



Integrating Furniture and Color For Optimal Learning Motivation and Positive Teacher-Student Communication Through Effective Classroom Arrangement Training

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ARTICLE INFO	Abstract
<i>Article history:</i> <i>Received May 2025</i> <i>Revised August 2025</i> <i>Accepted August 2025</i>	This study aims to examine the impact of effective classroom arrangement training on classroom design comprehension, learning motivation, and positive teacher-student communication. The research employed a quasi-experimental method with a pretest-posttest design, involving 30 respondents consisting of 13 teachers and 17 parents. The research instruments comprised three scales measuring classroom design comprehension (Alpha-Chronbach 0.882), optimal learning (Alpha-Chronbach 0.769), and positive teacher-student communication (Alpha-Chronbach 0.820). Hypothesis testing results indicated a significant increase in all three variables following the training (t-values: -17.836, -10.051, -8.637). Among these, classroom design comprehension showed the greatest improvement, followed by optimal learning and effective communication. This study highlights the importance of proper classroom arrangement in fostering a conducive learning environment and promoting positive teacher-student interactions. Consequently, the training offers practical insights for teachers and parents to create more functional and aesthetically pleasing learning environments.
	Keywords
	Classroom-arrangement, design-comprehension, learning-motivation, positive-communication

Introduction

The physical learning environment, particularly classroom arrangement, is believed to have a significant impact on students' learning experiences, learning motivation, and the quality of interactions between students and teachers (Bindal, 2022).

A well-organized classroom plays a crucial role in the overall learning process, as it does not only facilitate students' concentration by minimizing distractions and creating a structured learning environment, but also acts as a catalyst for enhancing



their intrinsic motivation (Alyahyan & Düşteğör, 2020). When students are able to focus more effectively, they are more likely to engage actively with the learning materials, participate in classroom discussions, and maintain sustained attention during lessons, which collectively contribute to optimal learning outcomes. Furthermore, an organized classroom layout—through thoughtful furniture arrangement, appropriate color schemes, and clearly defined learning zones—creates a welcoming atmosphere that fosters mutual respect and openness between teachers and students. This, in turn, encourages more positive interactions, including two-way communication, collaborative problem-solving, and constructive feedback, all of which are essential for building strong teacher–student relationships and promoting a supportive educational climate (Kercood, et al., 2015).

According to developmental and cognitive psychology theories by Vygotsky, factors such as color and furniture layout play a significant role in creating a conducive atmosphere. This, in turn, enhances students' comfort, promotes optimal learning outcomes, and facilitates positive patterns of interaction and communication within the classroom (Alyahyan & Düşteğör, 2020; Bindal, 2022).

Color in the classroom plays a crucial role as a form of non-verbal communication. It can influence students' moods, psychological energy for learning motivation, and their level of engagement with the lessons. Research indicates that warm colors, such as yellow or orange, can boost energy and enthusiasm, while cool colors, such as blue or green, tend to promote calmness and enhance focus. Proper integration of colors in the classroom can help create a learning atmosphere that aligns with educational objectives, fosters students' learning motivation, and supports effective communication between students and teachers (Alawad, 2021).

The arrangement of classroom furniture, such as desks, chairs, cabinets, and whiteboards, can significantly influence patterns of communication and positive interactions between students and teachers. Flexible furniture arrangements, such as grouping desks in circles or small clusters, promote more active interactions, both among students and between students and teachers. This flexibility allows teachers to facilitate collaborative learning and increase student engagement, ultimately enhancing communication and strengthening interpersonal relationships within the classroom (Nubani & Lee, 2022).

The psychology of color in classroom design also contributes to learning outcomes. Specific colors can influence students' emotional and psychological responses, thereby shaping either a positive or negative learning atmosphere. For example, soft colors are often used to reduce stress and enhance concentration, while bright colors can stimulate the brain and boost learning enthusiasm. With the right color choices, classrooms can be designed to create an environment conducive to communication and active participation (Alawad, 2021; Claessens et al., 2017).

Interior design that supports active learning has become increasingly relevant in modern educational approaches, which emphasize collaborative and interactive learning. Furniture that can be rearranged or moved according to activity needs can create a flexible space, allowing students to transition easily between individual and group activities. This arrangement also enables teachers to be more accessible to



students, facilitating more effective and targeted communication (Burns et al., 2022).

A visually engaging learning environment has been proven to enhance student engagement. Classrooms designed with bright colors and appealing decorative elements are more effective in capturing students' attention and boosting their motivation. A harmonious visual balance between colors and furniture arrangement can help maintain students' concentration and make the learning process more enjoyable and interactive. Ultimately, this fosters better communication between students and teachers (Ahmadi et al., 2023; Bosman et al., 2021).

An optimally designed classroom allows teachers to communicate more effectively with students. For example, seating arrangements facing the teacher enable students to engage both visually and physically in the learning process. Thus, effective interior design can create a space that supports open and participatory communication, strengthens teacher-student relationships, and encourages more open interaction during the learning process (Burns et al., 2022). A tidy classroom with well-arranged furniture and harmonious colors helps create a productive learning environment. A well-organized space allows students to easily find the learning tools they need and enhances their focus during lessons. This arrangement can also reduce visual distractions, fostering a calm atmosphere that is ideal for effective learning and communication (Bosman et al., 2021; Burns et al., 2022).

The alignment between color and classroom function is a crucial aspect of learning space design. Neutral colors can be used in spaces requiring calmness, while bright colors are more suitable for areas that encourage creativity. Selecting colors that match the room's purpose helps create an atmosphere conducive to learning and social interaction, encouraging students to be more active and engaged. Integrating color and furniture in classroom design contributes to a holistic learning environment, where every element supports educational goals while considering students' psychological and social needs. With this holistic approach, classrooms become not only aesthetically pleasing but also functional, fostering an optimal learning experience and effective communication between teachers and students (Ahmadi et al., 2023; Claessens et al., 2017).

Previous studies have recognized that classroom design, including furniture layout and color choices, plays an important role in shaping students' learning motivation and interaction quality. However, limited empirical research has examined the extent to which targeted training for teachers and parents on effective classroom arrangement can enhance understanding of design principles and positively influence learning outcomes. This gap highlights the need to investigate whether structured interventions, such as classroom design training, can significantly improve comprehension of classroom arrangement, learning motivation, and teacher-student communication.

This study assumes that the seminar may enhance an understanding of basic environmental psychology principles relevant to classroom design. For example, teachers can learn how to choose appropriate colors to create either a calming or energetic atmosphere, depending on classroom activities. Additionally, the seminars can equip participants with strategies for arranging classroom furniture flexibly,



enabling both collaborative and individual learning that ensures student comfort. Proper classroom arrangement is expected to enhance students' comfort, which in turn boosts their learning motivation and openness in interacting with teachers.

The seminars are also designed to help teachers and parents optimize physical learning environments to support educational outcomes and foster positive teacher-student communication. Supportive classroom environments encourage students to participate more easily in discussions, feel comfortable asking questions, and stay motivated to engage in active learning (Bindal, 2022). Ultimately, this positive learning atmosphere will strengthen relationships between students and teachers, contributing to more effective learning outcomes (Burns, et al., 2022).

Objectives and Benefits

Based on the background issues outlined above, the objectives and benefits of the seminar on effective classroom arrangement for teachers and parents are formulated as follows:

1. *Enhancing Understanding of the Importance of Classroom Design.* This training aims to provide insights into how classroom furniture arrangement and color selection can influence the learning atmosphere and student motivation. Benefit: With this understanding, teachers and parents are expected to recognize the critical role of classroom design in creating a conducive learning environment.
2. *Providing Practical Guidance on Classroom Arrangement to Support Learning.* The training will offer practical guidance and tips on selecting appropriate colors and implementing flexible furniture arrangements to support various learning methods, including both individual and collaborative learning.
3. *Promoting Increased Student Learning Motivation.* One of the primary objectives of this training is to assist teachers in creating classroom environments that stimulate students' interest and motivation through comfortable and appealing designs. Benefit: With a more aesthetically pleasing and well-structured classroom, students are expected to feel more motivated and enthusiastic about learning.
4. *Facilitating Effective Teacher-Student Communication.* The training aims to demonstrate how effective classroom design can promote positive interactions between teachers and students. Benefit: A comfortable and open classroom layout can encourage more effective communication, making students feel more at ease in asking questions and participating actively in learning activities.
5. *Providing Knowledge for Applying Consistent Learning Space Designs at Home.* For parents, the training also aims to offer ideas on arranging their children's study spaces at home. Benefit: By continuing the supportive learning atmosphere established at school within the home environment, parents can help reinforce their children's motivation and focus on learning.

Method

Research Type and Design



This study employs a quantitative approach using a quasi-experimental design with a pretest-posttest format. The primary objective is to examine the impact of effective classroom arrangement training on various learning and communication-related outcome variables. The design involves an initial measurement (pretest) conducted before the intervention, followed by the intervention, which consists of the application of effective classroom arrangement concepts. Subsequently, a post-intervention measurement (posttest) is conducted to evaluate changes in the outcome variables.

Variables

The variables measured in this study include three variables, namely:

1. Understanding of Classroom Design - measures the extent to which respondents understand the concept and application of effective classroom design.
2. Optimal Learning Motivation - measures the level of learning motivation in an optimally organized classroom environment.
3. Effective Communication between Teachers and Students - measures the extent to which an effective classroom arrangement is able to support positive and open communication between teachers and students.

Respondens

This study involved 30 respondents consisting of 13 public primary school teachers in Bandung, West Java, and 17 parents. The teachers were selected based on the following criteria: (1) actively teaching in public primary schools for at least the past two years, (2) having direct responsibility for classroom management, and (3) willingness to participate in the training. Parents were included if they (1) had children currently enrolled in the participating schools, (2) were involved in supporting their children's daily learning activities at home, and (3) provided informed consent to join the study. The respondents were selected to reflect the perspectives of those who directly interact in the classroom environment, namely teachers and parents who support the learning process. All respondents were obtained by purposive sampling.

Research Instruments

The instruments used in this study are three types of scales specifically designed by the research team to measure each of the research variables:

1. Classroom Design Understanding Scale - measures respondents' level of understanding of effective classroom design concepts and practices. This scale has an Alpha-Cronbach reliability score of 0.882 with a pearson correlation validity score that ranged from 0.566 - 0.732.
2. Optimal Learning Motivation Scale - measures learning motivation in an organized classroom. This scale has an Alpha-Cronbach reliability score of 0.769 with a pearson correlation validity score that ranget from 0.496 - 0.812.



3. Effective Teacher-Student Communication Scale - measures the quality of communication between teachers and students in the context of the classroom setting. This scale has an Alpha-Cronbach reliability score of 0.820 with a pearson correlation validity score that ranged from 0.606 - 0.778.

Each scale uses a Likert scoring format that measures the degree of agreement or feelings of respondents on various statements related to variables measured with 5 (five) answer preferences, namely; Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD).

Classical Assumption Test

The classic assumption test used in this study is the normality test. This test aims to ensure that the distribution data generated from each variable meets the assumption of normality, which is a requirement in the paired sample t-test statistical analysis. Normality tests were carried out on pretest and post-test data for each variable.

Hypothesis Test

To test the research hypothesis, the statistical analysis used was paired sample t-test. This test was chosen because the study measured differences before and after the intervention in the same group. Paired sample t-test was used to determine whether there was a significant difference between the pretest and post-test scores on each research variable, which included understanding classroom design, optimal learning, and effective communication between teachers and students.

Result and Discussion

Result

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest Pemahaman Desain Ruang Kelas	.118	30	.200 [*]	.961	30	.334
Posttest Pemahaman Desain Ruang Kelas	.118	30	.200 [*]	.956	30	.245
Pretest Pembelajaran Optimal	.121	30	.200 [*]	.951	30	.177
Posttest Pembelajaran Optimal	.114	30	.200 [*]	.965	30	.414
Pretest Komunikasi Efektif	.113	30	.200 [*]	.916	30	.021
Posttest Kominikasi Efektif	.130	30	.200 [*]	.966	30	.435

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Tabel 1. Normality test Output



Based on the results of the normality test output above, it can be seen that the Sig. Kolmogorov-Smirnov scores are all greater than 0.05 (> 0.05), thus it can be said that all data is normally distributed.

Hypothesis test

		Paired Samples Test							
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Pretest Pemahaman Desain Ruang Kelas - Posttest Pemahaman Desain Ruang Kelas	-27.300	8.384	1.531	-30.431	-24.169	-17.836	29	.000
Pair 2	Pretest Pembelajaran Optimal - Posttest Pembelajaran Optimal	-14.867	8.102	1.479	-17.892	-11.841	-10.051	29	.000
Pair 3	Pretest Komunikasi Efektif - Posttest Komunikasi Efektif	-14.800	9.386	1.714	-18.305	-11.295	-8.637	29	.000

Tabel 2. Hypothesis Test Output, Paired Sample t-test

Based on the hypothesis testing results, the Sig. (2-tailed) score for the variable Classroom Design Comprehension was 0.000 (< 0.05), indicating a significant difference in classroom design comprehension before and after the effective classroom arrangement training. For the variable Optimal Learning Motivation, the Sig. score was also 0.000 (< 0.05), signifying a significant difference in optimal learning motivation before and after the training. Similarly, for the variable Effective Communication, the Sig. score was 0.000 (< 0.05), indicating a significant difference in effective communication before and after participating in the effective classroom arrangement training.

If we want to compare which variable has the most influence on classroom design, it can be seen from the mean score of the paired sample test matrix above. The higher the mean score, the more influential the variable is on classroom design, and vice versa. Among the three measured variables, the effective classroom arrangement training had the greatest impact on the Classroom Design Comprehension variable, with a mean score of 27.300. This was followed by its effect on the Optimal Learning Motivation variable, which recorded a mean score of 14.867. Lastly, the training had the lowest impact on the Effective Communication variable, with a mean score of 14.800.

Discussion

The findings of this study indicate that effective classroom arrangement training has a significant impact on the three measured variables: classroom design comprehension, optimal learning motivation, and effective teacher-student communication. Specifically, the training successfully enhanced participants' understanding of the importance of functional and aesthetically pleasing classroom design in creating a conducive learning environment. These findings align with environmental psychology theories, which assert that a well-organized classroom



can improve students' comfort, enhance learning motivation, and facilitate communication between teachers and students (Ahmadi et al., 2023; Burns et al., 2022).

The greatest improvement was observed in the classroom design comprehension variable, with scores indicating a significant difference before and after the training. This finding highlights that training, which provides fundamental knowledge on classroom design—such as color selection and furniture arrangement—can help teachers and parents understand how these factors contribute to a positive learning environment. This increased understanding is crucial for application in daily practice to enhance the quality of learning both at school and at home (Zou et al., 2024).

Additionally, the training proved effective in enhancing optimal learning motivation. With an improved understanding of classroom arrangement, teachers were able to create a more conducive environment for students to focus and actively participate in the learning process. The use of appropriate colors and flexible furniture arrangements helped students feel more comfortable and motivated, which in turn could improve their learning outcomes. These findings align with previous research, which states that ergonomic classroom design can support students' emotional and cognitive engagement (Markova & Vouchilas, 2023; Zou et al., 2024).

The third variable, effective teacher-student communication, also showed improvement, although with a slightly lower increase compared to the other two variables. This result indicates that while good classroom design can support communication, its implementation requires a more specific approach. Classroom arrangements that facilitate visual and physical interaction between teachers and students—such as seat placements facing the teacher or grouping desks into small clusters—were among the key aspects emphasized during the training (Alfuraty, 2020; Humam et al., 2024).

From a practical perspective, this study provides implications for teachers and school administrators to pay greater attention to classroom interior design. For example, the use of soft colors to reduce stress and flexible furniture arrangements to support collaborative learning can be directly applied to create more interactive classrooms and promote a positive learning atmosphere. Thus, the implementation of effective classroom design principles can enhance students' comfort and support more open and effective communication between teachers and students (Kepez & Üst, 2024; Tan et al., 2024).

The relatively lower improvement in the effective communication variable suggests that the training may need to be combined with more specific teaching strategies or communication skills training. In this context, optimal classroom design should be integrated with teaching methods that promote two-way communication and active student engagement in the learning process. By combining appropriate design with effective teaching methods, achieving effective communication between teachers and students will become more attainable (Humam et al., 2024; Kepez & Üst, 2024).



These findings also provide valuable insights for parents regarding the importance of creating a supportive learning environment at home. With knowledge of effective space design, parents can help establish a comfortable learning environment for their children, ultimately fostering student engagement and improving academic outcomes. In this context, synergy between home and school learning environments can produce sustainable positive impacts on students' development (Kercood et al., 2015; Satır & Erdoğan, 2021).

Overall, this study demonstrates that effective classroom arrangement training can serve as a valuable intervention to enhance classroom design comprehension, promote optimal learning, and foster effective teacher-student communication. For future research, it is recommended that this approach be further developed by incorporating additional variables, such as student engagement and learning satisfaction, to provide a more comprehensive understanding of the benefits of effective classroom arrangement within the educational environment (Depreli et al., 2024).

Despite its promising findings, this study has several limitations. First, the research focused solely on three primary variables—classroom design comprehension, optimal learning, and teacher–student communication—while other potentially influential factors, such as student engagement, learning satisfaction, and long-term retention of training effects, were not included in the analysis. Second, the study employed a relatively small and specific sample, limiting the generalizability of the results to broader educational contexts. Third, the study used a short-term measurement approach (pretest–posttest), which does not capture whether the observed improvements can be sustained over time. Future research should therefore consider longitudinal designs, include a more diverse participant pool, and integrate additional variables to provide a more comprehensive and robust understanding of the impact of effective classroom arrangement training.

Conclusion

This study demonstrates that effective classroom arrangement training has a significant impact on improving classroom design comprehension, learning motivation, and teacher-student communication. Statistical test results indicate a significant increase in all three variables following the training, with the greatest improvement observed in classroom design comprehension. This finding underscores that knowledge and application of appropriate design principles, including color selection and furniture layout, can create a conducive environment for learning and positive interaction. Furthermore, the results suggest that effective classroom arrangement not only enhances the aesthetic appeal of the space but also serves as a learning support tool, capable of increasing student engagement and fostering more open and effective communication.

Recommendation

1. Practical Application in Schools



Schools are encouraged to adopt classroom arrangement principles proven effective in this study, such as selecting appropriate colors to create a conducive learning atmosphere and organizing furniture flexibly to support collaborative learning. Additionally, schools may consider conducting training sessions or capacity-building programs for teachers on functional classroom design, ensuring that learning spaces are optimized to enhance both student engagement and educational outcomes.

2. Collaboration with Parents

Parents are also expected to play an active role in creating a conducive learning environment at home. They can apply basic principles of comfortable learning space design to support their children's learning activities. With synergy between school and home learning environments, students' motivation and academic outcomes are expected to improve optimally.

3. Further Research

For future research, it is recommended to increase the number and variety of respondents and include additional variables, such as the level of student engagement and learning satisfaction, to obtain more comprehensive results. Future studies could also explore more specific classroom design approaches based on educational levels or specific subjects to ensure more targeted effectiveness.

Acknowledgments

This research was made possible by the contributions of many parties, including the school principal, teachers, teaching staff, and school security officers. In addition, parents of students who contributed greatly during their time as respondents who were very active and participatory. In addition, it was also supported by residents around the school who helped until the completion of research and workshops smoothly and without obstacles. Also, the Presidential University provided material and logistical support that greatly contributed to the course of the research in general.

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