

Study of the Physical Environment that Impacts Students' Stress According to the Healing Environment Concept Case Study: Faculty of Architecture, KMITL

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Abstract

Information from the psychiatrist of the KMITL's institute found that students from the Faculty of Architecture, KMITL, were admitted to the treatment of stress mental health problems amounted to 100 people over a period of one year, where architecture and physical environment play an important role in increasing stress or avoiding the effects of stress (Chuengsatsongsap, 2017, p. 18). This study aimed to

1) investigate factors of the physical environment that affect students' stress. 2) present guidelines for improving the primary physical environment impacting student stress.

Therefore, the healing environment concept was used as a guideline for solving the problem, according to the interviews with students of the Faculty of Architecture, KMITL, to find guidelines to improve the basic physical environment that help avoid the impact on stress.

This study was qualitative research collecting data by surveying the physical environment in the teaching area, rest area and activity area of the Faculty of Architecture, KMITL, and observing usage area behaviour of students by taking notes, recording

pictures and focused-group interviews with students about the causes of stress, problems of physical environment factors and needs for improving physical environment of students of Faculty of Architecture, KMITL, that has an impact on stress. The obtained data were analyzed for guideline to improve the basic physical environment. Results from a survey and interview with students of the faculty of Architecture, KMITL, about the physical environment factors that affect the stress including 1) not enough light to used, 2) colour inside the building is too white and the old colour condition looks pale, 3) noise from neighbouring classrooms and noise from nearby boat traffic, 4) non-ventilated air inside building and the odour that is unsatisfactory, 5) congestion of area and furniture layout and other factors such as thoroughfare, teaching and learning communication equipment, work area out of school time that affect usage and affect stress.

Keywords: *Healing Environment, Stress, Students of Faculty of Architecture*

1. Introduction

Stress is an emotional or emotional state when a person faces problems and feels uneasy. Worry, fear, anxiety, when people are aware of or evaluate these problems. Or cause harm to the body, resulting in physical and mental balance)Pornjirasilp, 2011.(Higher education is a period in which thought processes are developed. Adaptation to the school environment is an age with a change in lifestyle, greater responsibility, faced with pressures and worries about studying, exams, submitting projects due to rushing times and constraints. in various matters) WongThai, 2014, pp.4-5.(

Psychiatrists from the Faculty of Medicine ,KMITL, gave information that the students of the Faculty of Architecture were quite difficult to treat. Because the lack of rest makes the treatment with medication quite difficult and slow to work. may be at risk for depression. Faculty of Architecture There is a policy called Repair, Build, Determination of the Sustainable Budget System during 2018-2021 to improve the quality of the physical environment of the Faculty of Architecture. Because the physical environment is also associated with good quality of life. And in this policy, it addresses the mental health of students. to reduce the risk of depression caused by stress student pressure. Therefore, the researcher foresees the adoption of the concept of the healing environment as a guideline to improve the basic physical environment factors that reduce the factors affecting stress among students of the Faculty of Architecture, KMITL. It is a theory that guides the design or improvement of the physical environment to reduce the stress of the occupants of the facility.

2. Objective

1) *To study the factors of physical environment affecting student stress.*

2) *To suggest ways to renovate the basic physical environment that affects students' stress.*

3.Theory

Stress is an emotional or emotional state when a person faces problems and feels uneasy. Worry, fear, anxiety, when people are aware of or evaluate these problems. Or cause harm to the body, resulting in physical and mental balance.

Healing environment is an environmental design that contributes to treatment. Therefore, the environment affects the

positive role of human beings. Relax the environment, increase health, lower heart rate, lower breathing and lower blood pressure. Environmental factors can avoid the influence of stress.

1) Air quality affects human behavior that will change according to the weather. For example, hot weather results in a feeling of irritability. This also includes poor indoor air quality, foul odors, humidity, and ventilation. Indoors should be ventilated with door and window openings rather than circulating under air conditioners which may accumulate germs causing respiratory infections (Chakraphand,1999).

2) Noise affects health and spirit. Noise pollution is a very high frequency. Damage to the hearing system, leading to physiological changes, such as hypertension. In addition, there are risks to spirit and work efficiency (Chakraphand,1999).

3) Lighting is provided in the working environment, especially those working in the building will receive light. Light intensity, also known as light brightness, has a profound effect on the functioning of the eye muscles as well as the optic nervous system. or the intensity of light that is more or less than that specified by the standard called inappropriate lighting If given continuously for a long time, causing many problems such as eye pain, burning eyes, and indirect consequences are the destruction of the nervous system, causing stress) Siyangnok, 2013 p.2).

4) Color has a great relationship with emotional stimulation. Depression also affects their color choices. The colors of positive emotional reactions are usually cold, and the warm colors are orange, blue, orange and purple. Hot colors, such as red or yellow, stimulate emotions, but they tend to feel higher energy)Sevda Korkmaz, 2016. p 47). Colors have an influence on the soul. Notice

that colors give a beautiful, bright atmosphere, such as the golden glow of the sun, the color of the sea, often creating a feeling of warmth and happiness. Therefore, color has an influence on humans) Thepnoo ,2018 .pp15-16).

5) Congestion is a psychological response. Or are negative feelings (negative feelings) that result from density. It is a feeling that arises from human perception. There are several factors that contribute to the feeling of congestion, such as the feeling of being crowded due to the crowd. cramped building Limited usable space Lack of personal space, etc., which affects stress) Harayangkoon et al.,2013 pp229-231.

6(The landscape, if viewed in a large way It is the design of the urban community ever. But if you look at it in a small form, it may be just landscaping. Healing Garden is another term that is heard more often. Landscaping, landscaping, to look beautiful, have the beauty of natural plants, small and large, with stones, ponds, streams, fountains. Waterfalls and natural sunlight combined, the healing garden could be a health garden. which is a natural way to heal the mind) Chuengsathiensap , 2010, p.31(.

7 (Social support environment refers to information and object. Spiritual support from individuals or group of people a result, the patient's behavior shows that the way they want is healthy here. Social support may come from family members, such as parents, siblings, colleagues, students and teachers. The impact of social support on mental and physical health. Social support can improve people's ability to deal with life problems. It also helps to reduce stress and improve personal resistance (Chuengsathiensap ,2010, pp44-48).

Related research

Researcher/ ResearchName	Research Type	Research Results
WongThai, P. 2014 STRESS IN UNDERGRADUATE STUDENTS OF FACULTY OF ARCHITECTURE CHULALONGKORN UNIVERSITY	Quantitative Research	Most students are in moderate stress. The factors associated with stress are: too much amount of schoolwork, infrequent meeting between teacher and student about project designs and students' increasing age.
Boonpume, N. 2010 STRESS AND COPING OF THAI TRADITIONAL MEDICINE STUDENTS OF RAJAMANGALA UNIVERCITY OF TECHNOLOGY THANYABURI	Quantitative Research	Most students manage stress in a positive way is to accept the truth. And a number of students managed negative stress by venting emotions such as breaking things, shouting loudly, but not often.
Researcher/ ResearchName	Research Type	Research Results
Pongyen, N, and Waroonkun, T. 2014 DESIGN GUIDELINES FOR IMPROVING OUTPATIENT BUILDING OF A COMMUNITY HOSPITAL IN ORDER TO INCREASE SATISFACTION	Mixed Research	Building users focus on factors that affect negative feelings by first focusing on sensory factors such as lighting. Odor, second to indoor use factors Environmental beauty factors and treatment process factors
Juthamas, M. 2017 A STUDY OF PROBLEMS AND SOLUTION GUIDELINES FOR ARCHITECTURAL CLASSROOM BUILDING IN BANGKOK UNIVERSITY	Qualitative Research	The most problematic part is the school building, the classroom has insufficient space for students' use, and the limited equipment and equipment are not enough to meet the students' needs.

4. Research Methodology

This study was aimed at exploring physical environments that impact mental health among students from the Faculty of Architecture, KMITL, in order to recommend guidelines for improvement by using the healing environment concept. This qualitative research used surveys, observations and focus groups.

4.1 Area Scope and Key Informants

The scope of the area included areas used for education, relaxation and other activities of the Faculty of Architecture. The key informants were 30 students from the Faculty of Architecture who were informants in focus groups on 28 October 2020 and 6, 12, 15 November 2020.

4.2 Research Instruments

The instruments used in this study were in two categories, namely, recording instruments for physical environment surveys and focus groups as follows:

4.2.1 Physical environment survey and behavioral observation recording instruments were a camera and a notebook. The researcher walked, surveyed and recorded data in areas used for education, relaxation, other activities and observed student behavior.

4.2.2 The focus group recording form was developed from analysis of data from field surveys of physical environments that impact stress and observation of behaviors among students from the Faculty of Architecture, KMITL. The focus group recording form used by the researcher in in-depth interviews contained content regarding utilization behaviors, causes of stress, physical environments and recommendations on modification of physical environments that impact stress among students from the Faculty of Architecture.

4.3 Data Collection Methods

4.3.1 The researcher entered the area to survey physical environments in the lecture room (Lecture Hall), the library (Lecture Hall), the laboratory (Lecture Hall), the cafeteria, hallways in education buildings (Lecture Hall, Integrated Building and the Department of Fine Arts Building), the computer laboratory (Integrated Building) and the surroundings of the Faculty of Architecture. The researcher observed the behaviors of students in the Faculty of Architecture by taking photographs and taking unstructured field notes for the first time on 11 November 2019 between 9:00 am – 2:00 pm for four hours. In addition, the researcher entered the area to survey the physical environments that impact stress and observed utilization behaviors of students from the Faculty of Architecture for the second time on 26 October 2020 to find guidelines for improvement and develop focus group instruments.

4.3.2 The researcher held focus group discussions with students from the Faculty of Architecture and collected in-depth data regarding problematic physical environments and behaviors of students from the Faculty of Architecture. The researcher entered the area to conduct in-depth interviews and observe the behaviors of 30 students from the Faculty of Architecture, KMITL, on 28 October 2020 and on 6, 12 and 15 November 2020. The interviews covered content concerned with utilization behaviors, causes of stress, physical environments and recommendations for modification of physical environments at the Faculty of Architecture that impacts students' stress.

5. Research Findings

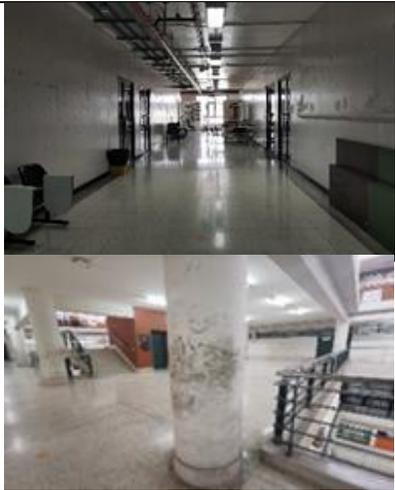
5.1 Area Survey of the Faculty of Architecture, KMITL

The data were obtained from surveying the lecture room (Lecture Hall), the library (Lecture Hall), the laboratory (Lecture Hall), the cafeteria, hallways in education buildings (Lecture Hall, Integrated Building and the Department of Fine Arts Building), the computer laboratory (Integrated Building) and the surroundings of the Faculty of Architecture. The researcher analyzed physical environments that impact stress consisting of lights, colors, sounds, air quality and overcrowding. These five factors were obtained from the literature review and the factors can impact stress if the factors cause negative feelings and have no response from use. From the survey of the area, the researcher found the following problems.

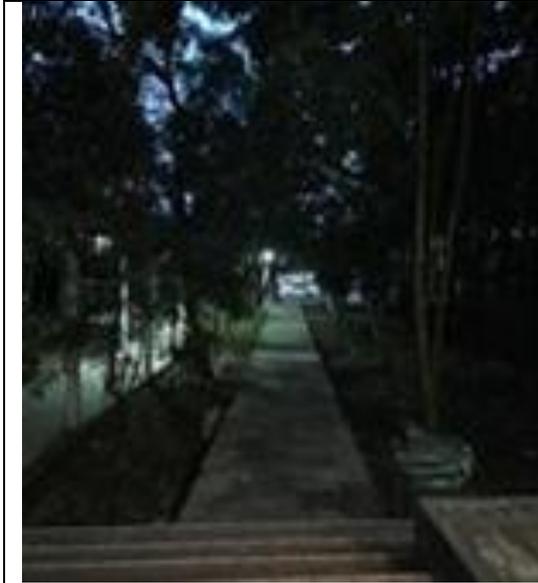
Table 1 – Data from Area Survey

Images from the Survey	Survey Data
	<p>Lecture Rooms (Lecture Hall)</p> <ul style="list-style-type: none"> - Some rooms do not have full lighting. - Room paint is old white paint with stains on the walls. - Unused items and furniture are placed at the sides, which may cause feelings of clutter and narrow space. - Some room walls do not hold sound, causing sounds from nearby rooms to be heard.
Images from the Survey	Survey Data
	<p>Laboratory (Lecture Hall)</p> <ul style="list-style-type: none"> - Lights are not spread, which may cause lights to be

	<p>insufficient for drawing designs.</p> <ul style="list-style-type: none"> - Room paint is old and does not motivate work. - Some pieces of furniture are damaged. - Unused items are placed at the sides, which may cause feelings of clutter and narrow space
	<p>Library (Lecture Hall)</p> <ul style="list-style-type: none"> - Poor lighting between bookshelves cause bookshelves to feel narrower. - The paint, the floor, the walls, the ceiling and the furniture look official, not relaxing and does not encourage reading. - Official-looking furniture models may not be comfortable and relaxing. <p>The furniture arrangement appears crowded. Reading tables and chairs are too closely placed</p>
	<p>Cafeteria</p> <ul style="list-style-type: none"> - There are few vendors, causing the lunch break to be crowded. In addition, vendors are available only

	<p>at one side of the cafeteria, causing people to choose to sit at the side with the cafeteria rather than the other side of the cafeteria.</p>
	<p>Computer Laboratory (Integrated Building)</p> <ul style="list-style-type: none">- The paint on the floor, walls, ceiling and the furniture is white, causing the laboratory to look like a science laboratory. This does not encourage creativity. <p>Lights at the front of the room should be capable of dimming to clearly see projector images.</p>
	<p>Hallways (Lecture Hall, Integrated Building, Department of Fine Arts Building)</p> <ul style="list-style-type: none">- Lighting is dark and does not cover every point. Hallways have insufficient natural light, causing hallways to look dark and do not boost awareness.

	
<p>Images from the Survey</p>	<p>Survey Data</p>
	<p>Hallways (Lecture Hall, Integrated Building, Department of Fine Arts Building)</p> <ul style="list-style-type: none"> - Most of the paint is old white paint with stains on the wall. When combined with green doors, this causes the building to feel more like a hospital than a school building. - Some of the hallways, such as those in the Lecture Hall, do not have many openings, causing hallways to lack ventilation and have a damp odor.
	<p>Surroundings of the Faculty of Architecture, KMITL</p> <p>-The Faculty of Architecture, KMITL, has an advantage from having many trees and ponds, causing the area to feel cool, shady and relaxing. Students came to sit and rest at various points with seats. If made to be more attractive, students may show interest in the area as a place</p>



for relaxing. However, this may have effects at night because heavy tree cover causes the area to be dark and have a frightening atmosphere.

Source: The Researcher (2020)

5.2 Focused-group interviews Data

According to data from a focus group discussion with 30 students who provided data concerning physical environments, which consisted of five factors, namely, lights, colors, sounds, air quality, overcrowding and other recommendations, issues, problems and solutions with the following details were summarized in Table 2:

5.2.1 General Data of Key Informants

1. Causes of stress were from students' personal factors, heavy workloads when studying, lack of sleep, inability to keep up with work, personal pressure and lack of progress at work.

2. Regularly used areas in the Faculty were the Lecture Hall, shared workspaces, the cafeteria, the basement of the 4-story building, studios of the Department of Architecture and the Department of Interior Architecture, the Integrated Building, the Department of Fine Arts Building and the library.

Table 2 – Focused-group interviews Data

Studied	Problem	Recommendations	from
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Variable		Interviewees
1. Light	<p>Lecture Rooms (Lecture Hall)</p> <ul style="list-style-type: none"> - Room lights cause students to feel drowsy and sleepy. The center of the room does not have as much light as the sides. <p>Library (Lecture Hall)</p> <ul style="list-style-type: none"> - The lighting between bookshelves is inadequate. When looking for a book, students have to squint. The narrow distance causes students to feel that bookshelves are dead ends. <p>Laboratory (Lecture Hall)</p> <ul style="list-style-type: none"> - Design Drawing Laboratory Lights are not evenly dispersed, causing drawing work to be unclear. Students have to squint to focus. This causes pain after a long time. <p>Hallways (Lecture Hall, Integrated Building, Department of Fine Arts Building)</p> <ul style="list-style-type: none"> - Hallways are not well-lit, causing students to feel depressed and unmotivated before entering class. Hallway atmospheres are similar to an abandoned building, causing the 	<p>Lecture Rooms (Lecture Hall)</p> <ul style="list-style-type: none"> - Rooms should have lights at the center to provide even lighting in the sitting area. <p>Library (Lecture Hall)</p> <ul style="list-style-type: none"> - Lights should be dispersed throughout the library or the furniture arrangement should be changed to be consistent with old light positions to allow light access. <p>Laboratory (Lecture Hall)</p> <ul style="list-style-type: none"> - Lights should be arranged evenly throughout the room and furniture arrangements should be modified to be consistent with light positions to prevent overhead shadows when sitting and drawing. - The drawing room on the 4th floor of the Lecture Hall should have more lights or shafts to allow natural light in. <p>Hallways (Lecture Hall, Integrated Building, Department of Fine Arts Building)</p> <ul style="list-style-type: none"> - More lights should be added to hallways in the building or warm white lights should be added to walls to create a livelier atmosphere. <p>Paths Outside the Building (At Night)</p> <p>Lights should be added to every</p>

	<p>building to appear narrow and unsafe, particularly in the evening.</p> <p>Paths Outside the Building (At Night)</p> <p>The Faculty's paths are lit at only certain points at night, causing students to feel afraid and concerned about danger.</p>	<p>point on paths outside buildings at night and not only at certain points.</p>
Studied Variable	Problem	Recommendations from Interviewees
2. Color	<p>Lecture Rooms (Lecture Hall)</p> <ul style="list-style-type: none"> - There is too much white (all-white), which does not create motivation and causes a sleepy atmosphere when studying. <p>Library (Lecture Hall)</p> <ul style="list-style-type: none"> - The colors of the floor, walls and the furniture are not relaxing; rather they are boring and more stressful. Color shades look old without any identity. - Tabletops should be in a bright color such as white, which is more comfortable for the eyes than dark brown wooden tables. <p>Hallways (Lecture Hall, Integrated Building, Department of Fine Arts Building)</p> <ul style="list-style-type: none"> - Indoor colors are all white, causing hallways to feel like 	<p>Lecture Rooms (Lecture Hall)</p> <ul style="list-style-type: none"> - Colors related to the Faculty or material colors should be included in building components and details without overusing in order to create more awareness. <p>Library (Lecture Hall)</p> <ul style="list-style-type: none"> - Color tones and material colors should be changed to be more modern, stimulating for reading, relaxing and attractive for use. - The Lecture Hall's interior should be repainted to look clean. Colors should be added according to building components and specifications. Posts should be changed from having a white color to having the Faculty's sepia-and-white color to feel lighter or a color that boosts awareness with

	<p>hospital hallways: comfortable but not lively (Lecture Hall) Colors are not improved, causing hallways to appear old and depressing.</p>	<p>possible graphic images related to designing work and philosophical words to inspire students.</p>
3. Sound	<ul style="list-style-type: none"> - Chatter from outside classrooms or sounds from people speaking into microphones in nearby rooms disturbs students when studying, causing students to lose concentration and feel irritated. - Sounds from deficient air conditioners in classrooms are disturbing. 	<ul style="list-style-type: none"> - Walls should be made to be thicker or use soundproof materials with covers for wall power sockets to prevent sound from escaping. - Air conditions may need to be checked to solve the problem.
4. Over crowding	<ul style="list-style-type: none"> - Close furniture arrangements in the library caused the library to feel crowded and narrow. When standing up, students have to pay attention to people around them. - The cafeteria at lunch has many people, few vendors and seats. Students have to stand and wait to buy food for a long time, causing students to feel crowded and busy. 	<ul style="list-style-type: none"> - Furniture arrangements in the library should be spaced to allow for good function with many choices in arrangements for individuals or groups. - Vendors should be increased and dispersed to both sides of the cafeteria to disperse seating choices.

Studied Variable	Problem	Recommendations from Interviewees
4. Over crowding	<p>Students have to be concerned about time needed to go to afternoon classes.</p> <ul style="list-style-type: none"> - Fine arts students have insufficient exhibition and drawing space, causing concerns about separating space when there is activity. 	<ul style="list-style-type: none"> - Exhibition and drawing areas for fine arts students should be added or expanded.
5. Air Quality	<ul style="list-style-type: none"> - Shafts in classrooms are usually not opened and the Lecture Hall does not have many opening shafts, causing damp odors. - Dust gathered at window sills, curtains and unused items causes effects on the eyes. In particular, when working in front of a computer screen, this causes students to have sties or eye irritation. - Cigarette smoke in the building area causes odors and uncomfortable breathing. - Unventilated odors from paint and used chemicals cause health impacts. - Odors from the canal next to the cafeteria cause students to lose appetite. 	<ul style="list-style-type: none"> - When classrooms are not used, doors and windows may be opened to vent air outside. - Window sills and curtains should be cleaned. Unused items should be removed from the building or placed in a storage area. - Smoking areas should be placed far from the Lecture Hall. - Ventilation should be provided for work that requires use of chemicals or openings should be added to buildings. - Fragrant trees should be planted on the banks of the canal next to the cafeteria and dish positions should be changed to a more enclosed area.
6. Other Factors	<ul style="list-style-type: none"> - Lack of supporting space for work outside class hours causes 	<ul style="list-style-type: none"> - Areas should support 24-hour work by students with

	<p>significant anxiety. Most work is group work. Separation causes inconvenient communication about work and, for large scale work, dormitory space is not sufficient; creates inconvenience for students.</p> <ul style="list-style-type: none"> - Damaged and fallen tiles from indoor passages for students to be careful for safety and concerned about more damage when walking. 	<p>diverse work area models to allow discussion with fellow students or allow students to work alone while facilitating simple access and use. Air conditioners may not be necessary and work areas may be open air with sufficient lights at night.</p> <ul style="list-style-type: none"> - Damaged floor tiles should be repaired or re-laid if fallen off for safety.
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Studied Variable	Problem	Recommendations from Interviewees
	<ul style="list-style-type: none"> - Footpaths cannot be used. This forces students to share the road with cars, do students do not feel safe. Furthermore, damage to traffic surfaces on the sidewalks makes students worried about tripping and falling when walking, particularly when hurrying to deliver work. 	<ul style="list-style-type: none"> - Damaged traffic surfaces on footpaths should be made smooth with a rough surface to prevent falling. Overgrown areas should be cleaned to be attractive for walking and sidewalks should be expanded to be functional with clear division of traffic modes. - Education equipment such as computer projectors should be modified to be convenient for use when teaching and when students present work.

	 <p>- The quality of education equipment such as computer projectors used in classroom presentations makes equipment difficult to use. Equipment has problems, causing students to feel irritated when turning equipment on to use, so students feel that learning is not smooth. Screens have deviant and unclear colors, which forces students to focus eyesight.</p>	
<p>7. Other Recommendations</p>	<p>- Most stress is caused by work. Students mostly relax from stress by talking with friends. With areas that support sitting and talking in a good environment, students should have less stress.</p> <p>- New areas should be created for sports, music and singing practice rooms and space for watching movies.</p> <p>- Resting areas under trees should be added for involvement with nature because the atmosphere in the Faculty of Architecture, KMITL, is shady and comfortable due to tree colors.</p>	

Source: The Researcher (2020)

6. Discussion of the Findings, Conclusion and Recommendations

6.1 Discussion of the Findings

In studying environmental factors that impact stress among students at the Faculty of Architecture, the following information was found:

6.1.1 Insufficient lights at the center of lecture rooms (Lecture Hall), the library (Lecture Hall), space between bookshelves, the laboratory (Lecture Hall), hallways (Lecture Hall, Integrated Building and Department of Fine Arts Building) and outdoor paths (at night). The aforementioned areas had effects on eyesight, causing fatigue and aches from focusing in addition to causing fear and anxiety. This is consistent with the theory in that prolonged exposure to excessive or insufficient lighting or inappropriate lighting causes many problems such as pain and eye irritation, including side-effects such as damage to the nervous system resulting in stress (Siyangnok, 2012, p. 2).

6.1.2 The all-white color of the lecture rooms (Lecture Hall), the library (Lecture Hall) and hallways (Lecture Hall, Integrated Building and Department of Fine Arts Building) make the buildings feel like a hospital, meaning the buildings are comfortable, but not lively or motivating. Old and faded paint does not have a fresh feeling attractive for use. According to interviews with students, the students would like more stimulating colors than calming colors. This finding differs from cited researches. One theory states that colors were significantly correlated with emotional stimulation. Furthermore, personal anxiety levels and depression have effects on selections of colors used to trigger positive emotional responses. In general, the colors are cool or warm colors such as orange, blue, grey and purple. Hot colors such as red or yellow trigger emotion.

However, these colors were likely to energize people more (Korkmaz, S., 2016, p, 47).

6.1.3 Noise disturbance from chatter outside classrooms, boats in the river, construction at the sides of the Fine Arts building and deficient air conditioners in class rooms disturb concentration, causing students to feel irritated when studying and when working. This is consistent with the theory stating that sound affects physical and mental health. Noise pollution, such as high frequency rhythms, causes danger for hearing and physiological changes such as high blood pressure, gastrointestinal abnormalities and arrhythmia, etc. Furthermore, noise disturbance is harmful to mental health. Loud noises affects work efficiency (Chakrapan, 1999, Paragraph 16).

6.1.4 In the area of air quality, problems were found due to few openings in the building, poor ventilation, damp odors in classrooms and restrooms. Odors from chemicals and cigarettes in the building cause health problems and difficult breathing. Unpleasant odors from the canal beside the cafeteria and the position for placing dishes after eating cause students to lose appetite. In addition, outdoor areas have no roofs over paths connected to other buildings, faculties and the parking area, causing students to feel hot or wet when it rains. This is consistent with the theory of how air quality affects human behavior based on weather changes. For example, hot weather causes students to feel irritated. When air in the building has poor quality, odors and dampness, the effects are the same. Building interiors should be ventilated with openings, doors and windows rather than air circulation by air conditioners, which may accumulate germs and cause respiratory infections (Chakrapan, 1999, Paragraph 10).

6.1.5 The library is crowded due to close placement of furniture. The cafeteria is crowded with many people at lunch, but there are few vendors and seats, causing students to feel the areas to be narrow and insufficient for use. Unused furniture and items are placed in classrooms and hallways in the buildings, which blocks paths and creates clutter. Exhibition and drawing areas for fine arts students are not sufficient, causing students to have concerns when performing activities. This is consistent with a theory stating that overcrowding is a psychological response or a negative feeling resulting from density and a feeling caused by human perception. Many factors caused feelings of overcrowding such as overcrowding from population density, narrow buildings and facilities, limited space, lack of privacy, etc., which affects stress (Harayangkoon et al., 2013, pp. 229-231).

Physical environments such as lights, colors, sounds, air quality and overcrowding have effects on stress among students from the Faculty of Architecture, KMITL, and other factors such as lack of space to support work outside studying hours. Tiles in the building are damaged. Outdoor passages, foot paths and roads have damaged surfaces. Path size is not functional and educational equipment quality causes negative feelings with effects on students' stress. Furthermore, student stress is caused by personal factors such as heavy workloads, lack of sleep, inability to keep up with work, personal pressure and lack of progress.

6.2 Preliminary Recommendations for Implementation of the Findings

The preliminary recommendations for modification of physical environments of the Faculty of Architecture, KMITL, to reduce factors with impacts on students' stress are as follows:

6.2.1 The center of lecture rooms (Lecture Hall), the space between library bookshelves (Lecture Hall), the laboratory (Lecture Hall), hallways (Lecture Hall, Integrated Building and Department of Fine Arts Building) and outdoor paths (at night) should have sufficient lighting to cover the area, and lights should be properly positioned. Appropriate lighting for education buildings is as follows: 300 lux for classrooms, 100 lux for hallways, 750 lux for drawing rooms, 200 lux for bookshelves and 21 lux for outdoor paths (Illuminating Engineering Association of Thailand, 2019, pp. 45-46).

6.2.2 The colors of walls and furniture of lecture rooms (Lecture Hall) and the library (Lecture Hall) should be changed according to building components with specifications to be colorful, new and lively. Hallways (Lecture Hall, Integrated Building and the Department of Fine Arts Building) should be repainted to be clean by changing indoor colors from all-white to the lighter sepia-and-white color of the Faculty or a stimulating color tone. Building components, specifications and posts should be added to have colors or graphics images related to design in addition to having philosophical words to create inspiration and drive. According to a theory, color has spiritual effects. When observing attractive and bright colors such as the sun's golden light or the color of seawater, humans usually have warm and happy feelings. Therefore, color has effects on humans (Tepnu Tanita, 2018, p. 15-16). Images, artworks and decorations with psychological value and objects of faith with psychological effects are a specific form of physical, psychological and spiritual drive (Jeungsatiansap, 2010, p. 53).

6.2.3 Disturbing sounds from activities that affect classroom learning, workspaces or indoor activities should be minimized. In a theory on development of systems for absorbing indoor noise such as wall, floor or ceiling systems, sound buffering materials such as curtains, carpets, rubber tiles and scientific vinyl rolls or sound-absorbing pads appropriate for buildings should be used. According to the findings of a research, floors and carpets can block more than 70 percent of noise disturbance and light music in a building (Jeungsatiansap , 2010, p. 74).

6.2.4 In the area of air quality, areas inside the Lecture Hall should have air conditioning products in classrooms, restrooms and workspaces to suppress unpleasant odors and air quality in buildings should be improved with fresh air machines or fans. Areas outside the Lecture Hall should be planted with fragrant trees such as herbs. When classrooms are not used, doors and windows should be opened to ventilate air. Improving air quality with fragrance from herbs that have healing properties or aromatherapy can calm emotions after improving air quality (Jeungsatiansap, 2010, p. 42).

6.2.5 To reduce overcrowding in the Faculty of Architecture, KMITL, library furniture should be arranged for convenient spacing and use with seating arrangements that allow a variety of choices ranging from individual seats to group seats. The cafeteria should have more vendors dispersed on both sides of the cafeteria to prevent students from clustering at one point. Exhibition and drawing areas for fine arts students should be sufficient for the number of students. According to a theory on preventing overcrowding, overcrowding can be solved by area management to increase use, modification of areas to have more privacy and furniture arrangements with spacing for convenient use. Furniture

models should be changed to have sizes that conserve space in addition to being furniture that can be hidden, folded and stacked. Seats should be arranged to allow individual or group seating choices (Horayangkoon et al., 2013. p. 229-231).

6.2.6 The landscape should be modified to be attractive by using natural plants with rocks, ponds, streams, fountains, waterfalls and natural sunlight. Healing gardens that use natural healing should be created (Jeungsatiansap, 2010, p.31). The Faculty of Architecture should modify the landscape to be attractive and increase seats under trees or improve the scenery to allow students to relax in a natural setting.

6.2.7 The Faculty of Architecture should have recreational areas such as sporting areas, music and signing practice rooms, movie viewing space and areas that support students to sit, talk and exchange opinions in addition to allowing students to perform activities together. Social support, information support, material support or mental support from individuals or groups can help the recipient perform or express desirable behaviors, which means good health in this situation. Social support may come from family members such as parents, siblings or colleagues.

Modification of physical environments at the Faculty of Architecture, KMITL, will reduce stressful factors for students. This is consistent with a theory by Jeungsatiansap (2010, p. 56) who stated that stress is a major factor given consideration in medical treatments. Therefore, creating relaxing environments is key to improving health recovery and creating more attractive workplaces.

Remarks: The researcher will use the preliminary recommendations for modification of physical environments that

impact stress among students from the Faculty of Architecture in further designs and questions to users.

6.3 Recommendations for Future Studies

In this study, the researcher studied only physical environments that impact stress among students from the Faculty of Architecture, KMITL. According to the findings, physical environments that impact stress were caused by lack of safety, which caused fear and anxiety. Therefore, in future studies, the researcher recommends using physical environment safety theories to study the physical environments of the Faculty of Architecture, KMITL.

References

Boonpume,N.(2010). Stress and coping of Thai traditional medicine students of Rajamangala University of Technology Thanyburi Master of Science degree program. Department of Social Science and health system management college Silpakorn University.

Chakraphand ,S.)1999). Environment and mental health.Retrieved from Gopher:

<http://www.healthcaethai.com>

Chuengsathiensap, K.)2010). Healing Environment. Retrieved from Gopher

https://www.hfocus.org/sites/default/files/files_upload/cp0000031_-_filecpg.pdf

Chuengsathiensap, K and PhænSomboon, B.)2017.(Healthcare Healing Environment Design) 2nd year.(Health Systems Research Institute,page18.Retrieved from Gopher

[ttp://164.115.27.97/digital/files/original/b91787b76d97fdca38e3432208683966.pdf](http://164.115.27.97/digital/files/original/b91787b76d97fdca38e3432208683966.pdf)

Lighting Association of Thailand.)2019). Guidelines for Indoor Lighting Design.Retrieved from Gopher :

<https://drive.google.com/file/d/10SMqKdSLBFWdn22uyfxenGjDtiZQo5RR/view>

Management Faculty of Architecture Sripatum University page 5-15 Retrieved from Gopher :

<http://dspace.spu.ac.th/handle/123456789/4313?locale=th>

Mark P. McCahill. (1991). Evolution of Internet Gopher. Retrieved from Gopher: <file:///C:/Users/User/Downloads/download.pdf>

Matujej, J. (2017). A Study Of Problems And Solution Guidelines For Architectural Classroom Building In Bangkok University. Master of Architecture Program Thesis. Department of Interior Architecture Bangkok University.

Pongyen, N, and Waroonkun, T. (2014). Design guidelines for improving outpatient building of a community hospital in order to increase satisfaction. academic journal environment design.1(2),49-62. Retrieved from Gopher :

Pornjirasilp, S.(2011). Stress and how to relieve stress Retrieved from Gopher :

<https://pharmacy.mahidol.ac.th/th/knowledge/article/47/>

<https://so02.tci-thaijo.org/index.php/jed/article/view/68322>

Rangyangkun,W, et al., (2013). environmental psychology,2rded., Bangkok.G.B.P

Center Co., Ltd.

Thepnoo,T) .2018 (Jewelry design project to soothe the soul Master's Degree Program Thesis.

Jewelry Design Silpakorn University. Retrieved from Gopher :

<http://ithesis-ir.su.ac.th/dspace/bitstream/123456789/1340/1/57157306.pdf>

WongThai, P. (2014).Stress In Undergraduate Students Of Faculty Of Architecture Chulalongkorn University Master of Science Thesis Program in Mental Health, Department of Psychiatry, Faculty of Medicine Chulalongkorn University. Retrieved from Gopher :

<http://cuir.car.chula.ac.th/handle/123456789/45734>

Siyangnok, Y.(2013).Stress Levels Study Of Building Users Who Work In Different Lighting Intensity Case Study : Eternity Building.Master of Science Program Thesis. Major in Building Resource

Sevda Korkmaz. (2016). The correlation between color choices and impulsivity, anxiety and depression. Retrieved from Gopher:

<http://www.ejgm.co.uk/The-correlation-between-color-choices-and-impulsivity-anxiety-and-depression,81905,0,2.Html>