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The Influence Of Ambient Environment On Coworking Space User Productivity At Alara Coffee And Space, Batam City

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Abstract

The shift toward flexible work patterns has increased the demand for coworking spaces that are comfortable and conducive to user productivity. One factor believed to influence productivity is the ambient environment, which encompasses lighting, room temperature, scent, and noise levels. This study aims to analyze the impact of the ambient environment on user productivity at Alara Coffee and Space in Batam City. A quantitative approach with a causal-associative design was employed. The study population consisted of 2,261 visitors between March and May 2026, from which 96 respondents were selected using purposive sampling. Data were collected via a questionnaire using a five-point Likert scale and analyzed through simple linear regression using SPSS software (version 32). The results indicate that the ambient environment has a positive and significant effect on productivity (t = 16.938; Sig. < 0.001), with the regression equation Y = 6.874 + 0.620X. A coefficient of determination of 0.753 suggests that the ambient environment accounts for 75.3% of the variation in productivity, while the remaining 24.7% is influenced by other factors. These findings suggest that management should maintain the quality of lighting, temperature, scent, and noise levels to support user productivity.

Keywords:Alara Coffee and Space; ambient environment; productivity; coworking spaces; coworking space users.

INTRODUCTION

The growth of information and communication technology has driven changes in people's work patterns toward more flexible systems, such as remote working, hybrid working, and working from anywhere. This shift aligns with the report "Working from Home: From Invisibility to Decent Work" published by the International Labour Organization (2021), which discusses the development of work-from-home practices

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and their implications for working conditions. This flexibility allows individuals to carry out work activities without being in a conventional office environment. This situation also opens up opportunities for the development of alternative workspaces, such as coworking spaces, which can be utilized by remote workers, students, entrepreneurs, and creative workers. As the need for flexible workspaces increases, the coworking space concept is also starting to be integrated into various types of businesses, including cafes that provide supporting facilities for work and study activities.

Development*coworking space*The development of cafe-based coworking spaces demonstrates the expansion of the cafe's function, no longer limited to providing food and beverages, but also as a place to work, study, and discuss. This change in function makes the quality of the physical environment a crucial aspect in creating comfort and supporting user activities. In the hospitality industry, the role of the physical environment can be explained through the servicescape theory proposed by Bitner (1992), which explains that the physical environment where services take place can influence user perceptions, emotions, and behavior. The relevance of this theory is reinforced by Espitia et al. (2025), who, through a systematic review of 261 articles published between 1992 and 2024, traced the development of the servicescape concept over three decades. The study also showed that ambient conditions have a greater influence on user satisfaction than design and layout aspects (Espitia et al., 2025). This finding emphasizes the importance of considering the physical environment in managing cafe-based coworking spaces, particularly the ambient conditions aspect, which is directly related to user experience and comfort during activities.

One of the main dimensions in the framework*servicescape*Ambient conditions are the characteristics of the physical environment that can influence user perception and response, including temperature, lighting, noise, music, and aroma (Bitner, 1992). In the context of cafes that function as workspaces, thermal comfort, lighting, and acoustic conditions are relevant aspects in shaping the comfort of coworking space users (Ardiansyah et al., 2025). Pan et al. (2024) also revealed that lighting, ventilation, and noise are related to user preferences in determining seating in coworking spaces. Furthermore, Zhang et al. (2023), through a systematic review of 55 office studies, showed that indoor climate conditions are related to mental well-being, productivity, and user satisfaction. In line with this, Tranggono et al. (2025) explained that thermal comfort, lighting quality, and acoustic quality have different levels of importance to work performance in assessing indoor environmental quality. Meanwhile, from the olfactory aspect, Cai et al. (2024) found that environmental aroma conditions can influence cognitive efficiency, both directly and through emotional responses. Based on the theoretical foundation and empirical findings, the ambient environment variable

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in this study refers to the ambient conditions dimension within the servicescape framework (Bitner, 1992), operationalized through four main indicators: lighting, room temperature, aroma, and noise level. These four indicators were chosen because they are relevant to the characteristics of cafe-based coworking space users who require a conducive environment to support concentration and work productivity.

In this study, individual work productivity is understood as a person's ability to complete work by considering the quantity of output, quality of work, and timeliness of completion (Simamora, 2004). This concept is supported by research by Rahim et al. (2023) and research on the work productivity of village government employees published in 2024, which used indicators of work quantity, work quality, and timeliness to assess work productivity. In the classical sense, productivity is defined as the ratio of output to input. However, this study does not measure this ratio directly. The term productivity here is used to refer to individual work performance as assessed by respondents themselves (*self-report*This approach relates to the concept of individual performance, which is multidimensional and encompasses task performance, including aspects of work quantity and quality (Koopmans et al., 2011). Quality, quantity, and timeliness are also included in employee performance assessment criteria (Bernardin & Russell, 2013). Based on this foundation, productivity in this study is operationalized as user perceptions of the ability to complete work while using a coworking space. Productivity is measured using three indicators: work quantity, work quality, and timeliness.(Simamora, 2004).

On*coworking space*Productivity is evident in a user's ability to complete tasks while working in the space. Productive users are able to complete a number of tasks according to their self-set targets. The results of this work must also meet good quality standards to be accountable. Furthermore, completing tasks within the planned timeframe indicates effective time utilization. Because users work independently without organizational targets, productivity is measured through user assessment of their own work, as in self-report-based individual performance instruments.(Koopmans et al., 2011)Therefore, work quantity, work quality, and punctuality are used as indicators of coworking space user productivity.(Simamora, 2004).

Several previous studies have shown that the quality of the physical environment is related to user productivity. Mittal and Rani (2022) found a positive and significant relationship between the physical environment and user productivity.*coworking space*and work productivity, and this relationship is strengthened by social interaction. Similar findings were reported by Bueno et al. (2018), who showed that the coworking space environment positively influences productivity. Coworking spaces also have the potential to provide benefits to workers, including increased productivity, but attention to the physical design of the space

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remains crucial to optimize the user experience (Kinsman et al., 2024). From a service perspective, ambience is also a factor studied in coworking space customer satisfaction (Tjahjawati et al., 2024).

However, most research still focuses on*coworking space*related to user productivity or customer experience (Ardiansyah et al., 2025). Therefore, research on cafe-based coworking spaces, focusing on thermal comfort, lighting, and acoustics, can provide a new and more developed research base, similar to previous research on the ambient environment in coworking spaces (Budiyanto et al., 2025; Ngurah & Satya, nd).

In line with the above explanation, this research will discuss*coworking space*However, they have different research locations. The coworking space used for the research is Alara Coffee and Space in Batam City. Alara Coffee and Space is one of the coffee shops that provides coworking space facilities. Based on pre-observation through semi-structured interviews with one of the employees, Alara Coffee and Space is located in the Tanah Mas Complex, Batam City, and has been operating since June 11, 2022 (Figure 1). The coworking space at this cafe is open to all visitors to Alara Coffee and Space, making it suitable for work, study, and other activities. The space has an industrial concept, warm lighting, air-conditioned temperature, a pleasant aroma, and relatively low noise levels due to its separation from public areas (Figure 2). Facilities include Wi-Fi, power outlets, sofas, work desks, and a seating area with a capacity of approximately 25-30 people. Based on visitor transaction data from Alara Coffee and Space from March to May 2026, 2,261 visitors were recorded over 92 days, or an average of approximately 25 visitors per day.

According to employees, the number of visitors increases between 11:00 AM and 3:00 PM on both weekdays and weekends. This is because it is a favorite among visitors during these hours, making it an interesting aspect to observe from the four characteristic elements.*ambient environment*This is also the reason Alara Coffee and Space was chosen as the research object. This study seeks to complement previous research by simultaneously examining these four environmental aspects within a specific research context and location. This allows for the assessment of the ambient environment's influence on the productivity of coworking space users at Alara Coffee and Space in Batam City.

Although the physical environment has been recognized as playing an important role in shaping the comfort and behavior of service users (Bitner, 1992), previous studiesResearch on coworking spaces largely focuses on general user productivity or customer experience (Ardiansyah et al., 2025). Consequently, empirical evidence regarding the simultaneous influence of ambient conditions in cafe-based coworking spaces remains limited. Alara Coffee and Space provides a workspace with

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air-conditioned temperatures, a pleasant aroma, and relatively low noise levels. This cafe recorded 2,261 visitors from March to May 2026, with peak visits between 11:00 and 15:00. However, it is unknown whether these environmental conditions actually affect users' ability to complete work, both in terms of quantity, quality, and timeliness. Based on this, the research problem is formulated as follows: does the ambient environment, including lighting, room temperature, aroma, and noise levels, affect the productivity of coworking space users at Alara Coffee and Space, Batam City?

Therefore, the following hypothesis can be formulated in this study:

1. H_0: ambient environment does not affect user productivity*coworking space*at Alara Coffee and Space, Batam City.
2. H_1: ambient environment influences user productivity*coworking space*at Alara Coffee and Space, Batam City.

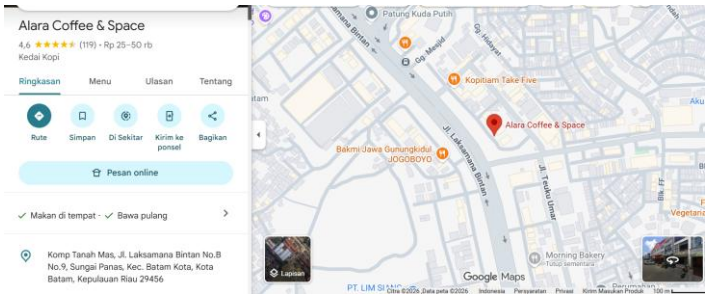


Figure 1. Location of Alara Coffee and Space, Batam City
Source: Google Maps (2026)



Figure 2. Interior of the coworking space at AlaraCoffice andSpace

Thus, this study aims to analyze the influence of the ambient environment on the productivity of coworking space users at Alara Coffee and Space in Batam City. The results are expected to contribute to the development of hospitality studies, particularly regarding the management of cafe-based coworking spaces, and provide

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input for managers in improving the quality of the physical environment to support user productivity.

RESEARCH METHODS

This study uses quantitative methods to obtain objectively measurable data. The research design or approach used is causal associative to analyze the influence of the ambient environment on the productivity of coworking space users. The research object is coworking space users at Alara Coffee and Space, Batam City. The research was conducted at Alara Coffee and Space, Batam City. Data were collected in the period March–May 2026 and processed and analyzed in September 2026. The sampling technique used is purposive sampling to obtain respondents who match the characteristics and objectives of the study.

The population in this study were visitors to Alara Coffee and Space in Batam City during the period March–May 2026. All visitors can use the coworking space because the facility is open to all visitors, so the number of visitors was used as the basis for determining the population. Based on daily transaction data obtained from Alara Coffee and Space, the number of visitors during that period was 2,261 people. This number consisted of 718 visitors in March, 823 visitors in April, and 720 visitors in May. The data on the number of visitors was used as the basis for determining the research population because it came from transaction records during the research period. Furthermore, respondents were selected purposively with the criteria of visitors who use the coworking space area for work, study, or other productive activities.

Table 1. Data on the Number of Visitors to Alara Coffee and Space for the Period March–May 2026

No.	Month	Number of days	Number of visitors/month
1	March 2026	31	718
2	April 2026	30	823
3	May 2026	31	720
Total	March–May 2026	92	2,261

Source: Alara Coffee and Space daily transaction notes March - May (2026)

Based on Table 1, the number of visitors to Alara Coffee and Space during the period March-May 2026 was 2,261 visitors. This data was obtained from a recapitulation of daily transactions for 92 days during the study period. Although the sample size was determined based on overall visitor data, respondent selection was carried out purposively to ensure that participating respondents were visitors who used

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the coworking space for work, study, or other productive activities. Thus, the selected respondents could provide information regarding perceptions of the ambient environment and productivity while using the coworking space. This number was used as the basis for determining the sample size of the study. The determination of the sample size in this study used the Slovin formula. Based on a population of 2,261 visitors during the period March-May 2026, the calculation of the sample size in the planning stage was carried out as follows: Slovin Formula:

$n = N / (1 + N \times e^2)$
Information:
n = number of samplesN = number of populatione = error rate 10%
Calculation:
$n = 2{,}261 / (1 + 2{,}261 \times 0.10^2)$
$n = 2{,}261 / (1 + 22.61)$
$n = 2{,}261 / 23.61$
$n = 95.76$ (rounded to 96)

A 10% error rate was chosen based on a balance between the need for estimation accuracy and the affordability of data collection, taking into account time, resources, and respondent accessibility. Based on these calculations, a minimum sample size of 96 respondents was obtained.

The research data consists of primary and secondary data. Primary data were obtained by distributing questionnaires to respondents using a five-point Likert scale. The Likert scale was used to measure respondents' level of agreement with each statement related to the research variables. Each statement has five alternative answers with scores ranging from 1 to 5 (Table 2). A higher score indicates a higher level of respondent agreement with the statement.

Table 2. Likert Measurement Scale

Score	Information
1	Strongly Disagree (STS)
2	Disagree (TS)
3	Neutral (N)
4	Agree (S)
5	Strongly Agree (SS)

Source: Processed by researchers (2026)

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Secondary data was obtained from books, scientific journals, and documents relevant to the research. The research instrument was developed based on ambient environment variables, namely lighting, room temperature, aroma, and noise level. Coworking space user productivity was measured based on work quantity, work quality, and punctuality indicators according to Simamora (2004). Developing the instrument based on these indicators aims to ensure that each variable can be measured in accordance with the research objectives.

Data analysis in this study was conducted using IBM SPSS Statistics version 32 with the following stages. First, a validity test was conducted on the ambient environment (X) and productivity (Y) variables to determine whether each item in the questionnaire was able to measure the variables studied. Second, a reliability test was conducted on both variables to determine the consistency of the research instrument. Third, descriptive statistics were used to provide an overview of the research data, including minimum, maximum, average, and standard deviation values.Fourth, hypothesis testing is carried out through simple linear regression analysis.to determine the direction and magnitude of the influence of the ambient environment on the productivity of coworking space users. At this stage, the significance of the variable's influence was tested using a t-test, the feasibility of the regression model was tested using an F-test, and the proportion of productivity variation that can be explained by the ambient environment was measured using the coefficient of determination (R^2). This research model consists of one independent variable, namely the ambient environment (X), and one dependent variable, namely the productivity of coworking space users (Y).

Ambient Environment (X)
1. Lighting
2. Temperature
3. Aroma
4. Noise Level
(Bitner, 1992).
(Rahim et al. (2023))

↓

Productivity (Y)

1. Quantity of Work
2. Quality of work
3. Punctuality

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Simamora (2004)

Source: Processed by researchers (2026)
Figure 3. Thinking Framework

Information:*Ambient environment*(X) is the independent variable in this study, measured through indicators of lighting, room temperature, aroma, and noise level. User productivity (Y) is the dependent variable, measured through indicators of work quantity, work quality, and punctuality.

Table 3. Questionnaire

Variables	Indicator	Sample Questions
Ambient Environment (X)	Lighting (P)	The lighting in the coworking space is bright enough to support my activities.
	Temperature (S)	The room temperature in the coworking space felt comfortable while I was working.
	Aroma (A)	The aroma in the coworking space provides a sense of comfort while I am working.
	Noise Level (TK)	The noise level in the coworking space does not interfere with my activities.
Productivity (Y)	Work Quantity (KK)	I can complete the amount of work or tasks that I have targeted while using the coworking space.
	Quality of work (KL)	I can produce good quality work or assignments while using a coworking space.
	Punctuality (KW)	I can complete work or tasks according to the time I have planned when using a coworking space.

Source: Processed by researchers based on research instruments (2026)

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RESULTS AND DISCUSSION

Results

Based on data collected from 96 respondents using the coworking space at Alara Coffee and Space in Batam City, the majority of respondents were aged 21–25 years (57.3%) and female (52.1%). In terms of occupation, the majority of respondents were students (41.7%), with the most frequent purpose of visit being for work (42.7%). The frequency of visits was dominated by respondents who had visited 2–3 times (36.5%), while the most frequent visit duration was 2–4 hours (40.6%).

Table 4. Respondent Characteristics

Characteristics	Category	Frequency (people)	Percentage
Age	17–20 years	11	11.5%
	21–25 years	55	57.3%
	26–30 years	9	9.4%
	>30 years	21	21.9%
Gender	Woman	50	52.1%
	Man	46	47.9%
Work	Student	40	41.7%
	Employee	39	40.6%
	Businessman	13	13.5%
	Freelancer	4	4.2%
Purpose of Visit	Work	41	42.7%
	Carry out a task	25	26.0%
	Study	16	16.7%
	Meeting	14	14.6%
Frequency of Visits	2–3 times	35	36.5%
	First visit	33	34.4%
	4–5 times	17	17.7%

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Characteristics	Category	Frequency (people)	Percentage
	>5 times	11	11.5%
Duration of Visit	2–4 hours	39	40.6%
	<2 hours	37	38.5%
	4–6 hours	14	14.6%
	>6 hours	6	6.2%

Source: Primary data processed with SPSS (2026)

This study involved 96 user respondents.*coworking space*at Alara Coffee and Space, Batam City, in accordance with the minimum sample size calculated using the Slovin formula at a 10% error rate. All questionnaires were completed completely, allowing 96 data points to be analyzed without missing values. The analysis was conducted using IBM SPSS Statistics version 32, with validity testing, reliability testing, descriptive statistics, classical assumption testing, and hypothesis testing using simple linear regression.

Validity Test

Validity testing was conducted using a Pearson product-moment correlation between the score of each statement item and the total score of the variable. With 96 respondents (degrees of freedom = 94) and a significance level of 5%, the r table value was 0.201. An item is declared valid if the calculated r is greater than the table r and the significance value is less than 0.05.

1. Validity Test of Ambient Environment Variable (X)

Based on Table 5, all 12 items of the ambient environment variable statements have a calculated r between 0.514 and 0.694, all of which are greater than the table r (0.201) with a significance value <0.001. Thus, all items in the Ambient Environment (X) variable are declared valid.

Table 5. Results of Validity Test of Ambient Environment Variable (X), N = 96

Item	r count	r table	Sig.	Information
X1	0.514	0.201	< 0.001	Valid
X2	0.584	0.201	< 0.001	Valid

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X3	0.686	0.201	< 0.001	Valid
X4	0.603	0.201	< 0.001	Valid
X5	0.635	0.201	< 0.001	Valid
X6	0.634	0.201	< 0.001	Valid
X7	0.572	0.201	< 0.001	Valid
X8	0.642	0.201	< 0.001	Valid
X9	0.579	0.201	< 0.001	Valid
X10	0.580	0.201	< 0.001	Valid
X11	0.571	0.201	< 0.001	Valid
X12	0.694	0.201	< 0.001	Valid

Source: Primary data processed with SPSS (2026)

2. Validity Test of Productivity Variable (Y)

Table 6 shows that the nine items in the productivity variable statement have a calculated r between 0.544 and 0.695, greater than the table r (0.201) with a significance value <0.001. Thus, all items in the Productivity variable (Y) are declared valid and suitable for use as research instruments.

Table 6. Results of the Validity Test of the Productivity Variable (Y), N = 96

Item	r count	r table	Sig.	Information
Y1	0.658	0.201	< 0.001	Valid
Y2	0.641	0.201	< 0.001	Valid
Y3	0.695	0.201	< 0.001	Valid
Y4	0.557	0.201	< 0.001	Valid
Y5	0.616	0.201	< 0.001	Valid
Y6	0.610	0.201	< 0.001	Valid
Y7	0.642	0.201	< 0.001	Valid
Y8	0.544	0.201	< 0.001	Valid
Y9	0.616	0.201	< 0.001	Valid

Source: Primary data processed with SPSS (2026)

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Reliability Test

Reliability testing was conducted using the Cronbach's Alpha coefficient. An instrument is considered reliable if the Cronbach's Alpha value is greater than 0.70 (Nunnally & Bernstein, 1994). The test results in Table 7 show that the ambient environment variable obtained a value of 0.843 from 12 items, while the productivity variable obtained a value of 0.798 from 9 items. Both values exceed the 0.70 limit, thus the research instrument is considered reliable or has good internal consistency.

Table 7. Reliability Test Results, N = 96

Variables	Cronbach's Alpha	Number of grains	Information
Ambient Environment(X)	0.843	12	Reliable
Productivity (Y)	0.798	9	Reliable

Source: Primary data processed with SPSS (2026)

Descriptive Statistics

Descriptive statistics were used to describe respondents' perceptions of the research variables. The average score per item was categorized based on a class interval of 0.80 (obtained from (5 − 1) / 5), namely 1.00–1.80 (very low), 1.81–2.60 (low), 2.61–3.40 (moderate), 3.41–4.20 (high), and 4.21–5.00 (very high).

Based on Table 8, the ambient environment variable has a total average score of 48.18 with a standard deviation of 5.51, from a theoretical score range of 12 to 60. When calculated per item, the average score is 4.01, which is included in the high category. This indicates that respondents assess the lighting conditions, room temperature, aroma, and noise levels in the Alara Coffee and Space coworking space as generally good. The productivity variable has a total average score of 36.76 with a standard deviation of 3.94, from a theoretical score range of 9 to 45. The average score per item of 4.08 is also included in the high category, which means that respondents feel able to complete work with good quantity, quality, and timeliness while using the coworking space.

Table 8. Descriptive Statistics Results of Research Variables

Variables	N	Average total score	Standard deviation	Average per grain	Category
Ambient Environment(X)	96	48.18	5.51	4.01	Tall

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Productivity (Y)	96	36.76	3.94	4.08	Tall

Source: Primary data processed with SPSS (2026)

Classical Assumption Test

Before conducting the hypothesis test, the regression model was tested using two classical assumptions: normality and linearity. A summary of the test results is presented in Table 9.

Table 9. Summary of Classical Assumption Test Results

Test	Statistics	Sig.	Criteria	Conclusion
Normality (KS)	Test statistic = 0.081	0.126	> 0.05	Normal
Linearity	F deviation = 1.439	0.127	> 0.05	Linear

Source: Primary data processed with SPSS (2026)

The normality test with One-Sample Kolmogorov-Smirnov on unstandardized residuals produced a test statistic of 0.081 with an asymptotic significance of 0.126 and a Monte Carlo significance of 0.117. Both values are greater than 0.05, so the residuals are normally distributed. The linearity test through the test for linearity showed that the linearity component was significant (F = 316.339; Sig. < 0.001), while the deviation from linearity was not significant (F = 1.439; Sig. = 0.127 > 0.05). Thus, the relationship between the ambient environment and productivity is linear.

Hypothesis Testing (Simple Linear Regression)

The influence of the ambient environment on productivity was tested using simple linear regression. The estimated coefficients are presented in Table 10, while the model summary and feasibility test are presented in Table 11.

Table 10. Results of Simple Linear Regression Analysis (Dependent Variable: Productivity)

Variables	B	Std. Error	Beta	t count	Sig.
(Constant)	6,874	1,776	–	3,871	< 0.001

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Ambient Environment(X)	0.620	0.037	0.868	16,938	< 0.001

Source: Primary data processed with SPSS (2026)

Table 11. Model Summary and F-Test

R	R^2	Adjusted R^2	Std. Error	F count	df	Sig.
0.868	0.753	0.751	1,967	286,889	1; 94	< 0.001

Source: Primary data processed with SPSS (2026)

Based on Table 10, the regression equation obtained is Y = 6.874 + 0.620X. The constant value of 6.874 indicates the baseline productivity score when the ambient environment score is considered zero, while the regression coefficient of 0.620 means that every one unit increase in the ambient environment score is followed by an increase in the productivity score of 0.620 units, assuming other factors remain constant. The coefficient is positive so the direction of the influence is positive.

The t-test results show a calculated t-value of 16.938, greater than the t-table of 1.986 (α = 0.05; df = 94), with a significance value of <0.001 (less than 0.05). Thus, H_0rejected and H_1accepted, which means the ambient environment has a positive and significant effect on the productivity of coworking space users at Alara Coffee and Space, Batam City. The F test in Table 11 supports these results, with the calculated F of 286.889 which is greater than the F table of 3.94 and a significance of <0.001, so the regression model is declared suitable to explain the effect of Ambient Environment (X) on Productivity (Y).

The correlation coefficient (R) of 0.868 indicates a very strong positive relationship (0.80–1.00) between the ambient environment and productivity. The coefficient of determination (R^2) of 0.753 means that the ambient environment explains 75.3% of the variation in user productivity, while the remaining 24.7% is explained by other factors outside the research model. The Adjusted R^2 value of 0.751, which is almost the same as R^2, indicates that the model estimate is stable.

DISCUSSION

The results of a study of 96 coworking space users at Alara Coffee and Space in Batam City showed that the ambient environment had a positive and significant effect on productivity (t = 16.938; Sig. < 0.001). This result indicates that the better users' assessment of the physical environment, the higher their perceived productivity. This finding aligns with Bitner's (1992) servicescape theory, which explains that the physical environment where services take place can influence user responses and behavior. In

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this study, the physical environment referred to includes lighting, room temperature, aroma, and noise levels.

The average ambient environment score of 4.01 and productivity score of 4.08 indicate that both variables are in the high category. These results align with pre-observations at Alara Coffee and Space, which indicated warm lighting, air conditioning, a pleasant aroma, and the separation of the workspace from public areas. These conditions provide a snapshot of the environment visitors use for work and study. Positive assessments of the environment also go hand in hand with high productivity ratings, including work quality, quantity, and punctuality. However, because this study used a questionnaire, these results reflect respondents' perceptions and do not directly demonstrate an increase in objective productivity.

The ambient environment's contribution of 75.3% indicates that this variable has a strong explanatory power on productivity variation in the research model. Conceptually, appropriate lighting, comfortable temperature, controlled noise levels, and a pleasant room aroma can support comfort during work. Research by Pan et al. (2024) shows the relevance of lighting, ventilation, and noise conditions to user preferences in choosing seating, while Cai et al. (2024) explain that environmental aroma can be related to cognitive efficiency through cognitive and emotional responses. These findings provide supporting explanations for the importance of environmental conditions in the workspace. However, this study tested all four indicators as one variable, so it cannot yet determine the indicator that most dominantly influences productivity.

The results of this study also align with Mittal and Rani (2022), who found a positive and significant relationship between the coworking space environment and work productivity. This similarity suggests that environmental quality is a relevant aspect to consider when providing shared workspaces. This study provides additional context by examining the influence of the ambient environment on productivity in cafe-based coworking spaces in Batam City. Thus, the results broaden the discussion on the physical environment and productivity in coworking spaces located in cafe environments.

Although the ambient environment contributed 75.3%, there was still 24.7% of the variation in productivity unexplained by the research model. This variation could be related to other factors not examined in this study, such as the availability of supporting facilities, spatial layout, social interaction, motivation, and the type of work performed by users. These factors are possibilities that could be further investigated, not factors that were proven to be influential in this study.

Practically, the research results demonstrate the importance of maintaining the quality of the physical environment at Alara Coffee and Space. Managers can maintain lighting suitable for work activities, ensure a comfortable room temperature, maintain cleanliness and aroma, and control noise. Attention to these conditions is especially

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relevant between 11:00 and 15:00, when, according to employees, the number of visitors tends to increase. Regular evaluation through visitor feedback can be used to determine whether the environmental conditions remain suitable for the needs of coworking space users.

This study has several limitations. First, productivity was measured through self-report, so the results reflect respondents' perceptions rather than objective productivity measurements based on a comparison of output and input. Second, the study was conducted at a single location using a purposive sampling approach, so the results need to be generalized with caution to other coworking spaces. Third, the study examined the ambient environment as a single variable consisting of four indicators, so it cannot explain the contribution of each indicator separately. Future research could involve multiple locations, examine each indicator more specifically, and consider other factors that may be related to user productivity.

CONCLUSION AND SUGGESTIONS

Based on the results of research on 96 coworking space users at Alara Coffee and Space, Batam City, it can be concluded that the ambient environment has a positive and significant effect on user productivity, as evidenced by the calculated t value of 16.938 > t table 1.986 with a significance of <0.001. The results of the regression analysis show that every one unit increase in the ambient environment is followed by an increase in productivity of 0.620 units, with a correlation coefficient of 0.868 indicating a very strong positive relationship. In addition, the coefficient of determination (R^2) value of 0.753 indicates that the ambient environment is able to explain 75.3% of the variation in productivity, while the remaining 24.7% is explained by other factors outside the research model. Descriptively, the ambient environment and productivity each obtained an average score of 4.01 and 4.08, respectively, which are included in the high category. This finding supports the servicescape theory (Bitner, 1992) which emphasizes the role of the physical environment in shaping the responses and behavior of service users. Thus, managing aspects of lighting, room temperature, aroma, and noise levels are important factors that need to be considered in creating a coworking space environment that is conducive to user productivity.

Alara Coffee and Space managers are advised to maintain the quality of lighting, room temperature, aroma, and noise levels. Pre-observations indicate that the number of visitors increases between 11:00 and 15:00, so managers need to maintain the quality of the physical environment during these hours. Regular short visitor surveys can help identify areas for improvement. These survey results can inform ongoing adjustments to the space's layout.

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Further research is recommended to include other variables, such as supporting facilities (Wi-Fi and power outlets), room layout, or user characteristics, as 24.7% of the variation in productivity remains unexplained. The influence of each indicator (lighting, temperature, aroma, and noise) can be analyzed separately using multiple linear regression to identify the most dominant indicator. The research object can be expanded to other cafes or coworking spaces. A larger sample size will increase the generalizability of the results. The questionnaire can also be combined with interviews and observations to obtain a more in-depth picture.

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