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FRAMEWORK OF ATMOSPHERE IN INTERIOR DESIGN: A PROPOSAL FOR DESIGN PROCESS

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Abstract. This study aimed to investigate the meaning of atmosphere in interior architectural spaces, explore the strategies and approaches used to design atmosphere, and identify the common difficulties encountered by designers during the process. The focus was on the intangible qualities of atmosphere and ambiguity in the design process. A qualitative research approach was employed, consisting of literature review and thematic qualitative interviews. The study identified different approaches and stages of processing in designing atmosphere and various strategies for conceptualization and communication. The difficulties encountered were related to the intangible aspect of atmosphere, communication, designing, background and experience, and project management. The acquisition of affective qualities in the atmosphere occurs through being a part of material worlds, whether other people are present or not. The study contributes to the field by developing a conceptual framework for considering the atmosphere in interior design process. The findings could be helpful to interior design academics, professionals, and students, by clarifying the complexity of dimensions related to the atmosphere in the design process and offering recommendations for design processing.

1.   Introduction

Throughout history, designers have highlighted atmosphere's role in architectural design as one of the most important ways to understand design practice, experience designs, and help the spatial development of present and future cultures (Martin *et al*., 2020; Perez-Gomez, 2016). The intangible qualities of atmosphere and ambiguity have been the focus of recent debate. As Anderson (2009) notes, "while the concept of 'atmosphere' is certainly back in vogue to make sense of contemporary consumption habits, limited research has considered how particular atmospheres are conjured through images and how power relations are embedded in them" (Degen, *et al.,* 2017). The concept of atmosphere and the ways of conceptualizing it through the design process still raises many questions about its phenomenological and psychological dimensions. As Bille et al. (2015) noted, being aware of the atmosphere surrounding us generates a huge ambiguity. We do not know if we should assign atmosphere to the objects or the environments from which it originates, or to the subjects who experience it.

In the design process, it may be unclear whether to attribute atmosphere to the characteristics of the space, the individual or group experience, or the interactions that occur in real space. This complexity can make it challenging to clarify the concepts and dimensions of the atmosphere in the design process. However, by clarifying these notions, designers can activate a more conscious practice, leading to more intentional and effective design outcomes. As Pallasmaa (2014a) has reasoned, thinking about "atmospheric ways" for architectural designers may lead not to accurately rendered plans but to "pervasive images, often as physical feelings without shape" (p 83). Such pervasive images highlight the complexity of drawing something as indefinite as the atmosphere, which has been described as shaping the world as if it were "through the fog", resulting from the "very sensual interface of people, places, and things (Bille *et al*., 2015; Martin *et al*., 2020).

The complexity of the "sensual interface of people, places, and things" may be generated by the different levels of meaning, processing, thinking, and representing of what the designer wants as atmosphere in the design space according to their own vision and strategies. Here, the "design process" is adopted as "complexus" (that is woven together) which happens in interaction—that is, several systems leading to a holistic outcome/output (Bettaieb, 2017) of designer, project, space, and user. Considering these elements, the study aims to delineate the layers involved in developing the concept of atmosphere in the design process; this includes framing its meaning, exploring related design approaches and strategies, and identifying common difficulties that designers encounter when designing the space atmosphere.

This paper is structured as follows: 1) The concept of atmosphere in architectural design is explored in relation to the lived space as a user experience context through phenomenological and psychological dimensions and in relation to the design thinking and process in architecture. To contextualize the concept of atmosphere in architectural space and present a common approach, we outlined the framework surrounding much of the recent theorizing. We then define our research methodology. 2) We examine the concept of "atmosphere" in architectural design, focusing on four key notions: meaning, design thinking, impacting factors, staging and processing, and communicating. First, we explore how designers in academia define "atmosphere" and then analyze how they prioritize various aspects, factors, spatial characteristics, and sensory modalities during the design process. We also investigate how designers process and communicate the atmosphere in their designs. 3) Finally, we consider the outcomes of different aspects of atmospheres for how interior spaces are apprehended, conceived, and represented.

Overview of atmosphere and lived space: understanding user experience

Pucillo and Cascini (2014) argue that atmosphere can be understood as active and dynamic configurations that enable analytical comprehension of a range of issues when we begin to think about them, within them, and through them. In the context of user experience, the concept of atmosphere can be approached from two perspectives. The first is the phenomenological perspective, which emphasizes the holistic and unique quality of individual experience. The second relates to experimental psychology, distinguishing and quantifying recognizable constructs through the experience tree (Julia Nehme *et al*., 2020; Law *et al.,* 2007; Pucillo & Cascini, 2014). Julia Nehme et al. (2020) have categorized models and frameworks related to the construct of user experience into three groups: cognitive, affective, and integrative.

Exploring atmosphere through the phenomenology of user experience

Bille et al. (2015) identified several philosophical terms that can provide meaning to the atmosphere, including *stimmung*, *mood* or *attunement*, *tempered space*, *tinctured*, or *tuned spaces*. They have noted that several philosophical studies investigating the concept of atmosphere and its variants, such as *stimmung* and *ambience*, have explored the nature of atmosphere as a concept between the subject and object, where emotional and sensory experiences are essential. Pallasmaa (2019) argued that our perception is not the sum of visual, tactile, and audible data but a holistic understanding of a unique structure that combines all senses simultaneously. Pallasmaa (2016) further emphasized the phenomenological aspect of individual and group experiences as users in designed living spaces by considering the components of mood and feeling that do not arise from directed guidance or focused and conscious attention. Bo¨hme (2006) and Anderson (2009) clarified that atmospheres are endowed with singular affective qualities (e.g., homely, serene, erotic, and so on) that go beyond the essential meaning derived from their origins. Atmospheres are considered an intensive space-time created from indeterminate affective "excess." Drawing on bodily experience in phenomenology apprehended by Dufrenne, who was more interested in aesthetic experience in the Greek sense of aiste¨sis ("sensory experience,") Anderson emphasized the unfinished character of affective atmospheres.

Bille et al. (2015) described atmosphere as a personal experiences that can be described as "friendly," "relaxing," "boring," "tense," or frustrating," with varying degrees of "thickness." However, atmospheres are not an exclusively psychological phenomenon, as they are not simply a state of mind but also an objective thing "out there" as an environment or milieu. Atmospheres always exist in between experiences and environments. Bo¨hme and Anderson clarified that the practices of spatial designers such as architectures, interior designers, and scenographers aim to understand how atmospheres circumvent and circulate through the distribution and composition of light, sounds, symbols, texts, and more. However, atmospheres are also "enhanced," "transformed," "intensified," "shaped," and otherwise intervened. Designers must understand the psychological ramifications of users' experiences with the physical world to effectively make emotional connections and meet their needs (Batra et. al, 2015, p. 26). In this paper, we will focus mainly on the affective dimension, framed according to the approach of experimental psychology.

Examining atmosphere through the psychology of user experience: the affective dimension

Shemesh et al. (2017) posited that human responses to space are complex and influenced by various factors, including spatial context, geographic location, society, culture, and the physical dimension such as color, light, texture, smell, and sound. However, the challenge lies in methodologically separating context and materiality. Despite this, the authors suggest that insights can be gained by exploring the relationship between the geometry of space and human perceptual experience. Pallasmaa (2016) explained that emotional reactions often appear without a specific object or cause but are instead relationships, moods and states of mind. Personality traits may also affect the perception of the environment (Ibrahim *et al.*, 2002). However, the properties of space itself, such as retinal size, location, and object identity, can also affect our mental state and elicit emotional responses (Baars *et al.,* 2003; Shemesh *et al.*, 2017) .

Batra et al. (2015) suggested that the abstract concept of emotional connections is based on the concrete concept of physical distance and that the associative relationships between physical concepts and their psychological analogs remain intact. Physical experiences corresponding to psychological concepts can be activated, bringing them to the forefront of people's thoughts, feelings, and behaviors. Pallasmaa (2016) noted that the atmosphere of a place is closely linked to its ethos and "genius loci," as well as our empathic and affective capacities. Like how music can evoke a certain mood, the ambiance of a landscape, city, or interior space can also elicit certain feelings and emotions, becoming embedding and incorporated into the environment. Atmospheres are developed in socio-material contexts and acquire affective qualities, potentially influenced by people's ability to affect their environment (Bille & Simonsen, 2019).

1.2. Overview of the role of atmosphere in design thinking and process of represented space

Design thinking and process. "Design thinking" (Liu *et al.*, 2021) refers to the designers' thinking skills and procedures to create new ideas and solve practical problems. It involves understanding human needs and generating new solutions using the tools and mindsets of design practitioners (Kelley & Kelley, 2013; p. 24). Design involves intentionally developing non-existent items or ideas (Kelley & Kelley, 2013; Liu *et al.*, 2021). Empathy is a crucial starting point for the design process, as designers must deeply understand the problems and reality of the person for whom they are designing; this involves understanding the complexities encountered by users, discovering their needs and desires, and explaining their behaviour (Liu *et al.*, 2021). Within this framework, the designer must recognize the user's environment and role and the interaction between users and the environment (Liu *et al.*, 2021).

The design process consists of several major stages, including an analytical stage for widening the field of observations, a synthetic stage for generating new ideas, and a stage for selecting the optimal solution (Baars *et al.*, 2003; Bettaieb, 2017). Design thinking involves a holistic approach that recognizes the intrinsic and extrinsic systems that interact with the designer throughout the process. The project is installed in a programming framework. While the need to follow the program is recognized, the designer's skills, experience and professionalism are also fundamentally necessary for program development, leading to a certain degree of uncertainty (Bettaieb, 2017).

1.3. Thinking atmosphere in the design process

The "atmospheric qualities of place" concept has been discussed extensively in the literature (Martin, 2016; Martin *et al.*, 2019). These qualities are shaped based on how users interact with the space rather than the architect's original intentions. Bo¨hme (2013a) underlined the paradox that exists when creating an atmosphere that is both fleeting and ambiguous yet profoundly felt by individuals. Affective atmospheres are proposed as dynamic patterns that emerge from bodily interactions, characterized by collective and shared qualities and transpersonal quasi-autonomous characters (Buser, 2014).

Spatial designers aim to shape people's moods and guide their behavior for various reasons through the physical environment, such as for aesthetic, artistic, utilitarian, or commercial purposes (Bille *et al.*, 2015). Buse et al. (2017) emphasize the importance of embodied practices in the early stages of the design process to design architecture that

evokes the desired emotional responses. Whether artificially created or naturally occurring, emotionally charged spaces have a stable atmosphere that resonates affectively with individuals, regardless of interpretation. The quasi-objective character of atmospheres suggests that different people may respond to the same atmosphere in various ways, depending on their physical disposition and personal history (De Matteis *et al.*, 2019). According to Bille et al., (2015) and Martin et al., (2020), focusing on the atmosphere could bridge the gap between the personal and the general, the discursive and the nonrepresentational, and better our understanding of the relationship between emotion and affect. Anderson (2009) suggest that affects are fundamentally important in the production and experience of a place, indicating the need to consider affective qualities in our understanding of the atmospheric qualities of a place. Here, atmosphere refers to "the tangible presence of something or someone in space" (Bo¨hme, 2013a; Martin *et al.*, 2020).

1.4. Complexity in atmospheric representation

Sensory terms and sensorial aspects. The sensory qualities of a particular environment contribute to its atmosphere, which can be described in sensory terms. For instance, a funeral has a typical dim, quiet, and orderly atmosphere, while a dance performance has a bright, loud, and rough atmosphere (Kotler, 1973). Böhme (1993, 2018) suggested that there exists a rich vocabulary that we can use to describe atmospheric qualities such as calm, sad, oppressive, compelling, attractive and sexy. Bille et al. (2015) identified several terms in everyday language that give meaning to the atmosphere, such as "ambience," "sense of place," or the "feel" of a room.

Kolter distinguished between the "intended atmosphere", which is the set of sensory qualities that the designer intended to imbue in the space, and the "perceived atmosphere," which may vary depending on individual perceptions. Our reactions to colors, sounds, noises, and temperatures are partly learned. The primary sensory channels of the atmosphere are sight, sound, smell and touch (Kotler, 1973; Pallasmaa, 2019). Kotler (1973) identified the leading visual dimension of the atmosphere as color, brightness, size, and shapes, while the central acoustic dimension is related to volume and tone, and the olfactory dimension is related to smell and freshness. The primary tactile dimension of the atmosphere is related to softness, smoothness, and temperature. Although taste does not apply directly to the atmosphere, it can be activated through artifacts in an atmosphere that trigger remembered tastes.

Pallasmaa (2016b) emphasized that we interact with our environments through our five Aristotelian senses and that there are over 30 systems through which we communicate with the world. He suggested that the atmospheric sense could be considered the sixth sense, as it is likely to be the most existentially important. We inhabit the entire universe through our senses, technological extensions, and facilities, extending beyond our physical selves.

Drawing atmosphere. The drawing is a tool that emphasizes the potential use of space by its users rather than focusing on specific instructions for the appearance or performance of the building. As a creative methodology, drawing offers numerous possibilities for capturing the nuanced and emotional qualities of our social worlds (Hurdley *et al.,* 2017; Martin *et al.*, 2020). According to Lyon (2020) and Martin et al. (2020) a drawing can range from "open sketches" to more precise and technically accurate "objective" drawings. A sketch allows us to observe the sensible version of a space, "not

so much to see what is 'out there' as to look at what is going on" (Ingold, 2011a: p. 223; Martin, et al., 2020). The power of hand-drawn designs lies in their aesthetic appeal and challenges the clear and unambiguous images typically associated with digitally aided architectural designs (Martin *et al*., 2020; Vidler, 2000). De Matteis et al. (2019) emphasized that an image of an affectively charged spatial situation cannot fully represent the atmosphere, even in fully immersive conditions experienced in a virtual environment. The experience of a represented atmosphere would require the presence of a medium, such as a screen, an image, a sound recording, a textual narrative, or a combination of these.

2. Methodology

This study utilized a qualitative research approach consisting of several stages, as shown in Figure 1. Thematic qualitative interviews were conducted as a part of a comprehensive, multi-stage case study in interior design. The academic context was chosen as the primary focus for investigating the design process due to the wealth of experience in design that it provides and the potential for obtaining clear answers to the research questions.
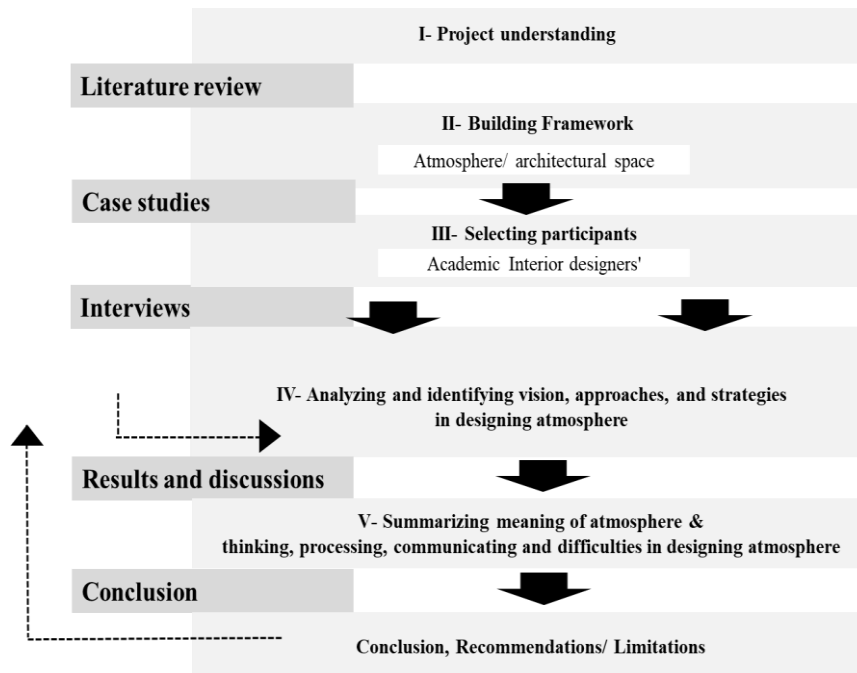
Figure 1. Study approach

2.1. Data collection procedures

First, the researcher recognized various concepts related to the notion of atmosphere in architectural space, as shown in Figure 2. Second, an open-ended interview was conducted with a group of colleagues in the field of interior design based on the study context. The interview questions were then reviewed and reorganized, adding some sub-questions to provide further clarification.
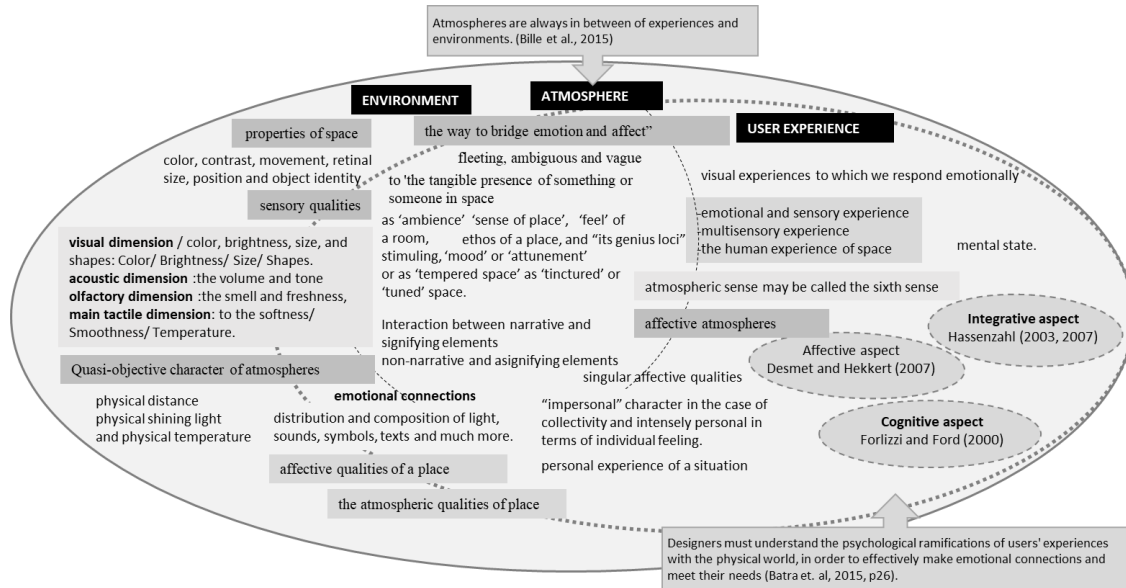
Figure 2. The proposed considerations of atmosphere in between experiences and environments in design process framework

2.2. Population / Sample

The study population consisted of academic interior designers from all public universities (King Abdelaziz University and the University of Jeddah) in Jeddah, Saudi Arabia. The sample was restricted based on the ability to participate in interviews and the availability of information. They were contacted through various means (phone, text messages, and social networking sites) to present the topic and schedule the online interview. The exclusion criteria for participants were as follows: 1) membership in public universities; 2) at least five years of teaching experience; 3) specialization in architecture or interior architecture; 4) experience in teaching studios; and 5) faculty member level raging from assistant professor to professor.

The participants consisted of 23 academic interior designers with a Ph.D. in spatial design who were assistant professors or higher (12 faculty members at KAU university, and 11 at JU university).

Only 10 of the 12 interior designers at KAU met the criteria and could participate in the interviews. Two could not participate, one being the researcher and the other not meeting the criteria (did not teach studio). Out of the 10, only seven participated in the interviews, while three did not respond to the participation request.

At JU university, eight of 11 academic interior designers accept to participate in the interviews. Three did not respond to the invitation. Out of the eight, one did not meet the criteria (did not teach studio), and one other accepted to participate but did not have time to arrange an online meeting. Only six participated in the interviews.

Thirteen participants were interviewed in a one-to-one and semi-structured meeting via Zoom based on pre-set dates and availability. The interviews were conducted in English and Arabic, and the researcher translated from Arabic to English. The participants' identities were concealed to maintain confidentiality, and the data and information were used solely for scientific research. Each interview lasted between 20 and 35 minutes. Interviewees were permitted to record the session and signed informed consent forms.

Table (1) summarizes the information of the interviewees:

Table 1. Sample Information

Participants Academic designer	Teaching design experience			Studio teaching design experience	Position	Teaching University	Phd university	Phd year
	Less 5years	5-10 years	More than 11years					
AD1		Yes		Yes	Assistant professor	KAU	University of Leeds, UK	2016
AD2		yes		Yes	Assistant professor	JU	University of Sheffield, UK	2021
AD3			yes	Yes	Professor	JU	KAU	2011
AD4			yes	Yes	Assistant professor	JU	KAU	2009
AD5		yes		Yes	Assistant professor	KAU	PhD, Architecture Cardiff University, Welsh school of Architecture **UK, Cardiff**	2021
AD6		yes		Yes	Assistant professor	KAU	University of Minnesota USA	2020
AD7			yes	Yes	Assistant professor	KAU	University of Edinburgh**, Scotland**	2018
AD8		yes		Yes	Assistant professor	KAU	Cambridge School of Art **Anglia Ruskin University UK**	2018
AD9			yes	Yes	Assistant professor	KAU	Politecnico di Milano, Italy	2017
AD10			yes	Yes	Professor	KAU	University of Toulouse Le Merail/ France	1995
AD11			yes	Yes	Assistant professor	*JU*	Texas university USA	*2016*
AD12			yes	Yes	Assistant professor	*JU*	**University of Leicester UK**	*2021*
AD13		*yes*		Yes	Assistant professor	*JU*	**Bournemouth University UK**	*2021*

2.3. Instrumentation and development of the interview

A template was created for conducting interviews to collect fundamental data related to the research problem, that is, the lack of clarity of the meaning of atmosphere, the complexity of notions and concepts related to the atmosphere, the main stages in processing, and the performance tools in communicating atmosphere in design process. The data was collected to identify the sample's vision, approaches, and strategies within the field of interior design.

The interview card included the following themes:

1) The first theme aimed to gather preliminary information about the sample, including information on their teaching design experience, studio teaching design experience, degree, teaching university, Ph.D. university, and year of Ph.D.

2) The second theme concerned defining the concept of atmosphere in interior spaces according to the interviewee's point of view.

3) The third theme framed how atmosphere is designed in interiors by identifying thinking priorities, impacting factors (tangible and intangible elements), processing stages, and the most important tools of communication atmosphere (e.g. drawing, video).

4) The fourth theme aimed to identify the most noticeable difficulties designers encounter while designing atmosphere according to the interviewee's point of view.

2.3. Data analysis procedures

The analysis examined the participants' characteristics based on their university of origin and the year they obtained their Ph.D. in interior design. A diverse range of interior design backgrounds were identified, with six out of 13 participants obtaining their Ph.D. from a UK University, two from KSA university, two from an American university, one from an Italian university, one from a French university, and one from a Scottish university. The contemporariness of the interior design knowledge and background for the sample was also determined. Of the 13 participants, 10 obtained their Ph.D. within six years (2016, 2017, 2018, 2019, 2020, and 2021), representing 77% of the sample as assistant professors. However, 33% of the participants obtained their Ph.D. thesis between 1995 and 2011 but occupied high university positions as full or associate professors. Regarding teaching design experience, seven out of 13 participants had more than 11 years of experience, while six had between five and ten years of experience.

Next, each interview was recorded and transcribed. Following Dey's (1993) "Circular Process" qualitative analysis, the interviews were analysed through three phases: description, classification, and linkage. The primary emphasis was on describing the data and then categorizing and linking them to produce innovative and more comprehensive classifications assembled under a common theme. Fundamental notions and concepts emerged by constantly revising, linking, and categorizing the collected data.
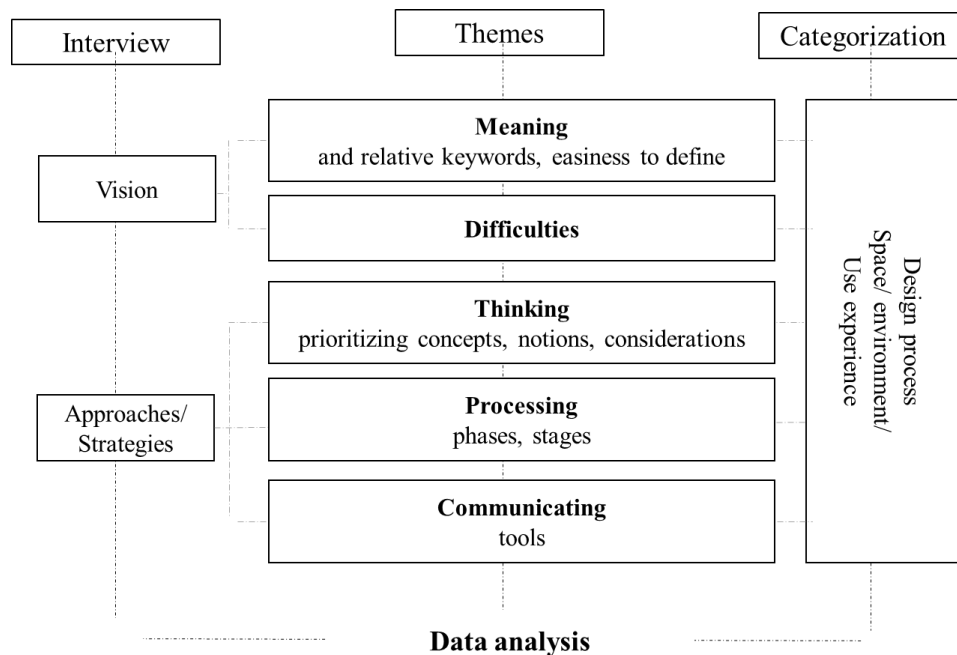
Figure 3. Procedure for data analysis

3.   Results and Discussion

3.1. Defining the meaning of atmosphere in interior spaces

Many participants (AD1, AD2, AD3, AD6 and AD8, AD11) found that defining the atmosphere in interior spaces required a high level of expertise, knowledge, experience, and competence from the spatial designer. Only four participants found it easy to define the concept of atmosphere in space design projects. AD9 suggested that by

choosing a descriptive word related to feelings that can translate atmospherically (such as "homey," "cozy," "noisy," and "comfortable"), designers could articulate what they want to communicate. However, thirteen participants found giving meaning to the atmosphere challenging. AD4 specified that while they can easily understand atmosphere, it can be difficult to communicate it. AD1, AD2, AD4, AD11 highlighted that it is more about practice, training, and experiencing than communicating verbally or graphically.

AD3, AD6, AD8, and AD13 specified that atmosphere is not only related to visuals, making it a challenge to interpret clients' aspirations into spatial sensorial qualities from client descriptions. Providing the atmosphere according to the client's desire is also challenging. Designers should take the time to understand the atmosphere. AD12 highlighted that atmosphere could be defined from many perspectives and includes more than one aspect.

3.2. The meaning of the concept of atmosphere in the context of a designer's work

The meaning of the concept of atmosphere was categorized according to many perspectives based on the participants' points of view, as follows: 1) Some participants (AD10) considered the relationship between space and the user by approaching the active and visual phenomena that interact with the psychological and kinetic behaviours of the user. Visual phenomena relate to all framed configuration of designs, through which the designer can extrapolate what is implied (according to his or her intentions). The implicit aspect is the designer's methods to support kinetic phenomena. AD10 suggested different forms of kinetic organization in space for the active phenomena. Others focused on the affective dimension (AD4). 2) Other participants (AD5) focused on the scenario of design perspective by defining the scenario as the central concept: each place has its own story. How the space is created has a meaning. The configured spatial elements give us the final story and the implication of the space on the people who live there. Mood and atmosphere are parts of the scenario that designers create. 3) Some participants (AD1, AD2, AD9, and AD12) considered the space's sensorial qualities through the sensorial or multisensorial perspective by focusing on movement in space, lighting, the tension between interior and exterior, and how to play with solid and void, light and shadow, space materials, temperature, sounds, and smells. By organizing, distributing, and interacting with attributes, spatial elements, and spatial sensorial qualities, designers can stimulate the five senses, which is critical in the process of creating mood and ambiance (involving smell, touch, sound, and feel). Others focused on its intangible aspect (AD6), physical and metacognition aspect, and cultural dimension (AD8). In one space, the physical dimension is related to color, light, and volume. Metacognition is the feelings, sense of space, and power in space. The atmosphere could be related to culture (Feng Shui is a powerful element for in Chinese culture, and spirituality is a powerful element in Arabic Islamic culture). 4) Another participant (AD3) considered the space through its environment and quality (AD7). The atmosphere is the design of the surrounding sensory environment of users that stimulates their feelings and emotions. Quality of environment is designed for users to experience circulation comfort pace, air quality, lighting, temperature, and view. 5) Regarding the power of design elements such as shapes, colors, and materials that affect user's comfort, activity and mobility (AD13), it was mentioned by AD 11 that there are various perspectives on the meaning of atmosphere in space design. These include the psychological atmosphere, weather atmosphere, culture atmosphere, and user categories.

3.3. Keywords

Academics have defined the concept of atmosphere by focusing on several keywords that can be categorized as follows:

Regarding space and environment, keywords link the concept of atmosphere to the tension between the interior and exterior space, temperature, people's movements, comfort, accessibility, ventilation, lighting, climate, and weather atmosphere. Additionally, several keywords are related to the sensorial qualities of space, such as ambiance, look and feel, mood, vibes, energy, sense of place, sensory aspects, and interactions. Other keywords include objectives, subjective elements (colours, light, shadow, solid), scenarios, intangibility, visual stimulation and mechanical organizations, and style.

Concerning the user experience, keywords link the concept of atmosphere to feelings, emotions, emotional and sensory experiences, perception of use, user reaction and behaviour psychology, culture, and user categories. The most frequently repeated keywords were senses (visuals, sounds, smells), pronounced by four of the 13 participants, and feelings, pronounced by four of the 13 participants.
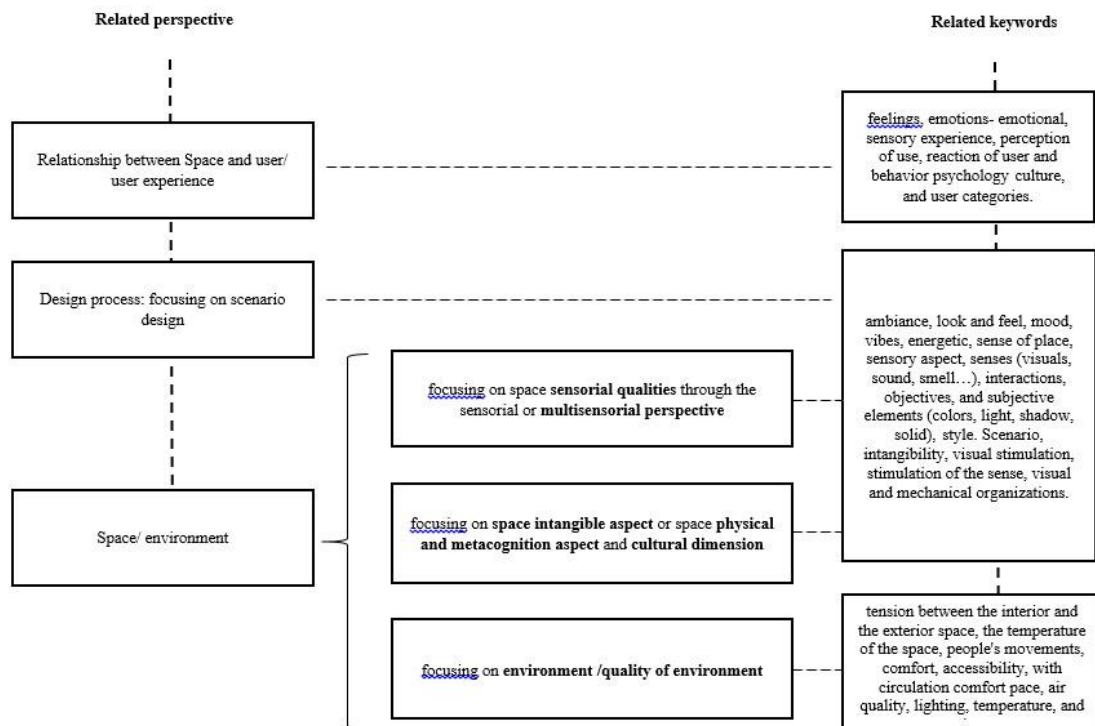
Figure 4. Atmosphere meaning in the interior spaces

3.4. Designing the atmosphere in interior spaces

The participant's views on identifying priorities in thinking, factors that impact the design process, stages in processing, and the main tools of communicating atmosphere during the design process are as follows:

Priorities in thinking. When designing the atmosphere, five participants prioritized aesthetics by focusing on all design elements (shapes, lines, textures, materials, colors) and principles (contrast, repetition, rhythm, movement in space) as seen

in AD3 and AD7. AD1 focused on color, light, and style, while AD6 prioritized lighting, color, and texture. AD13 determined colors, materials, and lighting as a priority.

Conversely, five of the 13 participants prioritized the functional and sensorial aspects of space by considering the relationship between function and desire to feel, playing with design elements and principles (materials, textures, lighting) as seen in AD4, AD5, AD11, and AD12, or function and space sensorial qualities (visuals, hearing, scent) based on client aspirations, project nature, and space functions as seen in AD9 and AD11.

In three cases, the participants prioritized the space's functional and aesthetic aspects by considering the use of materials, distribution of lighting and materials, movement, and circulation in space, as seen in AD2. AD8 focused on user needs and budget, while AD10 considered the complexity dimension, including all functional, aesthetic, sensorial, cultural, and technical aspects.

Impacting factors. The factors impacting the design atmosphere could be tangible or intangible space elements, as mentioned by participants in AD1 and AD5. It could also be related to the interaction between tangible and intangible aspects of space characteristics, discussed by participants in AD4, AD7, AD8, AD12 and AD13. These interactions generate many considerations, which may be related to the project characteristics (AD6, AD11 and AD12) or designer entity as (AD10).

Tangible elements refer to all elements of an object and all objects of space, such as furniture and lighting. All spatial elements help designers to translate the global atmosphere, textures, patterns, visuals, shapes, lines, the circulation of the space itself, the movements, and materials. However, intangible elements could refer to memory; design could target time, sense, emotion, and feelings but mainly it is regarding cognitive, emotion and affective aspects of user experience.

Many factors were identified regarding the intangible aspect which focus on space and environment interacting with the user, such as the psychological distance (AD3), which impacts the design atmosphere. Circulation and human movement in space define proximity and psychological distances between users in space. Psychological distances are related to the five senses in space, including smells, sounds, and visuals. Distances and circulation organize human behavior; thus, to improve human behavior, designers must consider human factors and psychological distances. AD9 specified that space dimensions, proportions, proximity, distances, harmony between dimensions (mathematical dimensions, psychological dimension), smells, and sounds fundamentally impact the design of the atmosphere.

For AD5, the interaction between spatial elements, objectives, and subjective elements (colors, light, shadow, solid objects, structure architecture) impacted the design atmosphere.

Regarding the intangible aspect and focusing on space characteristics, many factors were identified, such as the environmental factors (temperature, light, and humidity) and views related to the surrounding of the building related to the interaction between interior and exterior (AD4). For (AD7), the primary factors impacting the design atmosphere were space elements (furniture, used materials, color and light). For AD8, it was the flow of the space (movement, circulation, distribution of furniture, dimensions of furniture, physical comfort and psychological comfort, proximity, and distance related to user experience). Key factors were light and the flow of the space (user experience)

However, for AD6 and AD11, in addition to the tangible and intangible factors, the nature of the project to its target audience, the goal of the project, site location, the source of the project, its relationship to actual and future achievement, and its compatibility with

the requirements of the labor market affected the atmosphere design. For AD10, the designer's cultural particularities and the designer's line (differences regarding knowledge, choices, orientations, environmental specificities, objective data, and ways to exploit them) affected the design atmosphere and the tangible and intangible factors.

3.5. Processing stages in designing an atmosphere

12 of the thirteen participants agreed that designing an atmosphere involves two fundamental approaches: conceptualizing atmosphere and experiencing the approach in an actual building.

Experiencing approach. AD1's approach to designing the atmosphere involved focusing on feelings by visiting the space to get to know the general atmosphere, establish SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats), and feeling the ambience design. This approach prioritized experiencing and developing the design atmosphere before processing drawings.

Conceptual approach. For conceptualizing the atmosphere, two stages are identified (see Figure 5).

Stage 1: Initiating the design of atmosphere. For six of the 12 participants, the starting stage was related to the project, client and users, and function. For AD1, AD8, and AD12, the first stage involved understanding the relationship between the client (identifying mood from the profile of the client), and function of space requirements (surfaces, required functions, and potential activities of space). AD5, AD6, and AD10 indicated a more holistic approach by defining the project goal (target audience and the purpose of the design).

For three out of the 12 participants, the initial stage focused on inspiration, which involved searching for multiple buildings (through images, photos, and visiting actual spaces) that evoke the same feeling the designer wants to convey or experience. They then analyzed these buildings by identifying all the characteristics and attributes that contribute to the desired emotional response and used this information to inform their concept development process.

For AD3, AD7, and AD9, the starting stage was conceptual and related to the concept development phase in the design process.

Stage 2: Strategies for developing design atmosphere. For the development of the concept atmosphere during the design process, eleven participants proceeded from intangible to tangible aspects, and from conceptual to representational aspects. Only for AD10 and AD13, processing development of the concept atmosphere involved processing from a complexity approach by sketching, considering the interactions of the visual levels for designing the atmosphere. They focused on designing a spatial scenario with multiple "places," in which each specific place tell a partial scenario within the overall scenario (kinetic and visual organization).

However, according to the perspectives of the eleven participants, various approaches were employed in the conceptual phase to represent and develop the aesthetic aspects of space and study the atmosphere. Five participants indicated that developing atmosphere involves defining generic expressive keywords or collecting as many keywords as possible (such as mind map, tree, sketches), translating atmosphere, and selecting the most relevant keywords for the project. Those keys words are very descriptive, explicitly relating to the feelings the designers want to create (adjectives such as happy, intimate, focused, and excited) and identifying themes and feelings (AD1, AD3, AD6, AD7, and AD9).
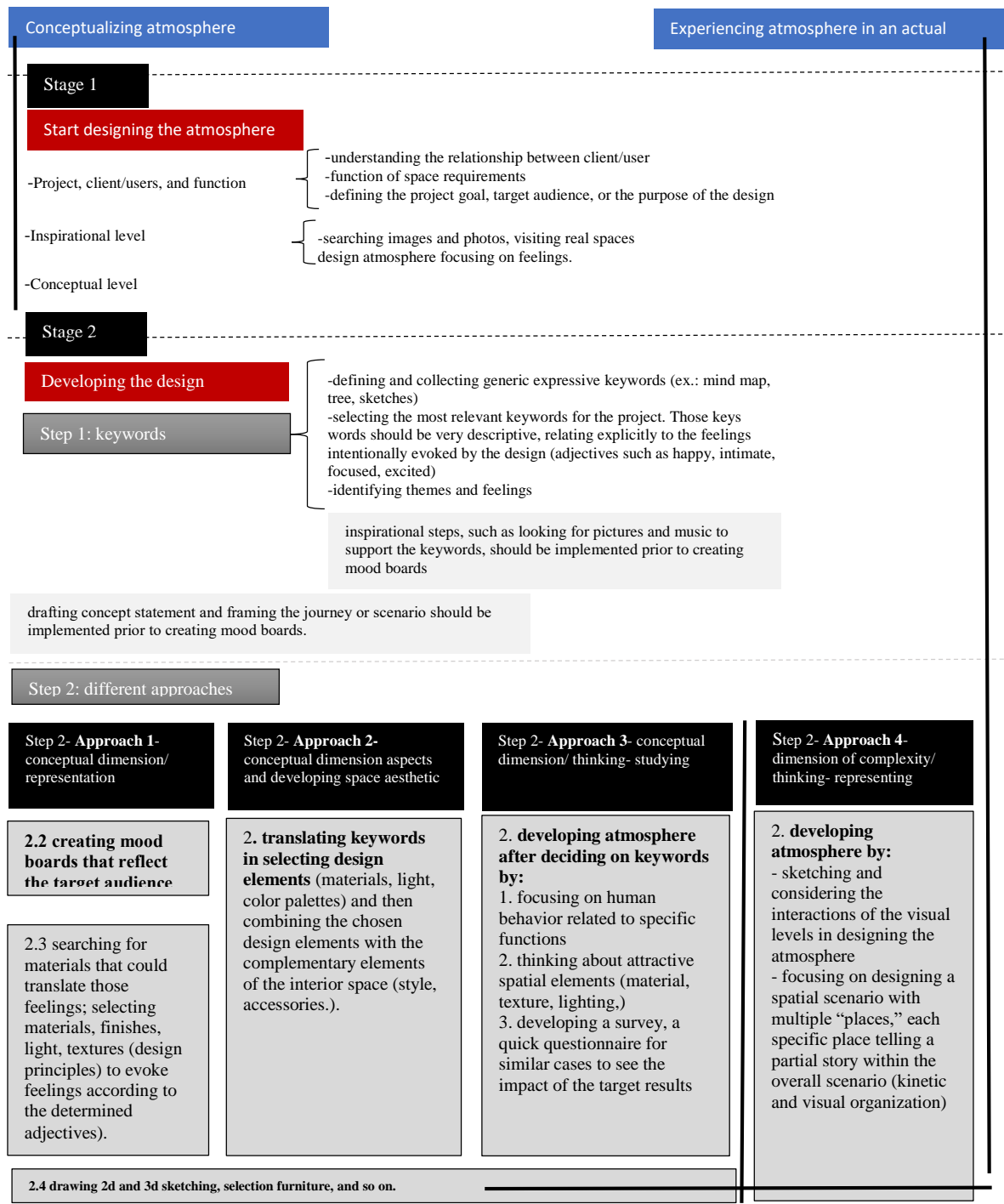
Conceptualizing atmosphere	Experiencing atmosphere in an actual

Stage 1

Start designing the atmosphere

-Project, client/users, and function
- -understanding the relationship between client/user
- -function of space requirements
- -defining the project goal, target audience, or the purpose of the design

-Inspirational level
- -searching images and photos, visiting real spaces
- design atmosphere focusing on feelings.

-Conceptual level

Stage 2

Developing the design

Step 1: keywords
- -defining and collecting generic expressive keywords (ex.: mind map, tree, sketches)
- -selecting the most relevant keywords for the project. Those keys words should be very descriptive, relating explicitly to the feelings intentionally evoked by the design (adjectives such as happy, intimate, focused, excited)
- -identifying themes and feelings

inspirational steps, such as looking for pictures and music to support the keywords, should be implemented prior to creating mood boards

drafting concept statement and framing the journey or scenario should be implemented prior to creating mood boards.

Step 2: different approaches

Step 2- **Approach 1**- conceptual dimension/ representation	Step 2- **Approach 2**- conceptual dimension aspects and developing space aesthetic	Step 2- **Approach 3**- conceptual dimension/ thinking- studying	Step 2- **Approach 4**- dimension of complexity/ thinking- representing
2.2 creating mood boards that reflect the target audience 2.3 searching for materials that could translate those feelings; selecting materials, finishes, light, textures (design principles) to evoke feelings according to the determined adjectives).	**2. translating keywords in selecting design elements** (materials, light, color palettes) and then combining the chosen design elements with the complementary elements of the interior space (style, accessories.).	2. **developing atmosphere after deciding on keywords by:** 1. focusing on human behavior related to specific functions 2. thinking about attractive spatial elements (material, texture, lighting,) 3. developing a survey, a quick questionnaire for similar cases to see the impact of the target results	2. **developing atmosphere by:** - sketching and considering the interactions of the visual levels in designing the atmosphere - focusing on designing a spatial scenario with multiple "places," each specific place telling a partial story within the overall scenario (kinetic and visual organization)

2.4 drawing 2d and 3d sketching, selection furniture, and so on.

Figure 5. Processing for atmosphere design in the interior spaces from participants' points of view

The next steps for several participants (AD1, AD6, AD7. AD9, and AD12) were to: 1) create mold boards that reflect the target ambiance by transmitting visual elements such as color, texture, and spatial elements into sensorial qualities to depict the feelings that the designer wants to communicate. The mood board should communicate emotions and transmit vibes and mood space design, 2) search for materials (related to furniture pieces, walls, and flooring) that could translate those feeling, selecting materials, finishes,

lighting, and textures (design elements and principles) to translate feelings evoked by the mood board and according to previously selected adjectives, and 3) draw 2D and 3D sketches.

For AD9, it was essential to draft a concept statement and frame a journey before creating mood board. Similarly, for AD6, the inspirational step of looking for pictures and music to support the chosen keywords was to be accomplished before creating a mood board.

Alternatively, for some participants (such as AD3), the development of the atmosphere was more focused on the analytical aspect after deciding on keywords. This involved: 1) focusing on human behavior related to specific functions and circulations, 2) considering attractive spatial elements (such as material, texture, and lighting), and 3) developing a survey or questionnaire for similar cases to evaluate the impact of the desired result.

For AD4 and AD12, the processing was related to developing the sensorial qualities of space by considering a holistic approach in selecting elements (such as furniture, finishings, and lighting). The keywords were translated into selecting design elements, including materials, light, and colors palettes. Finally, the chosen design elements interacted with complementary elements in the interior space, such as style and accessories.

3.5. Communicating design atmosphere

Various tools can be utilized and categorized according to their nature (visual, conceptual, representational, experiential) or stage to communicate the design atmosphere throughout the design process effectively. As shown in Figure 6, participants utilized different tools based on their design approach.

Visual presentations were the primary tool for AD7 to convey atmosphere by selecting photos that suggest feelings and themes. However, for AD6, sensorial tools such as music and descriptive keywords were also used in addition to pictures. For eight out of thirteen participants, conceptual and representational tools were used to communicate atmosphere, such as color palettes, lighting choices, sketches, and renderings.

For three other participants, specific tools were used based on the design process stage. For instance, in the research or foundation stage, photos, images, and 2D graphics were used to develop case studies. Conceptual mood boards and hand-drawn sketches were utilized in the concept development stage. In the implementation stage, drawings and sketches were prevalent, while rendering 3D images and videos were utilized in the final stage.

Lastly, for one participant (AD13), communicating atmosphere was achieved through simulation using VR, 3D animation, and integrating senses such as temperature, sound, and smells or using actual plans.

3.6. Difficulties encountered by the designer during the design of atmospheres

The difficulties encountered by designers during the design of the atmosphere can be summarized as follows: 1) Intangible aspect of atmosphere: Designers face challenges in creating the intended atmosphere and transferring it into the real designed space. There is also a difference between intended, suggested, and perceived atmosphere. 2) Communication level of the atmosphere: Designers face difficulties communicating particular feelings through mood boards and convincing others about the impact of the

atmosphere on user psychology and well-being. They may also need more than three-dimensional visualization. 3) Designing background and experience level: Designers require a high level of creativity, imagination, and intensity of feelings to design an atmosphere. They must also filter ideas and focus on the principal elements and keywords. 4) Design management project level: Designers face challenges related to project goals, emotions, subjective aspects, power dynamics, time, and facility policies and procedures.
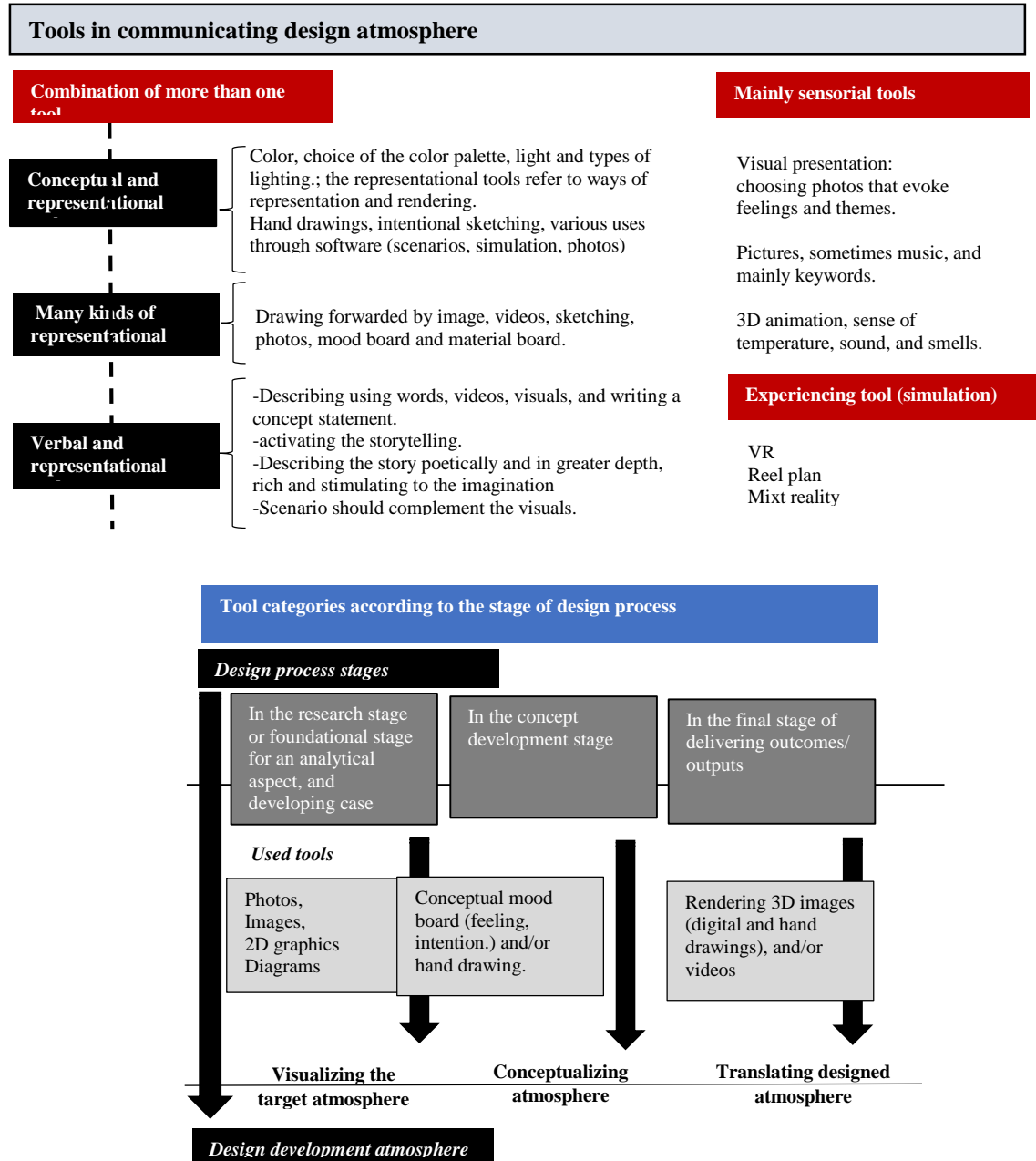
Tools in communicating design atmosphere

Combination of more than one tool

Conceptual and representational

Color, choice of the color palette, light and types of lighting.; the representational tools refer to ways of representation and rendering.
Hand drawings, intentional sketching, various uses through software (scenarios, simulation, photos)

Many kinds of representational

Drawing forwarded by image, videos, sketching, photos, mood board and material board.

Verbal and representational

-Describing using words, videos, visuals, and writing a concept statement.
-activating the storytelling.
-Describing the story poetically and in greater depth, rich and stimulating to the imagination
-Scenario should complement the visuals.

Mainly sensorial tools

Visual presentation: choosing photos that evoke feelings and themes.

Pictures, sometimes music, and mainly keywords.

3D animation, sense of temperature, sound, and smells.

Experiencing tool (simulation)

VR
Reel plan
Mixt reality

Tool categories according to the stage of design process

Design process stages

In the research stage or foundational stage for an analytical aspect, and developing case

In the concept development stage

In the final stage of delivering outcomes/ outputs

Used tools

Photos,
Images,
2D graphics
Diagrams

Conceptual mood board (feeling, intention.) and/or hand drawing.

Rendering 3D images (digital and hand drawings), and/or videos

Visualizing the target atmosphere

Conceptualizing atmosphere

Translating designed atmosphere

Design development atmosphere

Figure 6. Comunicating design atmosphere tools

4.   Conclusion

In conclusion, designing atmosphere depends on what aspects designers focus on in space design, whether it is psychological atmosphere, weather, culture, or user categories. However, considering the different design perspectives, the relationship between space and user is crucial; this includes the sensorial qualities of space, the environment and its quality, and the intangible or physical and cultural dimensions related to space-user relationship.

Different approaches to designing atmosphere exist, and designers must consider tangible or intangible space elements and the interaction between interior and exterior spaces. The design process involves conceptualizing and experiencing the atmosphere through various strategies and tools, such as visual presentations, 3D images, narratives, and imaginative scenarios. Designers also encounter difficulties on various levels, including the intangible aspect of atmosphere, communication, designing functional aspects, designer background and experience, and project management.

This study highlights important concepts, tools, and strategies for designing atmosphere in interior design. It emphasizes the importance of considering perceptual concepts, ideas, sensations, and feelings resulting from visuals in communicating atmosphere and the role of imagination in raising the subject of atmosphere. Ensuring that concepts correspond between the designer and the recipient is essential. Tools are vital in visualizing important perceptions during the design process.

4.1. Recommendations based on the findings of this study

The recommendations for spatial designers based on this study are as follows:
1) Engage in experiencing the atmosphere by visiting buildings and traveling, focusing on analyzing and understanding the reasons behind the feelings evoked in these spaces. Designers should be highly aware of the sensorial qualities of space and constantly develop their design senses.
2) Develop sketching skills that can effectively communicate feelings, mood, and atmosphere.
3) Use keywords related to the desired feelings and atmosphere in the design process and be prepared to provide arguments for their selection.

4.2. Limitations and Implications of the Research

The study's limitations are related to the sample being limited to Jeddah, Saudi Arabia. Future studies should expand the sample to include different cities and regions in Saudi Arabia and internationally. Additionally, future studies could use a quantitative approach, increase the sample size and range, and consider the impact of different thinking schools on the study outcomes. It would also be helpful to investigate the impact of different drawing techniques on design output, including manual and technical drawing methods using software like 3D Max and Revit. Finally, future studies could consider taking a case study approach to explore the sensory qualities of a specific project by conducting interviews or questionnaires to evaluate the correspondence between the intended atmosphere and the perceived atmosphere.

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