

**Environmental Factors: Their Level of Influence on Nursing  
Students' Academic Engagement**

## **Introduction**

### **Background of the Study**

Indoor environmental quality (IEQ) significantly shapes students' learning experiences. IEQ encompasses physical conditions in study environments, including lighting, temperature, noise, ventilation, and available space, all of which affect comfort, concentration, and overall academic functioning. Well-regulated indoor environments enhance cognitive efficiency and sustained engagement, whereas poor conditions can hinder learning performance and reduce motivation. Over the past decade, home environments have become important in education, particularly with the rise of online and hybrid learning.

Nursing students face rigorous academic and clinical demands requiring sustained cognitive, emotional, and behavioral engagement. Balancing theoretical coursework, clinical exposure, and practical skill development makes the learning environment especially critical. However, many students studying at home encounter challenges such as excessive noise, inadequate lighting, uncomfortable temperatures, limited study areas, and technological distractions. These stressors reduce focus, increase fatigue, and negatively affect academic engagement, making consistent study habits and productivity more difficult to maintain.

Previous research confirms that environmental conditions influence student performance. High temperatures and poor ventilation reduce cognitive efficiency, task performance, and motivation. Noise exposure decreases reading comprehension, memory retention, and sustained attention. In the Philippine context, household and community noise—such as karaoke or loud music—disrupts home-based learning, while poor lighting contributes to eye strain and fatigue, further reducing learning effectiveness. Crowded or poorly designed study spaces also impede focus, particularly for students living in small households. Persistent environmental stressors have been shown to impair nursing students' engagement, increasing stress and reducing participation in academic tasks.

Creating an effective home learning environment requires adequate space, ventilation, lighting, and thermal comfort. Minimizing distractions supports concentration, well-being, and academic productivity. Despite existing research on environmental conditions and student performance, limited studies have specifically examined the relationship between indoor environmental factors and academic engagement among Filipino nursing students. This study therefore aims to determine the influence of selected indoor environmental factors—including noise, lighting, temperature, study space, and technological distractions—on the academic engagement of nursing students in the Philippine context.

## **Statement of the Problem**

This study aimed to determine the environmental factors that influence the academic engagement of nursing students and to assess the coping mechanisms they use, along with the effectiveness of these strategies.

Specifically, this study aimed to answer the following questions:

1. What is the level of environmental factors experienced by nursing students in terms of:
  - a. Noise level
  - b. Lighting and Temperature
  - c. Study Space and Crowding
  - d. Technological Distractions
2. What is the level of academic engagement among nursing students in terms of:
  - a. Affective
  - b. Cognitive
  - c. Behavioral
3. Is there a significant relationship between the environmental factors and academic engagement among nursing students?

## **Hypothesis**

$H_0$ : There is no significant relationship between environmental factors and academic engagement among nursing students.

## **Theoretical Framework**

This study was anchored on the Study Demands-Resources Model and the Key Antecedents and Consequences of Study Engagement Model. These frameworks explain how environmental factors influence academic engagement by acting as either demands or resources. Environmental demands such as noise, poor lighting, and crowded spaces may reduce students' energy and focus, leading to decreased engagement. On the other hand, supportive environmental conditions serve as resources that enhance motivation, concentration, and persistence in learning tasks. When students are aligned with their learning environment, their engagement increases, resulting in improved academic outcomes and well-being.

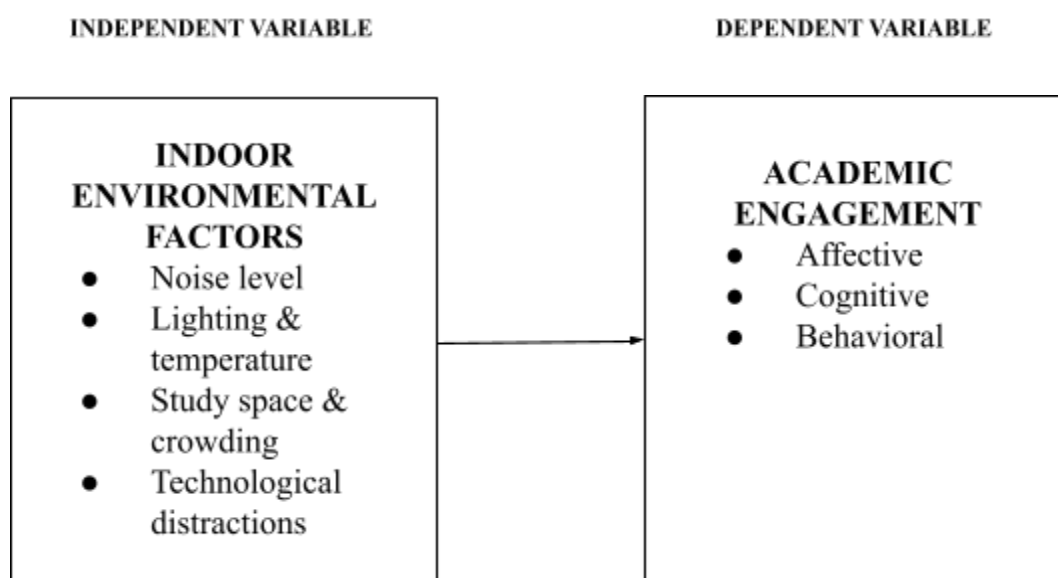
## **Conceptual Framework**

This study examined indoor environmental factors as determinants of nursing students' academic engagement. Conditions such as noise, lighting, temperature, study space, and technological distractions influence cognitive, emotional, and behavioral functioning. These factors affect the affective, behavioral, and cognitive dimensions of engagement, where favorable environments enhance motivation, attention, and participation, while unfavorable conditions reduce engagement and hinder learning. In this study, environmental factors serve as independent variables, and academic engagement is the dependent variable.

Figure 1 illustrates the hypothesized relationship between these variables.

**Figure 1.**

*Relationship of the Variables under Study*



### **Definition of Terms**

The following terms are defined as they are used in this study to provide clarity and consistency.

**Environmental Factors** refer to external social and physical conditions that affect an individual's performance, comfort, and behavior, including lighting, noise, temperature, space, and technology (Fishbein et al., 2019). In this study, it refers to indoor conditions in the nursing students' home environment, including noise level, lighting, temperature, study space, crowding, and technological distractions. It was measured using a 5-point Likert scale and categorized based on mean scores.

**Noise Level** refers to the amount and intensity of unwanted sound that can interfere with learning, concentration, and academic performance (Basner et al., 2014). In

this study, it refers to disturbing sounds that may distract students and was measured using a 5-point Likert scale, classified as high, moderate, or low.

**Lighting** refers to the use of natural or artificial light to improve visibility and visual quality (Langeek Inc., n.d.). In this study, it refers to the adequacy of illumination in the study area and was measured using a 5-point Likert scale, classified as adequate, moderately adequate, or inadequate.

**Temperature** refers to the degree of hotness or coldness (National Geographic Society, 2023). In this study, it refers to the comfort of room temperature and was measured using a 5-point Likert scale, classified as comfortable, moderately comfortable, or uncomfortable.

**Study Space** refers to a designated area where students can study effectively (Sheridan College Library & Learning Services, 2025). In this study, it refers to the adequacy, orderliness, and privacy of the study area and was measured using a 5-point Likert scale, classified as adequate or inadequate.

**Crowding** refers to having too many people or objects in a space, causing discomfort (Fiveable Inc., n.d.). In this study, it refers to the number of people sharing the study space and was measured using a 5-point Likert scale, classified as high, moderate, or low.

**Technological Distractions** refer to interruptions caused by devices and social media that reduce focus (Rosen et al., 2013). In this study, it refers to distractions from gadgets and was measured using a 5-point Likert scale, classified as high, moderate, or low.

**Academic Engagement** refers to the energy, attention, and persistence students bring to learning (Karki et al., 2020). In this study, it refers to students' participation and commitment and was measured using a 5-point Likert scale, classified as high, moderate, or low.

**Affective Engagement** refers to students' emotional responses such as interest and motivation (Navarro et al., 2024). In this study, it refers to students' emotional involvement and was classified as high, moderate, or low.

**Behavioral Engagement** refers to observable actions such as participation and effort (Loyola-Carrillo et al., 2025). In this study, it refers to students' participation and persistence and was classified as high, moderate, or low.

**Cognitive Engagement** refers to thinking processes such as reflection and problem-solving (Navarro et al., 2024). In this study, it refers to students' use of critical thinking and was classified as high, moderate, or low.

### **Significance of the Study**

This study was beneficial to the following:

***Nursing Students.*** This study will help students understand how environmental factors influence their academic engagement and improve their study habits, focus, and performance.

***Family Members.*** This study will help family members understand their role in supporting students by creating a conducive learning environment.

***Nurse Educators.*** This study will provide insight into how environmental factors affect student engagement and help improve teaching strategies.

***School Administrators.*** This study will guide administrators in improving learning environments, facilities, and policies.

***Dean.*** This study will help in improving institutional policies and programs to support student engagement.

***Future Researchers.*** This study will serve as a basis for further research on academic engagement and environmental factors.

### **Scope and Limitations**

This study used a quantitative descriptive-correlational design to examine how environmental factors—noise, lighting, temperature, study space, crowding, and technological distractions—affect the academic engagement of second-year BSN students at a private college during the Academic Year 2025–2026. A total of 220 respondents were selected from 513 students via stratified random sampling. Data were collected using a structured Google Forms questionnaire and analyzed with descriptive and inferential statistics. Findings are limited to second-year BSN students at the selected college and only include the specified environmental factors. Self-reported responses and reliance on student availability may affect data completeness and generalizability. Future studies should include other institutions, year levels, and variables for a broader understanding of academic engagement.

## **Review of Related Literature**

This chapter presents relevant literature and studies that strengthen the rationale of the present research. It also provides a synthesis of related concepts and a review of related studies to establish the foundation of the study.

### **Related Concepts**

#### **Noise**

Noise refers to unwanted sound that disrupts concentration and academic engagement. Exposure to high noise levels increases cognitive load and reduces mental resources for study, negatively affecting comprehension and performance (Chere & Kirkham, 2021; FBE, 2021). Studies show that noise mapping and sound management can minimize distractions and improve cognitive engagement (Huang, Liu, & Meng, 2022; Liang et al., 2025). Local research confirms that household and community noise in the Philippines impairs focus and academic performance among college students (Vevencio et al., 2023; Zoleta & Sacabin, 2022; Piamonte et al., 2021).

#### **Lighting**

Lighting—both natural and artificial—affects visibility, mood, and cognitive performance. Inadequate lighting causes eye strain, fatigue, and reduced attention, which can lower academic engagement (Golmohammadi et al., 2021; Lech, 2023). Proper lighting improves focus, motivation, and learning outcomes, with natural light

particularly enhancing attention and exam performance (Porras, 2020; Miranda et al., 2024). Local studies in the Philippines report noncompliance with recommended illumination levels, emphasizing the need for adequate lighting in classrooms (Alvarez & Nawang, 2020).

### **Temperature**

Thermal comfort significantly influences learning. Optimal temperatures (23–26°C) promote concentration and motivation, while extreme heat or cold impairs focus and engagement (Boelcke, 2022; Park & Goodman, 2020). In the Philippines, high temperatures disrupt learning, reduce motivation, and affect concentration in both online and blended learning settings (Factores, 2025; Sali et al., 2025).

### **Study Space**

A well-organized study space supports concentration, collaboration, and sustained attention. Proper seating, ergonomics, acoustics, and flexible layouts enhance learning effectiveness and academic performance (Lau et al., 2020; Lee et al., 2023; Kansal et al., 2023). Local studies show that libraries and campus spaces designed to meet students' cognitive and ergonomic needs positively affect productivity and engagement (Beneyet-Dulagan & Cabonero, 2023).

### **Technological Distractions**

Digital devices can facilitate learning but may also divert attention when used for non-academic purposes. Frequent notifications, social media, and multitasking reduce

focus, self-efficacy, and academic performance (Aslam & Akhtar, 2020; Flanigan & Gol, 2023; Liu, 2022). Managing device use through self-regulation and digital literacy strategies is crucial for maintaining engagement.

### **Academic Engagement**

Academic engagement includes behavioral, affective, and cognitive dimensions, influencing student success. Environmental factors such as noise, lighting, temperature, and study space directly affect engagement and learning outcomes (Fernandez et al., 2021; Refugio Husay & Escote, 2025). Digital distractions and broader environmental stressors, such as climate-related disruptions, can further reduce focus and participation (Catama et al., 2025; Ferma, 2025).

### **Affective Dimension**

Affective Dimension: Emotional involvement in learning, including motivation and interest, is critical in nursing education. Emotional competencies and support from instructors help students manage stress, remain motivated, and maintain engagement (Alkharj et al., 2024; Hwang & Kim, 2022; Villan & Cunanan, 2025; Cabag & Legaspi, 2025).

### **Behavioral Dimension**

Observable actions such as class participation, attendance, task completion, and self-regulation reflect dedication and positively influence academic outcomes. Online and blended learning contexts further highlight the need for self-discipline and organized

study routines (Schnitzler et al., 2020; Gao et al., 2020; Magallanes, 2022; Cabrejas & Mendoza, 2023; Cullantes et al., 2020).

### **Cognitive Dimension**

Mental investment in learning, including critical thinking, problem-solving, self-regulation, and strategic study, is essential for professional preparation. Nursing students' readiness for independent learning and positive learning attitudes are strongly associated with problem-solving skills and academic adjustment (Yao, 2021; Garcia, 2020).

### **Related Studies**

#### **Noise**

Noise refers to unwanted sounds that disrupt concentration. Excessive noise, whether from household activities or community sources, reduces students' focus and academic performance (Knauf Insulation, 2022; Hoang et al., 2022). Instruments measuring Indoor Environmental Quality (IEQ) consistently highlight noise as a key factor affecting learning (Taleb et al., 2023; Toyinbo et al., 2023). In the Philippines, domestic noise has been identified as a significant stressor for students, impacting attention and productivity (Piamonte, 2022; Oducado, 2021).

#### **Lighting**

Adequate lighting improves visibility, reduces eye strain, and enhances cognitive functioning (Boelcke, 2022). Studies show that LED lighting combined with natural light

enhances attention, productivity, and learning speed (Mogas-Recalde, 2020). Proper lighting supports both cognitive processing and emotional readiness to learn.

**Temperature:** Thermal comfort affects concentration and cognitive efficiency. Excessive heat or cold can impair learning, leading students to focus on regulating body temperature rather than processing information (Goodman et al., 2020; Folkerts et al., 2020; Santiago, 2025). Maintaining moderate temperatures improves engagement and learning outcomes.

### **Study Space**

Organized, quiet, and personalized study spaces promote focus and productive study habits, while cluttered or noisy spaces hinder concentration (Kamat et al., 2024; Ambubuyog et al., 2025). Adequate study environments facilitate sustained engagement and academic performance.

**Technological Distractions:** Excessive use of digital devices, social media, and notifications divides attention and reduces learning efficiency (Flanigan et al., 2023; Zhang et al., 2023). Students need self-regulation and awareness to manage these distractions and maintain engagement.

### **Academic Engagement**

Environmental factors strongly affect students' academic engagement and performance. Noise, lighting, and temperature influence concentration, with excessive noise, poor lighting, and uncomfortable temperatures reducing focus and engagement (Hoang et al., 2022; Bustamante-Mora et al., 2025). Indoor environmental quality, including ventilation and air quality, also impacts cognitive performance, as poor

conditions can cause fatigue (Miri et al., 2025). Local studies show that noise, lighting, temperature, and study space arrangement affect nursing students' learning efficiency (Jasa, 2024). Technological distractions further reduce focus, highlighting the need for digital literacy and self-regulation (Martin et al., 2025). Peer and instructor support enhances engagement, emphasizing the combined role of social, instructional, and physical environments (Elsayed et al., 2023).

### **Affective Dimension**

Refers to emotional involvement in learning, including motivation and interest. Physical comfort (lighting, temperature, noise) and minimized technological distractions enhance students' emotional readiness and positive attitudes toward learning (Hoang et al., 2022; Yuen et al., 2023; Lomibao et al., 2024).

### **Behavioral Dimension**

Refers to observable participation in learning activities. Favorable environmental conditions—adequate lighting, moderate temperature, and low noise—support attention, task completion, and active participation, improving overall academic behavior (Mudenda et al., 2021; Tian et al., 2021; Al-Kumaim et al., 2021).

### **Cognitive Dimension**

Refers to mental investment, critical thinking, and effective learning strategies. Proper environmental conditions enhance attention, comprehension, and information

processing, supporting independent learning and problem-solving (Gamiao, 2021; Solina et al., 2021; Cubero & Villocino, 2021).

### **Synthesis**

Environmental factors—noise, lighting, temperature, study space, and technological distractions—significantly influence nursing students’ academic engagement. Noise and household or community disturbances reduce concentration, comprehension, and focus (Chere et al., 2021; Hoang, 2022; Vevencio et al., 2023). Poor lighting and extreme temperatures decrease attention, motivation, and cognitive performance, while adequate light, proper ventilation, and comfortable conditions enhance alertness and readiness (Sadrizadeh & Holmberg, 2022; Al-Kumaim et al., 2021; Porras, 2020). Well-structured, orderly study spaces support focus and productivity, whereas cluttered environments hinder participation (Lau, 2020; Beneyet-Dulagan et al., 2023). Technological distractions, including social media and notifications, further reduce engagement (Flanigan & Gol, 2023; Martin et al., 2025). Collectively, favorable conditions improve behavioral, cognitive, and emotional engagement, but few studies examine all these factors together in Filipino nursing students, highlighting the need for further research.

## **Methodology**

### **Research Design**

This study employed a quantitative descriptive-correlational design using a survey method to examine the influence of environmental factors on nursing students' academic engagement. This design describes existing conditions and identifies relationships among variables without manipulation, allowing observation of natural correlations. Specifically, it assessed the impact of noise, lighting, temperature, study space, crowding, and technological distractions on second-year nursing students, classified by sex.

### **Study Setting**

The study was conducted at a private college in Iloilo City, an urban area with accessible transportation, commercial centers, and residential zones that may influence student engagement. The population included 513 second-year nursing students enrolled in the Academic Year 2025–2026. The institution offers modern classrooms, laboratories, libraries, and study areas, enabling evaluation of both supportive and obstructive environmental conditions.

## **Population and Sampling**

### **Population**

The study population comprised 513 second-year nursing students enrolled in a private College of Nursing. The participants met the following criteria:

#### ***Inclusion Criteria***

The respondents were the following:

1. Second-year students pursuing a Bachelor of Science in Nursing (BSN) who were officially enrolled in a private college institution in Iloilo City during the Academic Year 2025–2026.
2. Regular students who were enrolled during the second semester.
3. Nursing students who provided informed consent to participate in the study.

#### ***Exclusion Criteria***

The following participants were excluded from the study:

1. Students who participated in the pilot study.
2. Students from other academic programs or institutions.

### **Sampling**

The primary respondents were second-year nursing students enrolled in a private College of Nursing in Iloilo City during the Academic Year 2025–2026. The population

consisted of 513 students (107 males and 406 females). Using the Raosoft Sample Size Calculator (5% margin of error, 95% confidence level), the sample size was determined to be 220 students (46 males, 174 females) (Raosoft Inc., 2004). Stratified random sampling was used to ensure proportional representation across all sections, with students from the pilot study (approximately 30 respondents) excluded. Second-year students were selected due to their increased academic workload and initial clinical exposure, making them suitable for examining environmental factors and academic engagement.

The formula used to determine the sample size for each stratum is presented below.

$$n_h = N_h / N \times n$$

Where:

$n_h$  = sample size of sub-population in a stratum

$N_h$  = population size of sub-population in a stratum

$N$  = total population (513)

$n$  = total sample size (220)

*Chart 1. Distribution of Respondents according to Sex*

<b>Sex</b>	<b>N</b>	<b>%</b>	<b>n</b>
Male	107	20.9	46
Female	406	79.1	174
<b>Total</b>	<b>513</b>	<b>100</b>	<b>220</b>

The total number of second-year male nursing students was 107. From this population, a sample size of 46 respondents was determined from the sampling formula below:

$$n_h = \frac{107}{513} \times 220 = 45.89 \text{ or } 46$$

The total number of second-year female nursing students was 406. From this population, a sample size of 174 respondents was determined from the sampling formula below:

$$n_h = \frac{406}{513} \times 220 = 174.11 \text{ or } 174$$

### **Instrument**

A structured questionnaire was adapted to collect data on environmental factors and academic engagement.

Part 1: demographic profile (sex)

Part 2: environmental factors (32 items across lighting, noise, temperature, study space, technological distractions), rated on a 5-point Likert scale (1 = Never to 5 = Often)

Part 3: academic engagement (affective, behavioral, cognitive dimensions), rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree)

The questionnaire was administered online via Google Forms. Content validity was confirmed by three expert validators, and revisions were made based on their suggestions.

### ***Validity of the Instrument***

Validity refers to how accurately an instrument measures the construct it intends to assess (Ahmad et al., 2020). In this study, content validity ensured that the

questionnaire items adequately represented the variables under investigation. Since the items were adapted from established instruments, validation focused on clarity, relevance, accuracy, and cultural appropriateness for nursing students.

The instrument was reviewed by a panel of three experts, including a master's degree holder in Nursing, using the Survey Instrument Validation Rating Scale (Oducado, 2020), based on Good and Scates (1972). Mean scores were interpreted on a five-point scale: Excellent (4.21–5.00), Very Good (3.41–4.20), Good (2.61–3.40), Fair (1.81–2.60), Poor (1.00–1.80). Revisions were made based on expert feedback, and the Content Validity Index (CVI) was computed. An acceptable CVI confirmed the instrument's suitability for data collection.

### ***Reliability of the Instrument***

Reliability refers to the consistency and stability of an instrument under similar conditions (Zakariya, 2022). Ethical approval was obtained per the Philippine National Health Research System Act of 2013 (RA 10531). Pilot testing involved 30 nursing students from another college with similar characteristics, who were excluded from the actual study to prevent bias.

Internal consistency was assessed using Cronbach's Alpha Coefficient, with values  $\geq 0.70$  considered acceptable. Subscales scoring below 0.70 were revised to improve clarity and consistency. Through this process, the final instrument was deemed reliable and appropriate for the study.

## Data Gathering

Ethical clearance was obtained from the Research Ethics Committee, and approval was secured from the research adviser and dean. The questionnaire, prepared on Google Forms, was distributed through class presidents, and respondents were given 10–15 minutes to complete it. Follow-ups were made for incomplete responses, and confidentiality and the study's purpose were explained. The instrument included demographic information, environmental factors, and academic engagement, with the latter two measured on a five-point Likert scale. Responses were recorded, coded, and analyzed after collection.

## Data Analysis

In this study, the data gathered were analyzed systematically to ensure alignment with the research objectives. Descriptive statistics were used to describe the characteristics, while inferential statistics were employed to determine the degree and direction of relationships among the variables (Gray & Grove, 2021).

To analyze the descriptive data, the following statistical tools were utilized:

***Frequency and Percentage.*** Described respondents' demographic profile by sex.

***Mean.*** Calculated the average scores for environmental factors (noise, lighting, temperature, study space, technological distractions) and academic engagement, with higher scores indicating higher levels.

***Standard Deviation.*** Assessed variability of responses to determine whether perceptions of environmental factors and engagement were similar or varied.

To analyze the inferential data, the following statistical tools were used:

***Kolmogorov–Smirnov Test.*** Checked data normality ( $p > 0.05$  indicated normal distribution).

***Independent Samples *t*-test:*** Tested differences in academic engagement by sex.

***Spearman’s Rho Correlation:*** Determined the strength and direction of the relationship between environmental factors and academic engagement among second-year nursing students.

### **Ethical Consideration**

The study was reviewed and approved by the Research Ethics Committee of Iloilo Doctors’ College. Classified as minimal-risk research, it involved only structured questionnaires. Ethical principles—including autonomy, beneficence, non-maleficence, and justice—were strictly observed.

**Benefits:** Findings provide insights on environmental factors affecting nursing student engagement and may guide strategies to improve learning environments.

**Risk Assessment:** Minimal risk; participants could skip any uncomfortable questions.

**Informed Consent:** Participation was voluntary; respondents were informed of their rights, including withdrawal at any time.

**Privacy and Confidentiality:** Responses were coded; data were stored on password-protected devices and used solely for academic purposes.

**Incentives:** None provided; participation was voluntary.

**Data Storage and Disposal:** All data stored securely for five years, then disposed of according to institutional policy.

**Community Contribution:** Results may guide educators, administrators, and policymakers in enhancing nursing education.

**Conflict of Interest:** None declared; all research processes conducted impartially.

**Dissemination Plan:** Findings presented to the college, submitted to the library, shared at research activities, and planned for academic conferences or journals.

**AI Disclosure:** Grammarly improved grammar and clarity; ChatGPT assisted in literature identification and research frameworks; Google Scholar was used for sourcing references. All content was reviewed for accuracy and originality by the researchers.

## Results and Discussion

### Descriptive Analysis

#### Profile of the Respondents

Table 1 shows the demographic profile of the respondents based on sex. A total of 220 respondents participated in the study. Most respondents were female (79.1%), while males comprised a smaller proportion (20.9%).

**Table 1**

*Distribution of Respondents According to Demographic Profile of Second-Year Nursing Students (n = 220).*

Sex	<i>f</i>	%
Male	46	20.9
Female	174	79.1
Total	220	100

#### Level of Environmental Factors Experienced by Nursing Students

Table 1 shows the mean responses for environmental factors experienced by nursing students. Overall, the factors were rated high ( $M = 3.98$ ), indicating that most respondents perceived their study environment as generally conducive to learning, supporting concentration, comfort, and engagement.

Among the domains, lighting, temperature, and study space received the highest ratings, suggesting that respondents studied in well-lit, thermally comfortable, and organized environments (Elsaed et al., 2023; Villan & Cuanan, 2025; Miranda et al., 2024).

In contrast, noise, technological distractions, and crowding had relatively lower mean ratings, though still within the high range. Environmental noise from households or communities occasionally disrupted concentration, aligning with research identifying noise as a barrier to effective learning (Swargiary et al., 2023; Vevencio et al., 2023). Technological distractions, such as mobile notifications and social media, divided attention and interrupted engagement, supporting literature on the dual effects of technology in education (Dontre, 2021; Liu, 2022).

Crowding was a minor concern, indicating that shared study environments only occasionally affected comfort and concentration, consistent with findings that limited privacy may influence learning conditions (Beneyet-Dulagan et al., 2023).

Overall, these results underscore the importance of well-structured, comfortable, and minimally distracting study environments for nursing students, whose education demands sustained attention, critical thinking, and extensive cognitive processing.

## **Table 2.**

*Level of environmental factors commonly experienced by nursing (n=220)*

	Items	Mean	Description
<b>Lighting</b>			

The level of lighting in my study area allows me to see clearly what is around.	4.48	High
The level of lighting (from lamps, computer screen) in my study area allows me to have visual comfort.	4.41	High
I can control the level of lighting in my study area when taking online classes.	4.25	High
		Mean 4.38 / 5.0 (High)

**Temperature**

The temperature in my study area allows me to be comfortable and concentrate.	4.24	High
The air quality in my study area is appropriate.	4.18	High
I can control the temperature in my study area.	3.80	High
		Mean 4.07 / 5.0 (High)

**Study Space**

I feel comfortable while learning in my study environment.	4.40	High
I have my own study place.	4.35	High
I have a home learning-friendly environment.	4.10	High
I am at peace during class because it's quiet around me.	4.04	High
I have a spacious study environment.	4.02	High
I have an open study space where other people are lounging while I study.	3.29	Average
I share study space with my siblings.	2.80	Average
		Mean 3.86 / 5.0 (High)

**Technological Distractions**

I get distracted by my phone apps.	4.23	High
I get distracted by having my phone next to me.	4.14	High
I get distracted by my phone notifications.	4.13	High
Using my phone distracts me from tasks that are tedious or difficult.	4.09	High
I get distracted by my phone even when my full attention is required on other tasks.	4.02	High
Using my phone distracts me from negative or unpleasant thoughts.	4.01	High
Using my phone distracts me from doing unpleasant things.	3.99	High
Using my phone distracts me when I'm under pressure.	3.98	High
I use several applications on my phone while working.	3.87	High
I can easily follow conversations while using my phone.	3.77	High
I think a lot about checking my phone when I can't access it.	3.67	High
I often walk and use my phone at the same time.	3.63	Average
I get anxious if I don't check messages immediately on my phone.	3.52	Average
I get distracted with what I could post while doing other tasks.	3.46	Average
I often talk to others while checking what's on my phone.	3.41	Average
I get distracted by thinking how many likes and comments I will get while doing other tasks.	2.83	Average
		Mean 3.80 / 5.0 (High)

**Noise**

I have privacy in my study area when taking online classes.	4.15	High
The noise level (coming from devices, people's talks, external sources) in my study area allows me to concentrate.	3.62	Average

I can control the noise level in my study area.	3.56	Average
	Mean 3.78 / 5.0 (High)	
	Overall Mean 3.98 / 5.00 (High)	

Table 2 shows that the overall mean for environmental factors was 3.98, indicating a generally favorable learning environment. Students perceived their study conditions as supportive of academic activities.

Among the factors, lighting scored the highest ( $M = 4.38$ , High), suggesting adequate illumination for visual comfort. Temperature ( $M = 4.07$ , High) indicates that most students felt comfortable and able to concentrate. Study space ( $M = 3.86$ , High) was generally conducive, though some items—like sharing space with siblings or open study areas—were rated Average, reflecting minor privacy challenges.

Technological distractions ( $M = 3.80$ , High) were commonly experienced, mainly from mobile phones. Noise ( $M = 3.78$ , High) received the lowest mean; while conditions were generally acceptable, some students reported difficulty controlling noise. Overall, environmental factors were rated high, though variations in noise, study space, and digital distractions may still affect learning experiences. These results provide a basis for examining their relationship with academic engagement.

### **Level of Academic Engagement among Nursing Students**

Table 3 shows that overall academic engagement was high ( $M = 4.14$ ), indicating that students actively participate in learning, demonstrate emotional investment, and process materials cognitively. Among the dimensions, cognitive engagement ( $M = 4.22$ ) was highest, followed by affective engagement ( $M = 4.20$ ) and behavioral engagement in classroom participation ( $M = 4.10$ ). These results suggest students exert mental effort to

understand concepts, maintain positive attitudes, and engage in class activities, consistent with prior studies on deeper learning and professional readiness (Gulzar et al., 2022; Nazamud-din et al., 2020; Wong et al., 2024).

Lower-rated items included behavioral engagement in completing tasks outside class, group participation, and persistence with challenging tasks, though still within the high range. This indicates that structured classroom activities promote strong engagement, while independent and collaborative tasks may be less consistent, influenced by distractions, workload, and external demands (Hussain et al., 2021; Martin et al., 2025).

Overall, nursing students demonstrate high cognitive, affective, and behavioral engagement. Enhancing behavioral engagement in independent and collaborative learning could improve overall academic involvement. These findings highlight the importance of minimizing distractions and designing supportive learning environments to foster active, self-directed learning.

**Table 3.**

*Level of academic engagement among nursing students (n=220)*

Items	Mean	Description
<b>Cognitive Dimension</b>		
When I start an assignment, I think about the things I already know about the topic because that helps me understand better.	4.37	High
When I am doing an activity, I make sure I understand as much as possible.	4.33	High
When I read the material given by the teacher to do my homework, I try to distinguish the most important information instead of just reading the text.	4.21	High

I think of several ways to solve a task and then choose the best option.	4.20	High
When I solve assignments, I reflect on what I have learned and try to gain a new understanding of what I know.	4.18	High
I think about what I need to learn before I start working on the task.	4.16	High
In learning tasks, I always try to ask myself questions because they help me understand central aspects of the subject.	4.15	High
When I finish a task, I think about whether I have achieved the goal I had set for myself.	4.13	High
		Mean 4.22 / 5.0 (High)

<b>Affective Dimension</b>		
I feel a sense of satisfaction when I complete assignments in class.	4.44	High
What we do at school is very important to me.	4.37	High
I am always curious to learn new things and I enjoy doing the activities.	4.27	High
I enjoy learning and am interested in the subjects and learning activities.	4.20	High
Tasks proposed for my learning are engaging and motivate me to do them.	4.20	High
In the classroom, the content and activities are interesting and engaging.	4.07	High
I am very interested in studying new subjects, because it is pleasing to me.	4.06	High
I feel excited when we start a new topic in class.	4.01	High
		Mean 4.20 / 5.0 (High)

<b>Behavioral Dimension</b>		
I use different strategies to understand what the teacher teaches and to do the activities.	4.23	High
I listen attentively to the teacher's explanations about the task to be solved.	4.20	High
I don't give up easily on homework.	4.20	High
I really try hard in class and on homework.	4.15	High
I concentrate hard when the teacher introduces new topics or assignments.	4.13	High
I can concentrate on what the teacher is explaining in class.	4.05	High
I am attentive during class discussions.	3.99	High
I try to answer the teacher's questions.	3.86	High
I always participate in class discussions to solve assignments.	3.79	High
In the discussion of new topics, I actively participate and defend my opinions.	3.78	High
I ask questions to the teacher when I do not understand the content of the class.	3.77	High
		Mean 4.01 / 5.0 (High)
Overall Mean 4.14 / 5.0 (High)		
Legend: Low (1.00 to 2.33), Average (2.34 to 3.66), High (3.67 to 5.00)		

Table 3 shows that the overall academic engagement of nursing students ( $n = 220$ ) was high ( $M = 4.14$ ), indicating strong involvement across cognitive, affective, and behavioral domains. Among the dimensions, Cognitive Engagement was highest ( $M = 4.22$ ), followed by Affective Engagement ( $M = 4.20$ ), while Behavioral Engagement scored slightly lower ( $M = 4.01$ ) but remained high.

Within the Cognitive Dimension, students reported exerting effort to understand lessons thoroughly and identify key information, reflecting deeper thinking and effective learning strategies. In the Affective Dimension, students expressed satisfaction in completing assignments and recognized the value of academic tasks, indicating positive attitudes toward learning. Behavioral engagement showed that students listened attentively and employed strategies to understand lessons, though participation in asking questions and defending opinions was somewhat lower.

Overall, nursing students demonstrate high engagement, particularly in cognitive and emotional involvement, providing a basis for examining how environmental factors influence engagement.

### **Relationship between Environmental Factors and Academic Engagement among Nursing Students'**

Table 4 presents the Spearman's rank correlation results, showing a moderate positive correlation between environmental factors and academic engagement ( $r_s = 0.380$ ,  $p < 0.001$ ), which is statistically significant. The null hypothesis ( $H_0$ ) that no relationship exists is therefore rejected.

This indicates that students in favorable study environments—adequate lighting, comfortable temperature, organized study spaces, manageable noise, and minimal technological distractions—tend to exhibit higher cognitive, affective, and behavioral engagement. While environmental factors are not the sole determinants of engagement, they significantly support focus, participation, and overall learning involvement.

These findings align with prior research emphasizing that well-structured environments enhance attention, concentration, and learning outcomes (Ogunleye & Adebayo, 2020; Swargiary et al., 2023; Adeyemi, 2020; Klatte et al., 2021). Optimizing both home and academic settings can therefore promote sustained engagement, effective processing of learning materials, and improved academic performance among nursing students.

**Table 4.**

Relationship between the environmental factors and academic engagement among nursing students

	Academic Engagement
Environmental Factors	rs = 0.380 p < 0.001*
*Sig at 0.05	

Table 4 shows the Spearman Rank-Order Correlation between environmental factors and academic engagement. Results revealed a moderately positive and statistically significant correlation (rs = 0.380, p < 0.001).

This indicates that more favorable environmental conditions—such as adequate lighting, comfortable temperature, organized study spaces, noise control, and fewer

technological distractions—are associated with higher engagement across cognitive, affective, and behavioral dimensions. While environmental factors are not the sole determinants of engagement, they play an important role in supporting students' learning involvement.

Since  $p < 0.05$ , the null hypothesis that no significant relationship exists is rejected, confirming a meaningful relationship between environmental factors and academic engagement among nursing students.

## **Summary, Conclusions and Recommendations**

### **Summary**

This chapter presents the summary of findings, conclusions, and recommendations on the influence of environmental factors on the academic engagement of nursing students in a private college in Iloilo. The study aimed to assess environmental factors—noise level, lighting and temperature, study space and crowding, and technological distractions—and determine students' academic engagement in affective, cognitive, and behavioral dimensions. It also examined whether a significant relationship exists between environmental factors and academic engagement.

A descriptive correlational research design was used to describe existing conditions and determine the relationship between environmental factors and academic engagement without manipulating variables. The study involved 220 second-year nursing students, selected through stratified random sampling from a total of 513, and data were collected using adapted questionnaires to assess the influence of environmental factors on academic engagement.

### **Findings**

Most respondents were female nursing students, with males comprising a smaller proportion, reflecting the common gender composition in nursing education and indicating the findings largely represent female experiences. Regarding environmental factors, respondents generally experienced favorable learning conditions, with lighting

and temperature receiving the highest ratings. Adequate lighting enabled visual comfort for academic tasks, while appropriate temperatures improved physical comfort and concentration.

Most respondents had comfortable and organized study spaces, though some experienced minor issues with privacy and focus in shared or open areas. Noise levels were generally acceptable, but some struggled with surrounding conversations, household activities, or electronic devices. Technological distractions, such as notifications and social media, were common and occasionally affected focus.

Nursing students demonstrated high academic engagement across affective, cognitive, and behavioral dimensions. The cognitive dimension was highest, reflecting active learning strategies and mental effort. The affective dimension showed positive feelings toward learning, while the behavioral dimension, though still high, was slightly lower in participation behaviors.

A moderate, statistically significant positive relationship was found between environmental factors and academic engagement ( $r_s = 0.380$ ,  $p < 0.001$ ), indicating that more favorable environments were associated with higher engagement. The null hypothesis was rejected, confirming environmental factors significantly related to nursing students' academic engagement.

## **Conclusions**

Based on the findings of the study, the following conclusions were drawn:

The study concluded that nursing students experience favorable learning environments, especially regarding lighting, temperature, and study space, which

positively support concentration and participation in academic tasks. Despite these positive conditions, noise and technological distractions remain minor challenges that can occasionally affect focus and learning efficiency, highlighting the importance of well-managed study environments at home and school.

Nursing students demonstrated high academic engagement, particularly in the cognitive and affective dimensions, reflecting strong motivation and mental involvement. Behavioral engagement, such as active participation in class discussions, was slightly lower. Most importantly, environmental factors were significantly related to academic engagement. While not the only determinants, these factors meaningfully influence students' focus, participation, and involvement.

The study emphasizes that supportive physical learning environments can enhance academic engagement among nursing students.

### **Recommendations**

Based on the findings and conclusions of the study, the following recommendations are proposed:

**For nursing students.** Develop study habits that minimize distractions, such as designating quiet areas, limiting mobile phone use, and practicing effective time management.

**For family members.** Support a conducive home environment by providing adequate lighting, ventilation, quiet study spaces, and reducing household noise during study hours.

**For nurse educators.** Use interactive teaching strategies, case discussions, and collaborative activities to enhance behavioral, cognitive, and emotional engagement.

**For school administrators.** Improve campus facilities with well-lit classrooms, proper ventilation, adequate study spaces, and reduced environmental distractions to boost student engagement.

**For the dean.** Regularly evaluate policies and academic programs to ensure a supportive learning environment and invest in facilities and student support initiatives.

**For future researchers.** Conduct studies with larger samples and multiple institutions, and explore additional factors such as psychological, social, and instructional variables to better understand academic engagement.

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