STUDY OF COLOR, ATMOSPHERE, AND FURNITURE IN ARCHITECTURAL STUDIO CLASSROOM: PERSPECTIVE FROM MIX-METHODS RESEARCH

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ABSTRAK

Kondisi studio arsitektur yang optimal serta penataan pada ruang yang sesuai standar dapat membuat mahasiswa merasa nyaman. Faktor kenyamanan menjadi penting untuk dapat menerima materi pembelajaran dengan efektif tanpa distraksi negatif dari ruang itu sendiri. Adapun indikator ruang yang dapat mempengaruhi pembelajaran yang efektif adalah seperti pilihan warna, pensuasanaan, dan penataan furnitur. Penelitian ini bertujuan untuk dapat melihat bagaimana pemilihan warna, pensuasanaan, dan penataan furnitur dapat mempengaruhi efektivitas belajar di ruang kelas berbasis studio. Metode yang digunakan merupakan metode kuantitatif dengan interpretasi data mendalam secara kualitatif. Hasil penelitian menemukan bahwa terdapat beberapa hal pada pemilihan warna, penghawaan, pencahayaan, dan penataan furnitur pada ruang studio yang belum memenuhi standar dan mendapat respon negatif dari perspektif mahasiswa berkenaan dengan efektivitas belajar. Adapun hasil temuan penelitian diharapkan dapat menjadi masukan dan saran dalam merancang ruang kelas berbasis studio yang baik khususnya pada pembelajaran arsitektur.

Kata Kunci: Warna, Suasana, Penataan furnitur, Ruang kelas studio arsitektur, Pembelajaran efektif

ABSTRACT

Optimal architectural studio conditions and standardized room arrangements can make students feel comfortable. The comfort factor is essential to receive learning material effectively without 'negative' distractions from the space itself. The room indicators that can affect effective learning are the choice of color, atmosphere, and furniture arrangement. This study aims to see how the choice of color, atmosphere, and furniture arrangement can affect learning effectiveness in studio-based classrooms. The method used is a quantitative method with in-depth data interpretation qualitatively. The study's results found several things in the selection of colors, ventilation, lighting, and layout furniture arrangement in the studio-based classroom that needed to meet the standards and received negative responses from the student's perspective regarding learning effectiveness. The results of the research findings are expected to be input and suggestions in designing studio-based classrooms, especially in architecture learning.

Keywords: Color, Atmosphere, Furniture arrangement, Architectural studio classroom, Effective learning

INTRODUCTION

The effectiveness of learning can affect the quality of students, impacting the quality of institutions in global competition. In addition, successful students can also contribute to community development. Students also have responsibility for carrying out the *Tri Dharma*[1] of Higher Education. Therefore, student success is significant for educational institutions and society in general.

The achievement of learning activities in the architectural studio is influenced by the effectiveness of the environment that supports the learning syllabus. Effective learning makes it easy for architecture students to learn skills, values, and design concepts. In addition, the achievement of learning outcomes is the ease with which students learn valuable something in practice.

The learning process in an architecture studio has many distractions that can cause discomfort in the learning process. For example, a studio schedule that exceeds regular teaching hours makes students in the studio bored and need more ideas for designing some objects. Studio time, which is approximately three to four hours, requires stimulation around the room that can be psychologically touched, seen, and heard by the human senses. The variables in this study are color, atmosphere, and furniture choice, which will be discussed in depth.

Color in room interior can impact productivity, according to color expert Faber Birren, who seriously affects a person's work performance and productivity (Kurt & Osueke, 2014). For example, blue can help increase focus and concentration, while green can give a feeling of calm and balance. Moreover, Costa et al. (2018) argues that apart from providing aesthetic value, interior color can significantly impact satisfaction, psychological and social functioning. Also, Kanzaki & Wardhani (2022) stated that the choice of colors and the layout of furniture arrangements could enhance active learning in the shared space in the university. From the previous studies, the role of color in the campus environment can affect the learning process.

Several indicators can affect the efficiency and comfort of learning in the studio classroom, such as thermal and visual comfort. Proper room ventilation can increase user efficiency, as stated by (Nuraini & Raidi, 2021). Moreover, Watini et al. (2022) mentioned that the minimum corrected luminance for ideal room is between 250 lux so that it can provide comfort for studio users.

Architecture Studio Classroom Vs Common Classroom: What's the Difference?

Generally, design studio is where a student learns to design: and design is considered the key activity for an architect (Lamunu & Lueth, 2008). Before students get involved in the field, such as in an architect consulting studio, students are accustomed to experiencing the environment and culture of the studio to support their future career paths after graduating from college.
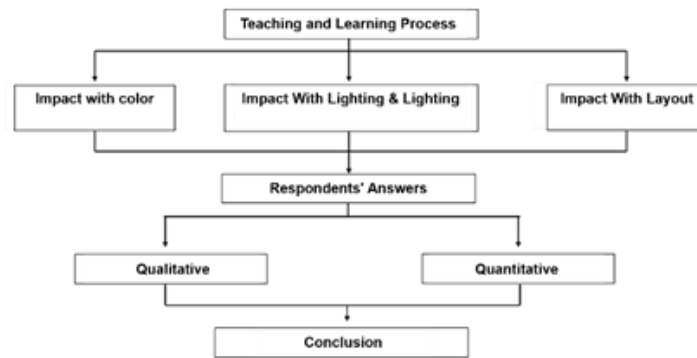
Previous research which aims to observe the intensity of light in studio classroom states that according to the Indonesian National Standard (SNI 03-2396-2001), space for 'common' learning activities requires 350 lux, and for drawing activities requires 750 lux (Purnama et al., 2022; Ragilyani & Dewi, 2021). In addition, thirteen aspects need to be considered in designing the architectural design of studio classrooms with the level of importance in studio design considerations: facilities, cleanliness, thermal comfort, and connectivity (Wi-Fi) (Fairuza et al., 2021).

The discussion above shows that several physical indicators influence learning effectiveness in studio-based classes. Therefore, within the scope of architectural psychology, this study will examine several indicators that can influence student comfort and effectiveness during the learning process in studio-based classrooms. Several variables that affect the quality of the learning process in studio-based classes, such as color, ventilation, lighting, and furniture layout, are state of the art in this research model, which have yet to be discussed in previous similar studies.

METHODOLOGY

This research aims to identify the effect of choosing color arrangements, atmosphere, and furniture layout in studio classrooms on the quality of student learning by comparing the results of the information obtained from field observations.

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[1] *Tri Dharma* are three obligations that consist of teaching, research, and community service

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Figure 1. Research phase
Source: Author, 2023

This research uses qualitative descriptive research methods. The research phase can be seen above (see figure 1):

Research Type

This research uses a descriptive research approach because its application includes analyzing information and interpreting the meaning and information obtained. The structure of this research is inductive research, which seeks and collects information in the field intending to understand the factors, formal elements, and characteristics of social phenomena Sunarna (2010).

Information Collection Procedures

This research collects information using field observations and questionnaires. After obtaining observational information from field observations, this information will be compared and analyzed with the theory sought before, and conclusions will be drawn based on the analysis results.

Population and Sample
1. Population

According to Nasution (2019), Population is the totality of subjects as an indication of test scores or events as a source of information with specific characteristics in research. The sample group of respondents who were taken as research objects were users in architectural studio classes at ITENAS. Based on PDDikti[2] statistics in 2023, the number of Architecture Students was 876 people.

2. Sample

Illustrations are part or representative of the population studied (Bura, 2022). The selection of illustrations used in this study uses a random sampling method considering that the findings are pure without being directed. It is called the random sampling method because when taking illustrations, the researcher combines the subjects in the population by assuming that all subjects are the same. The first step is to distribute questionnaires to studio classroom users. Making representative illustration dimensions is based on Ira (2021) with the following simple formula:

$$n = N/Nd^2 + 1$$

Where:
N : population size
n : the size of the illustration
d : level of confidence / accuracy
the desired 10%   (1)

from this formula, the illustrative dimensions of the 876 population can be calculated by taking the confidence level (d) = 10%, as follows:
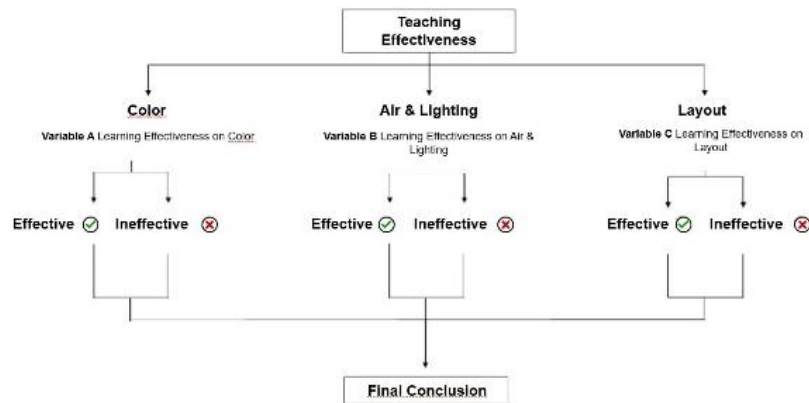
$$n = N/Nd^2 + 1$$
$$n = 876/(876)(0.10)^2 + 1$$
$$n = 9,887$$
$$n = 10 \text{ person}$$

From these calculations, the desired minimum sample with a 10% confidence level is 10 persons.

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[2] *PDDikti:* higher education database

Figure 2. Variables in research
Source: Author, 2023

Information Processing Methods

All the information collected is then presented neatly and neatly. Information processing activities include calculating frequency related to the influence of color, atmosphere, and interior layout based on information of at least 10 respondents , then processing to obtain a percentage of value. The steps for processing information are as follows:
1. Editing: All notes combined with interview questions and questionnaire information that was successfully collected was then reviewed and grouped.
2. Setup of Information Calculations: Setup and calculation of information is done manually by using a PC-shaped tool
3. Tabulation: Information collected and calculated is then presented in tabular form.

Information Analysis

The stages of processing information on the results of this research are as follows (Muhammad *et al.,* 2017):
1. Checking Completeness of Answers: In this session the information obtained was reviewed to find answers from incomplete questionnaires
2. Tally: Counts the number or frequency of each answer in the questionnaire
3. Calculate the percentage of respondents' answers in the form of a single table through the distribution of frequencies and percentages using the formula:
   $$P = f/N \times 100\%$$

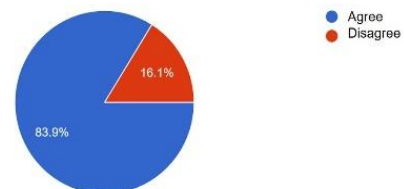Q: Percentage
f. : Frequency information
N : Number of illustrations processed (2)
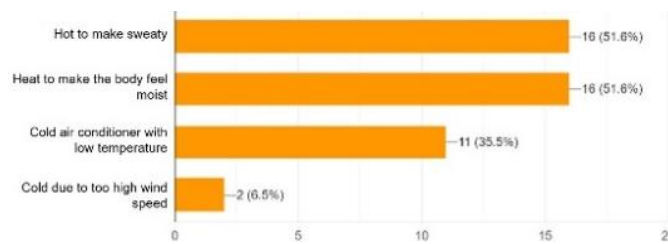
RESULT AND DISCUSSION

From the result of 31 respondents' answers obtained , Most of the architecture student respondents used studio classes for 3-4 hours in one day on average. However, the duration of the studio can be more in line with the needs of students in understanding the subject matter. Sometimes students use the studio space for more than the average hour to do in-depth assistance with lecturers.

Based on observations in this study, the average focus ability of Architecture Students while studying in the studio is only 30-60 minutes. This proves that students still need effective studio space to gain deep insight into designing objects, especially inspiration for design concepts. The variables that will be used in this study can be seen above (see Figure 2).

Figure 3. The Effect of Interior Color on Learning Focus
(Survey, 2023)

Figure 4. Perceived discomfort with indoor air conditioning
Source: Survey, 2023

Variable A (Learning effectiveness with interior's color)

The results of the discussion related to variable A (learning effectiveness with color) from 31 respondents, as many as 83.9% agreed that the interior color in the studio can help focus during the learning process (See figure 3). In addition, most of the respondents also preferred the ideal color as an architectural studio classroom that is not monotone or pale (as many as 7 respondents). The color of the studio interior used as a case study is dominated by beige colors so that it seems monotonous and pale.

The results obtained from this study were that variable A, learning effectiveness with color, was still ineffective. As for what can be concluded from students' preferences for interior colors, it leads to choosing a combination of 'cool' and 'bright' color tones that can provide comfort and inspire learning.

Variable B (Effectiveness of learning with air conditioning and lighting)

In the discussion related to variable B (effectiveness of learning with ventilation and lighting) from 31 respondents, 87.1% agreed that ventilation and lighting can increase the effectiveness of work performance. The results obtained from the respondents were that ventilation conditions that interfered with the quality of the room were hot and humid, with the criteria ranging from hot to sweating at 51.6% and from heat and making the body feel damp as much as 51.6%. percentage can be seen in Figure 4 above.

The author concludes from several graphs on variable B that studio classroom ventilation and classroom lighting should be better than now with the number of respondents (35.5%). The interpretation from this variable is that the respondent wants a 'cool' and 'bright' atmosphere inside the studio room to increase the learning's effectiveness.

Natural lighting and ventilation have not been able to answer these needs. Dependence on ventilation and artificial lighting still dominates. For example, the room's interior becomes dark and dim when the curtains are closed. However, if the curtains were opened, it would make the visuals too dazzling, and the atmosphere would become heated. Considering that the studio classroom is located on the 3rd floor with no barriers around the building, an appropriate recommendation for this condition is to choose semi-clear window glass. This can also be supported by a choice of color and curtain material that does not seem 'dark'.

Variable C (Learning Effectiveness with Layout)

The results of the discussion related to variable C which mentions the effectiveness of learning with furniture layout, out of 31 respondents, 77.4% feel comfortable with the furniture layout due to several factors, such as the arrangement of tables and chairs that are flexible for movement and the presence of a power source at each table. Computerized learning is required in studio classes, so a power supply is essential. The layout of the furniture in the classroom studio can be seen in figure 5.

As many as 31 respondents, 87.1%, agreed that the furniture in the studio room is uncomfortable and can make students tired even when sitting. Moreover, as much as 65.5% did not agree that the circulation path could interfere with their work or study. There seem to be no significant problems regarding circulation, so learning effectiveness can still be met through circulation indicators.
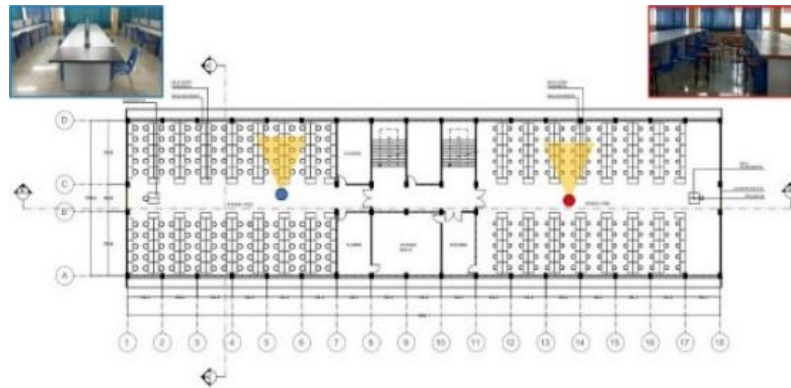
Figure 5. Research location's layout
Source: Survey, 2023

A total of 74.2% stated that the supporting facilities in the studio classroom had been fulfilled in regular classrooms but needed to meet the required studio classroom standards, such as adjustable drawing tables, ergonomically proper drawing chairs, and excellent and clear projectors as media for the learning process.

Figure 6. The layout of furniture in room 1
Source: Survey, 2023

Figure 7. The layout of furniture in room 2
Source: Survey, 2023

Figure 8. Chair type 1
Source: Survey, 2023

Figure 9. Chair type 2
Source: Survey, 2023

The graphic results obtained from the survey show that chairs and tables in room 1 are considered uncomfortable. For the chair sub-variable, 77.4% of the respondents felt very uncomfortable, while for the table, 45.2% of the respondents said they felt uncomfortable. While the chairs and table in room 2 are considered comfortable. Regarding chairs, 54.8% of respondents felt comfortable. For tables, 58.1% feel comfortable.

Layout arrangement and choice of studio-based class furniture is a form of consideration expected to provide flexibility for movement when drawing—the need for privacy and hand movement supports individuals' comfort. The ideal drawing table placement system affects the quality of the studio. Laying linear elongated circulation gives a broad impression. The direction of view is expected to be able to go directly to the blackboard and projector (table arrangement in room 1) so that the directions given by the lecturer do not leave students behind. The summary of the discussion can be seen in the following conclusion diagram (see figure 10):
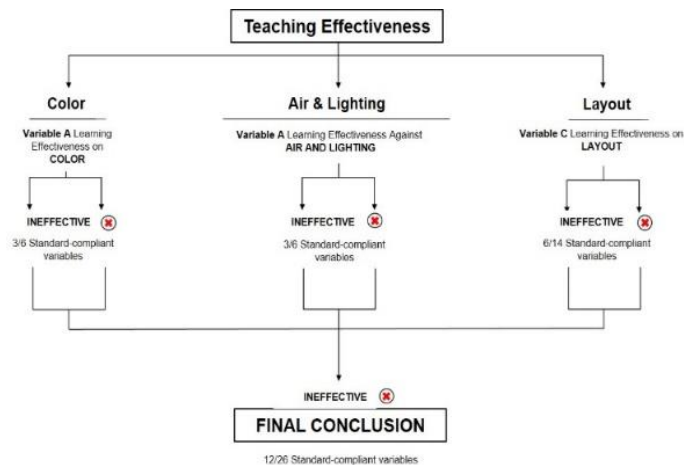
Figure 10. Diagram of Conclusion
Source: Author, 2023

In this study it was found that in order to achieve teaching effectiveness in studio-based learning classes, several indicators such as color selection, atmosphere consisting of air conditions, lighting, and furniture layout have not contributed well to achieving ideal standards. There are several indicators that need to be considered, such as the choice of bright colors in interior, sufficient natural lighting and ventilation, and the choice of studio-class furniture needs to be distinguished from the ordinary classrooms. The research findings can lead to recommendations.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Learning effectiveness can be achieved in studio classrooms through an integrated learning syllabus with a supportive learning environment. Some of the adjustments that can be made is the selection of interior colors, ventilation, lighting, and furniture arrangements according to existing standards. These considerations are to meet users' needs, in this case, students and lecturers.

From the results of this study, it was concluded that the three indicators used in the study were still ineffective in field implementation and had yet to receive a positive response from space users. Aspects of interior wall color received a positive response from students, but still, this has yet to significantly help the effectiveness of the learning style in the studio room. Most users prefer light colors over dark ones.

Aspects of ventilation and natural lighting received negative responses from students. Most studio users feel hot when the air conditioner is not turned on. This shows that studio room ventilation needs better arrangements to support the learning process in the studio which takes approximately 3-4 hours in one session.

In addition, the different aspects of the selection of furniture from the two parts of the studio evoked different responses. Rooms with chairs that use backrests and tables with partitions give a positive response. However, they react negatively in a room with a chair without a back and a table without a partition. This is influenced by the ergonomics of chairs and tables that have yet to be considered regarding the duration of learning in the studio class.

Suggestions/Recommendations

This study has several limitations, such as there are still too few respondents to reach a valid conclusion. There are other limitations, such as the need for more references regarding the studio learning-based classroom design discussion. In this paper, the discussion refers more to student learning effectiveness in the 'ordinary' classroom, not specific to studio-based learning classrooms.

The suggestions that the research findings can give are the need for research on furniture dimensions, supporting learning media objects in studio classrooms, and how they affect student productivity in design. Apart from this, there is a need for in-depth research regarding the efficiency of ordinary classrooms used for studio-based learning.

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