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The Dynamics of the Psychological Approach in Designing Spaces – A Study of Architecture Students

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Abstract

The psyche of human mind is best expressed through architecture and the interior design of buildings. No doubt, architecture and psychology are interconnected domains of human experience; while building design is the physical illustration of the creative perception of human psyche. Human interaction with the built environment prompts the senses to perceive and react to it in different logical manners, exemplified through unique spatial expression of every single designer. It has been observed that students as future architects, while tackling with the design projects, put forth their own spatial experiences of interaction with the built environment. For this reason, students of Bachelors in Architecture program at the University of Management and Technology, Lahore, Pakistan were interviewed informally to document their psychological approach regarding spatial thinking and translating it into architectural designs of varying quality. The findings acknowledged that the architectural psychology of the designer and the psychological influences of environment impact the construction and building design industry. The diversity in design driven by the psyche of each student is interesting to note and it establishes the fact that every single design is dominated by the concepts developed during the design process. The study has significance as a vital contribution towards the psychological implications of architects for a well-designed built environment.
Keywords: architecture, design, psychology, students

Introduction

Psychology is directly related to culture, art, and architecture. The appropriate use of various artistic components, such as color, space and size has the capacity to enlighten the atmosphere. The current study falls into the category of environmental psychology. Generally, society has become conscious about sustainability issues regarding environment and

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particularly about social issues and the current study emphasizes how natural environment affects human beings and vice versa (Young, 2013). Hunter (2005) described that research conducted over the past 40 years should be applied to classroom design to enhance creative problem solving skills in students. In the language of architects and designers, it is also called architectural psychology, which comprises three major domains of study namely built environment, spatial interaction and natural environment (Figure 1). With the passage of time, the field has evolved and a variety of investigations have emerged. Deep studies have been conducted with respect to visitor studies in the museum. Bitgood (2002) stated that in the late 1980s, a large number of new investigators joined the visitor studies movement and the amount of research has increased dramatically since then. Other types of buildings, such as schools and classroom designs, have attracted the attention of researchers toward architectural space designs. Anbari and Hossein (2015) emphasized that an architectural space for children as users should be clearly perceptible and children's tendency toward special environmental and graphic features such as light, color, and form should be studied. This research aims at an environmental friendly psychological-physical design in order to facilitate the development of children, both emotionally and physically.
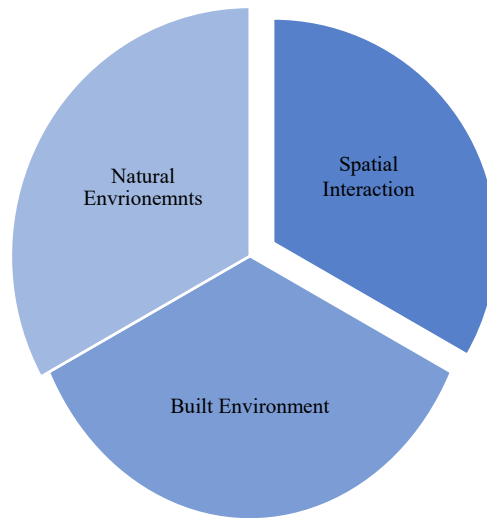

Figure 1: Domains of architectural psychology

Human element is articulated properly through architecture which reflects the psychology of its designers. Carl Jung, a great analytical psychologist, stated that a building is the physical illustration of what has been perceived by the human mind; so do architects perceive their building designs based on their psyche. For instance, Smith (2017) referred to the beautiful illustration of Iranian architect Zaha Hadid by Jeanette Winter, that she drew inspiration for her designs from the natural world, which she famously stated "is not a rectangle"; as a result, her buildings swoop, curve, twist, and flow. The traditional and modern roots of architecture of any region can be traced back to the individual expression of a particular designer, like buildings designed by architect El-Wakil in the Arab world speak for Arab architectural style (Al-dabbagh & Al-sofee, 2011). This affirms the fact established by Namazian and Mehdipour (2013) that art and architecture offer a vehicle for conveying the deepest unconscious thoughts of human beings.

The presence of a physical space is necessary for human interaction and associated psychological processes. Spaces created by architects and interior designers guide human functioning in a remarkable way, resulting as sound products of human psyche in addition to creating an impact on everyday life. Butterworth (2000) described that spaces, places and buildings are more than just props in people's lives; they are imbued with meaning and resonance since they symbolize peoples' personal histories, interpersonal relationships, and shared events in their extended relationships, families, communities and the wider culture. Built environment affects moods, enthusiasm, decision-making, well-being, behavior, and performance of individuals as well as how they interact with others. Unwin (1997) beautifully explained this impact through peoples' perspective, "People make places in which to do the things they do in their lives—places to eat, to sleep, to shop, to worship, to argue, to learn, to store, and so on and on. The way in which people organize their places is related to their beliefs and their aspirations, their world view. As world views vary, so does architecture: at the personal level; at the social and cultural level; and between different sub-cultures within a society."

Previous studies of engineering design also focused on the similarities of creative processes, such as in case of architectural design products. A

study by Howard, Culley, and Dekoninck, (2008), based on describing the creative design process by the integration of engineering design and cognitive psychology literature, established that the characterized 'design outputs' commonly referred to in engineering design literature show many similarities with the creative product described in psychology research literature. In addition to its connection with the literature of psychology. Maier, Fadel, and Battisto (2009) suggested that the idea of affordance, which is an established concept of ecological psychology, may serve as a conceptual basis and unifying framework for architectural theory, design, and practice. This is because many scholars in history have realized that there is a lack of rigorous theoretical grounds in architecture design like other design disciplines. Hence, the idea of affordance (Gibson, 1976) can serve the purpose well due to its descriptive element of linking human beings (users) and built environment (artifacts) with each other, providing the rationale for why and how users behave the way they do.

Another aspect of the current study is to emphasize the procedure of 'making of an architect'. In this regard, Sharon Sutton (environmental psychologist and architect) highlighted that schools are relatively powerless in this developmental process because they spend much of their time disagreeing with each other, rather than formulating a strategy to counter the current process of accreditation and licensure. As a result, the architecture educational curriculum is shaped by people whose primary concern is with "life safety", a topic more closely connected with engineering than psychology (Edgerton, Romice & Christopher, 2007). An architect or designer starts the project through case studies and concept studies focusing on design and its context. Eastman (2001) highlighted that a designer has multiple sources of information including the external world of objects and observation (example designs, the context of other designs), external sources of encoded information (such as books, the web, drawings), and the internal recollection of previous experiences and learning for developing the design world. Moreover, the process of design is itself a multifaceted one involving guidance, original thoughts, discussions with professionals and updates from the field (Adams & Fralick, 2010) described the design process as structured research is undertaken, information collated, pictures formed and problems identified,

and then 'the magic happens'. Sketches and graphical presentations play an important role in defining the exclusive role of designers and architects.

Students of architecture generally begin their work on the assigned projects through initial sketches. This is because the purpose of design sketches includes visualization, comparison and implementation of the design that occur in different stages. Suwa and Tversky (1997) mentioned that there are two ways of inspecting sketches, that is, 'seeing as' and 'seeing that', and that the former is an especially powerful means for what is called an interactive imagery. Free hand drawing and sketches are considered the strongest tool of communicating design to the viewers. The dedication of sufficient number of courses focusing on free hand drawing, architectural softwares and visual communication is a true sign of their importance in architectural education.

Studies have shown the significance of the designer's psychology for any type of building project. Recently, a research paper by Peterson, Sandin & Liljas for the future design of the 'rooms of silence' within a Swedish health care context, through an explorative study of design students' proposals, concluded that there is a need to lift the general issue of how much design in health care architecture reflects and supports existential needs (Petersson, Sandin & Liljas, 2016). Interestingly, there is another study which discussed the personal and technical capacities of architecture students to execute architecture as a profession and involved and analyzed architecture students of Selcuk University Architecture Faculty, Department of Architecture, Konya in a qualitative manner by asking them open ended questions. Moreover, Yalçin and Ulusoy (2014) suggested that how the architecture students consider themselves, their professional development and the reflections about the education they receive is the key to their architectural design for future projects. However, a psychological approach has not been taken into account for the students of architecture at undergraduate level. The aim of this research is to make a valuable addition to the architectural psychology of design students. Also, the thought process of future architects needs to be analyzed as they will design the spaces and buildings for coming generations. The objectives of study are,

- To analyze student psychology about spatial interaction.
- To overview architectural psychology on an individual basis.

- To examine the diversified psychological approaches of students towards designing hospital spaces.

The study holds significance for opening the door of research on this aspect of psychology and its relation with architecture. Innovative research about the psychology of architecture and interior spaces is featured in this study, which makes a contribution toward little existing research about the psychological implications of architects for a well-designed built environment. The built environment is truly a foot print of thinking pattern and spatial experience of one's personality.

2. Method

In-depth interviews along with participant observation was selected as the research methodology for this study (Table 1). Participant observation of researchers was included as one of the research methods, since the participating researchers taught the students for the hospital project. In this particular case, students of fourth year of BS architecture were sampled for a case study. The underlying reason is the maturity of their minds which are closer to professional designers as compared to junior students. By this time of their educational journey, they have an experience of professional life and possess practical knowledge. Random sampling was applied and five students out of a population of 40 were formally interviewed through a structured questionnaire. Structured interviews were conducted to get a detailed and deeper insight into how students use their spatial experience with the built environment and relate it with the psychological patterns of thinking. The results and discussion were compiled using thematic analysis for each interview. The following three themes were selected for formal interviews which were included along with the tagline from each interviewee.

- Perception
- Ideology/Concept
- Architectural design

Five students were taken as a random sample out of a class of 40 students. The individual design approach for the same design project, that is, a hospital of 300 beds was assigned to students to meet the following objectives.

Table 1

Questionnaire for In-depth Interviews, Source: Author

Themes for Questionnaire used for In-depth Interviews to Study the Psychological Approach of Architecture Students towards Architectural Design of a Hospital	
a. Perception	• How do you perceive hospitals? • What major areas of a hospital attract your attention in particular? • What features of interior and exterior design/layout can be associated with hospitals?
b. Concept	• What basic idea drives you to set the conceptual basis of your hospital design project? • Is there any case study incorporated in your own design or have you taken some inspiration from natural forms/shapes? • Which design elements or principles you have studied and utilized for health care design? • What tagline would you give to your design concept of hospital?
c. Architectural Design	• Which design pattern you have followed; form follows function or function follows form? • How did you figure out your inspirations and conceptual ideas about particular spaces in your hospital design through planning? • In detailing out the exterior form of your hospital building, what particular psychological aspects you have exhibited in your site planning and 3d form?

2.1. Design Requirements

The design should comply with the standards and bye-laws of building regulating authority of that area strictly. An elegant, modern and beautiful façade remains one of main objectives of the project. The students were provided with a list of basic hospital needs. They were required to develop a proper requirement and area chart of all the needed departments in the light of their client's requirements.

2.2. Scope

The scope of the project includes safety and security, patient movement, lighting, ventilation, auditory and visual privacy, housekeeping, maintenance, material specification, segregation, fire protection, signage, parking zoning, function space etc.

The analysis was done under the same themes as defined above. It is interesting to document the uniqueness of the psychological approach towards designing different spaces of a hospital. Moreover, a tagline was also documented through each interviewee. This added a more exclusive feature headline for the description of the thought process of the interviewees which they experienced during the project.

3. Results

Each interviewee was given a tagline defining the outcome of his/her architectural planning, which he/she believed to be in association with the final product. In every discussion, the tagline was put in a table along with its description, followed by thematic analysis and pictorial reference of the architectural design.

3.1. Healing Through Green Spaces

Table 2
Psychological Approach – Interviewee A

Healing Through Green Spaces	
a. Haider Reza, Age: 22 Source: Used with the permission of Raza	The headline "Healing Through Green Spaces" summarizes the psychological approach of the interviewee A. The final architectural design supports the perceptions and basic concepts. Nature is a great source of healing the wounds. Keeping this fact in mind, healing terraces have been provided by the student for breaking the monotonous look of hospital.

3.1.1. Perception of hospital space. Interviewee A thinks that a hospital is a major public space with a sustained presence of its users,

making it a busy place especially in our local context of Pakistan. Also, it is considered as a whole an institution on its own with diversified job profiles and professional linkages. As far as the exterior of a hospital is concerned, Interviewee A associated it with landscape and proper natural lighting, believing that physical healing goes hand in hand with psychological healing. He perceived that the interior of health care design should provide an appropriate view for indoor patients of outdoor landscape.

3.1.2. Ideology/basic concept. Interviewee A put forth his basic concepts into following points utilized in his architectural design: a) Patient comfort through architecturally designed spaces; b) Relationship of patients with the built environment; c) Inclusion of healing gardens and terraces (main concept); d) Inclusion of sitting lounges and; e) Calm environment for accompanying persons.

3.1.3. Architectural design. Architectural design of interviewee A is well connected with the psychological approach and his perception of the hospital. The final architectural product shows patients in wards connected with healing terraces and enjoying uninterrupted views of the outdoor landscape (plan, Figure 2). Believing that the contemporary look of hospitals should discontinue, he designed the exterior of his building in a modern style along with healing terraces (elevation & 3D, figure 2).
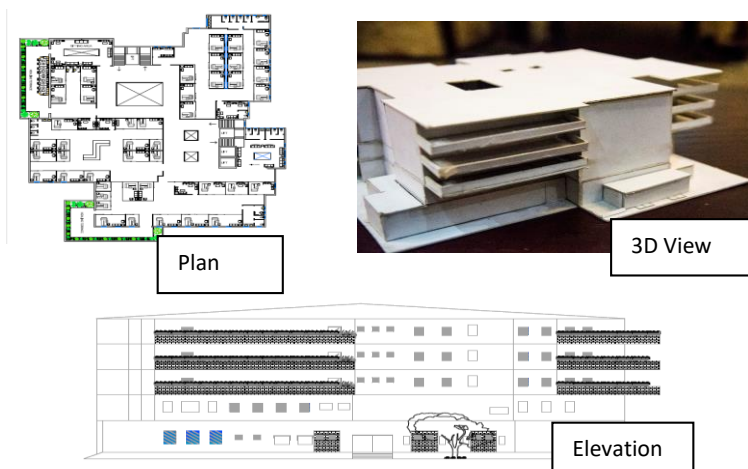

Figure 2. Final architectural product, interviewee A, source: used with permission of Raza

3.2. Healing Trough Colors

Table 3

Psychological Approach – Interviewee B

Healing Trough Colors	
b. Nushmea Fazal, Age: 20 Source: Used with the permission of Fazal	The headline "Healing Through Colors" summarizes the psychological approach of interviewee B. The ideology and basic concepts are well incorporated in final architectural design of the hospital. Colors do play an influential role on minds and moods. Color psychology has been applied in interior design. Also, wards have been designed based on the separate flow of doctors and patients.

3.2.1. Perception of hospital space. In the viewpoint of interviewee B, a good hospital features well-organized rooms and spaces, function oriented mechanical systems, efficient functionality of architectural design, environment friendly design, hygiene concerns and collaborative design approach for diverse user types including staff, doctors, and patients etc.

3.2.2. Ideology/basic concept. The basic ideology of interviewee B for hospital design revolves around outdoor spaces, visiting hours of patients, and the aspect of future expansion. But the most striking feature of the conceptual design is the inspiration from WBC (white blood cells) within the human body, which is well integrated in the spatial organization of the hospital in its strand form.

3.2.3. Architectural design. Interviewee B provided ease for doctors by incorporating the facility of triage space in planning. Also, the planning of wards is based on segregation of male and female users (plan, figure 3). Keeping in view the details of the interior design of a hospital, interviewee B applied color psychology in different spaces, that is, bright colors such as yellow, green, and pink on roof hanging in the children ward, blue color for male ward and red and orange color in the café (interior views, figure 3).

The exterior of the building is also blended with the interior color scheme and strand composition of white blood cells (WBC) (elevation, Figure 3).
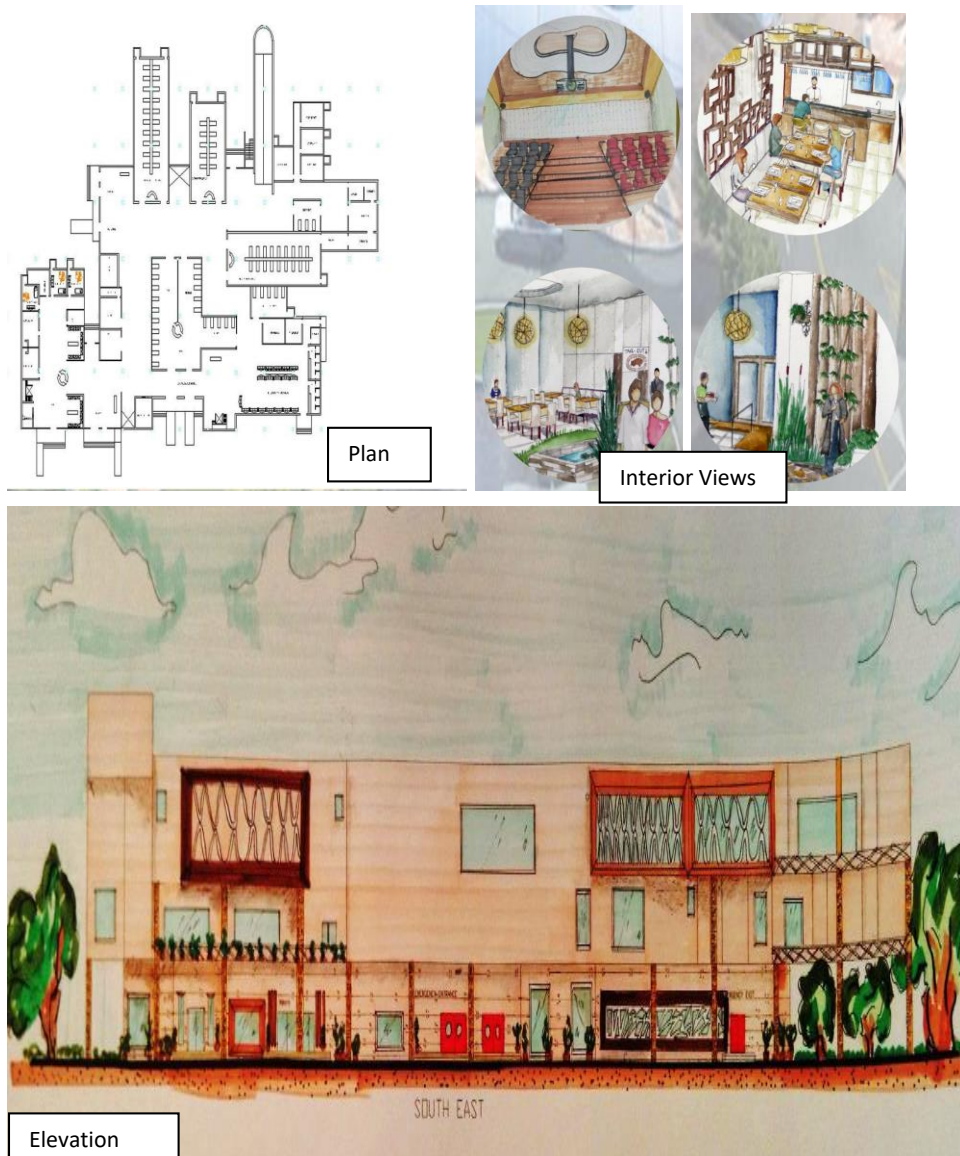

Plan

Interior Views

Elevation

Figure 3. Final architectural product, interviewee B, source: used with permission of Fazal

3.3. Make Hospitals Less Scary

Table 3
Psychological Approach – Interviewee C

Make Hospitals Less Scary	
c. Saad Mehmood, Age: 21 Source: Used with the permission of Mehmood	The headline "Make Hospitals Less Scary" summarizes the psychological approach of interviewee C. The final design of hospital is well justified with the designer's psyche. A patient does not feel good while visiting a doctor and local hospitals do enhance this fear factor. This associated feeling with hospital needs to be eliminated according to the designer. Façade design has been given special treatment for addressing this issue.

3.3.1. Perception of hospital space. Interviewee C associates his perception of hospital space with his real life experiences in local hospitals of the country. He mentioned that a hospital, being an important part of urban settlement, still portrays a confused layout of schematic planning. Hygiene is a critical issue for health care institutions. However, cleanliness is not maintained and this situation becomes even more severe due to the uncontrolled population of unnecessary attendees with the patient, especially in our culture. Hence, all these observations directed him to design an eco-friendly hospital with less mechanical dependency.

3.3.2. Ideology/basic concept. Interviewee C took his inspiration from the case study of hospitals of Washington D.C., which are designed to encourage calm spaces. These are normally located away from the city center believing that the best healing is through plantation and natural environment. Also, it demonstrates that calm environment helps patients to heal more quickly.

3.3.3. Architectural design. The final architectural design features one corridor approach to connect OPD (Outdoor Patient Department),

pathology department and emergency in order to avoid confusion for first time users (plan, figure 4). Interviewee C expressed his concept of calm environment by segregating the departments with separate lobby and waiting areas. The hospital staff is also allocated with proper spaces in the form of separate units. The façade design highlights the use of screen patterns and ceramic tiles as finishing material on the exterior (3D & elevations, Figure 4).
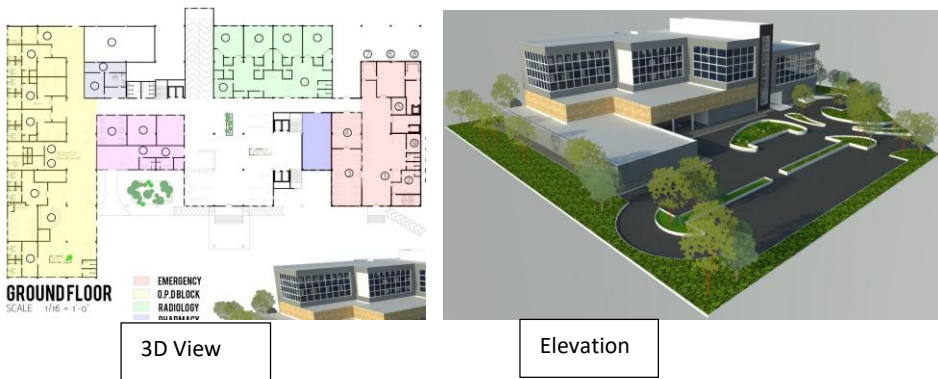

3D View

Elevation

Figure 4. Final architectural product, interviewee C, source: used with permission of Mahmood

3.4. Interlocking Outdoor Environment with Major Hospital Services

Table 4

Psychological Approach – Interviewee D

Interlocking Outdoor Environment with Major Hospital Services

d. Mehak Ali Wajid, Age: 21 Source: Used with the permission of Wajid	The headline "Interlocking Outdoor Environment with Major Hospital Services" summarizes the psychological approach of interviewee D. Outdoor environment needs to be incorporated into indoor spaces. The final design displays the promising attitude of the designer through the provision of courtyard gardens. This interlocking of outdoor and indoor leaves a fresh impression on spatial users (doctors and patients).

3.4.3. Perception of hospital space. Interviewee D perceives hospital as a healing center with more inclusion of green spaces and landscape

design with a controlled population of visitors. She believes that such an environment promotes healthy and vibrant effects on the users. Also, there should be convenient interlocking of spaces specified for doctors, hospital staff and patients.

3.4.4. Ideology/basic concept. Interviewee D recalled her experience of working as an internee on the project of eye hospital in the past. On the basis of this experience, she opted for the interlocking design principle for connecting the routes of different types of users in the hospital. Moreover, to integrate the outdoor landscape with the indoor environment of a hospital, the designer showed inclination toward the use of glass on the exterior façade of the building.

3.4.5. Architectural design. Site planning is based on the interlocking principle in the architectural design of interviewee D, which establishes the fact of being influenced by psychological experiences and approach of the individual designer. At the same time, segregation is also provided for each department by giving it a separate entrance. Again, indoor gardens are an image of connection to the outdoor landscape and views as elaborated by the designer in her concept (Plan, Figure 5). The exterior of the building is in harmony with the vernacular architecture of Lahore due to selection of red bricks (Gutka) on the façade (3D view, figure 5).
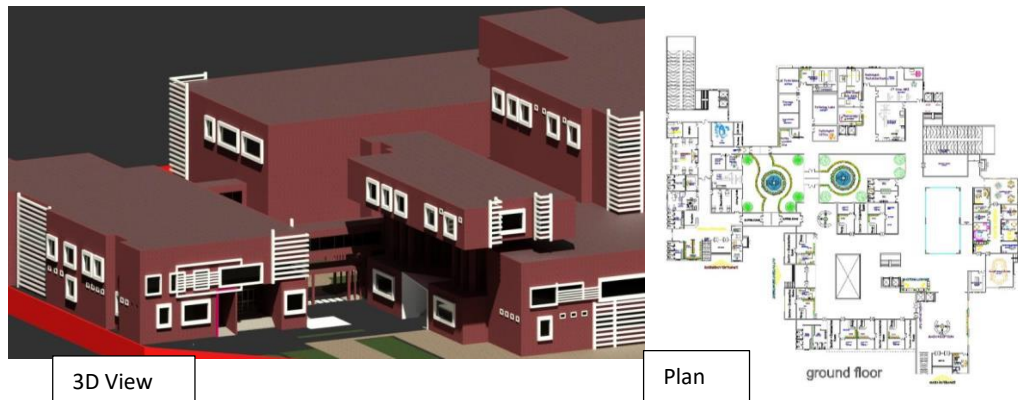
Figure 5. Final architectural product, interviewee D, source: used with permission of Wajid

3.5. Breaking the Monotonous Look of Hospitals

Table 5

Psychological Approach – Interviewee E

Breaking the Monotonous Look of Hospitals

e. Ibtesam Saeed,
     Age: 23

Source: Used with
the permission of
Saeed

The headline "Breaking the Monotonous Look of Hospitals" summarizes the psychological approach of interviewee E (Table 5). Hospitals should be vibrant in design and this perception needs to be specially addressed when it comes to the exterior look. Straight elevation has been denied and the interplay of different levels has been applied in the design. The final design rationalizes the psyche of the student.

   3.5.1. Perception of hospital space. Interviewee E specifies the perception of hospital with a monotonous look on the basis of his experience and observation of local hospitals. He associated his viewpoint of a hospital with suffocated spaces having medical odor, dark and gloomy corridors, dull color scheme on the interior walls etc. He expressed that the

monotonous look and impression of hospitals should be disrupted by using color theory and smart design approaches. In this regard, he mentioned Bahria Hospital (Lahore) for its façade of bright colors and modern design form.

3.5.2. Ideology/basic concept. Keeping in view his insight about hospitals, interviewee E based his concept on a nature friendly building style and large volume atriums. He divided the hospital plan into three main levels: the primary level is about OPD and emergency; secondary level hosts radiology, pathology and wards; and the tertiary level features private rooms, staff rooms, and the admin block.

3.5.3. Architectural design. The final architectural product of interviewee E enables the user to have its first interaction with open green spaces rather than concrete blocks. Double heighted atriums are spaced out for catering the primary user with a green cover of plantation (plan, figure 6). The different levels of parapet wall in elevation is an attempt to break the monotonous outlook of the hospital by the designer (elevation, Figure 6).
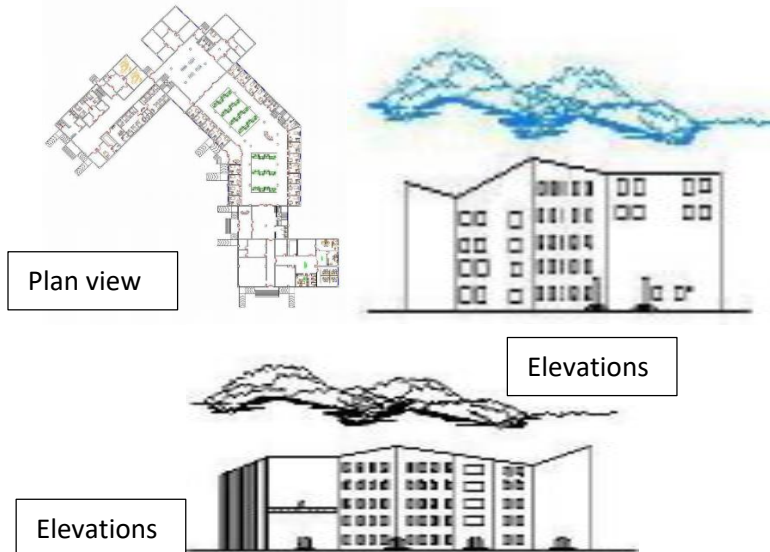

Plan view

Elevations

Elevations

Figure 6. Final architectural product, interviewee E, source: used with permission of Saeed

4. Discussion

The results of this study disclose that there is a vital difference between the ideas and psychological approaches of each student dealing with the studio project of hospital design. In this connection, this research evaluated the future architects in cognitive and interpretive dimensions of designing the final architectural product. The current research is quite focused and narrow in its scope in comparison to previous researches in this domain. For instance, visual analogy was studied as a cognitive strategy in the design process relying on expert architects and undergraduate students (Casakin, 2004). The results derived from the above study have important implications for design education since it formulated and tested the hypothesis that experienced architects in contrast to students added new constraints to design problems and created only a small number of alternative solutions. Another study examined the expert architects' design activity when they were blindfolded while sketching and investigated the outcomes of these activities to know the impact of the limitations of working memory. Research by Bilda and Gero (2007) suggested that sketching might not be the only way to design conceptually for expert architects, as they are capable of producing quality solutions like sketching proposals by relying on their memory.

The role of environmental psychology was examined in the educational roadmap of interior design in the recent researches. Yalçin (2015) emphasized student inquiry in terms of psycho-social factors affecting people, directing spatial design and identity in order to establish their analysis, providing "*Exploratory*" and "*Descriptive*" aspects to the design problem. Their exploration revealed that the relationships with interior and exterior spaces provide not only emotional and psychological affordances but also cognitive and social affordances which satisfy the sense of place, integrate and enable engagement. Other studies were conducted to examine the psychological connections with built environment in the context of workspaces (Vischer, 2008; Oseland, 2009). A comprehensive environmental comfort model of workspace quality was proposed covering the factors of satisfaction, comfort, sense of belonging, and environmental psychology of workspace, including well established concepts such as worker motivation and its relation with the surrounding physical setting

(Vischer, 2008). Oseland (2009) highlighted that different people require different environments at different times to perform well, depending upon the task they are conducting and personal factors, and concluded that designing for individual requirements is a challenge in a world of open plan office space.

To summarize, people connect deeply with the built environment around them in various contextual indexes and in layers of working capabilities and thinking patterns and so do the architects. While significant knowledge has been accumulated from previous studies incorporating various aspects of environmental psychology, built environment and architecture design, important voids remain in the contextual role played by the psychological approach of individual designers and architects. The analytical framework and content of the current research have promoted the idea of innovative and important questions to be investigated, providing fruitful directions for future research in the discipline of architectural psychology.

5. Conclusion

The majority of the discussed cases indicate that the outcome of an architectural design depends on the perception and psyche of the individual designer. The observed themes from the interviews include healing through green spaces, healing trough colors, making hospitals less scary, interlocking outdoor environment with major hospital services and breaking the monotonous look of hospitals. The diversity in design driven by the psyche of student is interesting to note. The study has established the fact that every single design is dominated by the concepts developed during the design process. Also, the reflections of the psychological approach are expressed through sketches and architectural drawings to maintain their uniqueness for a long period of time. The final architectural products justify the basic thoughts and ideas of hospital spaces expressed in each interview. The spatial experiences of architects serve as the starting points for dealing with any building project and sometimes, as finishing points, for executing paper drawings on ground in practical form. Research suggests that there is an inherent gap in the existing literature available for studying the psychological approach opted by architecture students at the undergraduate level to design the assigned projects. This area needs to be explored as these

young minds are going to contribute to the built environment. It is affirmed by this study that architectural psychology of the designer and psychological aspects of the surrounding environment impact the construction and building design industry. Hence, there is a dire need to make students of architectural and urban studies genuinely familiar with more courses of environmental as well as architectural psychology to ensure the development of sustainable and healthy buildings. The implementation of this suggestion in the curriculum of architecture schools on an undergraduate level could benefit the future architects by providing them with a deep insight into any building project with respect to its impact on the users and context, leading to user friendly buildings and structures.

Acknowledgement

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