***Dirasat***: Human and Social Sciences, Volume 52, No. 6, Supplement 1, 2025, 7421

Deanship of Scientific Research

# Visualizing Felt-Body Emotions through Two-Dimensional Compositions: A Comprehensive Experiment Using the Wheel of Emotions and Schmitz Vital Drive Theory

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Received: 14/4/2024
Revised: 30/6/2024
Accepted: 1/8/2024
Published online: 1/7/2025

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Citation: Abuhassan, L. B., Hussein, M. fahmi, Othman, N. N., Abu Alsoud, S. S., & Dweiri, M. M. (2025). Visualizing Felt-Body Emotions through Two-Dimensional Compositions: A Comprehensive Experiment Using the Wheel of Emotions and Schmitz Vital Drive Theory. *Dirasat: Human and Social Sciences*, *52*(6), 7421.
https://doi.org/10.35516/hum.v52i6.7421



## Abstract

**Objectives:** This study aims to present a novel approach to non-verbal communication for expressing felt-body emotions. It seeks to determine if the 'sensible space' of felt-body emotions can be represented and measured in two-dimensional forms by first-year architecture and design students at the University of Petra.

**Methods:** The study employs an empirical approach to the students' works, testing Hermann Schmitz's dynamic vital drive theory and applying it to the Circumplex model of emotions. This research follows Amedeo Giorgi's phenomenological qualitative approach to visually explore emotions, aiming to identify a shared pattern with students' experiences.

**Results:** The study finds that the spatial organizations arranging the shapes of the compositions can express the emotional impact on students. First, the sensible space can be seen through spacing between shapes, shaping their holistic bodily experience, where contraction expressed negative feelings and expansion mirrored positive ones. Second, the subject's arousal level is influenced by the spatial configuration of a composition; a clustered organization aligns with high-arousal emotions, a centralized layout mirrors negative valence and high arousal, and linear arrangements reflect positive valence. The limited use of radial and grid layouts prevented this research from drawing conclusions.

**Conclusions:** The study confirms that Schmitz's 'sensible space' can be visualized through the contraction and expansion of shapes, and it can be measured using two-dimensional compositions, aligning spatial arrangements with emotional valence and arousal to meet on the wheel of emotions.

**Keywords:** Circumplex Model of Emotions; Contraction; Expansion; Felt-Body Emotions; Schmitz's Dynamic Vital Drive; Sensible Space; Spatial Organizations

# تصور مشاعر الجسد المحسوس من خلال التراكيب ثنائية الأبعاد تجربة شاملة باستخدام عجلة العواطف ونظرية الدافع الحيوي لشميتز

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## ملخّص

**الأهداف:** تهدف هذه الدراسة إلى تقديم نهج جديد في التواصل غير اللفظي للتعبير عن مشاعر الجسد المحسوس. تسعى إلى تحديد ما إذا كان يمكن تمثيل وقياس "المكان المحسوس" لمشاعر الجسد المحسوس في أشكال ثنائية الأبعاد من قبل طلاب السنة الأولى في كلية الهندسة والتصميم بجامعة البترا.

**المنهجية:** تعتمد الدراسة نهجاً تجريبياً في أعمال الطلاب، حيث تختبر نظرية الدافع الحيوي الديناميكي لهيرمان شميتز وتطبقها على نموذج العواطف الدائري. لتحليل وتقييم أعمال الطلاب، تتبع هذه الدراسة نهج أميديو جيورجي الظواهري النوعي لاستكشاف العواطف بصرياً بهدف تحديد نمط مشترك مع تجارب الطلاب الفردية.

**النتائج:** توصلت الدراسة إلى أن التنظيمات الفراغية التي ترتب أشكال التراكيب يمكن أن تعكس التأثير العاطفي للطلاب: أولاً، يمكن رؤية المكان المحسوس من خلال التباعد بين الأشكال، مما يؤدي إلى تشكيل تجربتهم الجسدية الشاملة، حيث يعبر الانكماش عن المشاعر السلبية والتوسع يعكس المشاعر الإيجابية. ثانياً، يتأثر مستوى الاستثارة لدى الأشخاص وينعكس من خلال التكوين المكاني للتشكيل؛ التنظيم المجمّع يتماشى مع المشاعر العالية الاستثارة، التخطيط المركزي يعكس المشاعر السلبية العالية الاستثارة، و التنظيم الخطي يعكس جميع المشاعر الإيجابية. الاستخدام المحدود للتخطيطات الشعاعية والشبكية منع هذه الدراسة من التوصل إلى أي استنتاجات متعلقة بها.

**الخلاصة:** تؤكد الدراسة أن "المكان المحسوس" لشميتز يمكن تصوره من خلال الانكماش والتوسع للأشكال، ويمكن قياسه باستخدام التراكيب ثنائية الأبعاد، مما يربط التنظيمات الفراغية بالتقييم العاطفي والاستثارة، والتقائها على عجلة العواطف.

**الكلمات الدالة:** نموذج العواطف الدائري، الانكماش، التوسع، مشاعر الجسد المحسوس، الدافع الحيوي الديناميكي لشميتز، المكان المحسوس، التنظيمات الفراغية.

## 1. Introduction

Emotions and relative interdisciplinary studies have been a topic of much academic interest for more than two decades. However, it is still a relatively new field of research. The ability to display, i.e., visualize emotions is a key feature of human communication. Visualizing emotions encompasses the utilization of both verbal and non-verbal techniques to amplify comprehension and facilitate the exchange of emotional reactions.

Heatmaps, as a verbal method, are frequently employed to visually represent regions of an image or location that elicit more intense emotional reactions, typically obtained from eye-tracking data (Villegas et al., 2023; Ren et al., 2024; Zacharia & Hamelin, 2021), or self-reporting, which refers to individuals actively articulating their emotions.

Individuals describing their feelings is often considered a traditional methodology and a common technique in research such as those by Scherer (2005, 2013), where the Geneva Emotional Wheel (GEW) was introduced for self-reporting experiences, as described by Mulligan & Scherer (2012), Scherer (2013, 2005), Wagner et al. (2021), and Paloniemi et al. (2022). Another verbal method is sentiment analysis which involves representing emotions (positive, negative, neutral) communicated in spoken or textual data attached with images (Park et al., 2020).

Graphical or model representations illustrating emotions based on valence (positive or negative) and arousal (high and low) levels (Grgić et al., 2022; Marimpis et al., 2020; Magdin et al., 2021; Horvat et al., 2022) are defined as non-verbal approaches incorporating affective dimensions. Distinct emotions can be identified using emotion maps illustrating the spatial distribution of emotions and utilizing color coding (McGrath et al., 2020; Anderson & Robinson, 2021; Cohen-Kalaf et al., 2022). Facial expressions may also be linked to various emotions dependent on interpretations of visual depictions of frequency and the nature of the facial expressions (Canal et al., 2022; Minaee et al., 2021; Küntzler et al., 2021). While emotions such as fear and anger can be interpreted from facial expressions (Rosenberg & Ekman, 2020), not all emotions can be adeptly conveyed by it, such as sympathy and love which are more eloquently articulated by touch (Hertenstein et al., 2011). The capacity to discern emotions through body language alone was further evidenced in studies by Atkinson, Dittrich, and Gemmell (2004), highlighting the importance of understanding emotional states through non-verbal cues (Coulson, 2004). The comprehension and transmission of emotional experiences by presenting explicit, visual proof of emotional reactions are jointly improved through non-verbal strategies.

Visualizing emotions is important for numerous reasons. Firstly, it enhances the understanding process by simplifying the interpretation of complex emotional patterns and responses that may not be apparent from initial data alone (Trigg, 2022; Wagner et al., 2021). Additionally, allowing individuals to effectively comprehend and express their emotions by applying them in visual representations, which precisely carry complicated emotional states that may be challenging to express verbally. Secondly, visualization facilitates the communication of findings to a wider audience, including those who may lack a technical background, thus rendering emotional data more comprehensible and accessible (Horvat et al., 2022; Magdin et al., 2021; Marimpis et al., 2020). Thirdly, offering a clear and straightforward method for assessing the emotional affect and collecting feedback for improvements, thereby enabling the enhancement of services, products and interventions (Anderson & Robinson, 2021; Ren et al., 2024; Trigg, 2022; Villegas et al., 2023; Zacharia & Hamelin, 2021). Lastly, facilitating the analysis and validation of theoretical models of emotion by the visualization of emotions themselves, which provides a solid visual evidence that is vital for the advancement of scientific research and understanding in the field of affective science (Collier, 1996; Horvat et al., 2022; Melcher & Bacci, 2013; Xara-brasil et al., 2018).

Designers and architects must be able to visualize felt-body emotions in order to facilitate affective design. Affective design, defined as the process of creating environments and products that evoke specific emotional responses. Visualizing felt-body emotions can enhance user experiences, influenced by shapes, forms, and spatial arrangements, to create more engaging and emotionally resonant environments. Creating architectural spaces, physical products, animations, and interfaces that are intended to stimulate positive emotional responses is especially pertinent using this method. The integration of visual representation of emotions into the design process helps professionals guarantee that their creations do not only satisfy the functional requirements but also emotionally resonate with users. This approach results in more impactful and gratifying experiences in both products and spaces (Desmet, 2003; Foroni & Semin, 2009; Horvat et al.,

2022; Lu et al., 2019; Macrae et al., 2013; Paasschen et al., 2015).

This study presents a novel approach in non-verbal communication for expressing felt-body emotions. It does so through examining the capabilities of first-year Architecture and Design students in "Basic Design" course at the University of Petra through an empirical art project showcasing two-dimensional compositions, which represent and measure emotions.

Hermann Schmitz defines emotions as atmospheres and perceives space as a sensorial entity, defining atmospheres as they are spatially articulated and their communication is innate to the felt body's role, and sensorial entity as a 'sensible space' emerging in the felt-body as an embodiment that integrates emotions, atmospheres, perceptions, and spatial interactions (Schmitz et al., 2011; Griffero, 2014; Aletta & Xiao, 2018).

This paper questions if this 'sensible space' can be visualized and measured to present it as a new method in non-verbal communication. The paper claims that sensible space can be visualized in two-dimensional compositions according to Schmitz's dynamic vital drive theory of the felt-body. Furthermore, the study examines the spatial arrangement in design within these compositions, suggesting that these layouts may reflect emotional arousals, aligning with the Circumplex model of emotions, i.e., the wheel of emotions, as a way to measure the sensible space. To analyze and assess the students' work, this research follows Amedeo Giorgi's phenomenological qualitative approach to explore emotions visually aiming to identify a shared pattern with their individual experiences.

The novel non-verbal technique of expressing emotions is pioneered in this study through two-dimensional compositions, aligning with Schmitz's theory of vital dynamic drive concerning the valence aspect of the wheel of emotions and connecting spatial configurations to the arousal facet of the same wheel. Potentially, this study holds a multifaceted significance in the realm of design coupled with emotional studies.

According to Schmitz's theoretical framework, the sensible space that correlates with felt body space was not tested, measured, or visualized. Furthermore, there is currently no existing literature that establishes a connection between the wheel of emotion and Schmitz's vital drive theory.

Four main sections are incorporated into this research. The first section, the theoretical background, explores fundamental theories that assist in understanding emotions emphasizing phenomenological approaches that include a visceral perception of emotions. Additionally, it reviews previous research in visualizing and measuring emotions in the field of art. Furthermore, it includes a subsection presenting literature on compositions and spatial organization, providing a clear explanation of the essential spatial arrangements in design and their historical and cultural significance. This theoretical background establishes the foundation for the analytical framework to read the sensible space in two-dimensional compositions. The second section presents the experiment design that was assigned to the students to create their two-dimensional compositions, which will be tested for visualizing and measuring emotions. The third section presents the methodology of visualizing and measuring the felt-body emotions in the students' work. Lastly, the final section provides Results and conclusions.

## 2. Theoretical Background

### *2.1 Emotions*

Various scholars have addressed the definition of emotions historically. Ekman and Scherer suggested that emotions play a pivotal role, through their works on the cross-cultural universality of emotional expression, in conveying crucial information (Scherer et al., 2013; Scherer, 2005; Mulligan and Scherer, 2012). Scherer's foundational theory presents emotion as an interplay of moods and behaviors stemming from a cognitive standpoint, indicating readiness for reactions to both internal and external stimuli. He conceptualizes emotion as a synchronized process involving physiological responses, motor expressions, and cognitive representations over a set period.

The term 'emotion' is inherently complex as posited by Mulligan and Scherer. They viewed it as a time-line based process with a direction towards a specific object, that is instigated and steered by appraisals. However, they also argued that these appraisals for explaining the object of the emotion are not necessarily essential (Mulligan and Scherer, 2012).

In contrast, 'emotion' was also described as a consciously recognized neurophysiological state amalgamating hedonic and

arousal values by Russell. A 'Circumplex model' was introduced by Russell where the linear blend of valence and arousal dimensions emerges emotions. For example, high arousal coupled with pleasure defines 'excitement', based on activation levels, it is slightly different from 'alert' or happy' (Russell, 1980). While preserving Russel's original terms in upper case, the model was then later refined by Scherer (2005) adding new descriptors in lowercase. Figure 1 depicts a representation of this model, highlighting the valence-arousal dimensions, while Table 1 details the corresponding specific emotion.

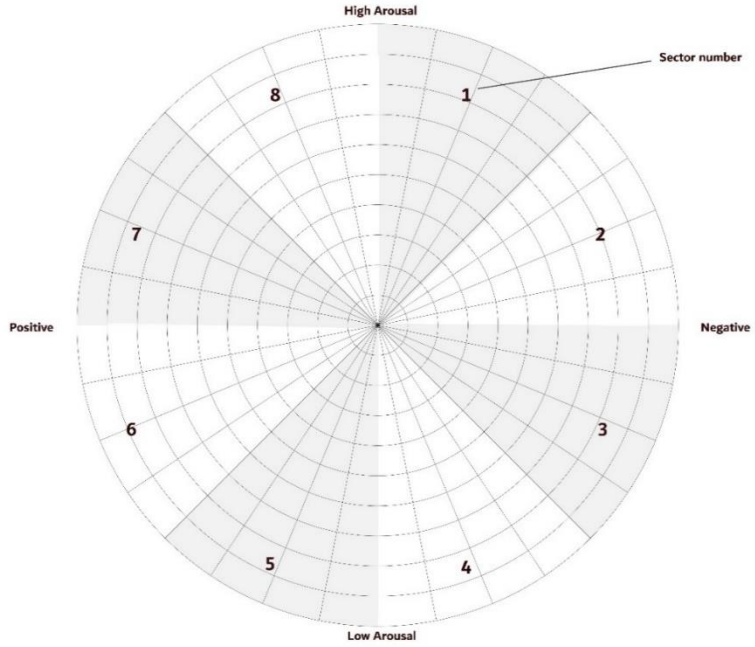



**Figure 1: The Wheel of Emotions created by Russel and enhanced by Scherer reproduced by the authors, showing the sector numbers, and the dimensions of the wheel– Visualized by authors.**

A well-established tool in psychological emotion mapping has emerged. Figure 1 depicts that refined version of the Circumplex Model of Emotions. The circular diagram is segmented into eight numbered sectors, each representing different emotional states based on arousal-valence levels. Emotions characterized by negative valence and high arousal, such as worry and stress indicating a state of alertness associated with discomfort or unhappiness are plotted in sectors 1 and 2. Negative valence coupled with low arousal this time, such as boredom and sadness, indicating low energy is plotted in sectors 3 and 4. Emotions that are positive and accompanied by low arousal, such as relaxation or contentment that involves a positive mood without significant energy expenditure, are situated in sectors 5 and 6. Positive feelings with high energy dispense are defined as high-valence and high-arousal emotions, such as excitement are located in sectors 7 and 8.

**Table 1. The wheel of Emotions as a table showcases the dimensions of the wheel and provides examples of positive and negative valence, as well as high and low arousal, created by authors.**

| | **Sector 1** | **Sector 2** | **Sector 3** | **Sector 4** | **Sector 5** | **Sector 6** | **Sector 7** | **Sector 8** |
|---|---|---|---|---|---|---|---|---|
| | **Negative Valence** | **Negative Valence** | **Negative Valence** | **Negative Valence** | **Positive Valence** | **Positive Valence** | **Positive Valence** | **Positive Valence** |
| **High-arousal** | Angry<br>Annoyed<br>Afraid<br>Tense | Distressed<br>Disgusted<br>Suspicious | | | | | Delighted<br>Happy<br>Courageous | Excited<br>Astonished<br>Aroused<br>Ambitious |
| **Low-arousal** | | | Miserable<br>Depressed<br>Gloomy | Bored<br>Droopy<br>Lonely | Pensive<br>Polite<br>Sleepy | Pleased<br>Glad<br>Calm | | |

Scherer advocated the importance of using of a wheel-based system to capture emotions more accurately, due to the limitations of verbal descriptions of emotional experiences (Scherer et al., 2013), providing a more structured framework. This approach allows individuals to conveniently pinpoint their feelings unconstrained by specific jargon or terminologies.

### *2.1.1 Emotions as a Felt-body Space*

The world around us and our understanding of it and interactions with it can be significantly shaped by emotions. The focus on bodily interaction with the environment, and crafting distinct atmospheres is central to this approach. The philosophy of presenting emotion as a subjective phenomenon in one's perception at any given moment by Hermann Schmitz is at the heart of this discourse. Schmitz perceives space as a sensorial entity called 'sensible space', which emerges in the 'felt body'; an embodiment that integrates emotions, atmospheres, perceptions, and spatial interactions. For Schmitz, emotions are atmospheres spatially articulated, and their communication is innate to the felt body's role (Schmitz et al., 2011; Griffero, 2014; Aletta & Xiao, 2018).

Building on this, Schmitz introduced the dynamic vital drive, which captures bodily dynamics—expansions and contractions—as experienced during emotional processing. He posits that these emotional dynamics, ranging from joy's expansive state to guilt's contraction, stem from our interactions with space, influencing our total corporeal experience. He also claims that there are some dualities in the felt-body for certain emotions; emotions like anger, for example, were manifested through a dual phase of contraction at the beginning followed by subsequent expansion, and shyness, for example, is manifested through expansion followed by contraction. Situations imprint marks on our sensations, spurring shifts in bodily states, yet subjects continually evaluate these experiences, relying on expressive-gestalt qualities that nurture felt-body dynamics.

Spaces are birthed from the interwoven nature of personal affect and reactions according to Griffero (2017). Spaces resonate emotions echoed from bodily experiences, as our states often mirror the encountered events rather than a mere reflection of the environment. Atmospheres function as the "space of bodily presence" conveyed by Bohme (1993).

However, a pressing dilemma arises: how does one objectively portray and measure inherently subjective first-person experiences? This paper focuses on exploring the viability of visually conveying the felt-body space—where emotions manifest—and measuring its representability. It strives to map this space visually and align this portrayal with the valence dimension of the wheel of emotions. Arousal is another facet, transcending the duality of positive and negative emotions, worthy of investigation. This raises the question of how can the representation of arousal be conceptualized.

### *2.1.2 Previous Research in Visualizing and Measuring Emotions in Art*

Methodologies for expressing emotions through verbal and non-verbal means of communication are summarized in the introduction section. Art manifests as a powerful medium for expressing emotion beyond conventional communication. Art's essence lies in artists channeling their emotions through various mediums pursuing the audience to resonate with the same emotions (Tolstoy, 1960, p.123).

Researchers such as Melcer and Isbister were intrigued to investigate these impressions in art, especially abstract art. They argued that emotions can be symbolized both visually and dynamically through the affective qualities of dimensionally various shapes. Spikes, for example, are associated with feelings like frustration. Furthermore, particular emotions can be evoked through the motion in the art creation process (Melcer et al., 2016). The analytical examination of abstract art by Melcher and Bacci (2013) revealed that specific elements, including texture, color, and shape, could consistently stimulate emotional centers within observers. Such bottom-up properties in abstract artworks offered insights into how art elements could convey diverse emotions. Table 2 below, summarizes the main findings.

**Table 2. Affective qualities of shapes according to Melcer et al. (2016), created by authors.**

| *Element* | *Meaning* |
|---|---|
| **Color** | Colors can evoke different emotions; for example, warm colors (red, yellow) are arousing, while cool colors (blue, green) are calming. |
| **Lines and Shapes** | Sharp angles and pointy shapes are associated with aggression and danger, while curved lines are linked to softer, more pleasant emotions. |
| **Symmetry** | Symmetry often correlates with beauty and positive emotions, while asymmetry can evoke interest or tension. |
| **Texture** | Complex textures might lead to higher arousal and negative emotions, while simple textures are associated with calmness. |
| **Movement** | Implied motion in art can influence arousal; fluid motion is seen as positive, while chaotic motion can be negative. |
| **Color Harmony** | Harmonious color combinations are calming, while contrasting colors can be stimulating. |
| **Gestalt Principles** | Good form, continuation, and grouping principles affect how emotions are perceived in visual compositions. |

Natural imagery, with a focus on angularity and roundness in shapes, was investigated by Lu et al. (2019). Adding another layer of the computational perspective to this discussion. Links between certain images and emotions were found. Circularity correlated with anger, while the orientation of line segments correlated to fear and sadness for example (Lu et al., 2019), summarized in Table 3 below.

**Table 3. Emotional impact of lines and shapes according to Lu et al. (2019), created by authors.**

| *Segment Type* | *Meaning* |
|---|---|
| Lines | |
| Upward Facing | Represents high arousal emotions. |
| Downward Facing | Represents low arousal emotions. |
| Angular Lines | Represents negative valence |
| Smooth Curves | Represents positive valence. |
| Shapes | |
| Rounded Shapes | Corresponds to positive valence. |
| Spiky Shapes | Corresponds to negative valence. |
| Smooth Shapes | Corresponds to low arousal. |
| Protruding Surfaces | Corresponds to high arousal. |
| Taxonomy of Affective Dimensions | |
| Spiky Shapes | Conveys frustration. |
| Round Shapes | Conveys contentment. |
| Flatness | Conveys boredom. |
| Symmetry | Conveys contentedness. |

### *2.2 Composition Design and Spatial Structuring*

Basic elements acting as the vocabulary of design discipline have historically guided the design intrinsically, which had implications in the conceptual, symbolical, and aesthetical realms of design and steered space formulation. These elements including, points, lines, planes, basic shapes, and solids, and their convergence generate a holistic perception, also known as a composition with humans perceiving the whole before the individual parts (McCreight, 2006). Spatial narratives are

intricately fabricated through design principles such as unity, contrast, balance, and more.

Design is often observed through the shape's spatial relationships, introducing unique implications within compositions. Ching (2014) recognized several space arrangements, such as centralized, linear, clustered, and grid.

Prevalent in several design applications, from the Pantheon in Rome to Buddhist mandalas, historically symbolizing unity and balance. A centralized spatial pattern reinforces equilibrium evolving around a core (Mastandrea et al., 2006). This layout amplifies student's focus in a classroom (Barrett et al., 2015). It also augments interpersonal interactions, and fosters connectivity (Sommer & Sommer, 2007).

Signifying progression, and consistency along an evident axis are reflected in linear arrangements (Abuhassan, 2009; Ching, 2014). This sequence, as depicted in exhibition designs, induces visitor immersion and navigation (Khooshabeh & Hegarty, 2010). Landmarks in such an arrangement aid in efficient navigation (Brieber et al., 2015). The Parthenon and Le Corbusier's Villa Savoie exemplify the power and unity embodied by linear arrangements (Psarra, 2009).

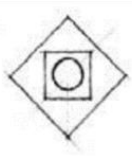
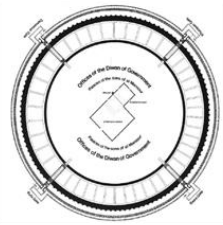
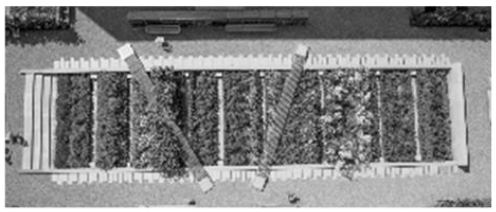
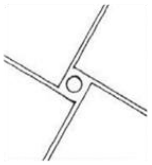
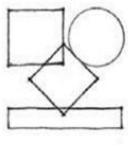
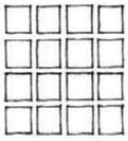
Radial organization fuses elements from centralized and linear structures. The defining feature is the central space, from which linear arms radiate outwardly. Notably, radial configurations in educational and work environments can foster active engagement and innovative thinking (Peponis et al., 2004; Wineman & Peponis, 2010). Dynamism and energy emanating from the nucleus remain the distinguishing features of a radial organization (L. Abuhassan, 2009; L. B. Abuhassan & Omari, 2021).

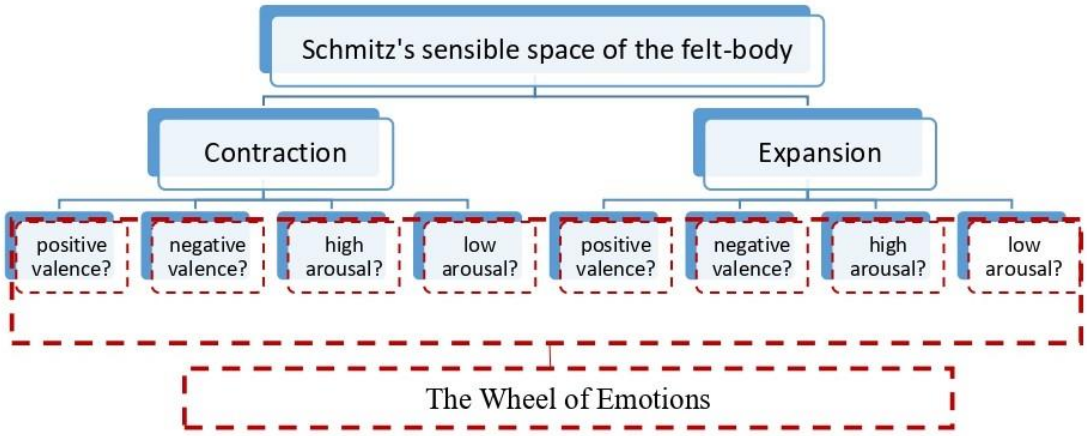
Common attributes unify elements in a clustered arrangement. The key strengths of clustered arrangements are their adaptability, growth potential, and capacity to accommodate evolving characteristics of elements (Ching, 2014). Reduced safety perceptions can be sometimes hinted at from an urban clustered design despite the diversity in experiences it provides. Heightened stress levels can also be experienced from clustered designs adopted in office spaces (Khooshabeh & Hegarty, 2010).

The sense of orderliness is conveyed by a grid arrangement evident by recurring modules (Ching, 2014). Spaces designed with grid layouts, like the Court of Oranges or the Chang-an layout, historically symbolize principles of unity and structured hierarchy (Boults & Sullivan, 2010). Kim and Kaplan (2004) identified that grid arrangements in urban spaces enhance navigability and perception. Table 4 summarizes the referential meanings of the spatial organizations derived from the aforementioned literature.

Most of the previous research mainly dealt with the shape characteristics and their affective dimensions such as; color, texture, angles, and proportions, or dealt with the referential meaning of the spatial organizations. Instead of focusing solely on visual features or spatial meanings, this study investigates the dynamic interaction of spatial compositions through visualizing the felt-body space. This study examines the contraction and expansion of the sensible space in Schmitz's theory through two-dimensional compositions to reflect the felt-body emotions and analyze the used spatial organization effect on the level of arousal aiming to align Schmitz's theory with the wheel of emotions. Figure 2 illustrates the study framework.

**Table 4. A Summary conclusion of spatial organizations types, definition, referential meaning, and examples, created by authors.**

| Spatial Organization | Definition | Referential Meaning | Application in Real-life | |
|---|---|---|---|---|
| **Centralized Organization**  | a centralized organization is a stable and concentrated composition that comprises several secondary spaces arranged around a significant central space. (Ching, 2014) | 1. Power.<br>2. Dominance.<br>3. Control.<br>4. Stability.<br>5. Balanced.<br>6. Attentiveness and focus.<br>7. Increases a sense of connectedness and interaction. | Baghdad (The Round City) – Master Plan  |  |
| **Linear Organization**  | A linear organization primarily comprises a sequence of spaces that can be directly connected to each other or linked through a distinct linear space.(Ching, 2014) | 1. Directionality.<br>2. Movement.<br>3. Extension.<br>4. Growth.<br>5. Flexibility.<br>6. Progression. | Novartis Physic Garden – Top view  | |
| **Radial Organization**  | The radial organization of space combines elements of both centralized and linear organizations. It features a significant central space, around which several linear organizations extend radially. (Ching, 2014) | 1. Energy.<br>2. Motion.<br>3. Increases participation and engagement.<br>4. Dynamic. | Secretariat Building, UNESCO Headquarters,  Paris – Plan |  |
| **Clustered Organization**  | A clustered organization relies on physical proximity to connect its spaces. It typically comprises repetitive cellular spaces with similar or dissimilar functions and shared visual characteristics, such as shape or orientation. (Ching, 2014) | 1. Flexible.<br>2. Growth.<br>3. Development.<br>4. Transition.<br>5. Complexity.<br>6. Chaos.<br>7. Information overload.<br>8. Diversity.<br>9. Interest. | Santorini, Greece – Clustered architecture  | |
| **Grid Organization**  | A grid is a framework of intersecting straight (vertical, horizontal, and diagonal) or curved lines used to structure the composition.(Ching, 2014) | 1. Regularity.<br>2. Repition.<br>3. Stability.<br>4. Order.<br>5. Tranquility.<br>6. Control.<br>7. Perceived stress.<br>8. Clarity.<br>9. legibility. | Barcelona City – Masterplan  | Wallpaper Pattern – Interior Space  |




***Formatting Heading 2: Use This Style for Level Two Headings***

*Heading 3: use this style for level three headings*

*Heading 4: create the heading in italics*. Run the text on after a punctuation mark

**Figure 2: Study Framework, created by authors.**

### *3. Project Design*

The experiment consisted of delegating a project to first-year students enrolled at the School of Architecture and Design at the University of Petra in 2019. It was part of the "Basic Design" course aiming to teach design principles through organizing and creating formal elements from lines and shapes in two-dimensional compositions. This project followed a previous assignment, which aimed to teach the same principles to the students and served as an application of their newly acquired knowledge.

The following sub-sections outline the design project aimed at creating two-dimensional compositions. These compositions will then be analyzed in alignment with the objectives of this paper.

#### *3.1 Project Overview*

Students were asked to express a moment they had gone through by reflecting on their emotions in a story sequence through a two-dimensional composition. The goal of this project was to utilize the principles of design to create a meaningful composition that reflects the emotions experienced by each one of them. The outcome of the project was represented in a 2-dimensional sequence, although the use of 3-dimensional relief may be employed for added emphasis. The final submission of the composition for this project had a dimension of 11.5 cm x 72 cm, framed by a 4 cm border. The submission was due four weeks after the project began (see Figure 3; the final project's dimensions).

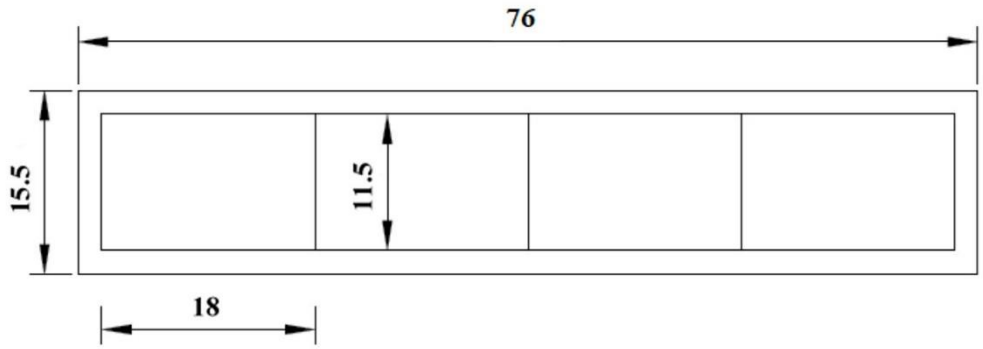



**Figure 3: The final project's outline, created by authors.**

### *3.2 Participants and Submissions*

A total of 50 first-year students took on this project across three different sections. The students' ages were between 18 and 19 years old. All students were given the same instructions and assigned the same timeframe to complete the project. Additionally, each student possessed a similar knowledge and background in design principles. However, only 41 students successfully fulfilled all the requirements of the project, and their work was selected for this research paper analysis.

Students were told that their submissions would be analyzed in a research paper, and the research paper was provided with an ethical approval no. Q1/6/2019 by the University of Petra's Ethical Approval Committee. Once the project was submitted by the students, they were not involved in the process of analysis that belongs to this research paper. No minors were included in the class, and accordingly, no guardian consent was needed.

### *3.3 Project Framework*

The experiment was conducted in two main phases: phase one deals with the story, and phase two deals with design, translating the story into a meaningful composition. Table 5 below shows the phases in general.

**Table 5. Project phases summary, created by authors.**

| | |
|---|---|
| **Phase One** | A- Write a narrative. |
| | B-Divide the story in segments and list down the felt emotions in each one. |
| | C-Draw a timeline expressing the peaks of the story. |
| | D- pick a basic shape to represent you, and another shape that represents your conflict; enemy or obstacle. |
| **Phase Two** | Translate your story in a 2-D composition; black and white. |
| | Extrude your composition with some 3-D relief and only use one color beside black and white or a different material for the peaks. |

#### *3.3.1 Phase one*

Phase one of the project aimed to develop a conceptual narrative through writing a story, deconstructing it into segments, and assigning a felt emotion to each segment. It was also designed to enhance the narrative structure by visually plotting the emotional high points within a timeline.

Additionally, it requires the selection of basic shapes to symbolize the narrator and any conflict, enemy, or obstacle within the story, adding a layer of abstract visual symbolism. Figure 4 represents a random sample chosen from one of the students' works which illustrates the sequence of phase one steps.

(A) The students shared their personal stories and composed a paragraph about a significant moment in their lives. The narratives were initially written in Arabic and were translated into English by the researchers for this study.

(B) The students were requested to record all the events they had experienced and segment their reactions and emotions by describing how they felt about each event until its conclusion. Then, the Circumplex model of emotions—the wheel of emotions—was introduced to the students. They were asked to identify their emotional state by choosing the appropriate zone (sector) of the wheel of emotions if they were unable to specify the exact emotion.

(C) Creating a timeline was then instructed to the student, which conforms with the segmented list from step (B) and visually translates their story. The timeline had to include a beginning (opening), a middle (climax), and an end (resolution).

The students were free to create as many climaxes as they preferred or rearrange the story's timeline as they saw fit to ensure that their story was told in a way that affected them personally. The students were also informed that the concept of time can be manipulated i.e., expanded or condensed reflecting a year or a minute in their lifetime portraying a felt time rather than actual time. For example, a second of happiness may feel shorter than a second of sorrow and pain.

(D) The students were then guided to select a single primary shape that represents their personalities such as a square, triangle, or circle. Their selection was influenced by basic research that explored the meaning behind commonly used shapes in film and literature. The selection of a secondary shape was optional for students who desired to enhance their story by complementing or contrasting it with their persona.

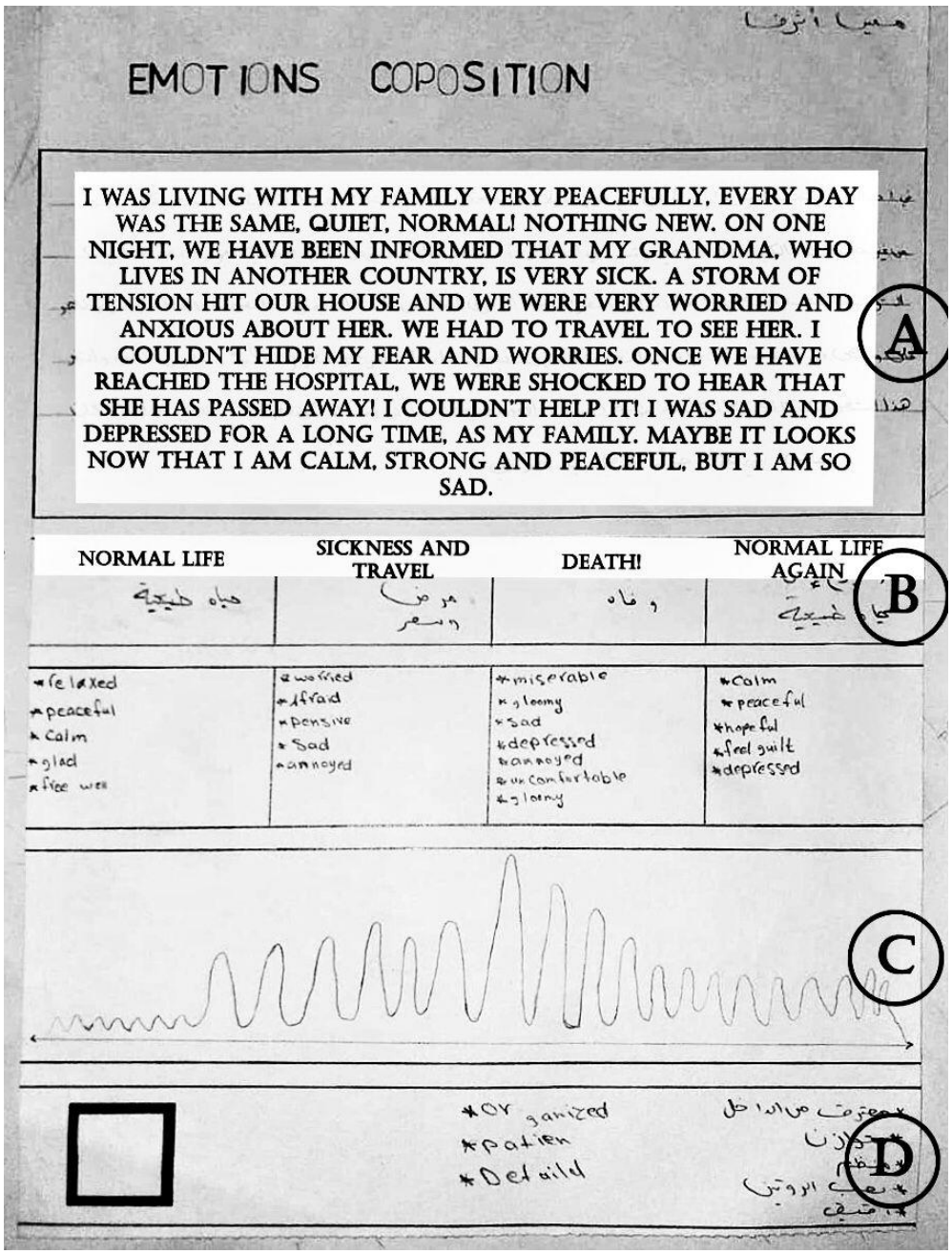



**Figure 4: A Sample of the work represented by one of the students (Phase One).**

*Note.* **A**: is the narrative written by the students. It was translated for the sake of the study. **B**: the main segments of the story that were analyzed. **C**: is the felt timeline, and **D:** is the selected shape.

### 3.3.2 Phase two

Phase Two shifts from conceptualization to visual translation and three-dimensional representation. During phase two of the project, the students transformed the timeline they created in phase one into a two-dimensional composition using the shapes they had selected, transforming the narrative into visual art. They have translated their emotions by using spatial organization between the shapes. They then transformed the most emotionally impactful moments into a three-dimensional representation to create a hybrid composition that blended two-dimensional and three-dimensional elements. The final representations were produced on cardboard measuring 76 cm by 15.5 cm. The two-dimensional compositions were limited to black and white only. The hybrid compositions were predominantly presented in black and white, except for the peaks, which allowed the students to choose their materials or colors to represent them (see Figure 5).

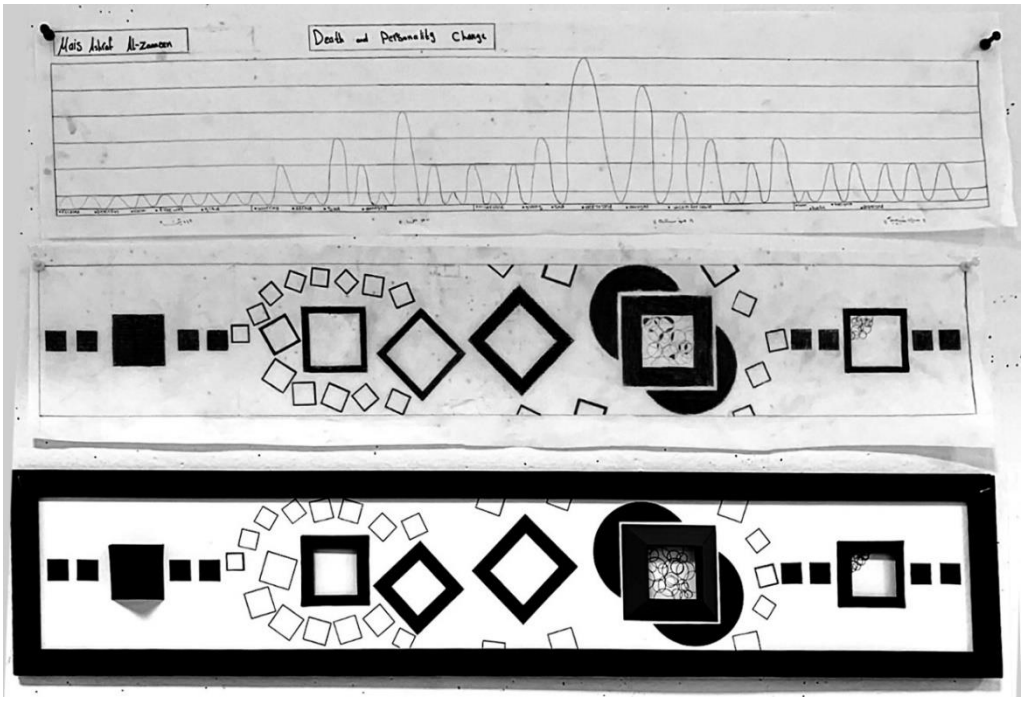



**Figure 5: The transformation of the same sample in figure 4 into two-dimensional and three-dimensiona compositions represented by one of the students (Phase two)**

This phase bridges the gap between storytelling and sculptural representation, offering a tangible form to the previously conceptualized emotions and events.

## 4. Methodology: Phenomenological Approach

A qualitative research method is used to explore and understand human experiences through interpretive, and descriptive analysis highlighting this phenomenological approach and laying the groundwork for relevant insights. David Seamon, M. Reza Shirazi, Julian Hanich, and Juhanni Pallasamaa are considered remarkable phenomenologists and have favored the descriptive aspect portrayed in literary works such as García Márquez's One Hundred Years of Solitude (Seamon, 2018) to architectural marvels like Villa Mairea (Pallasamaa, 1998).

Three core research phases encompass this approach; the phenomenon's essence observation, unbiased detailed description of it, and interpretations identifying shared patterns in individual experiences (Hanich, 2010; Shīrāzī, 2013; Seamon, 2015; Seamon, 2018). Seamon (2018) recognized four phenomenological research methods; ranging from the analysis of architectural spaces to the interpretation of personal experiences. This study targets the examination and recognition of consistent patterns conveyed in personal and emotional experiences in relation to the spatial arrangement of

the students' two-dimensional compositions.

Amedeo Giorgi (2016) posited a phenomenological analysis method derived from Edmund Husserl's foundational work and was structured into four stages. Initially, a holistic understanding of the described experience is established without delving into interpretations. Subsequently, distinct meanings are ascribed to segmented portions of the experience, leading to the identification of possible underlying psychological processes. Finally, an overarching structure of the experience is deduced, allowing for a comprehensive grasp of the phenomenon (Giorgi, 2016), see Figure 6 to illustrate Giorgi's method.


**Figure 6: Amedio Giorgi's structured phenomenological method to understand a phenomenon, visualized by authors.**

To operationalize Giorgi's method in understanding students' projects to find a shared pattern in their felt-body experiences, the phenomenological approach is used as in Figure 7;

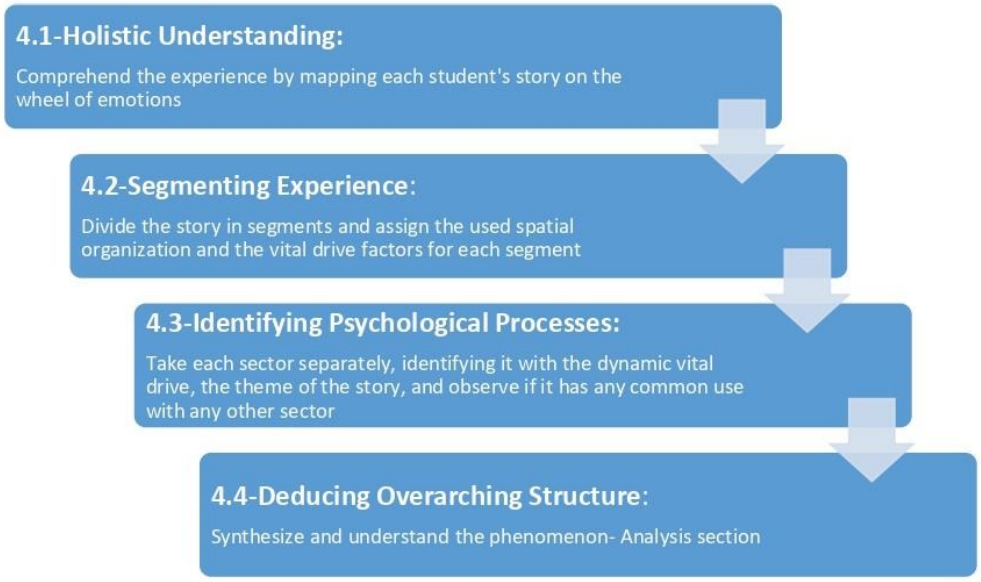



**Figure 7: Application of Amedio Giorgi's phenomenological method on students' work, created by authors.**

### *4.1 Holistic understanding*

To understand students' narratives and to zone their emotions, each project (script, timeline, and emotion-based notes that were described in Figure 4 was reflected on the wheel of emotions. To do so, the wheel was labeled from 1 to 8, where 1 captures negative emotions with high arousal such as 'anger' and 'anxious', clockwise to 8 where it represents the zone of positive emotions with high arousal as in 'excitement'.

Students mapped their self-reported emotions onto the wheel to ensure that their emotional understanding was holistic for the narrative. To guarantee consistency or emotional categorization, synonyms were used from Scherer's (2005) list as a replacement when students used terminologies unfeatured on the wheel. For example, a word like 'humor' is a synonym for 'Amusement' on the wheel, and 'nervous' is a synonym for 'Anxiety' on the wheel. Figure 8 illustrates the mapping for the sample used in Figure 4, where emotions were zoned and mapped in sectors 1, 2, 3, 4, 5, and 6. This step has been applied to the 41 projects to help the researchers understand the felt-boy experiences individually and holistically.

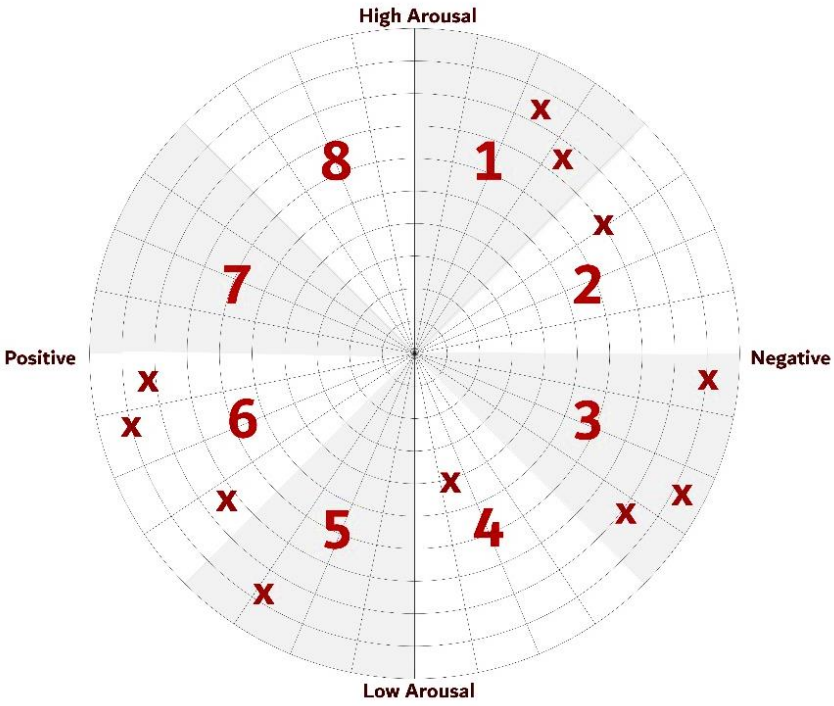



**Figure 8: Numbering the sectors of the wheel clockwise and assigning the felt emotions in the sample above, created by authors.**

*Note.* The sectors were numbered clockwise, starting with 1 and ending with 8. X assigns the felt emotions mapped on the wheel to figure out the zones of emotion.

### *4.2-Segmenting Experience:*

In the pursuit of a structured dissection of the experience, a table was constructed to categorize primary segments as the initial analytical step; see Table 6. The number of events in students' narratives varied: some recounted three, some six, while the majority identified four primary events; as in the sample in Figure 4.

For each principal event, a trio of attributes was cataloged: the positioning of emotions on the emotion wheel, the utilized spatial organization, and the interspace among shapes (i.e., contraction or expansion). Emotions were allocated according to the wheel's sectors. For instance, in the segment labeled "normal life" (as seen in Figure 3-B), predominant emotions occupied sectors five and six. However, for a segment such as "death," emotions primarily resided in sectors three and four.

Spatial arrangements within the compositions were differentiated into linear, clustered, radial, centralized, and grid

patterns. The contraction or expansion dynamic—the dynamic vital drive—was then documented for each segment. Determining the contraction and expansion level is based upon the narrative's commencement as a reference, after that, if the spatial arrangement between the shapes is tighter, it is considered, then, as a contraction, and if it is expanded more than the reference or the preceding state, then the spatial organization represents an expansion. All students' projects were segmented, table 6 illustrates this step using the sample from Figures 4 and 5.

**Table 6. Step one; Breaking down the experience of the selected sample shown in Figures 4 and 5, created by authors.**

| **The segment** | **normal life** | **the sickness and travel** | **the death** | **coming back to normal life** |
|---|---|---|---|---|
| **Sectors no. on the wheel** | 5 and 6 | 1 and 4 | 3 and 4 | 5 |
| **Spatial Organization** | Linear | Cluster and radial towards one direction | Centralized | Linear |
| **Contraction and Expansion** | Neutral (reference point) | Started as contraction then expansion | Contraction | Expansion then inner contraction |

***4.3-Identifying Psychological Processes:***

To infer the potential psychological processes inherent in each segment, the primary step's composition analysis was revisited in (4.2: Segmenting Experience:), referencing sector numbers. Here, projects were holistically assessed, and a table was formulated capturing spatial organization, dynamic vital drive, narrative theme (e.g., death, accident), and whether emotions in sectors were singular or recurrent. An added dimension was the story's emotional "peak," denoted as the paramount crest on the timeline. The trajectory of these crests varied: occasionally ascending, sometimes descending. Though the directional value wasn't analytically significant, peaks were earmarked to coincide with the emotion spectrum provided by students. The rationale for accentuating this peak stemmed from its potential as a phenomenological observatory tool. This methodology was consistently applied across all eight sectors: Table 7 showcases an analysis of sector one, Table 8 is that of sector three, and Table 9 delves into sector seven.

**Table 7. Step Two; Selected samples of Sector No. One for three students' works**

| **Sector no. 1** | **Spatial organization** | **Dynamic Vital Drive** | **The theme of the story** | **Common with sector no.** | **Students' final outcome of the project** |
|---|---|---|---|---|---|
| **Student (9)** | Clustered | Contraction | Accident PEAK | With 8, 4 |  |
| **Student (15)** | Clustred | Contraction | Accident PEAK | - |  |
| **Student (20)** | Grid | Contraction | Accident PEAK | - |  |

**Table 8. Step Two; Selected samples of Sector No. Three for three students' works**

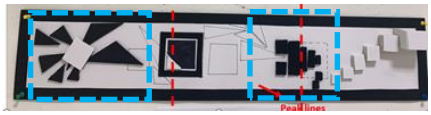
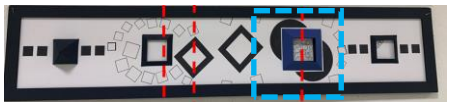
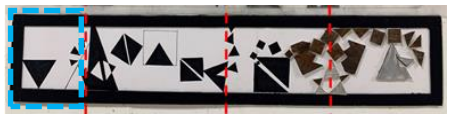
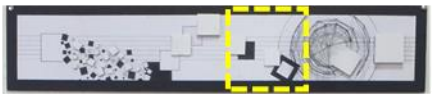
| Sector no. 3 | Spatial organization | Dynamic Vital Drive | The theme of the story | Common with sector no. | Students' final outcome of the project |
|---|---|---|---|---|---|
| **Student (1)** | Radial: Inward | Contraction | Death | 1 |  |
| | Centralized Linear | Contraction | PEAK | - | |
| **Student (2)** | Centralized | Contraction | Death PEAK | 4 |  |
| **Student (3)** | - Nothing (one triangle upside down) | Neutral | Death | - |  |

**Table 9. Step Two; Selected samples of Sector No. Seven for three students' works**

| Sector no. 7 | Spatial organization | Dynamic Vital Drive | The theme of the story | Common with sector no. | Students' final outcome of the project |
|---|---|---|---|---|---|
| **Student (21)** | Radial | Expansion | Bullied by friends | - |  |
| **Student (32)** | Linear | Expansion | Study | - |  |
| **Student (39)** | Linear | Expansion | Illness | - |  |

***4.4-Deducing Overarching Structure:***

In the experiment's final phase, a phenomenological examination of student projects was conducted. For simplification, all sectors were consolidated into a single column, facilitating the identification of spatial organizations, dynamic vital drives (contraction and expansion), and related sectors describing events. Table 10 summarizes this research step and provides a clearer data representation. It demonstrates the frequency of spatial configuration and its dynamic drivers and highlights in red the most common occurrences. For instance, in sector 'one' there were eight compositions with centralized and radial structures, twelve with linear and clustered designs, and thirty compositions reflected contraction configurations. It was also observed that sector 'one' frequently paired with sectors 'three' and 'four' in contexts like death or accidents. However, for other societal events sector 'one' was associated with sector 'four'.

**Table 10. Step Three; Outputs for The Analysis: Referring Each Sector of Russel's Wheel to The Used Spatial Organization, The Dynamic Vital Drive, The Story's Topic, and The Commonality with Other Sectors**

| Sector No. | Spatial Organisation | N | Contraction and Expansion | | The Story is About? | Common with Sector no. |
|---|---|---|---|---|---|---|
| **'one'** | Centralised | 8 | Contraction | 30 | Death | 3, 4, 5 |
| | Clustered | 12 | Expansion | 1 | Accident | 3, 4, 6, 8 |
| | Radial | 8 | Contraction then expansion | 4 | *Social story | 3, 4, 6 |
| | Linear | 12 | Expansion then contraction | - | Study | 3, 4, 6, 7 |
| | Grid | 2 | | | | |
| **'two'** | Centralised | 2 | Contraction | 4 | Death | - |
| | Clustered | 1 | Expansion | 2 | Accident | - |
| | Radial | 1 | Contraction then expansion | - | Social story | 3, 4 |
| | Linear | 3 | Expansion then contraction | - | Study | 3, 8 |
| **'three'** | Centralised | 14 | Contraction | 26 | Death | 1, 4, 5, 6 |
| | Clustered | 10 | Expansion | 7 | Accident | 1, 4, 6 |
| | Radial | 11 | Contraction then expansion | 3 | Social story | 2, 3, 4, 6, 7 |
| | Linear | 10 | Expansion then contraction | - | Study | 1, 2, 4, 6 |
| | Grid | 1 | | | | |
| **'four'** | Centralised | 11 | Contraction | 10 | Death | 1,2,3,5,6 |
| | Clustered | 6 | Expansion | 5 | Accident | 1,3,6,5,8 |
| | Radial | 5 | Contraction then expansion | 5 | Social story | 3,6 |
| | Linear | 3 | Expansion then contraction | 6 | Study | 1,2,3,6 |
| **'five'** | Centralised | 4 | Contraction | 2 | Death | 1,2,3,4,6 |
| | Clustered | 2 | Expansion | 7 | Accident | 1,8,4,3,2,6 |
| | Radial | 3 | Contraction then expansion | 1 | Social story | 1,3,6,7 |
| | Linear | 9 | Expansion then contraction | 3 | Study | 1,4,6,3 |
| **'six'** | Centralised | 11 | Contraction | 7 | Death | 4,2,3,5,1 |
| | Clustered | 13 | Expansion | 17 | Accident | 1,3,4 |
| | Radial | 7 | Contraction then expansion | 8 | Social story | 3,1,7,5,4, |
| | Linear | 21 | Expansion then contraction | 11 | Study | 1,2,3,4 |
| **'seven'** | Centralised | 7 | Contraction | 1 | Death | 1,3,4,5,6,8 |
| | Clustered | 9 | Expansion | 17 | Accident | 1,4,6,8 |
| | Radial | 6 | Contraction then expansion | 5 | Social story | 1,3,4,6 |
| | Linear | 11 | Expansion then contraction | 3 | Study | 1,4,6 |
| **'eight'** | Centralised | 5 | Contraction | 2 | Death | 1,3,5,6 |
| | Clustered | 2 | Expansion | 7 | Accident | 1,4,6 |
| | Radial | 1 | contraction then expansion | 2 | Social story | 6 |
| | Linear | 6 | Expansion then contraction | 2 | Study | 1,3,6 |

*Note.* social refers to stories relating to relationships or bullying, and the red font above represents the highest number of observations for each sector.

Data presented in Table 10 was then plotted into graphical representations to visually aid in its comprehensibility as in figure 9 which represents the results of the spatial organization of the two-dimensional compositions into the circumplex model of negative-positive and active-passive emotions. The spatial organizations focused on centralized, clustered, radial, linear, and grid arrangements. This assists in providing a concise and clear overview of the most commonly used spatial organizations and the emotions they represent.

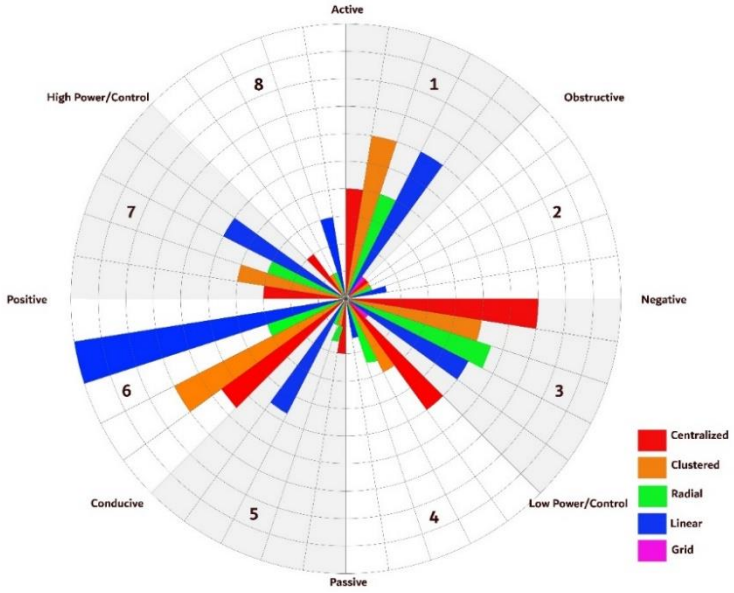



**Figure 8: Students' two-dimensional compositions spatial organizations within the Wheel, created by authors.**

On the other hand, Figure 10 was created to demonstrate the contraction and the conclusion within the two-dimensional compositions. The illustration aims to make it easier for the reader to interpret the data and understand how each sector is mainly represented. The visual format of this information provides a quick and easy identification for the reader to differentiate the patterns and relationships within the data.

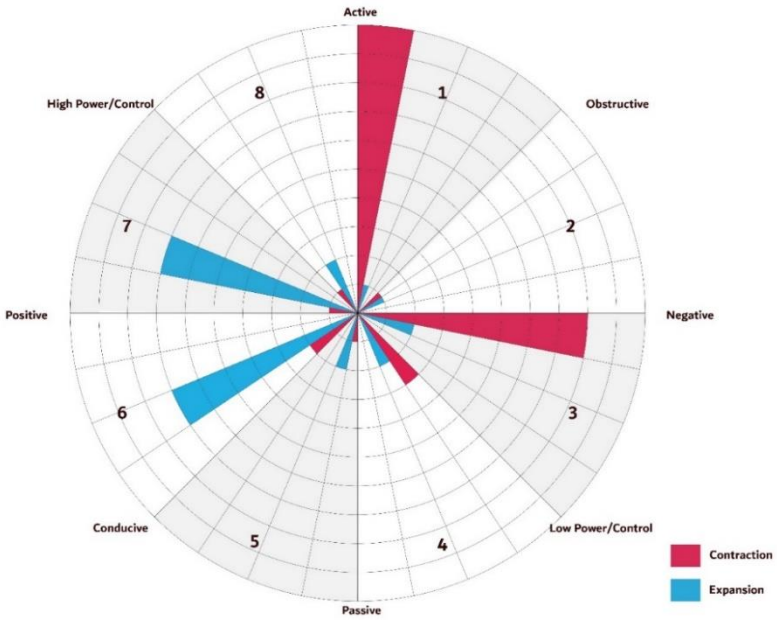



**Figure 8: Students' two-dimensional compositions vital body drive within the Wheel, created by authors.**

Evidently, students adopted diverse spatial organizations to reflect their emotions as seen in Figure 9. Although it is noteworthy that there are multiple factors, such as color and material selection, that could potentially impact the composition, this study concentrates on the most frequently used spatial layout to provide a more comprehensive representation of the emotions to capture the students' expressions and effectively communicate their emotional states. The results indicated that sector 'one' representing negative valence and high-arousal emotions such as anger, fear, annoyance, tension, and alarm was most commonly utilized and was translated into clustered and linear spatial arrangement. Sector

'two' representing emotions such as disgust, disappointment, bitterness, and boredom was the least used sector by students and was reflected in linear spatial arrangements.

The centralized spatial organization was commonly utilized in sectors 'three' and 'four'. Sector 'three' represents emotions such as misery, sadness, gloominess, depression, and desperation, and sector 'four' represents emotions such as worry, embarrassment, melancholy, and droopiness. In sectors 'five', 'six', 'seven', and 'eight', which all present positive valence with contrasting arousal levels, were mainly represented as linear spatial organizations. However, sector 'six' had the highest linear spatial organization representing emotions of happiness, hopefulness, relaxation, friendliness, and satisfaction.

In most cases, the radial spatial organization was combined with linear or centralized spatial organizations and was moderately used in sectors 'one', 'three', 'four', 'six', and 'seven'. Grid spatial organization was the least utilized in the two-dimensional compositions.

Upon comparing the usage of linear spatial organization between sector 'one' and sector 'six', researchers observed that the students utilized the linear organization to represent design principles such as movement, repetition, and transformation to convey their inner feelings, they used the clustered organization to express the tension and chaos they experienced. Furthermore, at times, the clustered organization was incorporated within the linear organization as students described their experiences in a continuous timeline. As a result, it is apparent that the most frequently used type of spatial organization in sector 'one' is the clustered spatial organization, with the linear organization being disregarded in most cases.

Conveying emotions is a complex and subjective matter, resulting in valuable insights for understanding the space where they manifest and how individuals perceive and respond to different emotional stimuli. In reference to Figure 10, the use of contraction was prevalent in sectors 'one', 'three', and 'four'. While expansion was used in sectors 'five', 'six', 'seven' and 'eight', maximized evenly in sectors 'six' and 'seven'. Transformational moments between events were also observed in some compositions, expanding and/or contracting subsequently. The subject's feeling is driven by the contracting and expanding fluctuations simultaneous to their physical displacement through space. This relationship is a complex phenomenon and necessitates comprehensive understanding through further research to be able to relate it to specific emotions. However, in this study, the researchers are tracking in general how students reflected their felt-body spaces.

Moreover, a close examination of both Figure 9 and Figure 10 reveals that students did not extensively utilize sector 'two' in a way that could aid in the analysis and conclusion. Therefore, it will not be included in theResults and conclusion setcions.

## 5. Results and Conclusions

The goal of this study is to define a novel method in non-verbal communication to visualize emotions. According to Schmitz, emotions are defined as atmospheres that are spatially articulated within a space known as 'sensible space'. The primary research question explored whether this space can be visualized and measured. The research hypothesis posits that sensible space can indeed be visualized in two-dimensional compositions following Schmitz's dynamic vital drive theory of the felt-body, dealing with the vital drive dynamics; contraction and expansion. Additionally, the study investigated whether spatial arrangements in these compositions reflect emotional arousals, aligning with the Circumplex model of emotions (the wheel of emotions), as a measure of the sensible space. Employing Amedeo Giorgi's structured qualitative phenomenological method created a framework to understand the phenomenon to create a common pattern in visualizing emotions. The following represents the conclusions of this study.

### *5.1 Visualizing and Measuring Emotions*

Conclusions were drawn from this novel approach in non-verbal communication for expressing felt-body emotions through visualizing and measuring the 'sensible space' of the felt-body presented in this paper.

#### *5.1.1 Spatial Organization vs. Valence and Arousal*

The subject's arousal levels are both influenced and mirrored by the spatial configuration of a composition. A chosen spatial layout can alter the emotional impact of a composition as shown in Figure 9. A clustered organization, for example, aligns with high-arousal emotions like anger and was predominantly used by students to portray feelings of disarray and

disorientation. Alternatively, a centralized layout mirrored emotions of negative value and high arousal. It was commonly adopted by students to illustrate external influences rather than personal conflicts such as sadness. Growth across narratives was indicated through linear configurations relating to positive valence. Due to the limited application of radial and grid layouts, their relation to arousal remains undetermined in this study.

*5.1.2 Sectors work together for intense emotions*

Often, multiple sectors were selected by students to express their emotions as observed in Table 10. Suggesting that subjects may experience a combination of high and low valence due to the complex nature of narratives. For example, a subject experienced both annoyance and worry due to their grandmother's sickness utilizing emotions from sectors 'one' and four' as seen in Figure 4 and Figure 5. Many other narratives included a similar pattern where they used emotions from sector 'one' and connected them to emotions in sectors 'three' and 'four' to portray peak moments in their stories that included death, accidents, and social scenarios such as divorce or bullying. Sectors 'seven' were associated with sectors 'five' and 'six' for positive feelings portrayed in the students' works. While describing the highest positive emotions, usually occurring at the beginning or the end of a narrative, subjects connected emotions from sector 'eight' and 'six'.

*5.1.3 Dynamic vital body drive on the wheel*

According to Schmitz, particular primary movements of contraction and expansion of bodily sensations are significantly influenced by an individual's spatial surroundings, resulting in shaping their holistic bodily experience.

An examination of student projects revealed their tendency to recall events holistically over time. Their evaluation of an event's positivity or negativity was comprehended from the totality of the experience, thereby generating specific felt-bodily dynamics. This was evident in their portrayal of event timelines, which broadly categorized emotions into expansive (positive) and contracted (negative) domains. As depicted in Table 10 and Figures, 9 and 10, students portrayed negative emotional valence using contracted spaces between shapes, while positive valence was represented expansively. See Figure 11 to apply on the study framework.

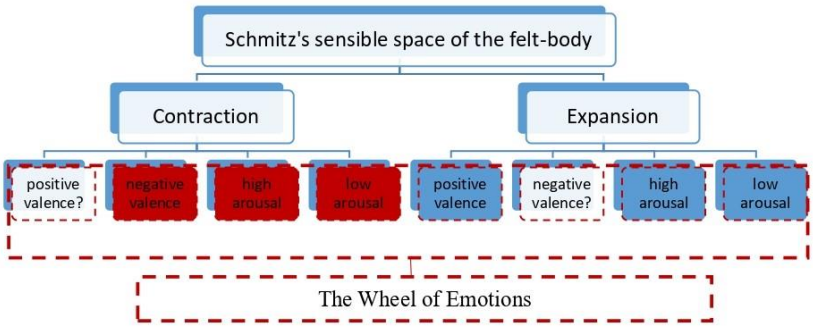



**Figure 11: Answering the study framework**

Interestingly, the study did not validate all aspects of Schmitz's theory, wherein specific emotions like anger were manifested through a dual phase of contraction and subsequent expansion. Rather, students predominantly illustrated anger solely via contraction, relying on expressive-gestalt qualities that nurture felt-body dynamics.

In conclusion, Figure 12 encapsulates the results of all analyses, combining the spatial organizations, with the dynamic vital drive on the wheel.

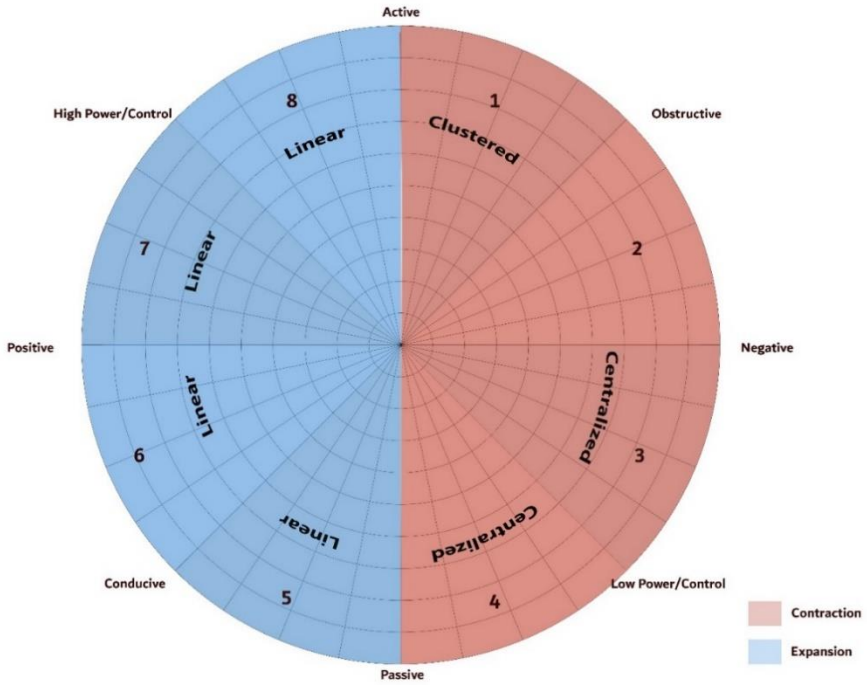



**Figure 12: 12 Schmitz's Vital Drive and Spatial Organizations Meet the Wheel, created by authors.**

***5.2: Visualizing Emotions Affect on Design***

To understand and analyze complex emotional responses and patterns it is essential to visualize emotions, as emphasized in studies on affective science. Professionals such as designers can gain a deeper understanding of the dynamic relationship between personal feelings and responses by including visual depictions of emotions. This may result in more knowledgeable and empathetic design decisions.

Space emerges from the interplay between personal affect and reactions, as suggested by Griffero, which emphasizes that the state of emotion is not only a mere reflection of the environment, but often mirrors encountered events. They resonate with body sensations triggering emotional responses within that space. In the realm of physical presence, atmosphere functions, establishing the importance of factoring in emotional reactions in the design of spaces.

Understanding the interaction between contraction and expansion in environments can be advantageous to architects and designers when improving user experiences. Its contribution underlays in evoking strong emotional responses when designing and developing surroundings. Architects and designers, by considering shapes, forms, and spatial arrangements, can create immersive and impactful settings that induce specific emotional responses. Adopting these methods guarantees intellectual and emotionally stimulating notions within the design process and promotes a profound bond between users and their occupied spaces rather than only aiming for visual aesthetics.

***5.3: Expressing Felt-body Emotions Effect on the Educational Process***

The design project assigned to students was proposed for the first time for the "Basic Design" course at that time. Implementing a project in which students express a moment in their lives proved to be highly effective and profound, both on the personal level and on the theoretical approach level.

Creating a two-dimensional composition that captures the student's emotions and personal experience proved to be a challenging task, as the focus was on expressing oneself rather than prioritizing design aesthetics. The primary mission was not only to create a visually appealing composition that fits the principles of design and the spatial arrangements, but also to express each moment in the way it should be expressed, resulting in genuine designs that reflect their inner states. In addition, expressing the students themselves through a two-dimensional composition enabled them to defend their ideas in

the assessment process, as they were confident that this was the only way to express themselves. Forty-one students out of fifty, with a percentage of 82%, succeeded in filling the requirements of the project. This demonstrates that the project effectively enhanced the students' ability to think critically and creatively in design.

At the theoretical approach level, students were provided with a process method to follow, starting with writing their narratives to encapsulate the most dramatic moments in a paragraph. The writing process helped students to decrease the burden of thinking about design and its aesthetics and replace it with being honest and expressing themselves. Afterwards, they were introduced only to the wheel of emotions, which served as a purely theoretical stage for comprehending and expressing their emotions. This stage allowed students to understand their emotions and track them on the wheel for the segmenting process. To keep the experiment clear and pure, students were deliberately kept unaware of aspects of Schmitz's dynamic vital drive theory. Subsequently, students were encouraged to do research to find out the meanings of shapes and know which shape was closer to representing each one of them. This step was necessary to bridge the gap between the theoretical phase and the design phase and to translate their emotions with the selected shapes to create a two-dimensional composition.

## 6. Recommendations

As a non-verbal communication method, this paper proved that emotions, as a sensible space of the felt-body, can be visualized and measured. The suggested framework enabled emotions to be seen through the dynamic vital drive, contraction and expansion of the two-dimensional compositions, and it allowed for the measurement of emotions by connecting the spatial arrangement of the compositions with the valence and arousal level. While the research could not create an accurate method to measure the emotion's level or the contraction and expansion level of the sensible space, it created a visual approach to visualize emotions that can help in creating a referential measurement scale.

Students employed varied design principles, such as unity, harmony, hierarchy, and many other principles, in their two-dimensional compositions, then arranged them in grid, cluster, centralized, linear or radial arrangements. This paper did not emphasize the design principles used, the shapes used in design and their referential meanings, or the selected color or material to present the compositions. It only took the spatial organizations as a factor to express feelings. However, the research extracted some interesting phenomena that could be analyzed in future studies;

- The analysis found that narratives revolving around death are often portrayed through design principles like 'space within space' and 'interlocking space'.
- Students used specific colors and materials when they represented the peaks in their stories.
- Connecting students of design with theories enhanced the level of their performance; thinking, anlayzing and application. More theories should be applied to explore their power on design.
- Future research could further refine this visual approach, potentially developing a more precise measurement scale for emotions.

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