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EFFECT OF LEARNING ENVIRONMENT ON ARCHITECTURE STUDENTS IN NIGERIA

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ABSTRACT

Learning environment has remained inseparable from the success or failure of students in every school of architecture. Learning environment which could either be physical or online has a major role to play in determining the level of interest and cooperation of students towards learning. The aim of this study is to explore the significance of learning environment as it relates to architecture and its effects on the students under training. The study adopted a semi structured interview, field observation coupled with an open-ended questionnaire. 5 schools of architecture were considered from the western part of the country, Nigeria. Minimum of 80 questionnaires per school were administered through 100 to 400 level. From the data analyzed and the result obtained, assimilation, concentration and academic performance of architecture students are tied to the components of learning environment. A proper consideration to the process of planning and designing of a learning facility and environment will in turn influence students' attitude and desire to learn.

Keywords: Architecture, Classroom, Environment, Learning, Student.

I. INTRODUCTION

The introduction should be typed in Times New with font size 10. In this section highlight the importance of topic, making general statements about the topic and Presenting an overview on current research on the subject. The simplest way is to replace(copy-paste) the content with your own material. Your introduction should clearly identify the subject area of interest. Learning environment refers to the many platform via which students learn – it could either be physical or online. Learning can take place in and out of a classroom. Online learning is becoming popular by day especially with the disruption of our regular classroom activities by covid-19 pandemic. For the purpose of this research, the author will be majoring on the learning that takes place within a defined school and its environment using architecture students as a case study.

Students and teachers contribute well to a learning atmosphere, they get input from one another via lecturing in a large hall or auditorium, small informal lecture spaces, and highly specialized settings such as laboratories. Different disciplines can rely on privilege over others for certain environments and approaches. For example, many science disciplines emphasize laboratory teaching and learning experiences, whereas arts education such as architecture has been primarily focused on the setting of the studio and its environment. A studio is a workspace where students, with or without the involvement of a teacher, explore a collection of abilities. In this scenario, the teacher works during specified class interaction between students and then students begin to work on their own to improve their work. (Ishizaki & Gross, 2013) wrote, design studio is where a student learns to design. It is the main place that offers the prospective architects the primary avenue and opportunity to become a successful designer. Hence, the studio is the most important piece in this context.

The relationship that exists between space and users is dynamic rather than static, with settings influencing what activities are carried out (Bøjer, 2019).

That suggests that users are capable of creating an educational environment of their choice especially in the field of architecture. Student attitude and behavior, motivation, self-esteem, peer and student teachers' experiences, discipline, focus, engagement, and interpersonal relationships have been shown to be related to school facilities (Maulana, Opdenakker, B, & Bosker, 2011)

According to architect Louis H. Sullivan the phrase "form follows function" was coined in 1896 (Manieri-Elia & Sullivan, 1996). There is direct relationship between a building design, built environment and those who use it. The architecture of a school has a direct impact on its users which are; teachers and Students, and their learning culture. The research work considered the reasons why the physical learning environment is important by exploring the significance of the learning environments as it relates to Architecture and its effect on students in the schools.

The objectives of this research work include:

i. Evaluating the components that make a good learning environment
ii. Assessing the influence of a good learning environment on the students
iii. Identifying how learning environment can be improved on to attain a better academic performance

1.1 Scope of Study

The study focuses on the effect of a conducive learning environment on students in the department of Architecture of selected schools in Nigeria and the conditions of a good learning environment:

i. Ahmadu Bello University, Zaria. (Federal University)
ii. University of Ilorin (UNILORIN) Ilorin, Kwara State – (Federal University)
iii. Ladoke Akintola University of Technology, Ogbomoso, Osun State (State University)
iv. Olabisi Onabanjo University (OOU), Ogun State – (State University)
v. Bells University of Technology, Ota - Ogun State. (Private University)

This research would examine these schools carefully and analyses the learning facilities.

1.2 Learning Environment

According to (Ibem, Owoseni, & Alagbe, 2017), Some learning environments are more relaxed than others and provide less distractions. They affirmed in their research work that physical characteristics that interfere with learning in any learning environment may be expected to encourage education and the growth that generate positive emotional state. The most relevant psychological areas of education and learning are environmental, educational and human factor. The learning environment, as defined by Wikipedia, may be an educational approach, a cultural context, or a physical environment in which teaching and learning are offered to all types of learners and activities. If you think the learning room is not going to have an effect on your studies, you'd better think again. Many educators and curriculum experts have agreed that the learning environment is a very significant element in the development of knowledge and skills.

1.3 Components of a Learning Environment

Learning environment is made up of physical and psychological aspects of the environment.

The physical environment influences the conduct, thinking, feeling and attitude of the human person. The study of the human behavior, thought, feelings and attitudes in the various physical context is environmental psychology. (Graetz, 2006), also states that some learning environments are more comfortable and less distractive than others. The field of psychology mostly deals with the design of classroom and the learning environmental, educational, human (engineering), and social psychology. Focusing on creating stimulating learning environment that encourages intellectual curiosity among students will involve the optimization of natural day lighting and better visibility of the area, the implementation of the ventilation systems that promote the quality of cleaner indoor air, and use of multi-faceted programmes that can easily be tailored to educational needs.

The physical dimensions of educational environments are highly contested in the following respects: temperature, heating and air quality (Barrett, Treves, Shmis, Ambasz, & Ustinova, 2019). Chronic noise exposure impairs cognitive functions, with various studies identifying noise difficulties, pre-reading difficulties, pre-reading ability defects, and more general cognitive deficits (Chepkonga, 2017). Some other variables in classroom design that can affect learning results were highlighted in another research study by (Lewinski, 2015):

Acoustics: The quality of sound-proofing and acoustics will restrict what you can do in a room. Some sites create both in the design and fitting-out; others accept a certain amount of sound leakage, arrange sessions so that a noisy activity does not interfere with a quiet one next door; and some appreciate a vibrant and efficient learning space's unavoidable 'hub-bub. The quality of sound is important, so consider: Shape and size of the room, including ceiling height Materials used in design or fitting-out, – for example glass walls Furniture and equipment in the room Number of people employed in the room Type and range of activities they can do disruption of noise from anywhere on or outside the site often measure the efficiency of sound-proofing or acoustic fittings or layout.

Light: The quality and quantity of light (illumination) certainly affects the sense of comfort in a specific space. (Boray, P. F; Gifford, R; Rosenblood, L, 1989) conducted a research analyzing how various forms of lighting

(warm white, cool white, and full-spectrum fluorescent) influence different dependent variables, including: cognitive efficiency, attractiveness of the environment, size of the room, and space pleasure. No major differences were observed between all the dependent variables with respect to the type of lighting used. The researchers could only conclude that management prefers warm white or cool white over full-spectrum light, mainly because buying and maintaining the first two is less expensive.

Color: For decades, interior designers have been using color to set the intent or mood of a room. Although often overlooked in the classroom, color remains an essential factor to be considered in any setting. The use of color may be wide, such as the color of a room wall, or a select accent, such as chairs, desks or tables, depending on the intended effect. With a few exceptions, the use of color within schools was limited to functional.

Temperature control & ventilation: Factors such as the number of exterior walls, the degree and type of glazing, the height of the ceiling, the type and location of the installed heating systems decide the temperature and ventilation of a learning room. A further concern is whether the materials or equipment used for activities in the space contain dust, fumes or heat. A classroom, for example, can maintain a minimum temperature of 18º C (64.4º F). Location can be a very important factor. For example, some architects and directors seem to be familiar with underground spaces, but they are also stated to feel restrictive, airless and enervating. Consider the following: The impact on space of both natural and artificial lighting. The heating system to be installed in space, in particular its efficiency and ease of control. Activities involving ventilation to control dust, heat or smoke. Benefits of getting to fresh air, whether or not you choose to be able to open windows. Whether windows need blinds for both cutting out glare and allowing TV/AV equipment to be used.

Seat Arrangement: Desks and chairs configurations influence student conduct. Students were assessed based on their on-task behaviors, such as hand raising, conversation statement, questioning / pupil request, listening, out-of-order comment, and speaking; and on their off-task behaviors, such as disruptive conduct, withdrawal, and attack. The dependent variables mentioned above have been clearly defined and measured by trained evaluators. Results revealed that the most on-task activities were exhibited by students seated in circles. A cluster arrangement was the second-best arrangement of desks and chairs, and desks arranged in rows were the least effective. (Lewinski, 2015) reported that both students and teachers favour a design that offers many opportunities for social interaction with regard to seat arrangement. Nonetheless, several individual considerations play a part, too. Flexibility in seating is important in that it makes it possible to adjust to changes in teaching styles.

1.4 Advantage of a Positive Learning Environment

A positive and a good learning environment is important for student's success as it promotes academic achievements. Positive learning, however, cannot just happen on its own they must be created in schools. The many components that must be considered in schools to create a positive learning environment for the students should be diligently paid attention to. Creating a good school will first begin in the classroom. A safer and a positive learning environment. The following are some of the advantages:

i. Promotion of academic excellence
ii. Interaction among students
iii. Safety, and
iv. Positive attitude

II. METHODOLOGY

To explore the learning conditions of students in the study area, qualitative approach was introduced to discern the opinions of students occupying the study facility and the different aspects impacting learning in the classrooms and studios respectively. A qualitative analysis helps the researchers to investigate phenomena such as emotions or thinking processes that are difficult to derive or learn from through traditional research methods (Corbin & Strauss, 2014). The study methods were semi-structured interviews combined with field observations taken for data collection using photographic equipment. This study involved open-ended questionnaires coupled with interview sessions with users/students within the learning facilities.

The data were collected through physical visitation to the study area to access the learning facilities. The authors also carried out an online search for information about the selected schools for the research. During

physical visitation, onsite pictures were taken while administering questionnaires to the students of the institutions.

Minimum of 80 questionnaires were administered in each of the school selected for the research work. Questionnaires were randomly distributed across all the levels, from 100level to 400level – 20 per level. The responses were then analyzed, interpreted so as to draw a scientific conclusion.

III. CASE STUDIES AND ANALYSIS

1. Ahmadu Bello University (Abu Zaria) Kaduna

ABU Zaria is a federal research university in Zaria, Kaduna Province, Nigeria. ABU was established as the University of Northern Nigeria on the 4th of October 1962. Two campuses are run by the university: Samaru (main) and Kongo in Zaria.

Plate 1: Faculty of Environmental Science Block

Source: (Researchers' field work 2020)

The Faculty of Environmental Sciences is approached through the North Gate, from the school road. The Department of Architecture is at the core of the Faculty.

Plate2: Faculty building showing the studio

Source: (Researchers' field work 2020)

There is a proper ventilation of spaces especially studio and office. This is also a proper zoning of functions. There is a good interaction within students due to studio arrangement and outdoor relaxation provided by courtyard area. A lot of spaces created are not being put to frequent use. Poor natural lightning in corridors due to the length of the building. Single and General studio area provided for all students. Poor archiving and provision of storage facility.

On safety, the design of the department considers the exit during fire incidence or an emergency through the introduction of exit spiral stairs. The stair hall is opened to natural light and ventilation, which makes it highly ventilated and a good spot for refuge.

2. University of Ilorin (Kwara State)

Plate 3: Department of Architecture

Source: (Researchers' field work 2020)

University of Ilorin, also known as Unilorin, is a Federal government-owned university in Ilorin, Kwara State, Nigeria. It was established by the Order of the Federal Military Government in August 1975. The university faculty of environmental sciences has five (5) departments. The departments are: Architecture, Quantity Survey, Estate Management, Urban & Regional Planning, Survey & Geoinformatics. The Department of Architecture was founded in 2013 at the beginning of the Faculty of Environmental Sciences. The building is made up of large windows and fenestrations for maximum natural lighting and ventilation. Floor plans dominated with a large number of lecture rooms and offices. Too major staircases and two major entrances and exits, two other entrances for emergencies.

3. **Ladoke Akintola University of Technology Ogbomoso, (Oyo State).**

Plate 4: Approach View of Department of Architecture building (LAUTECH)

Source: Researcher's field work,2020

Ladoke Akintola Technology University is a tertiary institution situated in Ogbomoso, Oyo State, Nigeria. The university enrolls 30,000 students and hires more than 3,000 employees, including contract staff. There are five faculties and a postgraduate school where courses are taught in various fields of pure and applied science, medicine, agriculture, engineering and technology, and environmental science. The Architecture department consist of two blocks; an old bungalow building and a new block of two-floors. The building consists of the following facilities which are: Studios, office spaces, students, HOD's office etc.

4. **Olabisi Onabanjo University (OOU), Ibogun Campus, Ogun State**

Plate 5: Approach View Faculty of Architecture (Olabisi Onabanjo University Ibogun)

Source: Researcher's field work,2020

Olabisi Onabanjo University, Ago-Iwoye is a state (owned and operated) university located in Ago Iwoye, Ogun State. The architecture building is a bungalow with office spaces and lecture halls. It is old with outdated building finishes such like its windows, doors and roof. Its layout is not properly defined and marked, separated walkway from green areas. It does not have a parking lot in front of it, cars are parked opposite the building facility. Not properly zoned for students and lecturers. It is not conducive enough as a learning environment for students of Architecture department. It has more office spaces than Studio/ lecture spaces. Poor lighting condition and the design arrangement is porous.

5. Bells University of Technology, Ota, Ogun State.

Plate 6: Entrance gate of Bells University of Technology

Source:https://www.eduwheel.com.ng/bells-university-of-technology

Bells University of Technology (BUT), also known as Bellstech, is the first private university of technology established in Nigeria. It was established in 2004, and began admitting students from the 2005/2006 academic session. The Study area is the Department of Architecture under the College of Environmental Sciences. Other departments under the college of Environmental sciences are: Building Technology, Quantity Surveying, Surveying and Geoinformatics, Estate management, Urban and Regional Planning.

Plate 7: Adenuga Building (Serves as Architecture students Lecture facility)

Source: Researchers' field work,2020

Plate 8: Interior view of 300Level Studio (Adenuga Building)

Source: Researcher's field work,2020

Table 1: Showing the results of the administered questionnaires from students of Schools where case studies was being carried out.

1.	**LIGHTING**	**RESULTS**
a.	How effective is the lightening of the lecture hall/studio?	30% picked GOOD lighting, 60% picked FAIR while 10% picked BAD Lighting.

b.	Does the lighting affect your level of concentration during lectures?	70% said No,30% said YES
c.	How effective is the natural lighting of your studio?	50% said GOOD lighting, 40% said its FAIR,10% Said its BAD.
d.	Can you receive lectures without artificial lighting?	30% said YES,70% said NO.
e.	How effective is your artificial lighting at the studio/classroom	30% said its GOOD, 40% said its FAIR while 30% said its BAD

2.	**THERMAL COMFORT**	**RESULTS**
a.	How conducive is the thermal comfort of you lecture hall/Studio?	70% said it is BAD,30% said its FAIR

3.	**INTERNAL FINISHES (COLOUR)**	**RESULTS**
a.	Does the painting have any psychological effect on you when receiving lecture?	30% said paint has psychological effect on them,70% said it does not.
b.	Is the Wall design/Paint Ok in the Studio	70% said it's not ok (BAD),20% said its GOOD and 10% said its manageable (FAIR).
c.	How would you rate the internal finishing of your studio/classroom?	40% said the finishing is BAD, 30% said its FAIR while 30% said its GOOD.

4.	**AUDIO VISUAL FACILITIES**	**RESULTS**
a.	How audible is your studio when receiving lectures?	70% said its GOOD, 20% said is FAIR, 10% said its BAD
b.	Do you hear the lecturer from any position of the class?	70% said they could hear from any position of the class/studio, 30% said they couldn't hear from any position other than the front seat.
c.	Do you prefer the use of Audiovisual for lectures than normal voice note	Every one prefers the use of projector instead of normal lecture voice note. 100% of students.
d.	d. Do you enjoy the current pattern of learning?	85% said NO, 15% Said YES
e.	How will you rate your audiovisual facility for lectures?	The rating for the audiovisual quality of the learning facility. 50% of students said GOOD, 25% said FAIR, 25% said BAD

5.	**OVER HEAD PROJECTOR**	**RESULTS**
a.	Do you currently have an overhead projector?	75% of students said NO, 25% of students said YES

b.	Do you think it's best to have one placed in your studio	100% of Students said YES. They all want a projector each for their studio since most of them only have one in their departmental office.

6.	**ACOUSTIC QUALITY OF STUDIOS**	**RESULTS**
a.	How will you rate the acoustic quality of your lecture hall/studio?	65% rated it GOOD, 25% rated their lecture room FAIR, 10% rated it BAD.

7.	**VENTILATION**	**RESULTS**
a.	Is your studio/Class well ventilated.	50% said its well ventilated (VERY GOOD),30% said its FAIR, 20% said its POORLY ventilated.
b.	Do you enjoy good ventilation during lectures?	60% said NO they don't enjoy good ventilation, 40% said YES, they enjoy good ventilation.
c.	Do you have adequate natural ventilation with or without air conditioning/Fan?	80% said NO, they don't have adequate natural ventilation except with fan and air conditioning. 20% said YES, they have enough natural ventilation

8.	**AIR CONDITIONING**	**RESULTS**
a.	Is your studio/Lecture hall air conditioned.	40% said YES, their studio is air-conditioned, 60% said NO air-condition in their studio
b.	If yes, is the air conditioning sufficient enough to circulate the entire classroom	80% of Students with air-condition studio said it's not sufficient enough to circulate the entire studio. Only 20% said its sufficient enough.

9.	**SIZE OF LECTURE HALL/STUDIO**	**RESULTS**
a.	How functional in size is your studio/classroom?	70% said its GOOD on the average,20% said its VERY GOOD,10% said its FAIR.
b.	Is it adequate enough to accommodate the class size with adequate space for circulation and students seating arrangements?	80% said the classroom/studio is not spacious enough with space for circulation, 20% said its GOOD enough.

10.	**FURNITURE ARRANGMENTS**	**RESULTS**
a.	Do you like the type of furniture designed for use?	From the sampling, most of the students didn't like the furniture used they said it's not comfortable enough. Only 10% feels it's GOOD, 90% said its BAD.
b.	How comfortable is your seating arrangement?	30% said the seating arrangement is VERYGOOD, only 70% of the students said its BAD, it needed to be changed.

11.	SHAPE OF THE STUDIO/LECTURE SPACE	RESULTS
a.	How creative is the design/ shape of the studio?	40% thinks the design of their lecture hall/Studio is creative and spacious enough (VERY GOOD) while the remaining 60% thinks the design is not functional and purpose built (BAD)
b.	How high is the head room of the classroom?	90% of respondents said the head rooms are not high enough (BAD)which makes space air trapped. 10% said the headroom is FAIR enough.

12	ACTIVE DATA POINTS/LIGHTING SOCKETS	RESULT
a.	Do you have sufficient lighting point in your studio for each student?	100% of respondents said lighting points is not sufficient enough.
b.	How convenient is it to work in the studio from your seating position?	30% said its convenient working in the studio with their workstations close to the lighting points, the other 70% said its not convenient working from their seating position. The lighting points(socket) is not adequate enough.
c.	How effective is your internet data for students to work with in studio?	70% of respondents said the internet data for students is not effective (BAD) The connectivity is not strong. Only 30% agree that its FAIR.

13.	NOISE CONTROL	
a.	Is your Studio/Class well zoned from noise pollution.	70% of student said the studio is well zoned. There's no noise pollution but the remaining 30% said the lecture hall/studio is always distracting from noise outside the studio and they easily get distracted during lectures.

14	LEARNING CONDITIONS	
a.	Do all these design elements affect level of concentration during Lectures, motivation for learning and performance?	From the research questions 60% of the respondents said these design elements does affects their level of concentration and assimilation during lectures. The other 40% said its does not affect their learning and assimilation

Source: Researcher's field work,2020

IV. RESULTS AND DISCUSSION

Below are the indicators that influence the learning environment as being analyzed from the questionnaire sampled:

1. Effective Lighting in the Learning Environment

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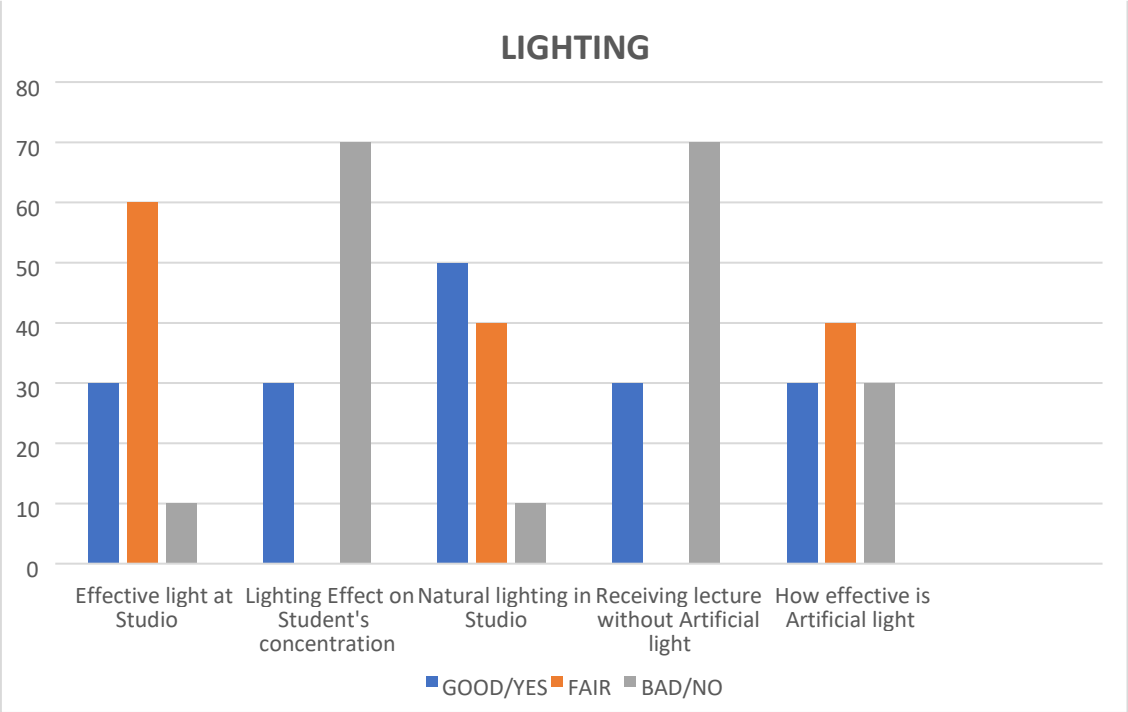

Fig 1: Result of Effective Lighting in The Learning Environment.

Source: Researcher's field work,2020

2. Thermal Comfort of Learning Environment

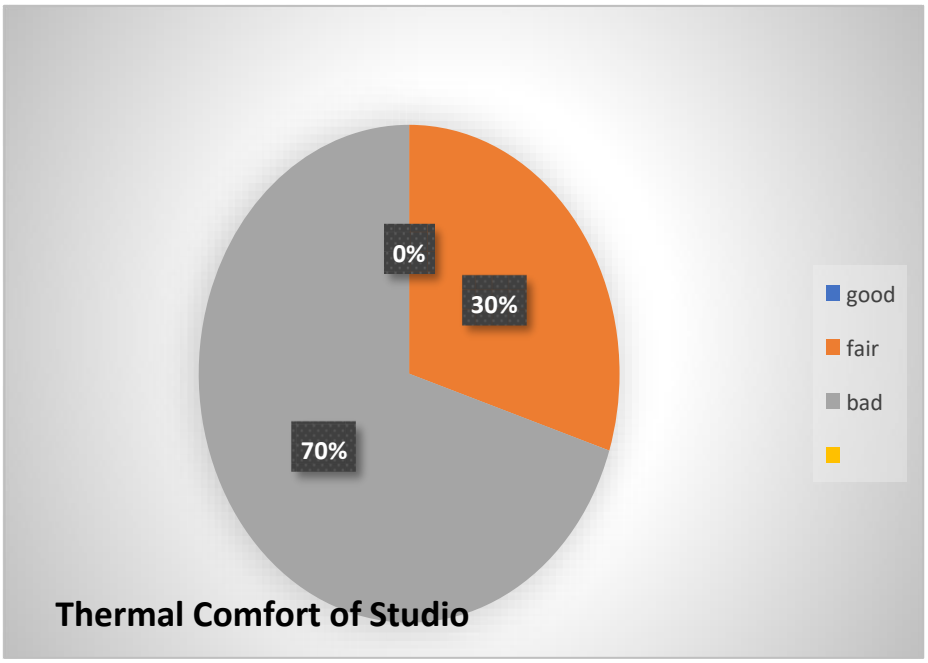

Fig 2: Results of Thermal comfort in learning environment

Source: Researcher's field work,2020

3. Internal finishes (colour)

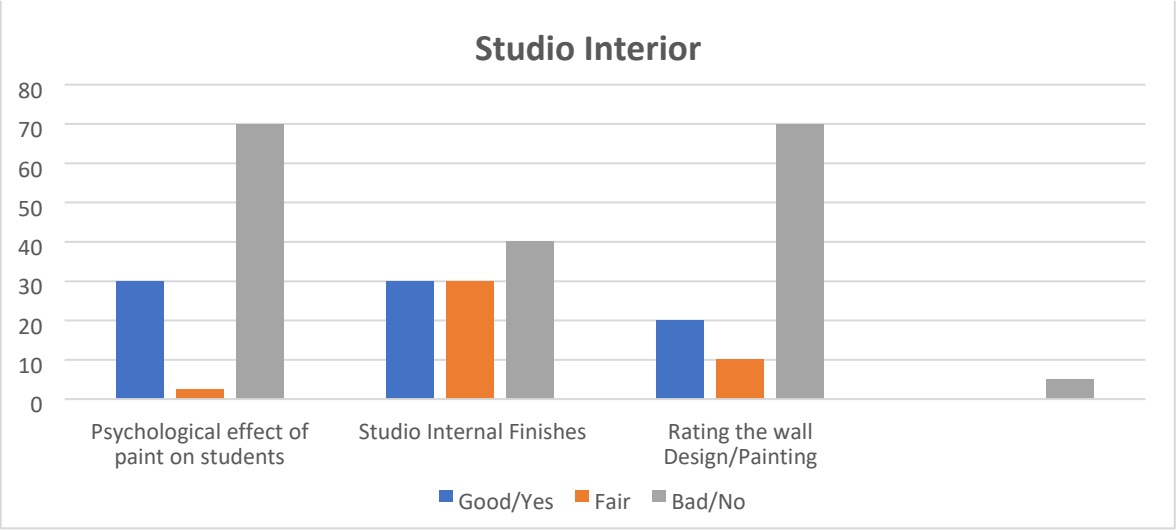

Fig 3: Results of data on internal finishes

Source: Researcher's field work,2020

4. Audio-visual Facilities

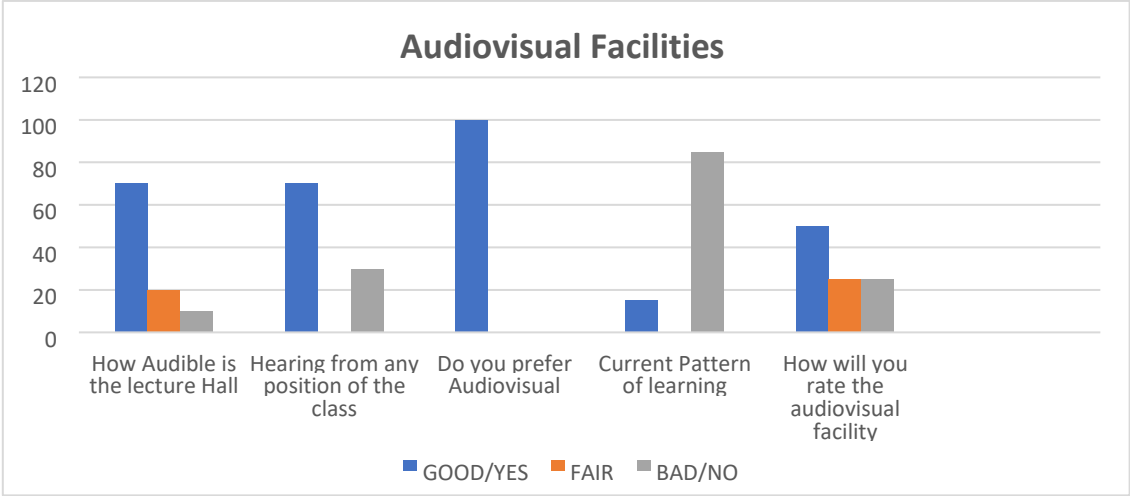

Fig 4: Results of Audiovisual Facilities

Source: Researcher's field work,2020

5. Overhead projector

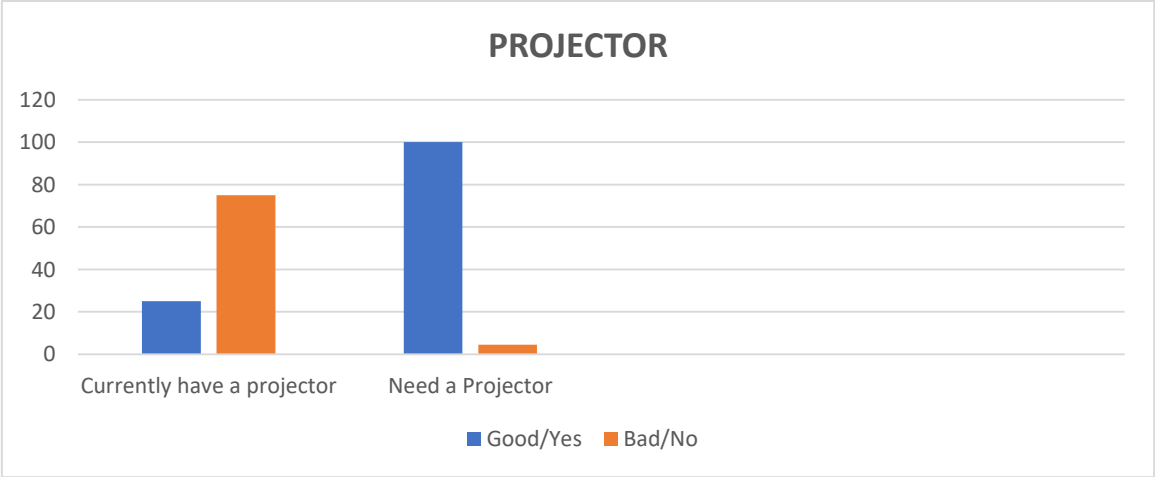

Fig 5: Results on Overhead Projector

Source: Researcher's field work,2020

6. Acoustic Quality of Studio/Lecture Space

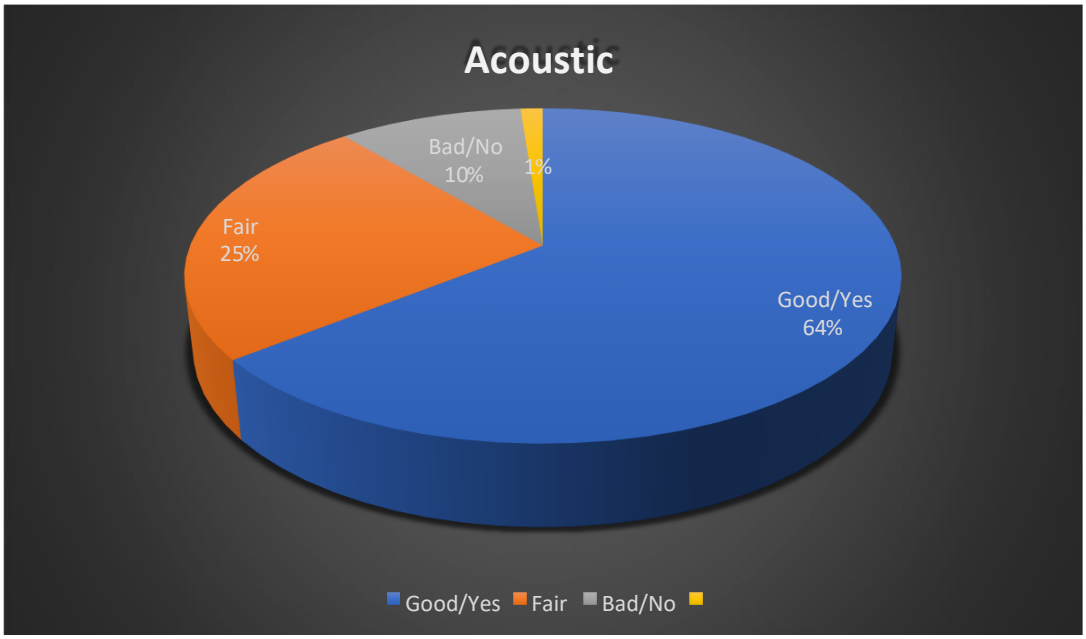

Fig 6: Results on Acoustic Quality of lecture space

Source: Researcher's field work,2020

7. Ventilation

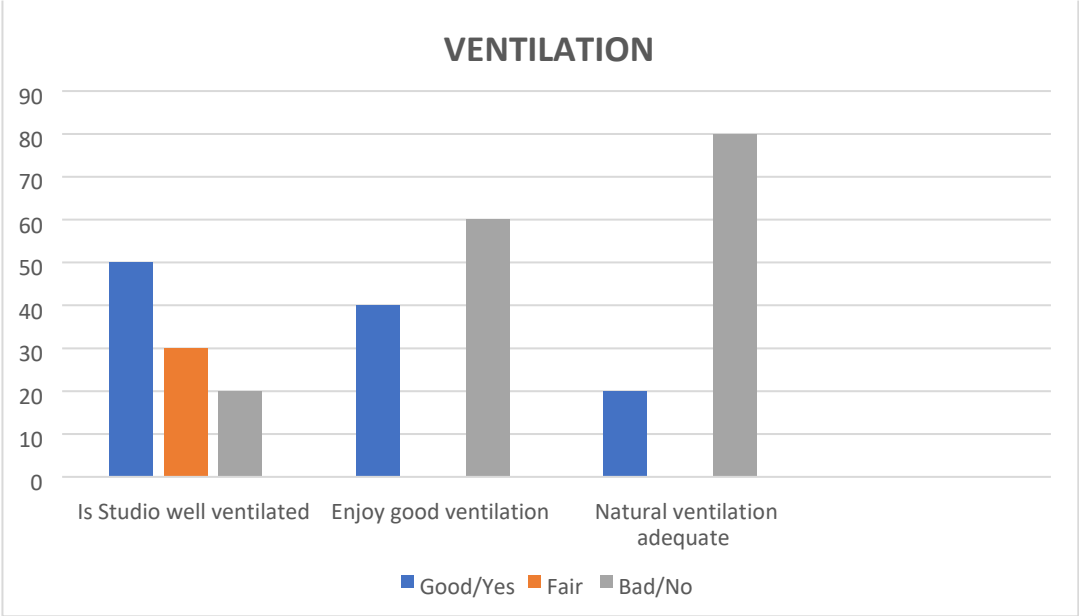

Fig 7: Results on Ventilation of lecture spaces

Source: Researcher's field work,2020

8. Air-Conditioned Classes/Studio

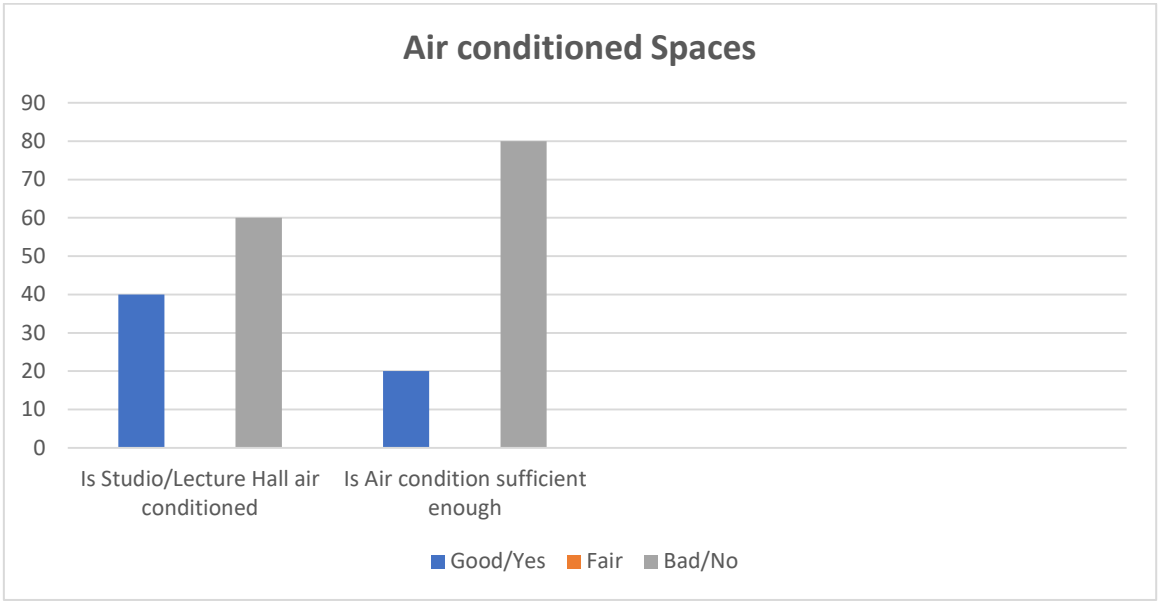

Fig 8: Results on Air-conditioning of classes/Studio

Source: Researcher's field work,2020

9. Size of Studio/Circulation Area

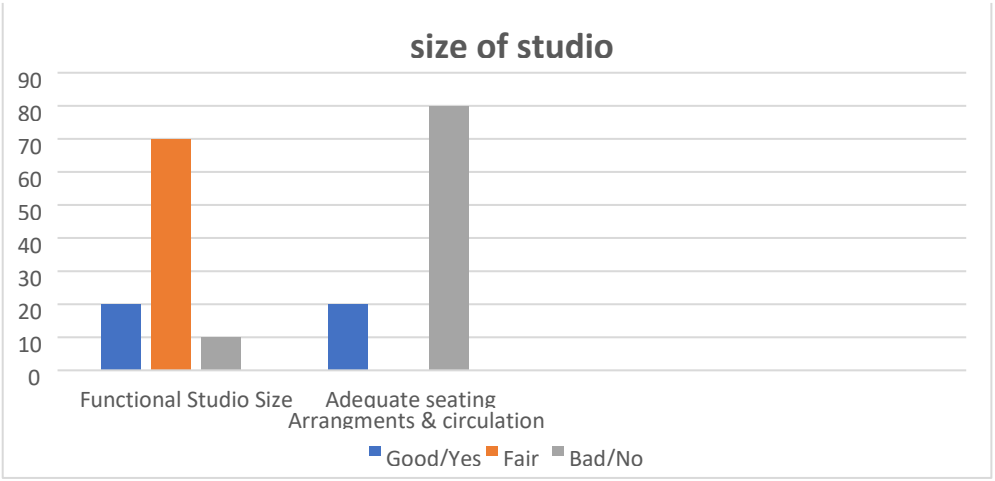

Fig 9: Results on Studio circulation Area.

Source: Researcher's field work,2020

10. Furniture Arrangement

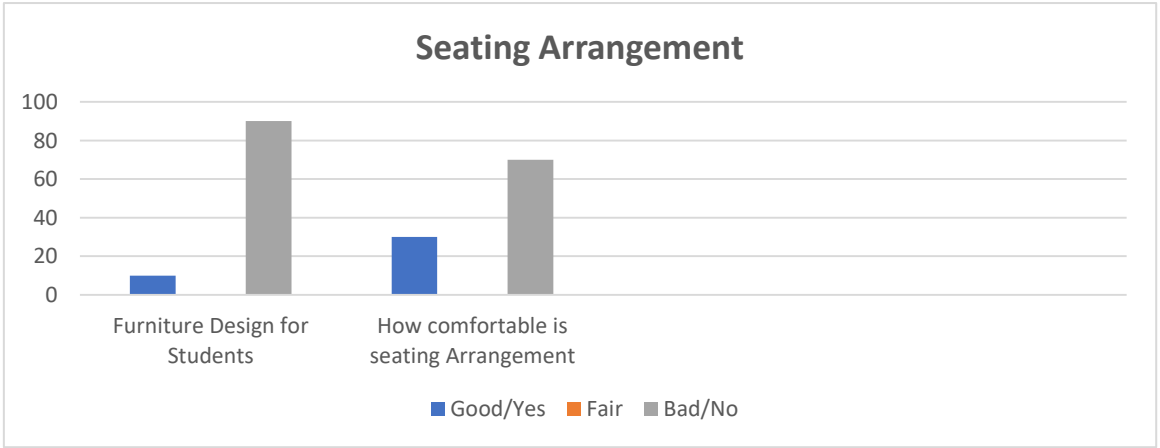

Fig 10: Results of Furniture arrangements of classes/studio

Source: Researcher's field work,2020

11. Shape of Studio/Lecture Space

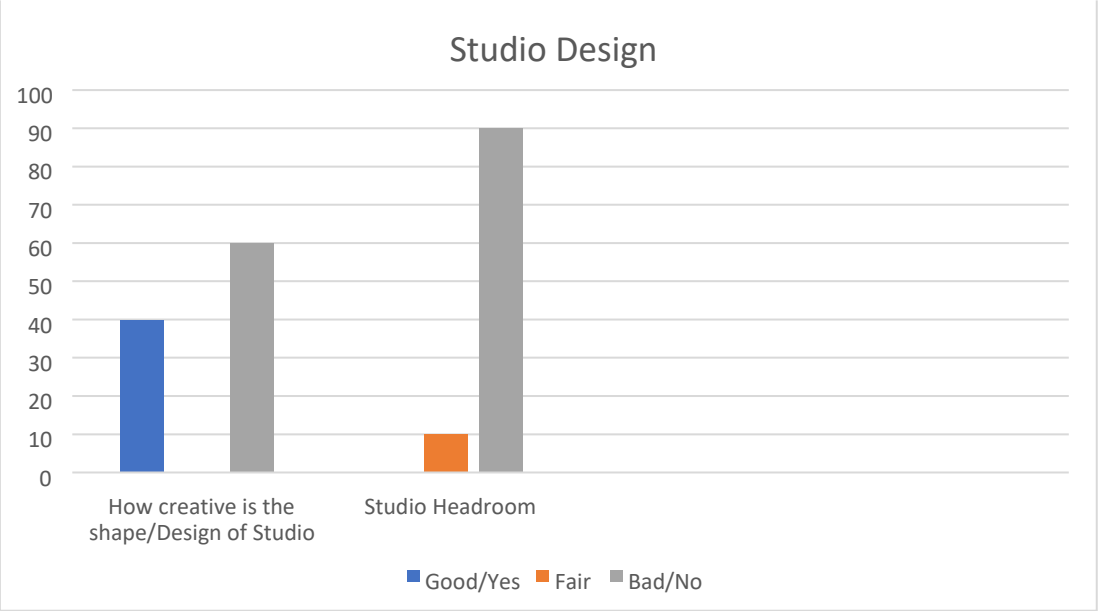

Fig 11: Results on shape of Studio/Lecture space.

Source: Researcher's field work,2020

12. Internet Data Access/Lighting Socket Point

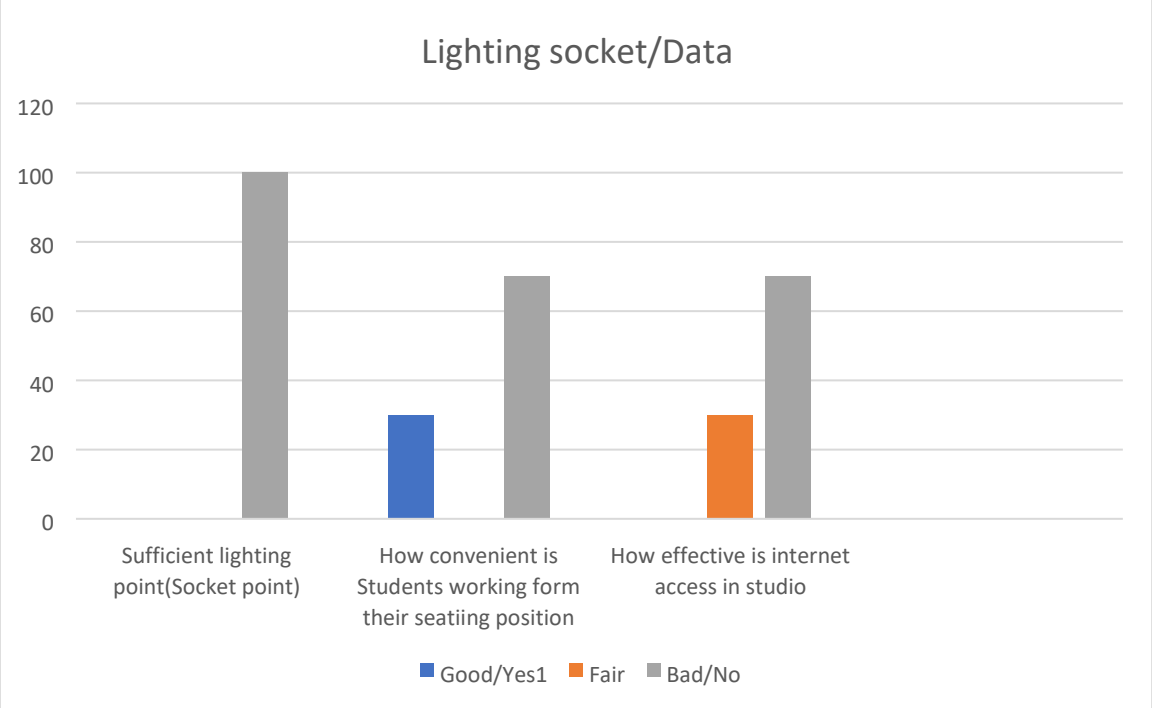

Fig 12: Results on Internet data points/Lighting socket points

Source: Researcher's field work,2020

13. Noise Control

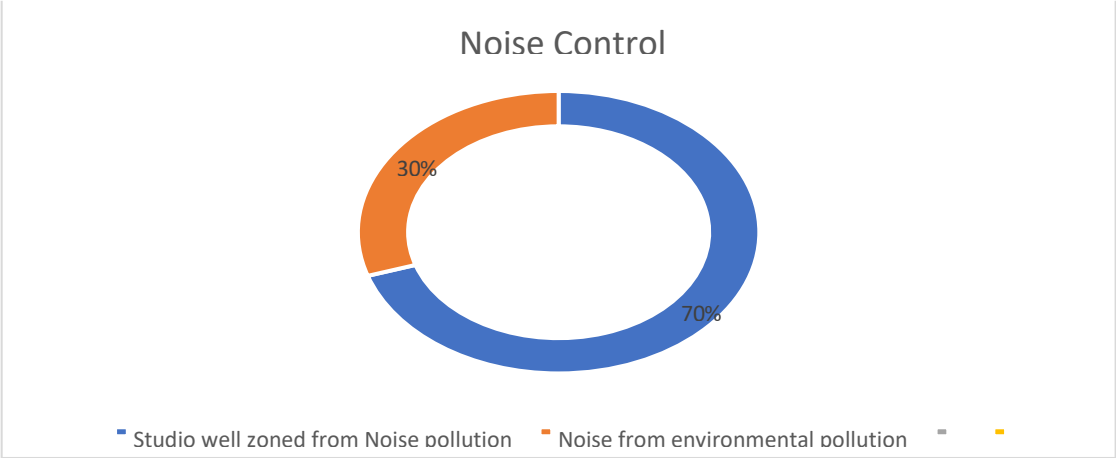

Fig 13: Results on Noise control

Source: Researcher's field work,2020

14. Learning Conditions

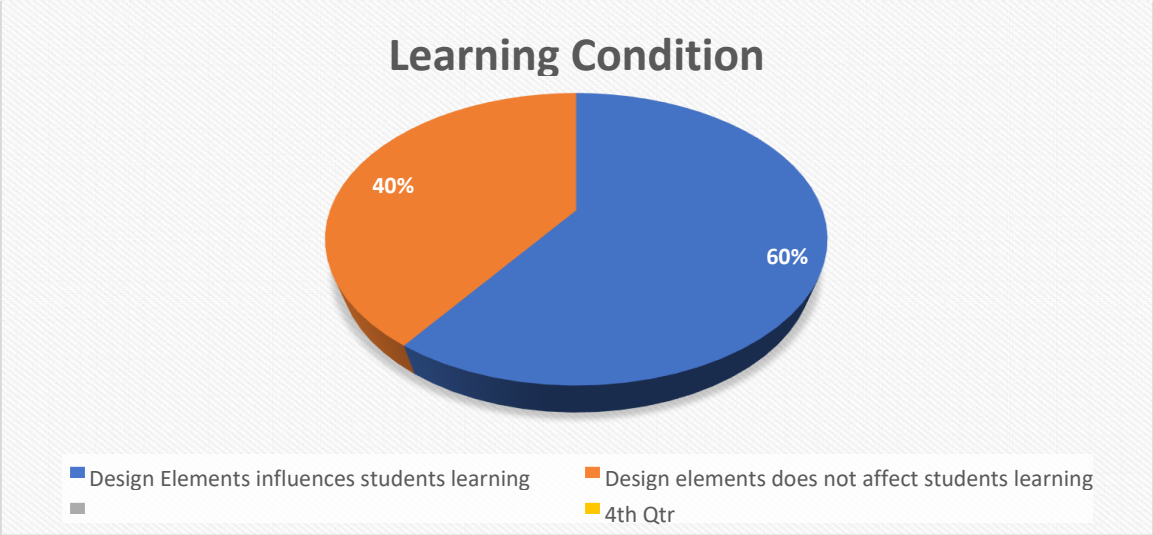

Fig 14: Results on learning conditions

Source: Researcher's field work,2020

V. CONCLUSION

To achieve an effective and conducive learning environment, a number of factors need to be put in place. The factors are a combination of design elements such as Painting, Lighting and furniture/seating arrangements. Others are, but not limited to air quality and ventilation, audiovisuals, noise control, internet and interior finishes From the data and results analyzed, student's assimilation and academic performance are tied to these components of learning environment. The result shows that students would perform better in a more conducive learning environment. A conducive learning environment has an effect on students. When proper considerations are being given to the processes of planning and designing of a learning facility, this in turn will influence student's positive attitude and desire to learn. This will also improve their academic performance and inspire them to be interested in the practice of architecture.

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