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Physical Learning Environment and Its Effect to Learners' Classroom Engagement in Cabiao, Nueva Ecija

Samantha Gabriela G. Cunanan[1], Ma. Angelina M. Calma[2], Bryan Adams R. Fesarillo[3], Ma. Denice V. Labao[4], Cristine Joyce G. Pabalan[5], Criselda P. Coronado[6]

[1,2,3,4,5,6] Polytechnic University of the Philippines – *Cabiao Campus, Nueva Ecija*

cunanansamanthagabriela@gmail.com, Calmaangel186@gmail.com, bryanfesarillo@gmail.com, mariadenicelabao@gmail.com, cristinejoypabalan539@gmail.com, cpcoronado@pup.edu.ph

Abstract

The physical learning environment had a primary role in shaping learners' classroom engagement. This study aimed to determine how environmental factors, such as color, lighting, seating arrangement, acoustics, and temperature, influenced the behavioral-social and social-affective engagement of Grade 5 students in selected public elementary schools in Cabiao, Nueva Ecija.

Data were gathered from 189 Grade 5 students via a researcher-developed and expert-validated questionnaire. To analyze the data and establish the correlations between physical environment factors and classroom engagement, mean scores and Pearson's correlation were calculated, employing a quantitative descriptive research design.

The findings showed that the specific physical learning environment variables had statistically significant positive relationships with both behavioral-social and social-affective engagement. Among the variables, lighting, temperature, and seating arrangement demonstrated the highest correlation with student engagement, such as behavioral-social engagement and affective-social engagement.

The results suggested that a well-structured and supportive physical classroom environment enhances learners' active participation, emotional comfort, and peer interaction. These findings underscore the primacy of thoughtful classroom design in promoting improved academic, behavioral, affective, and social outcomes of a learner. This research contributes to improving learning environments by offering actionable insights for educators.

Article Info

Keywords:
Polytechnic University of the Philippines Cabiao Campus, Bachelor of Elementary Education, Color, Lighting, Seating Arrangement, Acoustic, Temperature, Learner's Classroom Engagement

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INTRODUCTION

The physical learning environment significantly affects student engagement, such as behavioral-social and social-affective engagement, which connects to the ability to participate in class. Research suggests that elements such as lighting, color, seating arrangement, room temperature, and acoustics might affect students' emotional reactions, attention, and collaboration. While foreign studies have repeatedly associated all these variables with greater participation and better learning, local Philippine literature has been scarce, especially in analyzing several environmental variables concurrently. This research fills that gap by narrating the Grade 5 students' perceptions in the chosen public elementary schools in Cabiao, Nueva Ecija, on specific essential features of their physical learning environment, lighting, color, seating arrangement, temperature, and acoustics, and on their behavioral-social and social-affective engagement. By a data-driven, localized strategy, the research seeks to offer pragmatic advice for educators to plan classrooms that promote active engagement and positive affective attachments to learning.

LITERATURE REVIEW

These studies demonstrate that the physical environment of a learning space significantly impacts student engagement. They underscore the elements of the Physical learning environment, such as color, lighting, seating arrangement, acoustics, and temperature, that affect a learner's classroom engagement, including behavioral-social engagement and social-affective engagement.

Both environmental and emotional-social dynamics influence student motivation in the classroom. Classroom color research suggests that pale colors like blue and yellow promote relaxation, optimism, and improved learning and emotional stability. Dark colors like black and grey were likely to create anxiety and impact mood and academic performance (Baper et al., 2021; Al-Ayash, 2016).

The lighting can also make or break how well kids do. To stay awake, focus, and keep your mood in check, make sure you have good lighting. Some studies show that students have trouble focusing when the lighting is too low or too bright (Mogas Recalde & Palau, 2020; McDonald, 2023). How students see, move, and act is affected by where they sit. A study found that people are more interested when they are sitting in the front row and more likely to join, learn from each other, and talk when they are situated in cooperative forms like clusters.

Acoustics are an element of the physical learning environment that can affect students, who may find it hard to concentrate, feel more stressed, and be less likely to join in class if there is too much noise, whether inside or outside. Students can better understand each other and work together on group projects in quiet classes (Bhandari et al., 2024; Lapp, 2020; Swargiary, 2015).

Children's interests changed based on the classroom temperature. Students can focus better when the temperature is just right. When the temperature is too high or too low, they can get tired, less interested in what they are doing, and feel uncomfortable (Cantero et al., 2016; Ali, 2017)

You can define behavioral-social involvement by paying attention to how youngsters talk, cooperate, and take part. It has been shown that working on projects with a partner and raising your hand can help you get better grades and stay inspired (Baldwin, 2019; Boheim et al., 2020; Zhoc et al., 2019; DeVito, 2016).

Social-affective engagement can promote learning by focusing on emotional reactions and interactions among individuals. Belonging, emotional support, and pleasant peer interaction boost motivation and lead to deeper understanding. Emotional states like interest and astonishment support more active engagement, whereas boredom and disconnection tend to lead to withdrawal from learning tasks (Nazamud-din et al., 2020; Altuwairqi et al., 2018; Alrashidi et al., 2016).

METHODOLOGY

Our research methodology is structured to explain the systematic approach employed in examining the correlation between the physical learning environment and learners' classroom engagement of Grade 5 students in Cabiao, Nueva Ecija. The method is divided into the following main steps:

1. Objective Definition

- The main goal of this methodology is to investigate how specific elements of the physical learning environment, lighting, color, seating arrangement, temperature, and acoustics, affect the behavioral-social

and social-affective participation of Grade 5 students in some public elementary schools in Cabiao, Nueva Ecija. The study seeks to determine which environmental elements are most positively viewed by students and how these elements enhance the creation of active engagement, cooperation, and emotional involvement within the classroom.

- Measurable success is determined by establishing statistically significant relationships, through Pearson correlation analysis, between the physical learning environment factors such as color, lighting, seating arrangement, acoustics, and temperature, and the learners' classroom engagement of Grade 5 learners. Success is also indicated by the interpretation of weighted mean scores, which reflect the learners' overall level of agreement regarding the conduciveness of their classroom environment.

2. Scenario Development

- We will make realistic use-case scenarios that show the kinds of problems that Grade 5 students often have with their physical learning environment. For example, the walls of the classroom are either too dark or too dull in one scenario. This would make you think about how people might feel better and pay more attention if the colors were brighter and more interesting. Another example may show how to change from a typical row seating configuration to collaborative group pods to encourage teamwork and interaction. Another example may show how a cramped or congested seating arrangement makes it hard for people to move around and talk to each other. It could also show how a more open, strategic structure could make it easier for people to work together and get to know one another. In other cases, better ventilation or cooling systems may be needed to keep people comfortable when it is hot outside.

3. Setup and Configuration

- A total of 189 Grade 5 students were randomly selected through the fishbowl technique to have an equal chance of selection. A researcher-made questionnaire validated by educational research experts was used in collecting data. The instrument consisted of three sections: demographic profile, assessment of the physical learning environment in color, lighting, seating accommodation, acoustics, and temperature, and learners' classroom engagement, such as behavioral-social and social-affective engagement. A five-point Likert scale (1–Strongly Disagree to 5–Strongly Agree) assessed response, and reliability testing through JAMOVI software generated Cronbach's alpha values of 0.701 to 0.856 across the various factors, signifying good internal consistency. Dr. Ronaldo A. Pozon, Nueva Ecija Division Superintendent, Dr. Noemi C. Sagcal, District Supervisor, and all the school principals involved permitted to conduct the study. Ethical clearance was obtained from the University Research Ethics Committee, and permission from parents and school guarantees the safeguarding of student privacy and rights.

4. Step-by-Step Execution

- The workshop will begin with an introduction to the study's origins, objectives, and relevance, focusing on the necessity to investigate the impact of color, lighting, seating arrangement, acoustics, and temperature on the classroom participation of Grade 5 students in Cabiao, Nueva Ecija. To improve participation, focus, and mental health in the classroom, it will stress the importance of understanding these things. Using a verified questionnaire, Pearson's correlation coefficient, and weighted mean, the main results will show how to measure each factor. Suggestions based on facts for making learning spaces more fun and stimulating will emphasize the highest-rated components, those that require work, and those that strongly relate to engagement.

5. Data Collection

- The completed questionnaires gave us primary data. Letters granted permission to investigate the physical learning environment and students' level of involvement in class.

6. Evaluation and Iteration

- All five factors of the physical learning environment, color, lighting, seating arrangement, acoustics, and temperature, were strongly linked to the behavioral-social and social-affective engagement of fifth-grade students. Being involved, working together, focusing, and feeling emotionally connected to learning are all better in these types of classrooms. Lighting and seating were the most effective ways to encourage participation, underscoring their importance in creating comfortable, interactive learning environments. The study's outcomes show the importance of a classroom with good lighting, adjustable seating, low noise levels, comfortable temperatures, and pleasing colors to encourage students to join and behave well.

7. Conclusion and Next Steps

- The study shows that seating arrangement, acoustics, and temperature affect classroom engagement, with a poor physical learning environment resulting in lower performance during class. Classroom arrangements that enhance visibility and engagement, limit noise to support focus, and maintain suitable temperatures can improve learning outcomes. While color and lighting had no direct influence, they may still affect mood, attention, and engagement and can be improved to provide a more engaging learning environment. Next, teachers should use bright and pastel colors, optimize seating, decrease classroom noise, and use fans, windows, and curtains to maintain suitable temperatures. This study should include more grade levels, private schools, classroom size, wall displays, and technological integration in future research.

RESULTS & DISCUSSION

- The study found that classroom involvement is linked to the physical learning environment. Five environmental factors (color, temperature, lighting, seating arrangement, and acoustics) had significant positive correlations with behavioral-social and social-affective engagement ($r = 0.177$, $p = 0.013$, $r = 0.295$, $p < 0.001$, $r = 0.328$, $p < 0.001$, and $r = 0.278$, $p < 0.001$, respectively). More favorable settings in these areas are associated to increased Grade 5 student participation, cooperation, attentiveness, and pleasant emotional connections. Kassab et al. (2024), Barri and Moatasim (2020), and Che Ahmad et al. (2018) all talk about how important it is for the design of the classroom, the lighting, and the ability to move around in the chairs to keep students interested and motivated. According to them sound and temperature can affect a student's comfort and ability to focus.

CONCLUSION

- Results show that physical learning environments enhance class engagement, collaboration, attention, and peer relationships. The research shows that creating engaging, comfortable, and welcoming physical learning environments is important for increasing learners' participation. These methods may make learning fun. Further research is needed to implement these ideas in schools and communities. The classroom color, acoustics, and temperature may impact student social involvement. Results show that physical learning environments enhance class engagement, collaboration, attention, and peer relationships. The research emphasizes the need to offer engaging, comfortable, and welcoming learning environments to encourage participation. These methods can help students enjoy learning. More in-depth research is needed to implement these ideas in schools and communities.

RECOMMENDATIONS

- To maintain the behavioral-social and social-affective engagement of the students, teachers should update and enhance the physical learning environment. Just like having colorful school supplies that excite students. Teachers may also use electric fans, open windows, and shaded desks to cool classrooms. Proper artificial lighting is necessary, particularly on cloudy days. Classroom illumination should be checked by facility management to guarantee learning. Cluster seating encourages collaboration and learning. Flexible classrooms may simplify interactive and cooperative activities when organized and accessible. Schools should ban unnecessary class banter to minimize distractions. Sound-absorbing materials reduce outside noise and enhance indoor sound. Hands-on, interactive classes that promote active listening and involvement may thrill students. Clear expectations, positive reinforcement, and a supportive classroom

are essential. Especially when students make errors, teachers should be patient, fair, and polite. This study should cover other grade levels, private schools, classroom size, wall displays, and technology integration in future research.

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