settings. Conflicts, whether interpersonal or related to tasks, can create a hostile environment that disrupts students' ability to concentrate and engage effectively in their learning activities. The negative effects of conflict are compounded by physical environmental factors, such as inadequate lighting or uncomfortable temperatures, which can exacerbate stress and reduce overall learning efficiency (Barrett et al., 2023; Harris & Burnett, 2024). The mediation analysis indicates that physical factors significantly influence the relationship between conflict and learning outcomes, emphasizing the need for a holistic approach to improving both the physical and psychosocial aspects of the classroom.

Integrating these findings, it is crucial for educational stakeholders to recognize the interconnectedness of physical and psychosocial factors in shaping students' academic success. Effective classroom management should not only address physical environmental conditions, such as lighting and temperature, but also implement strategies for conflict resolution and promote a positive classroom climate. This comprehensive approach can enhance student comfort, reduce stress, and improve learning outcomes, ultimately leading to a more supportive and effective educational environment.

In summary, the interplay between physical environmental factors and psychosocial aspects like conflict highlights the need for targeted interventions to optimize both elements. By addressing these factors, educators and policymakers can better support students' academic performance and well-being, paving the way for more successful and fulfilling learning experiences.

**Recommendations**

This study offers a novel contribution to Malaysian literature by being the first to extensively explore how physical classroom environment factors mediate the relationship between psychosocial aspects and learning outcomes in Malaysia. Utilizing an exploratory sequential mixed-methods design, the research provides a detailed examination of how elements such as lighting, temperature, and noise interact with psychosocial factors to influence students' learning experiences. This approach adds significant value to existing Malaysian literature by delivering empirical data that can inform educational policy and teaching practices.

The findings reveal that while physical factors like lighting and temperature can impact student comfort and focus, they are not the primary determinants of excellent learning outcomes. Students in Malaysia can achieve strong academic results even in less-than-ideal physical conditions, challenging the belief that perfect physical environments are necessary for effective learning.

Moreover, the study emphasizes the critical role of psychosocial aspects—such as interpersonal relationships, social support, and a positive classroom climate—in fostering a conducive learning environment. It suggests that a holistic approach, which integrates both physical and psychosocial factors, is crucial for optimizing learning outcomes. Psychosocial elements significantly influence students' motivation, engagement, and overall academic performance, underscoring their importance in shaping effective learning experiences.

## 9. Conclusion

In conclusion, this study provides a comprehensive analysis of how physical and psychosocial factors within the classroom environment impact students' learning outcomes. While physical aspects such as lighting, temperature, and noise are important, they are not the sole determinants of academic success. The study highlights that psychosocial factor, including the quality of interpersonal relationships, social support, and overall student satisfaction, play a more critical role in fostering effective learning.

The research further reveals those conflicts, often perceived negatively, can have a constructive impact when managed properly, potentially leading to deeper discussions and enhanced critical thinking. These finding challenges traditional views and underscores the importance of a balanced approach in education.

Overall, the study emphasizes the need for educational practices and policies to address both physical and psychosocial elements to optimize learning environments. By integrating these insights, educators and policymakers can create more supportive and effective classroom settings that enhance student well-being and academic performance. This holistic approach is essential for advancing educational quality and achieving the best outcomes for students.

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