IMPACT OF INTERIOR ARCHITECTURE OF DESIGN STUDIOS ON UNDERGRADUATE STUDENTS' PERFORMANCE

تأثير العمارة الداخلية لأستوديوهات التصميم على أداء الطلاب بمرحلة التعليم الجامعي

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ABSTRACT

University Education is a critical stage in any student's life as it contributes to shaping one's personality, communication skills, and way of thinking as well. The interior design of educational spaces is considered one of the main aspects that have a noticeable effect on the student. As There are important interior design elements of the educational space that affect students' physical comfort and psychological comfort. The main objective of the research is to describe and analyze the interior design elements and their effect on undergraduate student performance during their studio hours. To evaluate the interior design impact on students a questionnaire has been conducted on undergraduate students in the studios of the Faculty of Fine Arts, Cairo, Egypt, in two architecture and décor departments for the five stages. The study results show the impact of the educational interior design on undergraduate students' performance and which aspects have the most influence on their performance based on their responses.

KEYWORDS

Interior architecture; Educational spaces; Built environment

الملخص

يعتبر التعليم الجامعي مرحلة هامة وأساسية في حياة أي طالب حيث يساهم في تشكيل شخصية الفرد، تنمية مهارات الاتصال ويساهم في تطوير طريقة التفكير أيضًا. يعتبر التصميم الداخلي للفراغات التعليمية أحد الجوانب الرئيسية التي لها تأثير ملحوظ على الطالب من عدة نواحي. حيث توجد عناصر أساسية للتصميم الداخلي للفراغات التعليمية مثل الاستوديهات والتي تؤثر على الراحة الجسدية والنفسية للطلاب. يهدف البحث الى تحليل عناصر التصميم الداخلي المختلفة لتلك الفراغات ودراسة تأثيرها على أداء الطلاب الجامعيين بمختلف المراحل الدراسية بداية من الفرقة الاعدادية وحتى البكالوريوس خلال ساعات العمل داخل الأستوديوهات. لتقييم تأثير التصميم الداخلي والعوامل المختلفة المرتبطة به على اداء الطلاب وكذلك رضاهم العام عن تصميم تلك الفراغات، تم إجراء استبيان للطلاب في استوديوهات التصميم بكلية الفنون الجميلة، القاهرة، مصر، تحديداً في أستوديوهات قسم العمارة والديكور. تبين نتيجة الدراسة تأثير التصميم الداخلي لتلك الفراغات على أداء الطلاب وتنتهي بتوضيح الجوانب التي لها التأثير الأكبر على أدائهم طبقاً للدراسة.

الكلمات المفتاحية

التصميم الداخلي؛ الفراغات التعليمية؛ البيئة المبنية

1. INTRODUCTION

University Education is a critical stage in any student's life as it contributes to shaping one's personality, communication skills, and way of thinking as well. One of the main aspects that affect him and play a critical role in an educational space for making education accessible for everyone in the interior design of the built environment.

Interior design affects all users of any educational space and in particular, studios which are being used by the academic staff members, and students of different ages in different stages of university years. This research will focus on studying the interior space of studios as the student spends a considerable number of hours daily based on the nature of the activity with an average of 4 hours daily and sometimes from 6 to 10 hours a day during execution days.

Studies and scientific theories on human intelligence have proved that each interior design user has his physical capabilities, and needs and that there is no specific pattern for human intelligence, which make the interior design of the educational interior space important as it prepares the interior environment for the students to learn and get motivated through the different elements of interior design in an educational space that should correspond to their interests and ideas to reflect on them and motivate their creative abilities.

2. RESEARCH PROBLEM

There are no sufficient studies in Egypt that address neither critical aspects of interior design being considered in undergraduate education facilities and its impact on students' performance nor clearly assess its influences during the design stage. In addition to considering that the perception of each student of the interior design environment is different due to some individual differences which are culture, mental state, social and economic factors, character, visual acuity, experience, and personality.

3. RESEARCH OBJECTIVES

The paper aims to observe the impact of the interior design environment on the students' performance, to consider the interaction between the interior space design elements and the student performance, and to explore the potential of the interior design solutions for providing better environment quality and improving overall students' performance.

The research paper objectives:

- Analyze relatable elements of interior design in undergraduate educational spaces.
- Analyze the factors that affect the human body in an educational interior space.
- Understand the relationship between student performance and interior design elements.
- Analyze the influence of interior design on undergraduate students according to the difference in gender or stage (level 1, middle levels, last year level) of students.

4. LITERATURE REVIEW

4.1 INTERIOR DESIGN FACTORS AFFECTING THE QUALITY OF EDUCATIONAL SPACES

Creating an educational interior space is a critical process for the interior designer as the built interior environment affects the educational experience and social behavior of the students and has a role in the outcomes of students (Tanner & Langford, 2003). As a result, the environment in an educational space should focus on the users (students) who need to educate, communicate, socialize, and achieve physical, psychological, and emotional needs (Fan, 2016). And when the interior design of an interior space meets the requirements of the users of different ages and capabilities it will be a successful interior environment. (Mueller, et al., 1998)

The educational interior space is a built environment for the student in which he spends a considerable number of hours per day in it, therefore it will highly affect his capabilities which will reflect on his productivity, and the student will be affected by the elements of interior design. (Moubarak, Eid, Khalil, 2020) which most of them could be considered as visual appearances such as color and light (Dazkir S., et al., 2011), also affected by thermal, and acoustic comfort, humidity, and indoor air quality. (Bustamante W., et al., 2009)

According to (Caan, 2011), users understand the interior space through their senses and the role of an interior space is to respond to the human needs in an interior space which are safety, peace, and balance, therefore during designing interior stage it is crucial to understand physical, psychological, and emotional human needs. This study will classify the students' needs in an educational interior space into two main types of comfortabilities which affect the student during his presence in the university studios for several hours, which are physical comfort and psychological comfort (Abdulqader M., et al., 2019).

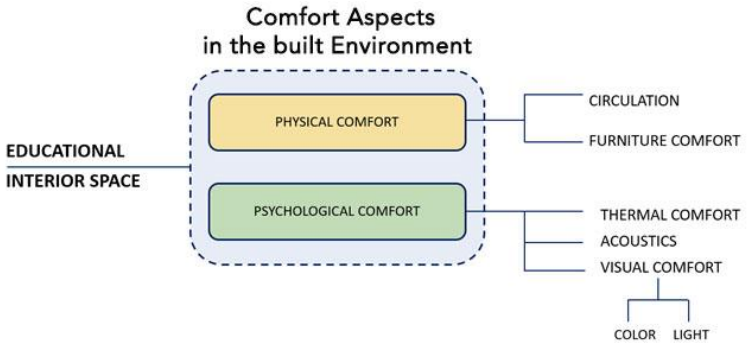

Figure 1: Factors affecting education interior space. (Source: Author)

4.2 PHYSICAL COMFORT

4.2.1 CIRCULATION

Circulation in an education interior space is addressed in two cases, first case is that the architect and interior designer are both paying attention to the human needs through the design process by integrating their views on considering the circulation and movement in the educational space, while considering the interior space accessibility, so they both will be able to achieve the requirements. and consider the given weight to build an adequate space. (Mahmoud, H. T., 2017), (Perolini, P. S., 2011), (Smith, D., et al., 2012)

4.2.2 FURNITURE COMFORT

Furniture comfort in an educational space could maximize productivity, efficiency, safety, and comfort by reducing students' fatigue, stress, accident, and discomfort as it depends on furniture dimensions which are built according to human (student) body parts measurements, (UNESCO 1979) this data named Anthropometry which also covers the various sizes of human body such as the weight of the body, different body positions while standing or moving or stretching (Hari P., 2013)

Anthropometry measures human body in two ways which are static anthropometry such as measuring human body in a static state which changes according to the gender or age and the second way is dynamic anthropometry which is measuring human body during moving or working on activities. (Margono. 2004)

While ergonomics is a science that concerns with human safety, comfortability in an interior space, increasing work speed and reducing fatigue (Nurmiyanto E. 2003) as its the science that understands the interaction between humans and other elements of a system. (N. Skepper, L. Straker and C. Pollock, 2000)

4.3 PSYCHOLOGICAL COMFORT

4.3.1 THERMAL COMFORT

Thermal comfort has been recognized as an important aspect of interior space users' overall comfort. As a result, it is as an important aspect of a student's overall comfort in an educational interior space as improving a learning performance could be optimized by the indoor comfort conditions, (CEN, EN 15251:2007) as thermal comfort depends on air temperature, airflow direction, and opening location, As thermal comfort could be provided by the orientation of the building and also the location of the openings. Also, thermal comfort could be provided artificially in an interior space using HVAC (heating, ventilation, air-condition) terminal systems to improve the interior space thermal comfort. (Chatzidiakou, et al., 2014)

4.3.2 SOUND CONTROL (ROOM ACOUSTICS)

An educational building should be built with proper isolation for the wall, floor, and ceiling coverings to avoid or limit unwanted echo and dead spots as well as control external noise that could move from the exterior environment to the interior e.g. air traffic or highway noise, aircraft, automobiles, trains, machines, generators, etc. that affect the silence of the private interior space as this phenomenon affects the Acoustic comfort of the students in the educational interior space. (Anderson, Sven, 2012)

Poor room acoustics will directly impact students learning, focusing, concentrating, remembering, and academic performance, (Gilavand, et al,2016) (Allen, J., 2017), as this noise is considered a direct distraction for the students (Ariani, M.G.; Mirdad, F., 2015).

When an Educational space develops discomfort that is generated by noise, it could cause students' physical stress and fatigue, due to the tension that it creates. Likewise, noise could produce psychological stress that reflects on the students by feeling irritable or frustrated. (Guardino, et al., 2016).

4.3.3 VISUAL CONTROL

Color

Color plays a key role in affecting undergraduate students' performance in an interior educational space as it can perform a multitude of roles that can affect students' energy level and their sense of disorder during their presence in the educational space, as well as get the feeling of formality or informal, worm space or cool. (Kurt S., et al., 2014, Poore, J.,1994)

The color factor is utilized in the design of an educational interior space depends on the student receiving process through their visual distractions of the color feature which is reflected on the student's visual comfort.

The interior designer should be aware of the effect of each color and know what color to be used to get the desired mood in this interior space, also the shades of the color and tones can create illusions and different effects as if the objects in an interior space take different tones. (Kurt S., et al., 2014)

The designer's decision of using certain color in an education space should be aligned with the cultural aspect as every color may reflect certain references in diverse cultures. for example, white color refers to a totally two different meanings to the people in China and Europe, as people in China see white color as a sad color as they wear white in mourning while in Europe people perceive it as purity and cleanliness. (De Bortoli, M., Maroto, J.,2001)

Lighting (Light)

Lighting quality of interior space directly affects undergraduate students' motivation, achievement, concentration, and cognition in an educational interior space. (Wohlfarth, H.,1986)

Light could be provided naturally and artificially in an interior space, and during daylight natural light could be optimized with artificial lighting to control visual comfort in an educational interior space. As lighting directly and profoundly affects students functioning such as vision, circadian rhythms, mood, and cognition which directly affect students learning and performance in the educational interior space. The quality and color of the lighting can either improve or enhance undergraduate students' visual skills and accordingly their academic performance as the visual impairments could reduce students' behavioral problems and concentration. (Winterbottom, M. et al. 2008).

5. METHODS

The potential impact of different elements of interior design solutions from the student's perspective on the current solutions has been discussed during the study through the case of the Faculty of Fine Arts - Helwan University in Egypt.

This study evaluates the existing condition of interior design of the studios on campus. which has been analyzed by considering the varying needs of diverse user groups, positive and negative effects of the interior design environment on the educational experiences of users. A total of 556 students from all undergraduate stages have participated and responded; they are considered as the sample size of the community.

A programmed questionnaire of twenty-one questions was used to collect data about the current interior design in the studios to observe its impact on the students' performance and get a conclusion about which interior design elements affect the most on the students in educational space. The questionnaire is documented in *Annex 1*.

The study used a questionnaire form as a data collection tool utilizing a five-point Likert Scale to measure all the variables, The scale starts from 1 to 5; 1 means: (very unsatisfied) with the question, and five means: (very satisfied). Therefore, students express their reaction to each item within the scale.

Students' answers to the questionnaire are based on their daily experiences and interactions during studio hours to examine whether these factors influence the students' performance. Then, the questionnaire observes a general data about interior design environment in the studio and their impressions, followed by questions about each element of the interior design that affect its performance.

Table 1: Questionnaire structure & responses (source: author)

Influencing Factors	Question	Likert Scale (Responses)				
		Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
Studio Interior Design	How satisfied are you with the studio's overall interior design?	85	191	236	38	6
	Do you prefer to work for long hours inside the studio?	156	170	139	68	23
	Do you find studio interior design pleasing?	158	193	165	33	7
Circulation	Ease of movement in the studio: good circulation overall	87	159	219	73	18
	Circulation areas between tables are enough and accessible	93	170	191	87	15
	Entrance/Exit doors are enough and reachable	41	65	204	202	44
Furniture	Furniture is comfortable to use for long hours	332	154	59	9	2
	Furniture dimensions are suitable for use	147	113	213	74	9
	Number of tables and chairs suits students' capacity	206	119	154	62	15
Thermal comfort	How satisfied are you with the ambient temperature in the studio	111	116	131	144	54
	How satisfied are you with the temperature impact on your focus and work activity	85	129	207	101	34
Acoustics	How satisfied are you about: Overall acoustic performance in the studio	259	108	120	58	11
	How satisfied are you with External noise (background noise) impacts your focus	186	96	99	112	63
	How satisfied are you with: Sound clarity and quality: echo and dead spots	151	115	191	76	23
Light	How satisfied are you about: Natural sunlight in the studio	72	104	219	121	40
	How satisfied are you with Lighting intensity (lux levels) being suitable for work in the studio	67	101	227	121	40
	How satisfied are you with: Lighting distribution and quality (no glare or reflections)	69	111	216	129	31
Colors	Colors affect my overall mood and perception of space	129	136	206	67	18
	Current colors improve my focus and motivate me to work/study	155	159	179	51	12
	Color selection suits the type of function/activity of the studio	166	160	175	44	11

6. RESULTS & FINDINGS

Factors are identified and classified according to their priority from the questionnaire according to the student's perspective.

Sample responses are segregated as follows: 20.7% respond from the foundation stage, 30.9% respond from year 1, 12.2% respond from year 2, 21.4% respond from year 3, 14.7% respond from year 4, regarding the students' gender, there were 66.2% responds from the female students while 33.8% male students.

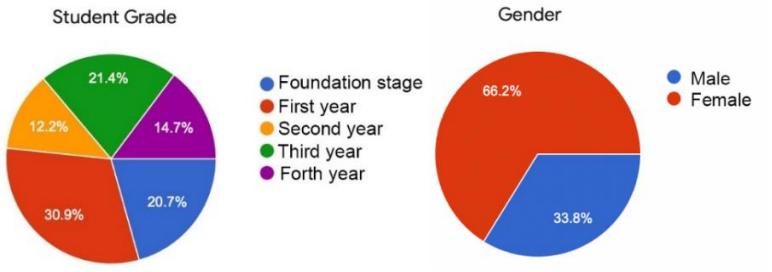

Figure 2: Students graduate and gender percentiles. (Source: author)

As the questionnaire starts with three questions about their satisfaction with the overall interior design experience, look and feel while using the studios, then students were asked 18 questions to measure specific interior design factors that affect their performance which are circulation, furniture, thermal comfort, sound comfort, light, and colors.

Relative weights of influencing factors

Based on the mean values (μ) of each factor based on the sample responses, students' priorities on the most influential factors are set as visualized in figure 2 which highlights that comfortable and ergonomic furniture is a top priority while colors heavily affect their perception of space followed by acoustic performance which affects their focus and productivity while lighting design and circulation were the least influential factors as the basic functional design is enough.

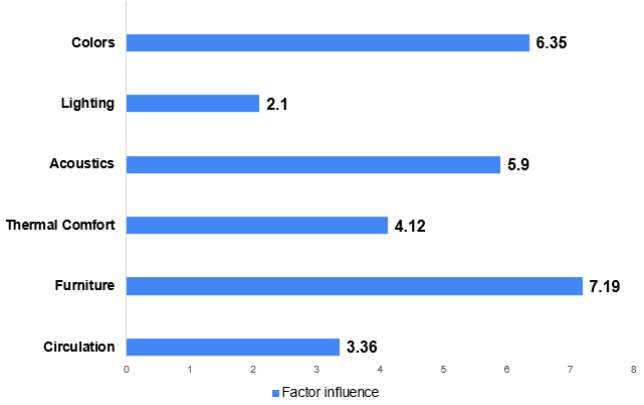

Figure 3: Relative weights for each influencing group of factors (source: author)

Influencing factors based on gender

By analyzing results based on gender, the study shows (figure 3) that male and female mean values are almost identical with a variance of ± 3% which means that students regardless of gender developed the same perception towards influencing factors that affect their experience and performance in the educational interior space.

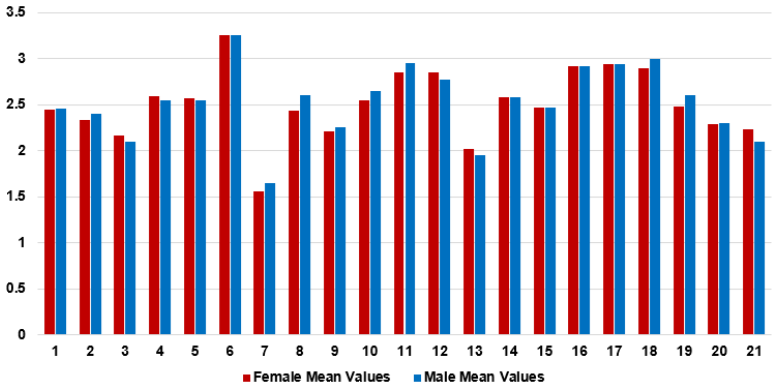

Figure 4: Survey question responses mean values tendency according to gender (source: author)

Influencing factors based on year (stage)

With further exploration of sample data based on year (stage), Figure 4 highlights key findings for several factors with the most affected years are the first year (foundation stage) and final year (year 4) like circulation which appears to be crucial for bachelor year students (year 4) that reflects an increased activity in that year.

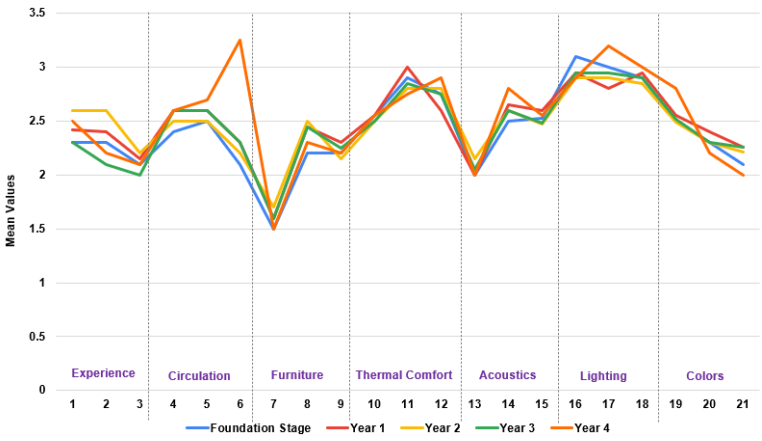

Figure 5 (right): Factors mean values tendency according to the stage (source: author)

As for furniture, overall mean values reflect almost identical results, as for thermal comfort, the foundation stage and year 4 have to be more affected than mid-years. For room acoustics and quality, both the foundation stage and year 4 have higher values which reflect the increased need for focus during their studio hours.

Interior design quality and overall experience inside the studios

According to the students' responses about the comfortability of the interior design while using the studio, the majority of students (63.1%) responded as it is not comfortable, while 29.6% of students were feeling neutral about it which means that the interior design needs modifications, as most of the students' feedback that the studios need maintenance and renovation.

(58%) students responded that they don't prefer to work long hours inside the studio, as the interior design needs modifications as it reflects on their overall comfort, while (25%) students were feeling neutral about working long hours inside the studios as the nature of studio needs specific working tables and they don't have it at home to do the studio work.

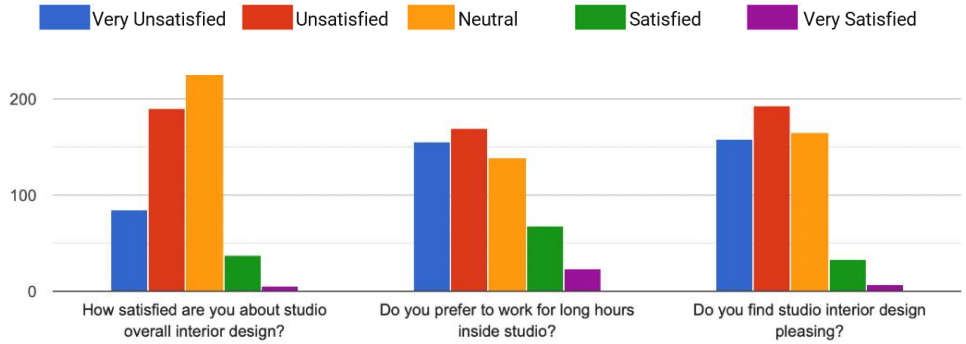

Figure 6: Students' responses on overall experience inside studios (source: author)

Circulation inside the studios

- Regarding the accessibility of the entrances and exits in the studios, most architecture students were satisfied as (73%) students responded were satisfied, as architecture studios have 2 entrance/exit doors one in the front wall and the other is in the back of the studio which make the circulation and accessibility during entering and exit the studio much easier than interior department as the studio has only one door for entering and exit, as (19%) students responded that it's not easy to reach the entrance and exit points.

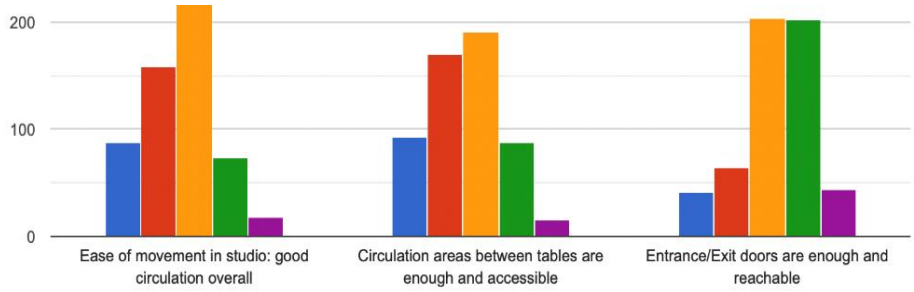

Figure 7: Students' responses on circulation (source: author)

- According to the students' responses for the circulation, the main pathways inside the study are easy to recognize as (44.2%) of students responded were satisfied while moving in the main pathways inside the studios, while the corridors between the tables are hard to pass, as they're so close to each other, (47.3%) students were feeling discomfortable to reach their tables, and (34.3%) students were feeling neutral, as most of the students feedback that the drawing tables in studios need different organization, As before furnishing the number of tables in the interior space, circulation, and flexibility should be considered so the students could reach their tables easier and work comfortably.

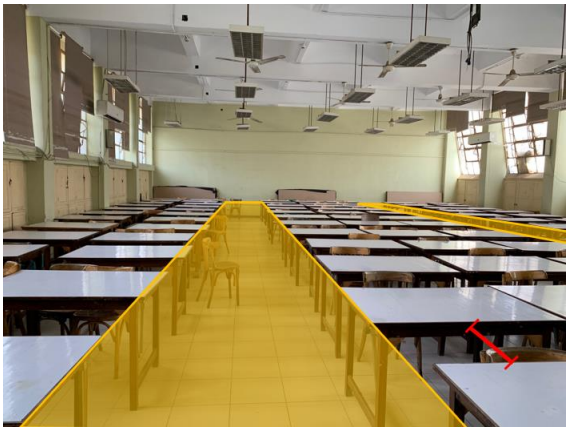

Figure 8: circulation inside studios (source: author)

Furniture

Most of the students' responses were showing that the furniture used in the studios is in bad shape as well as under actual capacity of the students which reflects on their learning process and performance, As (58.4%) students responded that the tables and chairs are not enough for them as the number of students is bigger than the number of furniture, and (27.6%) responses were neutral, According to (Elsayed Y., Abdel-Shakour M., 2021), the number of enrolled students exceeds the actual capacity as it was around 200 student, then it exceeds to around 300 students in 2019, whereas the actual capacity is limited to 200 students.

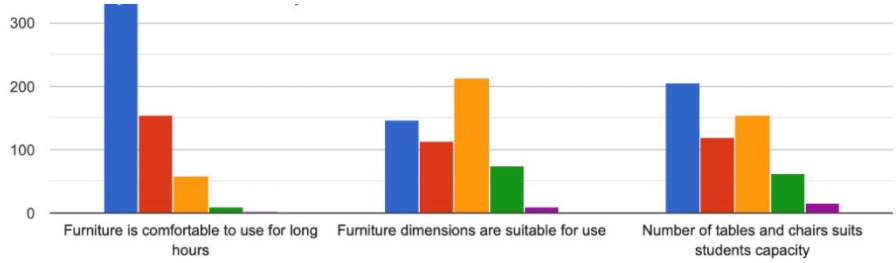

Figure 9: Students' responses on furniture (source: author)

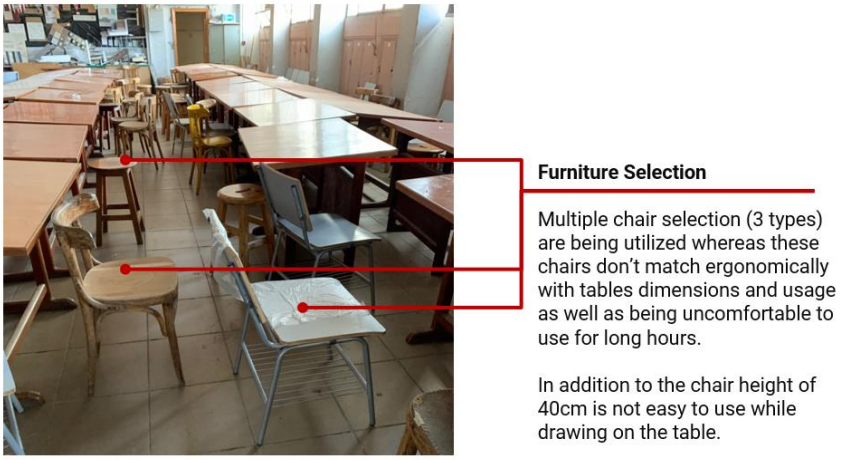

Figure 10: Different chair selections that do not fit the desired function (source: author)

According to the students' responses for the furniture dimensions if it is suites the function, (46.7%) students are not satisfied with the furniture dimensions, as the dimensions of the table are suitable, but the chairs are not designed for a height table as it's a normal chair height while there are a few height chairs but it's not enough for all the students and the whiteboard need to be bigger according to the number of students.

Figure 9: The chalkboard is not utilized and provided whiteboard is too small for the studio and fixed on the wrong height as from the bottom there is unused area as its on 70cm height from the floor (Source: Author)

Figure 10: Tables need renovation to be usable by students (source: Author)

Thermal comfort

- There was a normal distribution in students' responses regarding the thermal comfort inside the studio and it show a uniform bell curve as (37.2%) of students responded that were satisfied, and (38.4**%**) of students were not satisfied when the air-condition is off or some fans are not working, However, the building orientation and provided sun breakers on the building facade is the main reason that the temperature is suitable inside the studios around the year.

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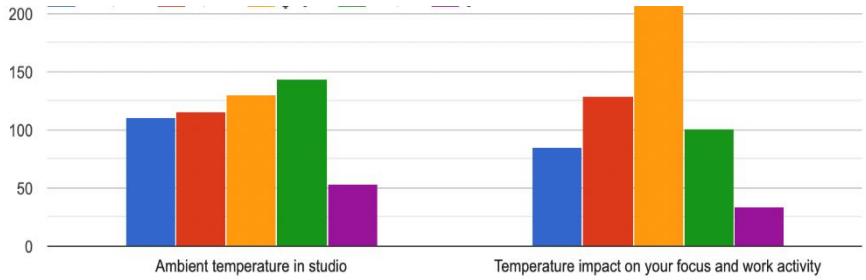


Figure 11: Students' responses to thermal comfort (source: author)

Sound comfort (acoustics)

- According to the student's responses (47.8%) students were satisfied with the sound that there is no echo inside the studios, while (34.3%) students are feeling neutral about the sound clarity, only that the interior space of the studio needs more speakers as bot all the students can hear the sound of the instructor due to the increase of the number of students.

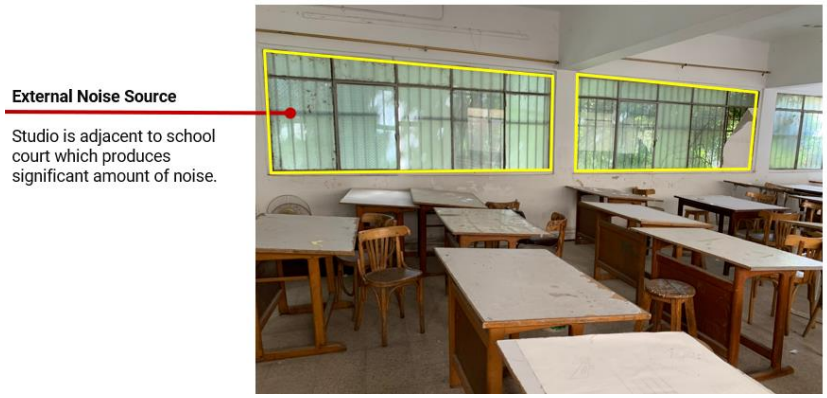


Figure 12: Background noise directly affecting studios. (Source: author)

Regarding the sound isolation of the studio, (66%) of students who are the majority of students responded that it is not isolated, and they are affected by external noise which directly affects their focus while working in studios.

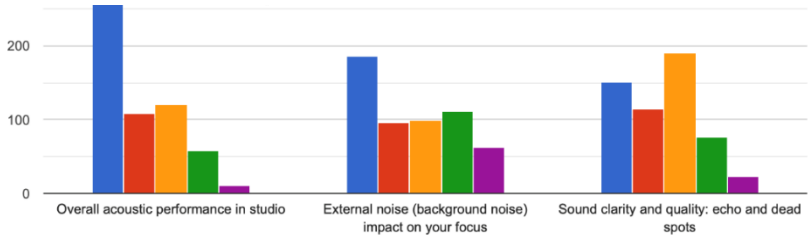


Figure 13: Students' responses to sound comfort (source: author)

Light

Most of the students are satisfied with the lighting distribution as (38.6%) are neutral, (28.7%) are satisfied with the light as they see clearly and could do their studio work with a good focus, while (32.3%) of students responded that they're not satisfied as there is a glare on the tables near the windows in a few studios of the architecture foundation stage, which could be solved by using curtains as this happens while working in the studio on the drawing table in the afternoon period.

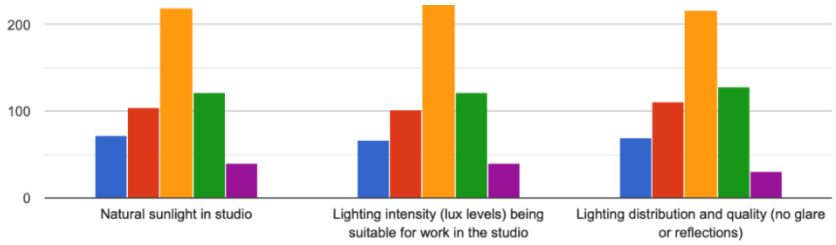


Figure 14: Students' responses to light (source: author)

Figure 15: Current luminaires in studios, Glass is not maintained or clean, as well as shattered panels are present in addition to using opaque panels which prevent natural sunlight penetration. (source: author)

Color

Regarding if the colors used in the studio reflect the work nature as student's fields are interior and architecture, thus students need to see a unique color scheme, (31.4%) students' responses were neutral, while (58.6%) students' responses were not satisfied as they see that the colors used in the studios do not reflect their fields. As it needs to be more attractive to grab their attention and to feel enthusiastic during working in studios.

Figure 16: Students' responses on color (source: author)

7. CONCLUSIONS

According to the research and survey findings, below are study conclusions:

- Most interior design elements in an educational interior space especially the studios affect the student's performance as elaborated through the study, according to students' responses the interior design of the educational space needs to relate to their study and to be comfortable as well as providing a suitable environment that will lead to improved productivity and focus.
- Due to the nature of educational spaces being used by students for long hours as their work environment, periodical maintenance is essential to maintain adequate functionality by ensuring the quality and workability of furniture, power sockets, ...etc.
- Circulation is one of the important psychological comforts that any interior designer should consider for the comfortability of students to reach their tables. 2 entrances should be provided for larger studios for better accessibility.
- Furniture needs to be chosen according to the students' use, with the right dimensions so they would be comfortable using it for extended hours.
- Thermal comfort could be achieved with proper building orientation and adequate façade engineering (e.g., sun breakers for southern facades).
- Sound comfort factor according to the study appears to be neutral, it affects their performance if there is an external noise outside which does not happen usually.

- Providing basic light appears to be sufficient for students, as the fancy light design would contribute to a better space look and feel but will not noticeably affect the performance as studio hours are mostly daytime hours.
- Colors inside the studio should reflect the students' fields as being in a surrounded environment reflect their feelings and what they are learning and influences communication. However, over years, students develop a sense of tolerance for the current situation.
- According to the study, both genders responses were so close in values which reflects that regardless of gender, influencing factors are perceived the same by students.
- Foundation stage who develops a perception of space are more likely to get affected by the mentioned influenced, unlike mid-years which develops adequate tolerance to particular factors.

8. RECOMMENDATIONS

The research that has been undertaken for this study has highlighted several factors on which further action would be beneficial to improve the studios subject to study. Following are recommendations based on each influencing factor.

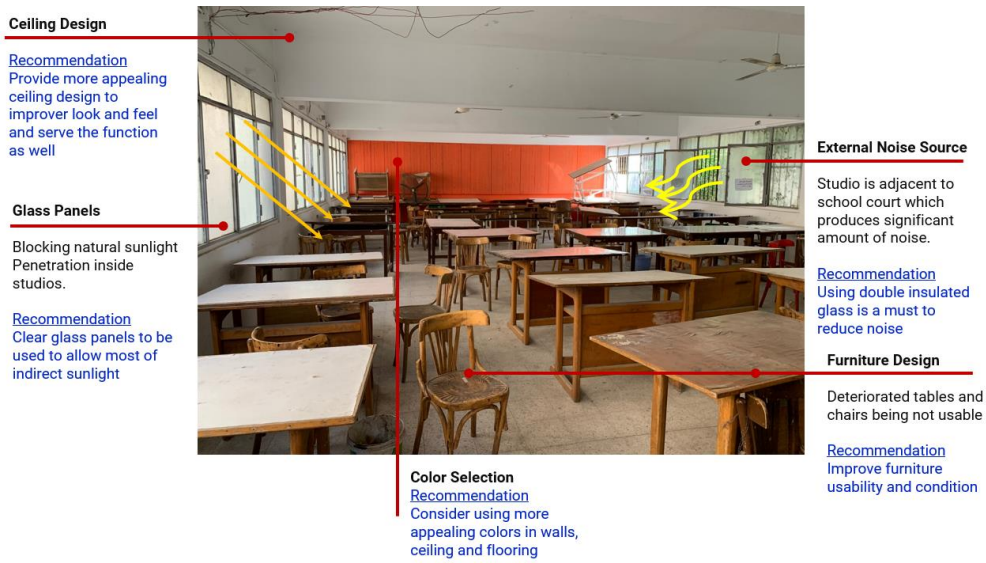


Figure 17: Foundation stage studios recommendations. (Source:

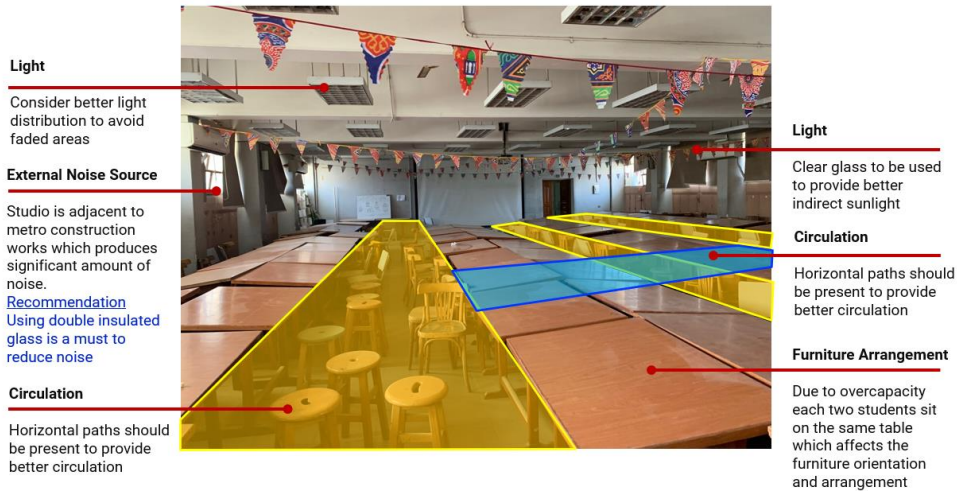


Figure 18: Architecture studios recommendations. (Source: Author)

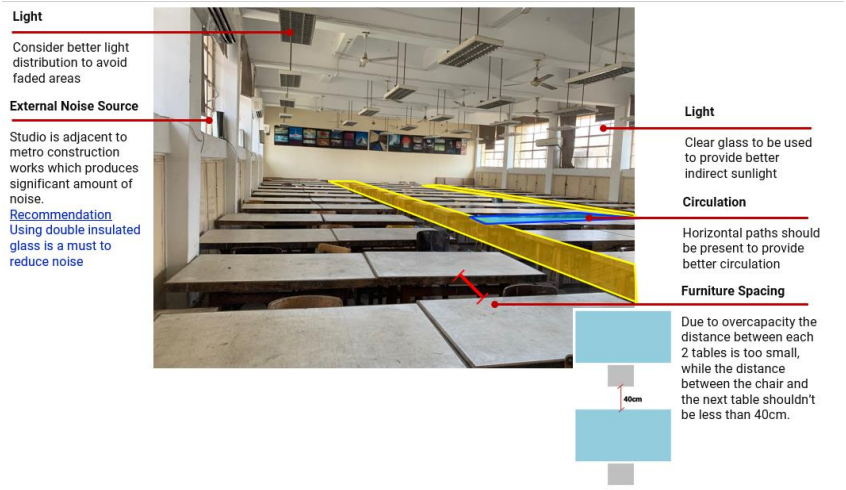


Figure 19: Recommendations for décor studios (source: author)

Overall interior design

The overall studios interior design needs a more modernized design to add a vibrant ambient mood for the space to be more appealing for the students during their working hours.

Walls, floors, and furniture need periodical maintenance and renovation, in addition to adding add more electric outlets to facilitate students to work with their laptops and electronic devices.

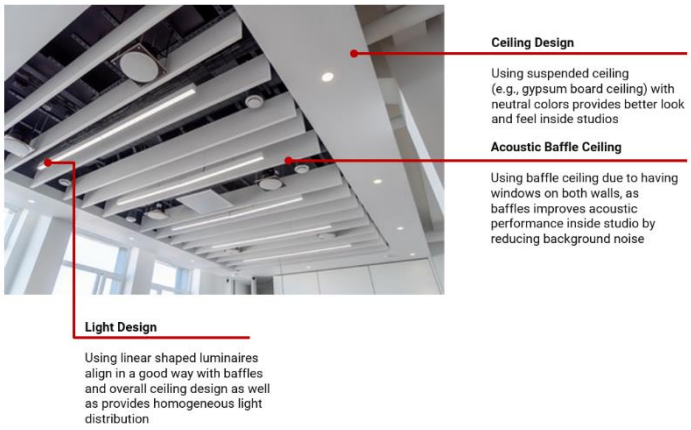
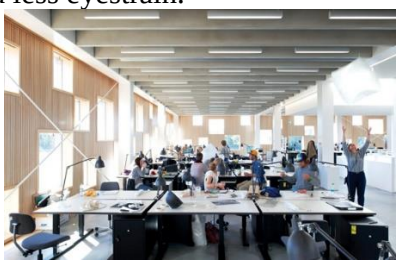


Figure 20: Ceiling design recommendation (source: Author)

Table 2: Recommended actions. (source: author)

Circulation	**Furniture**
• The necessity to add an additional exit door to make the circulation during entering and exit the studio more convenient. • Adding wayfinding signage above the doors to specify the entrance door and exit door. • Make the wall more identified by cladding the wall with different material like wood or to be	• Pay more attention to tables condition and provide adequate maintenance in order to be usable in an appropriate way by the students. • Provide height chairs to match table height and be more comfortable for use or chairs with adjustable heights.

<table>
<tr>
<td>visually clear by coloring the wall with accent color
• Reserve a buffer space around the doors for better accessibility and circulation.
• Provide adequate spacing between tables for students' activity area.
• Provide horizontal crossings between tables for better circulation.</td>
<td>• Cushioned chairs are preferable to be comfortable for the students during long working hours.
• Provide whiteboards with appropriate dimensions.
• Consider adequate capacity for each studio as adding more students will result in an uncomfortable environment.</td>
</tr>
<tr>
<td>Thermal comfort
• Provide double insulated glass for the windows of the studios to provide better (U-Value) to keep ambient temperature within the acceptable range in all seasons.
• Clean glass panels to be provided in order to allow indirect sunlight to access studios for better lighting as well as better energy efficiency.
• Periodical maintenance for ceiling fans and ACs is recommended.</td>
<td>Sound comfort (acoustics)
• Use acoustic baffles in the ceiling to mitigate external (background) noise originating from adjacent activities. e.g., Metro construction, ...etc.
• Using double insulated glass to mitigate external noise as well.
• Adding reflectors to the ceiling above the instructor area to amplify instructor sound pressure that will result in better acoustic performance and mitigate dead spots.</td>
</tr>
<tr>
<td>Light
• Consider providing better lighting distribution to meet recommended LUX levels in studios as well as using better decorative luminaires.
• Daylighting is vital when it comes to improving students' mood, less fatigue levels, and less eyestrain.
 
Figure 21: Using acoustic baffles, School of Architecture, Umeå, Sweden (source: The architecture review)</td>
<td>Color
• Provide a unique identity for every design studio to be more unique in terms of design as well as reflecting students' activities.
• Use better color palettes to provide a better look and feel that will result in increasing students' performance and boost their focus.
• Consider colors with positive psychological impact such as warm colors (beige, yellow, and red) that provide a joyful and motivating atmosphere.
• Color should not be limited to walls but to all elements of interior design (e.g., chairs, ceilings, floorings ...etc.)</td>
</tr>
</table>

9. RECOMMENDATIONS FOR FUTURE WORK

The research has been undertaken for this study has highlighted several topics on which further research would be beneficial. Further research in the field of assessing the impact of every interior design element in more detail as well as providing a robust design framework/checklist is required so that it could eventually be used as a useful design evaluation tool for the educational studios' design.

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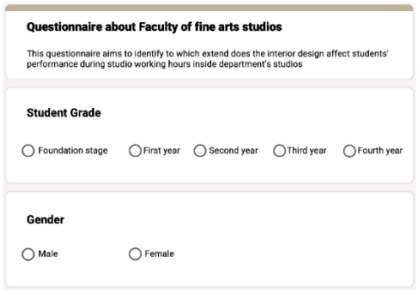
11. ANNEXES

Annex 1: Questionnaire Form



Questionnaire about Faculty of fine arts studios

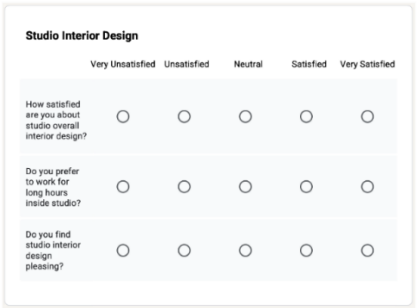
This questionnaire aims to identify to which extend does the interior design affect students' performance during studio working hours inside department's studios

Student Grade

○ Foundation stage ○ First year ○ Second year ○ Third year ○ Fourth year

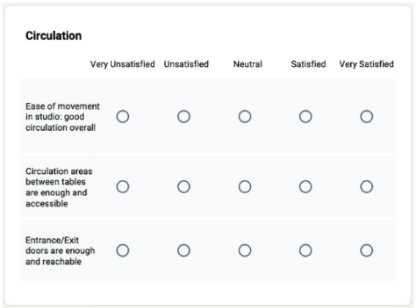
Gender

○ Male ○ Female



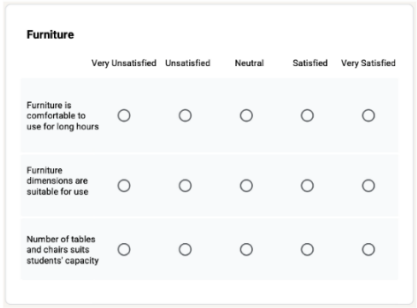
Studio Interior Design

	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
How satisfied are you about studio overall interior design?	○	○	○	○	○
Do you prefer to work for long hours inside studio?	○	○	○	○	○
Do you find studio interior design pleasing?	○	○	○	○	○



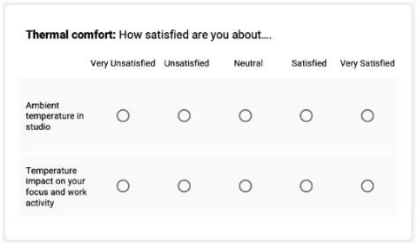
Circulation

	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
Ease of movement in studio: good circulation overall	○	○	○	○	○
Circulation areas between tables are enough and accessible	○	○	○	○	○
Entrance/Exit doors are enough and reachable	○	○	○	○	○



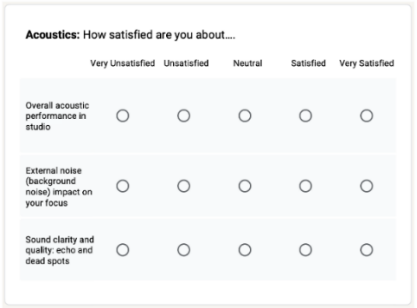
Furniture

	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
Furniture is comfortable to use for long hours	○	○	○	○	○
Furniture dimensions are suitable for use	○	○	○	○	○
Number of tables and chairs suits students' capacity	○	○	○	○	○



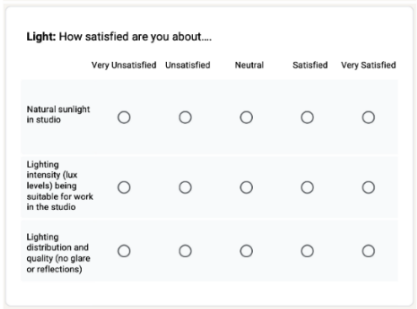
Thermal comfort: How satisfied are you about....

	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
Ambient temperature in studio	○	○	○	○	○
Temperature impact on your focus and work activity	○	○	○	○	○



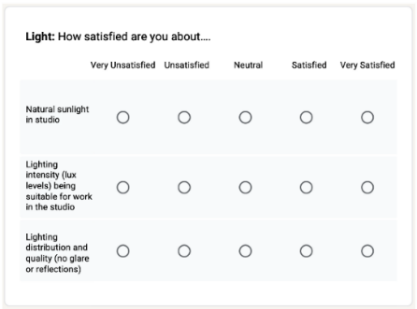
Acoustics: How satisfied are you about....

	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
Overall acoustic performance in studio	○	○	○	○	○
External noise (background noise) impact on your focus	○	○	○	○	○
Sound clarity and quality: echo and dead spots	○	○	○	○	○



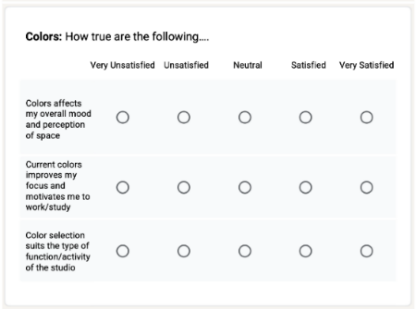
Light: How satisfied are you about....

	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
Natural sunlight in studio	○	○	○	○	○
Lighting intensity (lux levels) being suitable for work in the studio	○	○	○	○	○
Lighting distribution and quality (no glare or reflections)	○	○	○	○	○



Light: How satisfied are you about....

	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
Natural sunlight in studio	○	○	○	○	○
Lighting intensity (lux levels) being suitable for work in the studio	○	○	○	○	○
Lighting distribution and quality (no glare or reflections)	○	○	○	○	○



Colors: How true are the following....

	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
Colors affects my overall mood and perception of space	○	○	○	○	○
Current colors improves my focus and motivates me to work/study	○	○	○	○	○
Color selection suits the type of function/activity of the studio	○	○	○	○	○