

# Architecture Pedagogy: Investigating the Physical Environment of Design Studio for Pedagogical Needs

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**Abstract** - Environment of design studio is built up with the various types of activities, habits, experiences and patterns and plays an important role in students productive work outcome. The design studio is considered as an important component in architecture education where students and instructors spending their most of time for doing design work. Physical environment effects the human being in very different way, they also play their important role to give the efficient outcome during work thus for a successful learning it is important to full filled the needs of it in the giving space. Physical environment is related to user’s working habits to stay in studio, innovation of individuals and studio's cultural environment which includes the space layout, interior arrangements, ambient factors, furniture quality, anthropometrical requirements and green spaces. The purpose of this paper is to investigate the physical needs and expectations of students in the design studio for their project process work and productive results. The required data is collected from the third and fifth-year students of Architecture Department CEAD, MUET Jamshoro through a questionnaire survey and sample size comprises of 73 participants. The results of this study indicates that separate discussion area, furniture and equipment availability with storage spaces, technological facilities, wall colours and nearby green areas in design studio are important factors which need to be improved and enhanced for creative work productivity in design studio.

**Keywords:** Architecture education, design studio, physical environment, pedagogic needs user’s satisfaction.

## I. ARCHITECTURE PEDAGOGY

The word “Pedagogy” is the concept of art and science teaching methods or education methodology which is instructed by the teachers. It concentrates on the methods that how to teach the students in most effective way, to increase the general human mind potential, productivity, creativity & vocational education. The architecture education signifies as a complex process of learning in education system and it only acquire by completing its creative demands. The architectural

design is a major subject that’s why design studio is consider as a major component of architectural academics which is divided into small number of groups instructed and directed by the instructor. Design studio provides the space to students and instructors to build the most feasible physical environment with all the essential components required for professional learning and social interaction through all possible means & measures. It has the observers and participants who experience the things and spaces in their perspectives. Thus it is the process of learning adopted through an adequate pedagogical procedure to give the students an opportunity to learn by practicing.

## II. PHYSICAL ENVIRONMENT OF DESIGN STUDIO

Environment of design studio plays an important role in student’s creativity. Physical environment effects the human being in very different way, they also play their important role to give the efficient outcome during work thus for a successful learning it is important to full filled the needs of it in the giving space. Physical environment is related to their working habits to stay in studio, innovation of individuals and studio's cultural environment which includes the physical structure, space layout, interior arrangements, ambient factors, furniture quality, anthropometrical requirements and green spaces. Following diagram shows the summarized understand of above study.

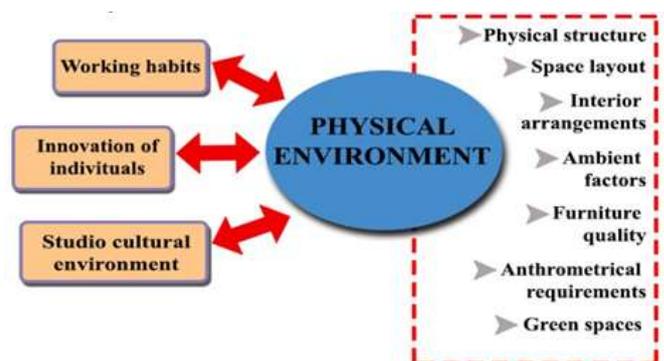


Figure -1: Physical environment

## III. THEORITICAL FRAMEWORK

### **a) Background of study**

Architecture education is a creative and complex process of learning which is learned and taught in a specific way. Architecture education has its own peculiar creative needs and demands. It is a creative process of learning thus it has some specified requirements and needs such as adequate studio structure, studio interior arrangement and teaching management. It further can attain in a proper way by giving importance and improves the quality of its environment. Environment of design studio is one of the aspects which affects and stimulates the learning ability of students and also have greater impact in the effective outcome from the students. Design studio is a core component of architecture education where students and instructors engaging in doing their design projects day and night. Therefore here environment plays its supportive role of motivation to provide a sound concentration for constructing productive outcome.

### **b) Context of problem**

Learning environment in universities offering the courses for architectural studies are less provided and furnished to fulfill the pedagogic needs of students and instructors such as inadequate natural lighting, discussion spaces, and views, space for critic sessions, display areas, green spaces, and interior design can affect the psychological needs of learners (Obeidat and Al-Share 2012)<sup>[1]</sup>. Within the designated environment of the studio along with its limitations of area utilization, learners are not exhibit and share their work to their fellows from different groups even during presentations and critic sessions. Design studio is the place where students and instructors spend their most of the time. Therefore, creative environment boosts the concentration level of students in learning. Thus for such motivation the environment need to be supportive and valuable for creative, innovative and productive endeavors.

### **c) Department of Architecture, CEAD, MUET Jamshoro**

The first name of Centre of Excellence in Arts and Design is Federal college of Art and Design (FCAD).It was established in the year of 1990-91 by the ministry of education. The building of FCAD started its construction at Jamshoro. The project was initially handed to the University of Sindh later on; in 2004 this college converted into Centre of Excellence in Arts and Design (CEAD) by the ministry of Education and then the project was affiliated to the Mehran University of Engineering and Technology Jamshoro. This college has 4 departments namely: department of architecture, department of fine arts, department of communication design, and department of textile design. The aim and objective of the .ARCH course is to build the students for higher education in advanced research and professional studies. The outline of

course is arranged to build the professional skills which are mandatory for professional practices. Along with that it focuses on the understanding for developing and composing the different forms of architecture in Pakistan and also emphasis the relationship of ecosystem and its spaces with the anthropometrical requirements. The Department of Architecture is consider as one of the most improved & well equipped department which offer the quality education in field of architecture. On the other hand, faculty is practicing in the field and obliges to share their professional experiences in to their academic sessions.

## **IV. LITERATURE REVIEW**

The architecture education is considered as a complex procedure therefore it is count as a new system and experience in the field of education and technology, because it is highly based on the discussion and arguments with the teachers. The previous study exposes the enormous efforts of researchers concerned towards enhancing the worth of design education and focusing on improving the quality design education. New research signify the need for a main change in current design education since the professional practice is transforming (Paparizou and Protzen2004)<sup>[2]</sup>.Physical environment is practically based on the combination of psychological needs of users and their potentials, directs greater impact on the student's perception and their pedagogical needs for being stay in design studio (Muniandy, Khan et al. 2015)<sup>[3]</sup>.Innovative work outcome demands a resources of knowledge, motivation and collaboration measures in design studio thus physical environment is count as one of source providing the innovative space. (Oksanen and Stähle, (2013)<sup>[4]</sup>.Impacts of physical environment on student's productivity are thoughtful issueswhich needed to be measured at the initial stage. It also resulted that appropriate interior arrangement improves the functionality of learning environment, satisfying the user's pedagogic needs and also increases the involvement of students into their design development process (Obeidat and Al-Share 2012)<sup>[1]</sup>.

## **V. RESEARCH METHODOLOGY**

Theoretical study based questionnaire were designed for data collection from the Department of Architecture, CEAD, MUET Jamshoro .Survey is collected from the 3<sup>rd</sup> and 5<sup>th</sup> year students, first two years of course were not the part of survey because they are beginners and they can only provide the information about the basic design education. 3<sup>rd</sup>-year students are at the transition stage and experience only the present condition. 4<sup>th</sup> and 5<sup>th</sup>-year students are at the degree level thus 5<sup>th</sup> -year students are fully experienced from all the scenarios and are count as judgmental without taken any biased decisions. The 80 number of questionnaires were distributed

among the sample population of 3<sup>rd</sup> and 5<sup>th</sup> year students (40 students each year). The questionnaire have total 30 (close ended) questions and divided into 3 sections i.e.1-section, asking about the personal information of the participant, 2-section, have the 6 questions based on the working habits of students, 3-section, have the 24 questions where students asked to answer about their satisfaction to the physical environment of design studio. For this study, descriptive statistics methods will be used to summarize the data and only 36/40 (3<sup>rd</sup> year) and 37/40 (5<sup>th</sup> year) students were participated in this study. The responses were analyzed by using statistical software IBM SPSS 20 and Microsoft Excel version 10.0 for making statistical models for analyzing the quantitative data. After conducting the survey, statistical software IBM SPSS 20 and Microsoft Excel version 10.0 was used for analyzing the quantitative data, which is passing through the following 3 stages:

1. Frequency analysis, to better understand their preferences to do the work and how much time they are spending in design studio and to know the respondents satisfied and dissatisfied variables.
2. To find out the overall satisfaction of students for their provided physical environment is calculated by applying Yeh's satisfaction index formula<sup>[5]</sup>.  

$$YIS = \frac{\text{Satisfied} - \text{Dissatisfied}}{\text{Total Respondents}} \times 100$$
3. Comparative analysis of 3<sup>rd</sup> and 5<sup>th</sup> year students on the basis of their satisfactory level.

## VI. FINDINGS AND RESULTS

The findings of the 2-section taken from the 36 students of 3<sup>rd</sup> -year students shows that only 20 students like to work

at the design studio while the 16 students like working at home. From these 36 students, 25 spend 4 hours during University timing with strength of 20 students per group while 28 student spend 2 hours after University .They like to work at design studio but only 8 students are satisfied with design studio layout while 28 are not. When the questions were asked about their satisfaction with their design studio's physical facilities, only 9 students are satisfied while 27 are not satisfied. Whereas the findings of 37/40 students of 5<sup>th</sup> year indicates that 33 students like working at outside design studio and only 4 students like to work at design studio with strength of 20 students per group. Besides that, 21 students from them spend 6 hours during the University timing while 21 students spend 2 hours after the University. Thus 16 students also spend 4 hours during and after University timing respectively. As they like to do their work outside the design studio but still only 12 students are satisfied with the design studio while 25 are not. When the question was asked about their design studios physical facilities, only 9 students were found satisfied while 28 are not (see Table I).

3-Section of questionnaire having the 24 variables based on the physical environment of design studio. The table II shows the strongly low satisfaction index of students that is - 6.9 (3<sup>rd</sup> year) and -14.1 (5<sup>th</sup> year) which means that students are dissatisfied with the overall physical facilities provided in the design studio and need to improve and maintain it. Where S= satisfied, D=dissatisfied. The highlighted data represents the dissatisfied variables found in this study thus to better understand those factors through which the satisfaction index become low.

TABLE I  
Work habits of 3<sup>rd</sup> and 5<sup>th</sup> year students

WORKING HABITS		Options	3 <sup>RD</sup> YEAR		5 <sup>TH</sup> YEAR	
			Frequency 36/40	Percentage	Frequency 37/40	Percentage
1.	You like to do your design project at?	Design studio	16	44.4	33	89.1
		Outside design studio	20	55.5	4	8.1
2.	Mention number of hours spent in design studio during University hours	4 hours	25	69.4	16	43.2
		6 hours	11	30.5	21	56.7
3.	Mention numbers of hours spent in design studio after University hours	2 hours	28	77.7	21	56.7
		4 hours	8	22.2	16	43.2
4.	Are you satisfied with the physical facilities of your design studio?	Yes	9	25	9	24.3
		No	27	75	28	75.6
5.	Are you satisfied with your design studio	Yes	8	22.2	12	32.4

	layout?	No	28	77.7	25	67.5
6.	How much number of students per group in design studio?	15	10	27.7	4	10.8
		20	26	72.22	33	89.1

**TABLE II**  
3<sup>rd</sup> and 5<sup>th</sup> year student’s satisfaction level

Variables of physical environment		3 <sup>RD</sup> YEAR (36)		5 <sup>TH</sup> YEAR (37)	
		Satisfied	Dissatisfied	Satisfied	Dissatisfied
7.	Space layout for students per group	23	13	22	15
8.	Orientation /location	20	16	19	18
9.	Safe location	28	8	27	10
10.	Clear studio pathways	21	15	20	17
11.	Indoor circulation	12	24	12	25
12.	Floor area of your own workplace	14	22	18	19
13.	Personal workplace	18	18	24	13
14.	Area for open group discussion	22	14	14	23
15.	Space for critic sessions on tables	19	17	13	24
16.	Critic session and presentation display areas	13	23	7	30
17.	Furniture quality	5	31	4	33
18.	Equipment	3	33	7	30
19.	Natural and artificial lighting	16	20	23	14
20.	Temperature	24	12	23	14
21.	Air quality	23	13	24	13
22.	Sound quality	21	15	19	18
23.	Technology involvement	11	25	12	25
24.	Internet facilities	4	32	8	29
25.	Wall color	9	27	10	27
26.	Green space location	21	15	20	17
27.	Near green space	27	9	21	16
28.	Indoor and outdoor views	23	13	9	28
29.	Bathroom location	17	19	16	21
30.	Storage space	8	28	9	28
Total		402	462	381	507
Satisfaction index		-6.9		-14.1	

**VII. DISCUSSIONS AND CONCLUSIONS**

The aim of the study is to investigate the physical environment for pedagogical needs of students in order to understand their perception, preferences for design studio and to determine their needs and physical facilities so that students can give and implement their best ideas into work and built the creative learning environment in design studio. The analytical data indicates the student’s satisfaction index in relation with the physical facilities provided in their design studio according to their working habits as mentioned in Table I. Although it also indicates the highest and lowest satisfactory level of students in context of design studio and its physical facilities by highlighting the dissatisfied variable found in this study (See Table II).

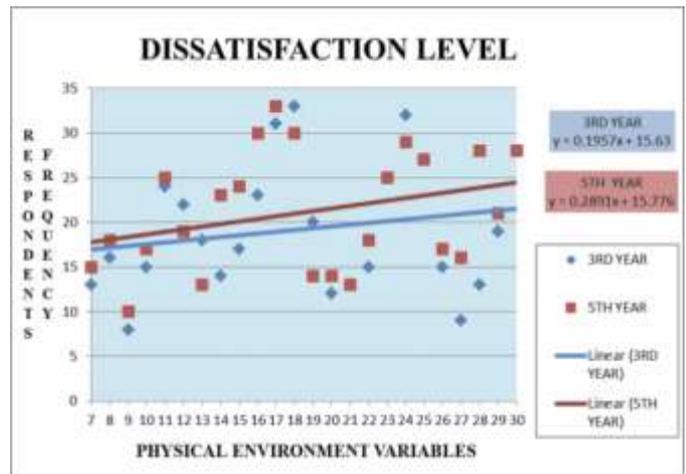
*a) Design studio findings*

It is clarified from Table I that 77.7% and 67.5% strength of 3<sup>rd</sup> and 5<sup>th</sup> year respectively are dissatisfied with the design studio layout. While more than half are satisfied with the space layout, its orientation and studio pathways. It was found from the Table II that students preferred to do work at their personal workplace in design studio because they like to have their privacy but they are dissatisfied with floor area and indoor circulation of working place due to the congested furniture layout which bothers locomotory paths in the studio. Such layout helps in increasing the socially creative learning factors but it bothers the individual’s privacy. Thus for such social interaction and multifunctional communal spaces for exchanging the ideas, a separate centralized open group discussion area in design studio is preferred which may reduce the no privacy leading factor and can be used for different purposes and display areas. Beside above facts, students are

satisfied from nearby green spaces but more than half students are dissatisfied with indoor and outdoor views around the studio and deficiency of such environment may disturb the aesthetic and psychological pleasure.

**b) Physical facilities findings**

From the Table I, 75% and 75.6% strength of 3<sup>rd</sup> and 5<sup>th</sup> year respectively are not satisfied with the physical facilities of design studio in the department. In spite of this students prefer to do their work at design studio but almost all supposed students of 5<sup>th</sup> year doing their design project at outside the design studio because of dissatisfaction with the furniture quality and equipment availability, provided in the design studio. As they don't have the ergonomic features which defines the workplace efficiency according to the student's anthropometry. Moreover unavailability of secured storage spaces for their personal belongings and tools which is the necessity for organizing their work without expanding their workplaces. Another point of focus is that students are dissatisfied with the internet facilities and technology involvement such as electrical connections, internet connection, learning packages and access to online studies which reduces the self-esteem and cognitive factors in users for enhancing the efficiency of work for frequent productivity. While from some of the basic facilities like lightening (natural and artificial), wall colors (internal and external) and bathroom location, at some extent students are dissatisfied which is impacting whole physical environment negatively and decreases the satisfaction index. The above discussion is further verified by comparative study between the 3<sup>rd</sup> and 5<sup>th</sup> year students thus to better understand the current status of university in relation with the student's satisfaction level (See Figure 2 & 3).



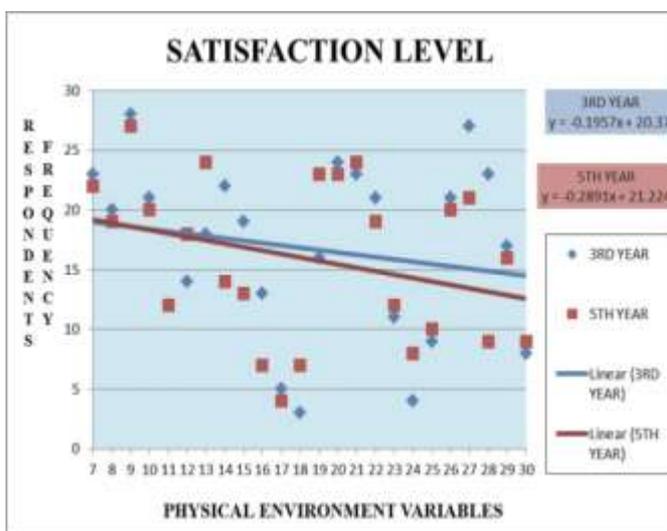
**Figure -3: Dissatisfaction level**

The above figures shows that line equation of satisfaction level is negative which indicates that students' satisfaction level is decreasing due to the dissatisfaction with individual space provided for them in design studio, inadequate area for open group discussion creative outcome during the design process, furniture quality, equipment availability, non-inspirational wall colors, internet facilities and non-availability of storage spaces provided in the design studio.

From the above study and discussion it is concluded that trend of regression line for satisfaction level is decreasing and for dissatisfaction level it is increasing, which indicates that students are satisfied with the physical environment at some extent but need to improve the floor area and indoor circulation of personal workplace, quality of furniture, equipment, technical facilities and illumination while providing open group discussion area and display areas for critic session and presentation. In order to get the maximum creativity and productivity there is a need of improvement in providing the supportive and motivational physical environment in design studio which can be obtained by enhancing the indoor and outdoor views, green spaces and wall colors of design studio. From the study it is concluded that students are not preferring to stay in design studio because of dissatisfaction regarding physical facilities which leads the students to stay outside the design studio. It promotes the non-integrated behaviors and disassociation bonding among the peers. Due to that learners having deficiency to inhale cohesive work environment in future professional practices.

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**Figure -2: Satisfaction level**

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