Shaping Space Psychology: Towards a Study-Work Café Interior Design Effect on User's Behavior

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Abstract

All design influences user's actions (Lockton& Harrison, 2012). Interior designers consciously consider space psychology, which is the interaction between users and spatial environments. Interior design has the power to influence users' behaviour in public spaces by implementing elements that convey desired intentions. The concept of "Study – Work Café", has become popular as a result of schools' and universities' growing adoption of project-based activities and group work. Moreover, driven by the rise of startup businesses, remote jobs and freelance work. The shift of these activities to cafés is also seen as a post-COVID-19 response to people's desire for shared spaces (Văn Đạt, 2021; Cruz & Pombo, 2022; Liu, 2022). Interior design studies that support the optimum planning for study-work cafés remain underdeveloped. This study aims to explore the field of space psychology while investigating interior design elements' effect on the user. Through literature review and field research, the study explores space psychology, the spatial needs of a study-work café and design aspects affecting its user's behaviour. A case study methodology is employed in two enterprises in Cairo sharing the same concept. Methods used are observation and behavioural mapping. The findings reveal interior design elements employed in study-work café that contribute to environmental, functional and psychological aspects that shape users' behaviour. The study provides a tentative checklist as a steppingstone to reach solid design considerations for interior designers to apply for this type of space.

Keywords: Space Psychology; Study/Work Café; Participatory Design.

Introduction:

Space psychology is the interrelation between psychology and architecture. Space psychology examines the effect of designed spaces on user's behaviour (Abel, 2021). It explores how the users feel and interact within space presenting a prospect to enhance their well-being through conscious design. As different space typologies evoke different psychological responses, exploring how these space variations affect the user's behaviour is essential. Accordingly, the interior designer's role is to recognize users' responses to their design decisions, shape the spatial experience per that, and orient users' behaviour, by fulfilling their requirements and needs. Interior designers use their understanding of space psychology to enhance productivity, comfort, and satisfaction in their design scope. One of these scopes is spaces that support working and studying, "Study-Work Café". The "Study-Work Café" caters to individuals seeking a blend of productivity and social connection. It has gained popularity with the increasing prevalence of remote work and people's desire for social interaction in this work mode. Whether or not a café positions itself as a study-work café, its spatial environment ultimately dictates and shapes the functions it supports and promotes. This entails focusing on environmental aspects, such as nature integration, location and orientation which are vital to users' comfort. Additionally, understanding functional aspects that ensure the fulfilment of users' needs, among these aspects are furniture selection, layout planning, facilities, lighting, colour and material. Lastly, responding to psychological aspects, which highlights the emotional impact regarding user experience, meanings and semantics.

Research Importance:

Understanding aspects that contribute to the effect of interior design elements on users' behaviour in a study-work café develops a substantial positive association to users' comfort, creativity and productivity in this spatial typology. This knowledge contributes to the development of future interior designs that are optimally designed with an intentional planning of how users interact with the created environment.

Research Issue:

The emergence of new modes of studying and working has emphasized the necessity for café operators to support their environment with the evolving needs of their users. However, interior design studies and

implementations that support the concept of study-work café remain underdeveloped, with designers often overlooking environmental, functional and psychological factors that influence user experience, creating a gap in the understanding of space psychology.

Research Aim:

This research aims to explore the field of space psychology while investigating interior design elements that affect user behaviour in Study-Work Café. This is by providing a tentative checklist that can assist future interior designers working on this typology. The research seeks to enhance the user's experience and contribute to the overall success of the study-work café business model.

Research Field:

Space psychology is also known as environmental psychology. It is an interdisciplinary field defined as the interrelation between users and the spaces they inhabit (De Young, 1999).

Research Methodology:

The research follows a qualitative approach where case study methodology is employed. The literature review establishes the theoretical background for understanding space psychology and the concept of Study-Work Café. This is along with interior design elements related to environmental, functional and psychological aspects affecting user's behaviour in such spaces. The research investigates two case studies that share the same typology, 1- Bibliothek Bookstore – Gallery – Café in El Sheikh Zayed, Giza, Egypt and 2-Cloud Nine Café in El Sheikh Zayed, Giza, Egypt. Methods used are observation and behavioural mapping. The authors' roles in these case studies are considered complete participants. Participant observations provide an interpretation of the authors' overall experiences. Behavioural mapping is conducted as a timelapse of 1 week-day – one in the morning, one at noon and one at night. Thematic analysis of the data collected is conducted to reach the research findings and recommendations.

1. Literature Review:

The research based the theoretical grounding on a collective literature review. In light of that, studies published to define space psychology one the studies that defined the term proficiently are:

-Research by "Ledford, D. 2014" titled "Psychology of Space: The Psycho-Spatial Architecture of Paul Rudolph", he acknowledged and affirmed the

role of a well-designed space in positively affecting the user's psychological state, defining space psychology as the interrelationship between space and its user.

Moreover, to cover separate or specific design aspects affecting the users several publications are reviewed, synthesized, and presented to form a theoretical framework. Including but not limited to,

-Research by "N I Silalahi et al 2020" titled "The influence of biophilic design applications to visitor's duration of stay in café", Gave a thorough direction on the biophilic patterns affecting user's behaviour in the Cafe typology .

-Research by "Justinus, J., Bin Abdullah, M., Haguan, S., Aziz, A., 2024" titled "Café Choices of Youth: Perspective Of University Students", Investigated the concept of "study-work cafe" particularly and the needs of this enterprise from a spatial standpoint.

1.1.Space psychology:

Space psychology is a field that combines psychology and architecture. It is defined as an integration between environmental and ecological psychology as it plays a crucial role in orienting human behaviour, spatial experience, and the fulfilment of living requirements and needs (Ledford, 2014). It explores how people feel and interact within space, whether by enhancing or lessening their spatial perception. Space psychology also explores the effects of cognitive, social, and emotional well-being. According to psychologist Deinsberger-Deinsweger (2018), a well-designed space can endorse the well-being of its users, unlike sick buildings, which can promote stress, encourage exhaustion, induce psychosomatic symptoms and create physical discomfort to its users. Different spaces create different psychological impacts on users through their configuration like location, form, texture and colour, affecting the user's spatial perception and psychological reactions (Zhao, Ruoxi. 2016). Interior design can raise social interaction and prompt stress responses using its elements. The arrangement of furniture in societal and sociofugal spaces influences user socialization, thereby modulating their stress reactions. (Bil & Pawłowski, 2016; Kantola, 2020). For instance, open areas can boost social interaction while undisclosed spaces can induce reflection and individualism. Variations in designs, the establishment of community spaces, and the addition of natural elements all contribute to an increase in cerebral stimulation, while optimized natural lighting and

ventilation are connected to better overall health (Marques, 2018; Donald, 2015; Pedersen Zari, 2009). According to Izci and Erbaş (2015), the human brain has neurological cells which play an essential role in memorizing spaces and environmental mapping that are activated by various sensory stimuli such as the visual, auditory (hearing), olfactory (smell), and somatosensory (touch) systems. This concludes that there is a strong relationship between environmental psychology and interior design on users which leads to different psychological responses whether behavioural or emotional as perceived in various environments. Hence, interior designers should respect the importance of individuals' needs, limitations and abilities by creating better solutions for design problems. They are obliged to understand these responses in the process of designing a space where people live and interact (Samancioglu, 2017).

1.2.Study-Work Café:

Cafés play a vital role as informal social hubs that satisfy human interactions (Obenza & Buenaventura, 2024). Visitors invest their earnings in cafés for the multi-beneficial experience they offer; not just for the beverage and the service they provide. The term "experience selling" becomes important when a café design is studied to give distinct satisfaction to its visitors (Silalahi et al., 2020). Today, cafés are regarded as one of the most visited spaces providing environments that support study, work, and socialization. Study-Work Café has become popular as a result of schools' and universities' growing adoption of project-based activities and group work, aiming to bridge the gap between education and market competencies. Moreover, driven by the rise of numerous startup businesses, remote job positions and freelance work. The shift of these activities to cafés rather than homes can be also seen as a post-COVID-19 response to people's renewed desire for shared spaces (Văn Đạt, 2021: Cruz & Pombo, 2022). Whether or not a café positions itself as a study-work café, its physical environment ultimately dictates and shapes the functions it supports and promotes. As café operators are obliged to establish sustainable business strategies to make profits, they must understand the social and environmental needs of their users. Understanding the activities that take place in space is crucial for designers to create environments that enhance usability and comfort, and advocate for a systemic approach to ergonomics (Samancioglu, 2017). Therefore, the role of interior designers becomes crucial, as the distinctiveness of the study-work model lies in fostering the physical experience offered to

customers (Salim, 2024). This is by designing spaces that engage the community as well as establishing environments that make users feel comfortable and relaxed to enhance productivity and creativity (Coronel etal., 2024). Therefore, understanding the environmental, functional, and psychological aspects of designing a study-work café is critical in shaping an experience that fosters user satisfaction. Focusing on environmental aspects, such as nature integration, location and orientation is vital to users' comfort. Additionally, understanding functional aspects that ensure the fulfilment of users' needs include furniture selection, layout planning, facilities, lighting, colours and materials. Lastly, responding to psychological aspects, which highlights the emotional impact regarding user experience, meanings and semantics. These factors contribute to the effect of design on users' behaviour in a study-work café with a substantial positive association with how users interact with the environment. Overall, attention to detail in the interior design of a study-work café contributes to creating a welcoming and memorable environment that encourages clientele and fosters their loyalty, creating a clear connection between the atmosphere of the space and their users' behaviour (Justinus et al., 2024).

1.3. Environmental, Functional and Psychological Aspects Affecting User's behaviour in Study – Work Café:

Environmental aspects are essentially considered when designing a study-work café. Implementing biophilic design by linking humans to nature can help individuals feel relaxed and comfortable. According to Silalahi, et al (2020), the more biophilic design patterns found in a café, the greater the variety of activities that can happen within its space. These patterns include visuals such as greenery and landscape) and non-visual connections to nature (such as birds' sounds and nature aroma). Additionally, airflow variability and refuge from the weather. Furthermore, water features with fluctuating natural water movements. Also, the length of visibility within the space, ranging at least 6 meters providing a sense of prospect (Silalahi et al., 2020). Location and orientation of space play a key role in users' comfort. Building orientation significantly affects the comfort of its users. When buildings are adapted to the local climate, they can take advantage of the surrounding environment to enhance comfort. Research has shown that in Cairo for instance, southern façades in summer have the greatest amount of sun exposure contributing to a high energy load to achieve thermal comfort. Accordingly, they also result in the least energy consumption due to lower heating loads in winter (Ashmawy & Azmy, 2018).

Functional aspects contribute to the fulfilment of users' needs in a study–work café (Justinus et al. ,2024; Coronel etal., 2024). As the current work mode focuses on community, collaboration, and interaction; flexible, modular and light furniture is preferred, allowing users to effortlessly form different configurations that support the different activities performed (Cruz & Pombo, 2022). Users seeking concentration alone should be accommodated within the configuration as well by small seating or bar seating. Square or rectangular tables are easy to pull together and work better in accommodating groups. The selection of seats is important to be comfortable, easy to clean and preferably upholstered. The provision of window seats is highly recommended even if outdoor views are unavailable. A solution to provide views of other areas within the café, a neighbouring bookstore, or nearby indoor spaces can effectively enhance the atmosphere (Waxman, 2004). Thoughtful colour strategies allow cafés to cater to both casual visitors and those seeking work-friendly spaces. Generally, cafés that use a balanced strategy, including components of both high and low contrast, are best able to draw in a variety of customers. Colour affects space's practical features in addition to its aesthetic appeal. For instance, users can navigate a location when contrast is used effectively to draw attention to important areas like menus, seating arrangements, or focal points. Specifically, in study-work cafés, neutral tones, cool blue shades, and a balance of warm and cool colours promote productivity and focus (Kamaruzzaman et al., 2010; Savavibool et al., 2018). Therefore, the use of colour as well as materials is more than just a design decision; it's a calculated component that improves the general visitors' experience and creates long-lasting connections (Jain, 2024).
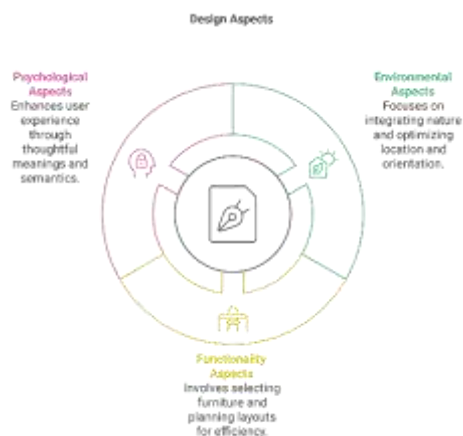

Fig. (1) Shows the Psychological, Functional, and Environmental aspects that affect the design. – by the authors.

Materials selection is important to convey an atmosphere that allows focus and concentration. They should be easily cleaned, non-slippery, and have colours or patterns that camouflage dusting and endure high traffic (Waxman, 2004).

Psychological aspects are key in creating inclusive, visually appealing settings that emotionally connect with users (Obenza & Buenaventura, 2024). Simulating sensory elements by the design creates unique environments. Visual factors have the strongest positive influence on user experience. Auditory, gustatory, and olfactory elements contribute secondary. While tactile elements come last. Although visual experiences should be prioritized, integrating other sensory elements is essential to provide a holistic and unique customer experience (Ma & Kim, 2024). Every study–work café has its specific approach to creating visual expressions that may stimulate users to take photos of their places (Rahardjo, 2018). These types of expressions can be by using artwork by local artists. It is an easy way to enliven the space, connect with artists in the community, and provide artists with a place to display their work (Waxman, 2004).

Fig. (2) shows Bibliothek layout, credit to AIIGLL firm.

2. Case Studies:

2.1. Bibliothek Bookstore – Gallery – Café

Bibliothek identified as a "cultural hub" was initiated in 2021 as an integration of a bookstore (A), gallery (B) and café (C) in one spatial
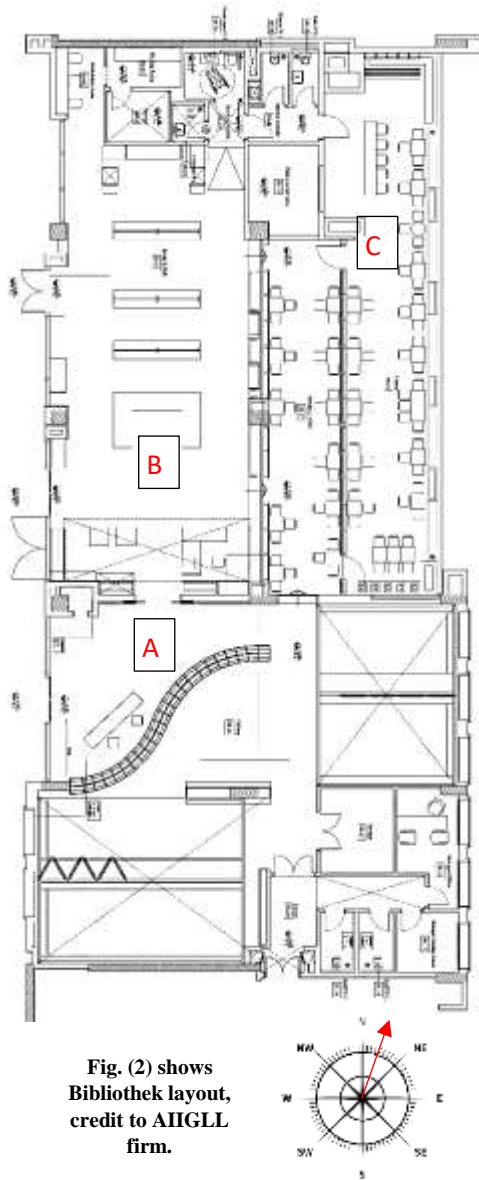
experience, as shown in (Fig.2). The deficiency in the application of this concept in Cairo made this place appealing to professionals and students who repeatedly use Bibliothek as a convenient workspace. The owner's vision is to provide a space that features intellect and art in society and to be a pioneering role model for other cultural spaces in Egypt. Bibliothek is located in a complex mall building on the roof of the second floor (Fig.2) at Shiekh Zayed, with a linear layout overseeing the mall's outdoor features (green area & water fountain), oriented towards the 30° Northeast direction (Shown in Fig. 1), which allows sun exposure for a limited time in the early morning. The coworking area is divided into two zones: indoor and outdoor and has a service area in each zone to serve food and beverages to users. The coworking areas are used for individual use and group work depending on the users' needs. The outdoor area has visual access to the green area and the fountain downstairs outside the mall through the configuration of the high tables and highchairs. On the other hand, the indoor area is completely isolated from nature as it is located in the middle between the bookstore and the outdoor area. Frequent visitors are classified in terms of age, ranging from 18 to 40 years. Students can be easily identified as one of the main users. After university hours, the space gets busy with various activities, ranging from light discussions, enjoying coffee, working with laptops individually, to working in a team format. Bibliothek is designed in an industrial style, with exposed ceiling throughout its space in the bookstore and the gallery areas. While in the café's area there is exposed skylight system with large window openings in steel structure. There is a high dependency on daylight from the glass ceiling and the window openings. Bibliothek has a clear character by its distinctive black and white colour scheme and furniture.

Table (1) shows the analysis of Bibliothek cafe' design aspects analysis.

	Element	Attribute	Description
Bibliothek Café	1. Environmental aspects	Location and orientation	• Northeast direction, limited time with sun exposure. Preferred in summer. • On the roof of a complex mall building. • Linear layout. Fig. (1)
		Visual connection with nature.	• Indoor green walls. Fig. (8) • Planters on the windows. • Outdoor view of the fountain and green areas. Fig. (6)

Element		Attribute	Description
		Nonvisual connection with nature	• No non-visual connection with nature.
		Thermal or air flow variability	• There is no thermal /airflow variability as the only access to change is the door openings to the outdoor. • The outdoor area creates a shadow barrier to the thermal change. • The airflow circulation occurs due to the air-conditioning with no ventilation.
		Water features	• The water fountain found downstairs stagnant and predictable water movements only accessed by the high table.
		Prospect length of visibility	• Missing due to the linearity of the layout.
		Refuge protective of weather	• Adjustable electronic shade are found in the outdoor. Fig. (8)
2.	Functionality	Furniture selection and planning layout	• Flexible lightweight polycarbonate furniture (armchairs, highchairs, tables, and a round high table), easy to store and to create different layout configurations due to the square table shape. Fig. (6)
		Facilities and equipment	• Indoor bathrooms. Fig. (4) • Support external electricity outlets beside the fixed sockets; indoor on the floor, and outdoor sockets on the walls between each two tables. • Support Wi-Fi access.
		Light design	• Daylight from the skylight indoor and fixed track lights directed to the tables from the steel frame structure. • Outdoor florescent light fixed on the steel frame, depends on cool light system.

	Element	Attribute	Description
		Color	• Clear achromatic color scheme to achieve memorable character and contrast appeals in design in the checkered floor tiles, tables and seatings patterns, contrast between menu board and the bar.
		Materials	• Reflective materials through easily cleaned ceramic tiles, steel, and glass. (Fig.7)
3.	Psychological aspects	User experience	• A variety of indoor activities took place in the place beside studying/ working. (Fig.5,9)
		Meanings and semantics	• Dark and formal ambiance. • Two display shelves with planters and pottery accessories, three blackboards with handwritten menu plays as artistic board distributed in the place. (Fig.3)

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Fig.

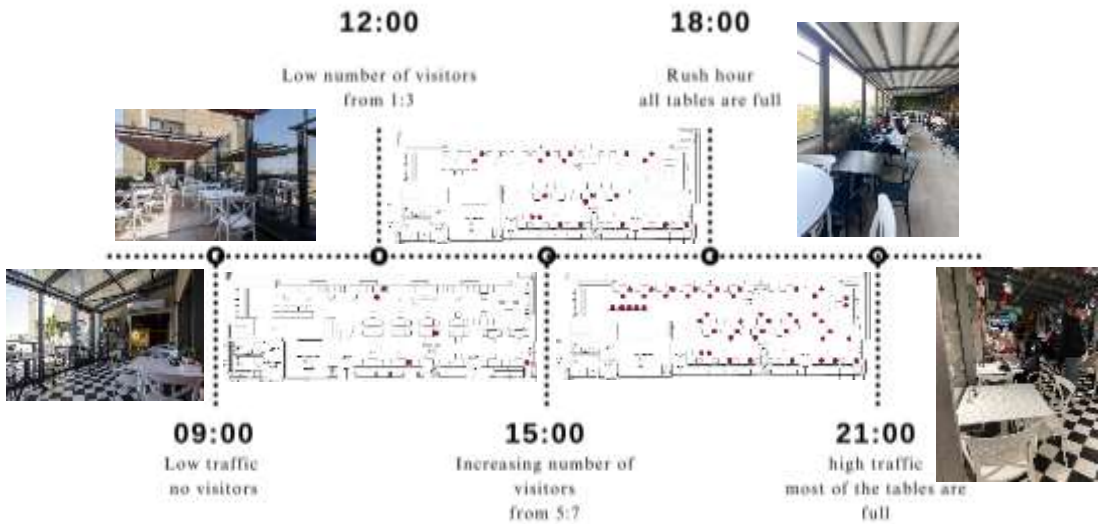**Bibliothek Café' – by the authors.**

Fig.11 shows the behavior mapping within a timelapse of Bibliothek café'

The behavior mapping shows that in the early morning from 9:00 till noon 12:00 there is a low traffic of visitors from 1 to 4 visitors. At this time the staff organize the tables with less number of tables and chairs. While from 15:00 till 19:00 are considered the busiest hours due to the high flow of students showing up after the end of their classes. This leads the staff to add more tables and chairs in the space with no regard to circulation or the chance to change your direction of seating. The high traffic continues till 21:00 as no tables are empty except one is reserved. The authors found that although the place showed a formal and dark ambience but still has a lot of visitors due to the achievement of functional needs (Fig.11).

2.2.Cloud Nine Café'
Cloud Nine café was established in 2023, located in Dune's hub - Zayed Dunes Compound within the public space of the compound (Fig.12), next to a well-known international school, it is ground level with a lightweight structure (A). It has direct access to outdoor areas filled with seating (B), oriented on the East direction which allows full exposure to the sun from the sun rise till the sun set. Initially it was just a café and hangout for residents and out comers but soon it turned into a study-work café, attracting the age group from 14 to 60 mainly school and university

students after their classes gathering to study individually or in groups. As the building is considered a lightweight structure (Fig.13) it is designed in a modern minimalist with a hint of biophilic design. It has full-height openings (Fig.18) visually connecting the indoors with nature creating an integration between the indoors and the outdoors. The bamboo canned pendants (Fig.14) reflect the use of natural materials contributing to nature integration as well. In the indoor area there is a mirror that reflects nature

Fig.12 shows Cloud Nine café' layout – By the authors.

outdoors (Fig.19), a planter found in each corner and small planters on the upper units. The outdoor area is accessible with a vast landscape designed space (Fig.16) where users can hear birds' and plants' sounds and the natural aroma of plants. The coworking area is divided into two zones; indoor and outdoor and a service area, the coworking areas are used as individual use or groupwork, and indoor seating with variations in design to the outdoor seating.

Supporting a variety of activities such as conversations, drinking coffee, working alone or in groups. Outdoor portable bathrooms approximately 400 m away (Fig.17). Electricity outlets are available in the indoor and outdoor areas. This café is busy even though it belongs to a gated community but visitors from outside the compound keep coming to study or work there.
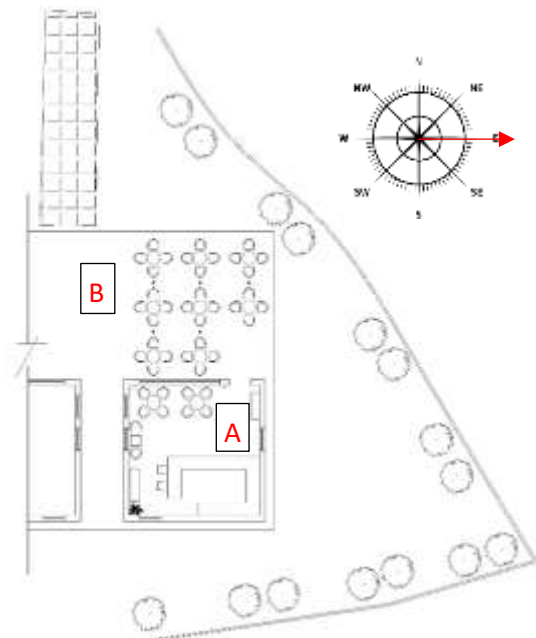
Table (2) shows the analysis of Cloud Nine cafe' design aspects analysis.

	Element	Attribute	Description
Cloud Nine Café	1.Environmental aspects (Nature Integration)	Location and orientation	• East direction. • In a gated community. (Fig.12)
		Visual connection with nature	• Full height openings. (Fig.14) • Blue mirror that reflects the outdoor nature (Fig.19). • A planter in each corner and small planters on the upper units. (Fig.14)
		Nonvisual connection with nature	• Birds' and plants' sound and natural aroma of plants. (Fig.16).
		Thermal or air flow variability	• There is no thermal /airflow variability as the only access to change is the door.
		Water features	• Missing.
		Prospect length of visibility	• The passage of the outdoor area.
		Refuge protective of weather	• Only portable shades, which is not optimal in rainy weather.
	2.Functionality	Furniture selection and planning layout	• Flexible lightweight furniture, easy to store but fixed layout configuration due to the round tables and the armchairs used. (Fig.16) • Indoor seating with variations like wooden armchairs and another type of upholstered chairs, and bar stools. (Fig.20) • Although there is a variety in chairs design, but it does not meet the ergonomic comfort for the users for long hours studying/working.
		Facilities and equipment	• Outdoor portable bathrooms approximately 400 m away. (Fig.17) • Electricity outlets are indoor and outdoor, however the floor sockets outdoor are not working due to low maintenance and weather conditions.
		Light design	• Daylight from full openings and outdoor seating. (Fig.19) • Steel structure ceiling with exposed ceiling design and modular mesh parts which have LED light on its edge and pendants in canned bamboo. (Fig.14) • Track lights above the bar, depending on the warm light system. (Fig.15) • Outdoor light system. (Fig.21)

Element	Attribute	Description
	Color	• A natural hue color scheme is obvious in the café, which can be recognized in the wooden color in the structure outdoor and all the display units indoor, and the chairs, the blue color representing the sky in the mirror and the green color representing the trees in the planters. (Fig.19)
	Materials	• Materials used are wood bar top, chairs, and upper display units. (Fig.15) • Glass in large windows, stones in the bar, and grey epoxy non slippery floor. (Fig.20)
3.Psychological aspects	User experience	• A variety of outdoor activities took place in the place beside studying/ working. (Fig. 21)
	Meanings and semantics	• It is a part of a natural environment, comfortable and welcoming ambiance. has 1 display shelf, upper wooden display shelves, mirror, memory photo board. (Fig.14).

Fig.13

Fig.14

Fig.15

Fig.16

Fig.17

Fig.18

Fig.19

Fig.20

Fig.21

Cloud Nine Café' – by the authors.

12:00
Low number of visitors
from 1:3

18:00
Rush hour
most of the tables full

09:00
Low traffic
no visitors

15:00
Increasing number of
visitors
from 5:7
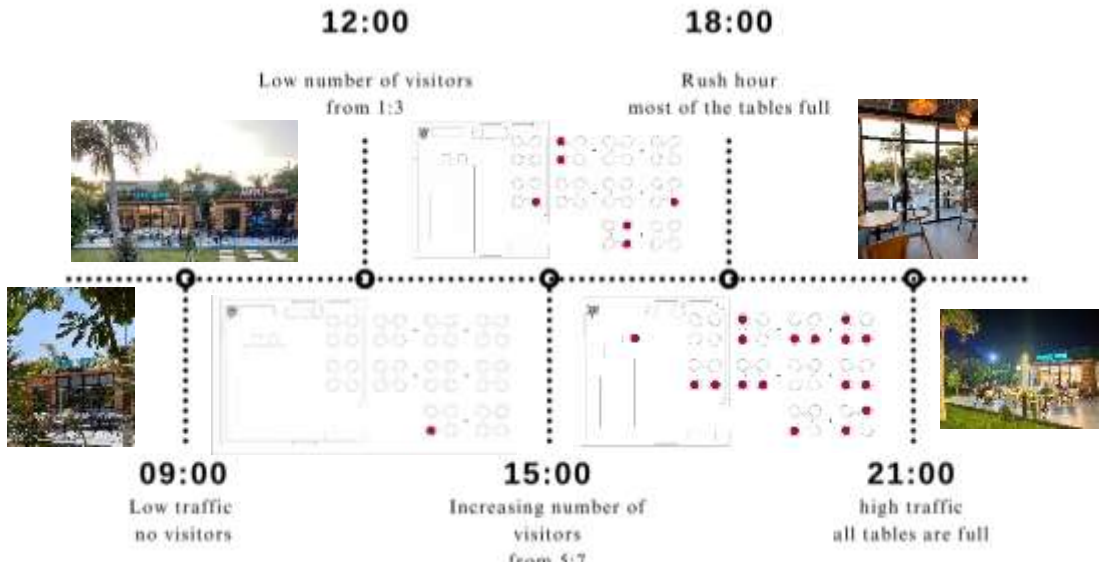
21:00
high traffic
all tables are full

Fig. 22 shows the behavior mapping within a timelapse of Bibliothek café'

The behavior mapping shows that in the early morning from 9:00 till noon 12:00 there is a low traffic of visitors from 1 to 3 visitors. Starting from 15:00 till 19:00 a high traffic occurs due to the high flow of students showing after the end of their classes. The authors noted that the tables and chairs are the same, with no difference in configurations. As the rush hour continues till 21:00 only two tables are empty. Due to the lack of weather shelter for the outdoor area in winter; the floor boxes for electric outlets are not working - users are keen to claim the limited electric outlets on the outdoor wall. Regardless of functional inconveniences, Cloud Nine receives a lot of visitors due to the achievement of aesthetic needs. (Fig.22)

Research Findings:

The research reveals that environmental aspects vastly affect user's behaviour and comfort. The building orientation of Biblioteck being on the north side benefits from optimal thermal comfort during the summer creating a nice breeze. Yet, this orientation creates a cold and dark atmosphere in winter, reducing its seasonal appeal. Cloud Nine, with its east-side orientation, enjoys full sun exposure, offering warmth and cosiness in winter season which appeals to more visitors during winter mornings. However, the hot temperature in the summer requires extensive air conditioning in the indoor area, raising energy consumption. Although the inner horizontal blinds reduce heat, they give the impression that the café is closed, possibly deterring visitors. Biblioteck, located at a raised

level, has a weak visual connection to nature, relying on artificial green walls that do not create an immersive experience. Non-visual connections, such as sounds or aromas, are also absent. A stagnant water feature is pleasant but does not add much to the visual connection as it is visible only from highchairs. Biblioteck depends completely on-air conditioning, as no design elements enhance airflow. However, it provides a weather refuge through ceiling shade structures and vertical glass windows, offering protection from sunlight and rain. Cloud Nine has a strong connection to nature, with outdoor seating immersed in nature and indoor spaces supported by plants. It also has non-visual connections to nature due to its location within a lively landscape design hosting natural aromas and bird sounds which contributes to a multisensory experience. However, like Biblioteck, Cloud Nine depends on air conditioning for thermal airflow. While it offers extensive landscape view and a sense of prospect from any seat, its weather refuge is partial to portable shades, making it less effective than Biblioteck's integrated solutions.

Biblioteck provides ergonomically friendly furniture, light weight, flexible seating configurations and stacking storage solutions that contribute to a well studied functionality aspect. The square-shaped tables available are more practical than Cloud Nine's round tables. While Cloud Nine has a wider variation of seating options, its layout remains fixed due to limited flexibility caused by its round tables and stacking storage solutions limited only to outdoor seating. Biblioteck bathroom facility is well-designed supporting users' long hours stays more than Cloud nines' outdoor portable bathroom facility. Both spaces support the study-work concept with Wi-Fi and well-distributed electrical outlets; Biblioteck guarantees the availability of extra external outlets. In contrast, Cloud Nine faces maintenance obstacles, with many outdoor sockets that are non-functional due to weather exposure. Biblioteck's orientation avoids screen glare during daylight and uses cool-toned artificial lighting to promote productivity. Cloud Nine struggles with glare from direct sunlight and relies on warm-toned lighting, creating a cozy but less productivity-oriented ambiance.

Biblioteck has effective daylight lighting that avoids screen glare, though it has a shortage of direct sunlight warmth. Its cool artificial lighting promotes productivity nonetheless forms a colder atmosphere, which could be softened by the infusion of natural materials. The achromatic color scheme and reflective materials complement the cold ambiance, while adding color could increase interest. In contrast, Cloud Nine's natural color scheme and materials create a warmer, more welcoming environment, integrating with the outdoor area. Biblioteck encourages

users to perform different activities like visiting the gallery and bookstore as a pause from studying and/or work. While Cloud Nine offers the opportunity to pause from studying and/or work by walking through nature. None of the case studies have multipurpose zones for different activities. Accessibility-wise, Cloud Nine struggles with universal design standards, while Biblioteck provides partial wheelchair access. In terms of ambiance, Cloud Nine uses a memory wall and natural scenes to encourage loyalty and social media engagement, while Biblioteck's seasonal décor fosters a dynamic, community-based atmosphere, especially with its connection to a local gallery and bookstore.

This research reveals that Biblioteck successfully achieves functionality and adaptability as a work-study café, while Cloud Nine accentuates comfort and well-being but faces functional impediments.

3. Discussions:

This research recognizes the presence of study-work cafés in Cairo, Egypt, while highlighting users' needs in such space typologies. The notion of designing these spaces intentionally to affect users' behaviour and interactions is essential. It has been noted that considering environmental, functional and psychological aspects in design decisions can shape space psychology. The checklist below is a tentative framework for interior designers with considerations to incorporate the key elements that promote user's satisfaction and influence positive behaviour while designing a study-work café.

Table (3) shows the Design aspects checklist for interior designers with consideration.

Element	Attribute	Guideline
4. Environmental aspects	Location and orientation	• It is optimal to have the café on the north orientation to avoid screen glares. However, it is also suggested to have a secondary area of the café with an east/south orientation to allow seating with direct sunlight exposure. (Ashmawy & Azmy, 2018) • If the location is on the east or south side, it is recommended to consider adding adjustable shading systems like retractable blinds to avoid glare.
	Visual connection with nature.	• Incorporate natural elements both indoors and outdoors. • Create a direct visual connection with nature through large windows for comfort, well-being and enjoyment of space. It is optimal if the location has a landscape possibility; if not, create visual connection to nature by adding indoor green walls, plants and views that can be implemented indoor or outdoor. (Waxman, 2004)

Element	Attribute	Guideline
	Nonvisual connection with nature	• Consider sound systems to simulate nature sounds like birds sounds and leaves' movements. Consider adding air scent diffusors to simulate natural aromas to create a multisensory experience. (Silalahi et al., 2020)
	Thermal or air flow variability	• Enhance natural airflow by operable windows or cross-ventilation design. Consider installing mechanical ventilation if the windows are non-operable.
	Water features	• Add a water feature if possible. Water sound creates a comfortable atmosphere.
	Prospect length of visibility	• Allow for 6 meters as a prospect of visibility.
	Refuge protective of weather	• Design durable, integrated weather shields. Install adjustable shade.
5. Functionality	Furniture selection and planning layout	• Choose flexible lightweight, ergonomically friendly, and stackable furniture for people who linger for hours. • Use rectangular or square-shaped tables to be easily grouped. • Create areas for collaboration and group work, meetings, sound isolated spaces for online meetings, and other areas for individual working. (Include multipurpose zones for varied activities like meetings or relaxation) (Cruz & Pombo, 2022)
	Facilities and equipment	• Install accessible, clean and well-designed bathrooms. • Ensure accessible and functional electrical outlets. • Support Wi-Fi access.
	Light design	• Optimize lighting for productivity. • Install cool-toned artificial lighting to support focus. • Prevent screen glare with proper daylight management. • Add warm lighting to zones that are solely dedicated to out/relaxing zones.
	Color and Materials	• Use a mixed colour palette to enhance ambience and productivity while incorporating colors from nature to increase comfort. • Incorporate natural materials to soften colder tones. (Kamaruzzaman et al., 2010; Savavibool et al., 2018) (Jain, 2024)

Element	Attribute	Guideline
6. Psychological aspects	User experience	• Create a variety of indoor and outdoor activities to allow for intermissions. • Apply universal design standards.
	Meanings and semantics	• Use elements like a memory wall to boost loyalty, seasonal décor to engage users, and announcement boards. Design the space to allow hosting various cultural events. (Obenza & Buenaventura, 2024)

4. Research Recommendations and Future Implications:

The research uncovers tentative patterns associated with environmental, functional and psychological aspects contributing to interior design planning and implementations in Work–Study Cafes. The research recommendation is to establish further analytical studies of current cafes to reveal patterns that exhibit a "study – work café" whether intentional or unintentional. Future analysis in Egypt and globally can disclose factors and aspects that contribute to a well-designed study-work café which ultimately stems from the users' behaviour. Using this knowledge in the design of future "study – work" cafes in their interiors will directly support its users thus contributing to their comfort, creativity and productivity.

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تشكيل سيكولوجيا الفراغ: نحو تأثير التصميم الداخلي للمقاهي الدراسية ـ العملية على سلوك المستخدم

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المستخلص

يؤثر كل تصميم على سلوكيات المستخدم (Lockton & Harrison، 2012). يأخذ مصممي التصميم الداخلي بعين الاعتبار سيكولوجيا الفراغ وهو التفاعل بين الأشخاص والبيئة المكانية، التصميم الداخلي لديه قوة التأثير على كيفية التفاعل السلوكي للأشخاص وتصرفهم في الأماكن العامة.

وأصبح مفهوم "مقهى الدراسة – العمل" شائعًا نتيجة لتبني المدارس والجامعات المتزايد للأنشطة القائمة على المشاريع والعمل الجماعي. بالإضافة إلى ظهور العديد من الشركات الناشئة ووظائف العمل عن بعد والعمل المستقل، كما يمكن أيضًا اعتبار تحول هذه الأنشطة إلى المقاهي استجابة لما بعد كوفيد-19 لرغبة الناس المتجددة في المساحات المشتركة (Văn Đạt, 2021; Cruz & Pombo, 2022; Liu, 2022). سواء تصنيف المقهى نفسه وتصميمه كمقهى للدراسة والعمل أم لا، فإن بيئته المادية تملي وتشكل في النهاية الوظائف التي يدعمها ويعززها. تظل دراسات التصميم الداخلي وتطبيقاته التي تدعم مفهوم مقهى الدراسة والعمل غير متطورة.

تهدف هذه الدراسة إلى استكشاف سيكولوجيا الفراغ مع التحقيق في عناصر التصميم الداخلي التي تؤثر على سلوك المستخدمين داخل هذه الفراغات. من خلال الدراسات السابقة والبحث الميداني، تستكشف الدراسة علم سيكولوجيا الفراغ واحتياجات مقهى الدراسة – العمل وجوانب التصميم التي تؤثر على سلوك مستخدميها. تم استخدام منهجية دراسة الحالة لمشروعين لمقهى دراسي/عملي في القاهرة تشتركان في نفس المفهوم للكشف عن الأنماط المتعلقة بقرارات التصميم الداخلي التي تؤثر على المستخدمين أثناء الدراسة و/أو العمل. الأساليب المستخدمة هي الملاحظة ورسم الخرائط السلوكية.

تكشف النتائج عن عناصر التصميم الداخلي المستخدمة في مقهى الدراسة – العمل التي تساهم في الجوانب البيئية والوظيفية والنفسية التي تشكل سلوك المستخدمين.

تقدم الدراسة قائمة مرجعية مؤقتة كحجر أساس للوصول إلى اعتبارات تصميمية صلبة لمصممي التصميم الداخلي لتطبيقها على هذا النوع من الفراغات.

كلمات مفتاحية:

سيكولوجيا الفراغ؛ المقاهي الدراسية/العملية؛ التصميم التشاركي.