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The Influence of Physical Working Environment on Employee Performance at TVET Institution

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ABSTRACT

The purpose of this study was to ascertain how physical aspects of the workplace, such as indoor temperature, lighting and noise levels, affect employee performance in TVET institutions. Organisational effectiveness is influenced by employee performance, and organisations suffer when employees underperform. A Likert-scale questionnaire was administered to 217 participants in this correlational study. Regression, correlation, reliability and descriptive analyses were used to analyse the data using SPSS Version 26. The findings showed a strong positive correlation between employee performance and physical aspects of the workplace, highlighting the importance of proper lighting, ideal indoor temperature and lower noise levels to increase productivity. These results highlight the need for TVET institutions to prioritise environmental quality to optimise employee productivity and organisational effectiveness.

Keywords: *Physical working environment, employee's performance, level of lighting, level of noise, indoor temperature.*

1.0 INTRODUCTION

In addition to strengthening policy guidance and the regulatory framework for an educational system that can meet a country's needs and aspirations, Malaysia is taking steps to improve its governance and program implementation for economic transformation and sustainable development. As a result, TVET educators must be well-prepared to meet the challenges of globalisation. In order to support its mission, programs,

and services, the institution constructs and maintains physical facilities that are easily accessible, secure, and of sufficient quantity and quality to guarantee healthy learning and working environments. This is consistent with its mission, fundamental principles, and traits. A well-designed ergonomic workstation is essential to lowering stress and increasing productivity because Industry 4.0 technologies and the evolution of the business landscape have increased stress among Malaysians (Makhbul et al., 2022). Workplace layout and design have a big impact on wellbeing and productivity (Jameel et al., 2021). The lighting, temperature, and noise levels in an office setting all have a significant impact on how employees work on a daily basis (Kingsley, 2012). Employee performance and job satisfaction can be impacted by background noise in both positive and negative ways (Sultan et al., 2021; Sarode & Shirsath, 2014). Similar to how indoor temperature affects productivity, high temperatures can cause discomfort and health problems (Sarode & Shirsath, 2014; Andrew et al., 2022). According to Sarode and Shirsath (2014), non-ergonomic furniture raises the risk of workplace injuries, and inadequate lighting causes eye strain. Employee performance is negatively impacted by poorly designed workstations and inappropriate office furniture because of discomfort and health problems (Chandrasekhar, 2011; Awan & Tahir, 2015). The physical environment, workload, leadership, organisational culture, and other elements all work together to shape the workplace and affect performance (Jameel et al., 2021). Sick Building Syndrome (SBS), which has a detrimental impact on worker performance and health, can be caused by problems with indoor environment quality (IEQ), such as poor lighting, excessive noise, and insufficient temperature control (Sulaiman, 2013; Samudro et al., 2022). The TVET institution seeks to support its mission by offering a favourable learning and working environment that reflects the country's educational aspirations (Abdul Rahim et al., 2022).

Employee behaviour and performance are negatively impacted by unfavourable physical working conditions, which raise absenteeism and lower work quality (Hamidi et al., 2020). Health problems like Sick Building Syndrome, carpal tunnel syndrome, back pain, and vision problems can result from subpar conditions (Mendelson et al., 2000; Quibble, 2001). For workers to concentrate and be productive, a comfortable workplace is crucial. According to a study on Malaysian IPTAs, teaching and learning activities are impacted by the moderate IEQ levels and the fact that many institutions do not meet requirements for temperature, lighting, and noise comfort (Sulaiman, 2013). In Malaysia, musculoskeletal disorders (MSDs) are prevalent, affecting a sizable portion of office workers (Choong, 2021). These disorders are a result of poor ergonomics, especially from repetitive motions and bad posture (Marras et al., 2009). Eye strain and decreased productivity can result from inadequate lighting in offices (Jameel et al., 2021). Ergonomic office furniture is necessary to prevent accidents and boost motivation because the use of noisy equipment in TVET institutions exposes workers to noise-induced hearing loss (Sehgal, 2012; Sultan et al., 2021).

Furthermore, the TVET institution's observation revealed that the majority of the furniture for the trainer's office would be placed in a workshop or laboratory, making it unsuitable. The justification is that the trainer can easily oversee or manage the workshops and labs in the absence of lectures and exercises. TVET is regarded as a "game changer" since it assists the Malaysian government in addressing the pressing problem of a shortage of skilled labour, according to Abdul Rahim et al. (2022). TVET graduates are anticipated to become skilled workers in a variety of industrial sectors. The TVET training environment is built to mimic actual workplace conditions in order to guarantee that these graduates have the skills required for future employers.

Odehalshawabkeh and Alsawalhah (2019) assert that since organisational success depends on employee performance, it is an essential prerequisite in today's workplace. Today's businesses look for productive employees as a vital resource to gain a competitive edge in the marketplace. The workplace is a place where employees perform their duties, which may have a positive or negative impact on their ability to achieve the intended results. While a negative work environment will negatively impact job continuity, a positive work environment will have a significant impact on job stability. Heizer. et al. (2023) pointed out that workers' performance, safety, and general quality of work life are all impacted by their workplace. The study's goal is to investigate how employees' performance at TVET institutions is impacted by the physical workplace. Organisations will benefit from the findings by improving the physical workplace and

increasing worker productivity in the TVET Institution. The study aims to investigate the relationship between the physical working environment and employee performance. Previous studies have predominantly focused on office settings (Makhbul et al., 2022; Jameel et al., 2021), but there is a notable scarcity of research addressing educational institutions specifically. Past research has explored general aspects of working environments rather than focusing on the physical aspects (Chandrasekhar, 2011; Andrew et al., 2022). This highlights the need for more targeted studies within educational settings to understand how physical working environments impact performance. Thus, the study aims to investigate the relationship of the physical working environment towards employees' performance at TVET Institution in Mukah. The results to be obtained will be useful in assisting the organizations to improve the physical working environment and enhance their employees' performance.

2.0 LITERATURE REVIEW

2.1 TVET INSTITUTIONS

The skills and attitudes required for success in the workplace are imparted through TVET. Malaysia has embraced TVET reforms in order to capitalise on its advantages. TVET aims to build professional identities and vocational skills that are in line with industry demands. A student's future is affected by a high-quality TVET education in several ways, including social, economic, cultural, technological, and ecological. It aims to improve the vocational skills needed by society and the workforce, emphasising impact rather than output (Minghat et al., 2021). TVET includes technological education as well as practical skills for a range of social and economic occupations. It upholds values that guarantee successful professional performance and personal development.

2.2 EMPLOYEE PERFORMANCE

According to Lemma et al. (2022), which is determined by task completion in comparison to predetermined standards is essential for organisational success. Employee performance is greatly impacted by elements in the physical environment, such as indoor climate (Rorong, 2016). Ergonomics, including cosy furniture, is essential for improving wellbeing and productivity. Refer to Mbazor (2021), the office environment affects job attitudes, job satisfaction, and productivity, but it's unclear how exactly this affects university employees.

2.3 PHYSICAL WORKING ENVIRONMENT

The phrase "working environment" describes all of the surroundings in which employees perform their duties. Workplace temperature, equipment, computers, work processes, and procedures are examples of physical components. The work environment is also greatly influenced by the building's structure (Ndubuisi et al., 2022). Employees' performance and general well-being are influenced by their physical workplace. The physical work environment is shaped by a number of important factors, including layout, comfort, ventilation, heating or temperature control, artificial and natural lighting, furniture, and fixtures. Employee performance and well-being are impacted by the physical work environment, including temperature, equipment, and layout (Ndubuisi et al., 2022). A well-designed workspace improves productivity and interpersonal connections (Nzewi et al., 2018). It is essential to comprehend how behaviour and performance are influenced by the workplace (Chandrasekar, 2011). Good workplaces inspire workers to achieve, which has a direct impact on the efficacy of the company (Hamidi et al., 2020). A positive physical work environment significantly boosts employee motivation, well-being, and productivity. Positive aspects like adequate lighting, air quality, temperature, ergonomic and comfortable furniture, and a well-thought-out workplace layout create a calmer and focused atmosphere, while negative aspects may lead to decreased motivation and performance.

2.3.1 Level of Lighting

The performance of employees is greatly impacted by lighting conditions. According to Sarode and Shirsath (2014), poor lighting can lead to headaches, eyestrain, and decreased productivity. Artificial and

natural lighting are both essential; poor lighting, such as excessive glare or dimness, impairs performance (Hamidi et al., 2020). While inadequate lighting can cause discomfort and a decline in job performance, adequate lighting preserves productivity and eye health (Jensen, 2015). Natural daylight, fluorescent, incandescent, and high-intensity discharge lamps are examples of effective office lighting (Hamidi et al., 2020). The studies mentioned above allow for the formulation of the following hypotheses:
H1: The level of lighting will have a positive and significant effect on employee performance

2.3.2 Level of Noise

In an office setting, noise levels are very important. Excessive noise can be detrimental to one's health and productivity, leading to stress and low motivation (Pindek et al., 2019). Employee coping mechanisms for noise vary (Appel-Meulenbroek et al., 2021). All office spaces are affected by noise in terms of comfort and productivity (Rasheed et al., 2020). Reduced focus, health problems, and emotional strain can result from excessive noise (Makhbul, 2023). A productive workplace requires effective noise control (Herdianzah et al., 2023). The explanation provided above allows for the formulation of the following hypothesis:
H2: The level of noise has a positive and significant effect on employee performance

2.3.3 Indoor Temperature

Controlling the temperature indoors is essential for worker comfort and output. HVAC systems with poor design can be uncomfortable and lower productivity (Ali et al., 2019). The ideal temperature improves performance and well-being. While moderate temperatures promote a productive environment, extreme temperatures can lead to weariness, stress, and health problems (Makhbul et al., 2023). A healthy workplace requires adequate temperature control and ventilation (Seppanen et al., 2006). The explanation provided above allows for the formulation of the following hypothesis:
H3: The indoor Temperature has a positive and significant effect on employee performance

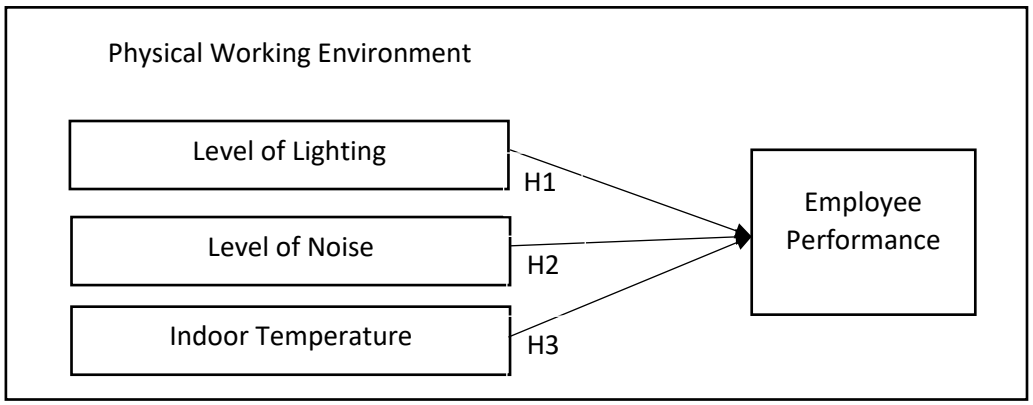

Figure 1: Proposed Conceptual Framework on The Relationship between Physical Office Environment and Employees Performance at TVET Institution

3.0 METHODOLOGY

The population refers to the group of potential participants to whom the study results apply (Salkind, 2017). For this study, the population includes 506 employees from three TVET institutions in Mukah: Politeknik Mukah, Giat MARA Mukah, and CENTEXS Mukah Branch. For this study, the sample size includes employees from TVET institutions in Mukah. A total of 217 employees were randomly selected from the institutions. The respondents of the research study were the employees of the TVET Institution. The data needed for this study were obtained from the Administration Department of the institution. Phone calls and visits to the organisation were made in order to gather the data needed. Data were gathered using questionnaires distributed to employees at TVET institutions in Mukah. After completing all 30 items from six different sections, the data were processed using IBM Statistical Package for the Social Sciences (SPSS) Version 26 software. The questionnaires were divided into six sections as follows. The questionnaires

utilised a Likert scale with five options for responses. The survey achieved a 100% response rate, with all 217 distributed questionnaires returned and usable, underscoring the study's robustness and reliability.

Table 1: The total number of employees selected from every TVET Institution in Mukah

TVET Institutions	Total Population	No. of Respondents
Politeknik Mukah Sarawak	306	131
University Teknologi MARA Campus Mukah, Sarawak Branch	125	54
Giat MARA Mukah Branch	32	14
Centre of Excellent Sarawak (CENTEXS) Mukah Branch	43	18
Total	506	217

4.0 RESULTS

The study carried out at the TVET Institution in Mukah is thoroughly analysed in this study. It includes the survey return rate, a thorough analysis of the survey questions, and data analysis with IBM SPSS Version 26. The survey response rate, respondent demographics, and an examination of the physical office environment elements affecting worker performance are the first steps in the methodical presentation of the findings

Table 2: Cronbach's Alpha Values of Reliability Test

Variable	No of Items	Cronbach's Alpha	Internal Consistency
Employee performance	5	.776	Acceptable
Level of Lighting	5	.795	Acceptable
Level of Noise	5	.877	Good
Indoor Temperature	5	.810	Good

The Cronbach's Alpha values indicate that the measurement tools used in this study are generally reliable, with some variables demonstrating stronger internal consistency than others. The reliability of these tools supports the validity of the study's measurements, allowing for confident interpretation of the data regarding the impact of environmental factors such as lighting, noise, and indoor temperature on employee performance. This reliability ensures that the findings of the study are based on consistent and dependable measurements, contributing valuable insights into the factors influencing workplace performance.

Table 3: Profile of Respondents

Variables		Frequencies	Percentage
Gender			
	Male	95	43.8
	Female	122	56.2
Age	18 - 30	104	47.9
	31 – 40	43	19.8
	41 – 50	50	23.0
	51 - 60	20	9.2
Education Level	Skill Certificate	30	13.8
	Diploma	87	40.1
	Degree	121	69.1
	Master	38	17.5
	PhD	8	3.7
Working Experience	1 – 10 years	138	63.6
	11 -20 years	42	19.4

21 -30 year	36	16.6
31 years above	1	0.5

The study revealed that 43.8% of respondents were male (95 individuals) and 56.2% were female (122 individuals), suggesting higher participation from female employees. Most respondents (47.9%) were aged 18-30 years, followed by 23.0% aged 41-50 years, 19.8% aged 31-40 years, and 9.2% aged 51-60 years. The majority of respondents held bachelor's degrees (69.1%), followed by diploma holders (40.1%), and those with master's degrees (17.5%). Furthermore, 63.6% of respondents had over six years of service, indicating a senior employee profile.

Correlation Analysis

Table 4: The Pearson Correlation

	employee performance	Level of lighting	Level of Noise	Indoor Temperature
Pearson Correlation	1	0.672**	0.682**	0.652**
Sig (2 tail)	.000	.000	.000	.000

**Correlation is significant at the 0.01 level (2 tailed)

The data show the following significant positive relationships with employee performance ($p < 0.01$):
- Level of Lighting ($r = 0.672$): Suggests improved lighting enhances employee performance.
- Level of Noise ($r = 0.685$): Optimal noise levels might stimulate better performance.
- Indoor Temperature ($r = 0.652$): Highlights the importance of maintaining a comfortable workplace temperature, crucial for high productivity. Creating conducive work environments fosters employee well-being and organizational These findings underline the significance of a well-designed work environment on employee performance, advocating for improvements in lighting, noise management, and temperature control to boost productivity and job satisfaction.

Table 5: The Regression Analysis

Variable	Unstandardized Coefficients (β)	Standard Error (SE)	Unstandardized Coefficients (beta)	t Value	p-Value
Constant	.728	.178		4.086	0.000
Level of Lighting	.258	.072	.268	3.593	0.000
Indoor Temperature	.221	.073	.251	3.018	0.003
Level of Noise	.284	.066	.281	4.303	0.000

The regression analysis reveals how lighting, furniture ergonomics, indoor temperature, and noise levels impact employee performance. The intercept of 0.728 represents baseline performance in the absence of these factors. The unstandardized coefficients show that a one-unit increase in lighting quality, indoor temperature, and noise levels is associated with increases in performance by 0.258, 0.221, and 0.284 units, respectively, while furniture ergonomics has a minimal impact with a coefficient of 0.058. Standard errors indicate the precision of these estimates, with noise (0.066), lighting (0.072), and indoor temperature (0.073) showing reasonable precision. The standardised coefficients highlight noise (0.281) as having the strongest impact on performance, followed by lighting (0.268) and indoor temperature (0.251). Significant t-values and p-values further confirm these relationships: noise ($t = 4.303$, $p = 0.000$), lighting ($t = 3.593$, $p < 0.005$), and indoor temperature ($t = 3.018$, $p < 0.005$) are significant. Thus, improvements in noise management, lighting, and temperature control are associated with better employee performance.

5.0 DISCUSSION

The hypothesis test results provide crucial insights into the relationships between environmental factors and employee performance. Some hypotheses are supported by the data, indicating significant associations between specific variables and employee productivity, while others are not supported, suggesting less conclusive relationships. These findings lay the groundwork for further exploration and discussion in the study. The hypothesis testing results indicate that all the hypotheses are supported. The level of lighting shows a significant positive relationship with employee performance in TVET institutions ($p = 0.000$, $\beta = .268$). Indoor temperature significantly influences employee performance ($p = 0.003$, $\beta = 0.251$), and the level of noise has a strong positive impact on employee performance ($p = 0.000$, $\beta = 4.303$). These results highlight the significance of indoor temperature, lighting, and noise levels in improving worker performance. According to the analysis, environmental elements like lighting, indoor temperature, and noise levels have a big influence on how well employees perform in TVET institutions. Mbazor et al. (2021) found that adequate lighting improves mood, alertness, and task performance. Comfortable indoor temperatures are crucial for cognitive function and work performance (Nzewi et al., 2018) and minimising noise levels reduces distractions and enhances job satisfaction (Tabassum, 2021). These results highlight the significance of optimising.

6.0 CONCLUSION

The study revealed that participants' responses were influenced by the organisation's workplace culture. According to the study, the organisation must improve the physical workspace in order to encourage employees to stay there, work comfortably, and complete their tasks. The study also revealed that employees are sometimes disregarded as distinct individuals, which implies that there is no bond between them and the organisation. This can sometimes demoralise them because they are unable to voice their opinions. This study showed that the availability of job support within the organisation had a significant impact on employees' performance. This suggests that having a job aid will help employees execute and plan for growth so that it can be used to get the best performance utilisation. It was found that the organisation, to some extent, provides fair compensation to employees who perform well. decent. The study also demonstrated that workers will improve their performance if management resolves the problems found during the investigation. The workplace's adaptability, noise distractions, the manager's relationship with staff, the availability of support resources, the execution of performance reviews, and the improvement of work incentives within the organisation to motivate employees to complete their tasks are the problems. This study finds important connections between employee performance in Mukah's TVET institutions and environmental factors. Success depends on important elements like controlled noise levels, comfortable temperatures, and ideal lighting. To guarantee employee motivation and performance, these variables must be thoroughly managed.

Declaration of Generative AI and AI-assisted technologies

This work was developed using Quillbot and ChatGPT, which assisted the authors in reviewing and refining the content. Specifically, Quillbot was used to paraphrase sentences, while ChatGPT contributed to generating ideas for the study. The authors take full responsibility for the final publication.

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