

Form of Taste1: Arupa in Pedagogy of Design-3

Taste Perception for Practice and Pedagogy of design

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Abstract: The paper "Taste Perception for Practice and Pedagogy of Design" introduces an innovative framework, termed 'Arupa the Implicate Order,' for understanding taste perception in the context of design education and practice. Multifaceted nature of taste, not only as a biological and neurological phenomenon but also as an element deeply intertwined with culture, art, and aesthetics are explored. The research traverses various domains from the scientific bases of taste, including the discovery of taste components and their multi-sensory integration, to the cultural and artistic expressions of taste in cooking and culinary arts. The discussion extends into the impact of modern technology, particularly AI, on creativity in taste perception and its implications for design pedagogy. By unfolding the complex layers of taste perception, the paper aims to enrich design thinking and practice with deeper insights into sensory experiences, advocating for a holistic approach in design education that integrates taste as a critical element of creativity and innovation.

1.0 Introduction

Information gets enfolded in each field into units with tacit and articulated knowledge, contextually. Thus each unit would have content with enfolded boundary. In any essay or write up in a scientific mode, these units are placed with a linear order. In narrative style such enfolded units may appear in non-linear orders. (for example, chapters in a narrative may appear in alternative order to indicate parallel happenings)

In the frame work of 'Arupa the Implicate Order', we may look at enfolded units of content, with a wide scope, across different areas and disciplines, where connections are not visible, at first sight. However, intention of the write up is clear as indicated in the title of paper. The new frame work offers an advantage to discover new patterns connecting elements of information in different enfolded units, as they get unfolded.

'Arupa is a new frame work to unfold with new chosen intention or meaning.

'Practice and Pedagogy of Design' with new capabilities like AI, homing on Foundation programme' is the present chosen intent to explore, 'Taste Perception'.

Form of 'Taste perception' is enfolded in following topics which have evolved in their own contextual orders. We may see the connections across the 'folds' as we unfold each of them to reach a conclusion

- Academic and Scientific frame: study and research, biological and neurological processes of Taste Perception: **2 and 3**
- Cooking and Culture: Art, Aesthetics and Design: **4**
- Food Consumption and distribution in Industrial mode (With measures, technology and language used): **5**
- AI based Creativity , Silence (Inner Order and Individual and collective Creativity), Generative metaphors: **6**
- Conclusion: A cohesive narrative bridging disparate domains—biology, neuroscience, culinary arts, aesthetics, and artificial intelligence is presented by unfolding areas mentioned above to enable conclusions for the objective of the paper. **7**

2.0 Academic and Scientific frame

In this frame, disciplines of Philosophy and Science with an accepted culture of 'publications' become the norm to look at Taste Perception.

2.1 Basic tastes or components

Five abstracted components are identified through scientific studies. These are commonly experienced. A sixth, 'Fat Taste' is claimed recently, based on new studies.

- Salty
- Sweet
- Sour
- Bitter
- **Umami** (1) It has been described as savoury and is characteristic of broths and cooked meats
- **Fat Taste**: potential [taste receptor](#) called the [CD36 receptor](#) is claimed as a new taste.

2.2 Taste in the land of Flavours

Flavour refers to the 'taste perception' or 'combination of tastes perceived', when consuming food or beverages. It can encompass various sensations mentioned above as well as aromatic elements. The basic tastes contribute only partially to the sensation and flavour of food in the mouth, Other factors include

- Aroma, Smell or odour
- Structure and Texture: Touch experience of tongue
- Temperature
- astringency (cranberries and tea)
- pungency (hot pepper and ginger)

Flavour is influenced by ingredients, cooking techniques, cultural preferences, and personal perception.

2.3 Flavour Layering

Flavour Layering is a Culinary technique to create an exclusive taste experience in a dish.

Flavour layering in an Indian dish: Butter chicken (Murgh Makhani)

- Base Layer: Onions, garlic, and ginger sautéed in butter or ghee, for aromatic base.
- Spice Layer: Addition of spices like Eaichi (Cardomum), turmeric, cumin, coriander, and chili powder for depth of flavour.
- Tomato Layer: Tomato- sauce is added for sweetness and tanginess.
- Cream Layer: Yogurt is added for creamy texture and to balance the spices.
- Finish Layer: Garnished with fresh coriander leafs, after a touch of lemon juice.
Each layer contributes to the overall flavour profile for a balanced and harmonious dish.

2.4 Multisensory Flavor Perception

Prof. Charles Spence, in a paper (2) with the above title discusses the complex and fascinating interplay of our senses in the perception of flavour, emphasizing that flavour perception is not merely about taste but involves a **multi-sensory integration** process. This paper explores the contributions of various senses—olfactory (smell), gustatory (taste), visual, auditory, and oral-somatosensory (touch)—to our experience of food and how these sensory cues combine to form our perception of flavour. The paper leads us to Multi-Sensory Perception (MSP) and Cross Modal Interaction (CMI) with Taste.

3.0 Multi-Sensory Perception (MSP) and Cross Modal Interaction (CMI)

MSP as an enfolding, takes us to attempts in holistic understanding of world, considering all senses including 'Taste'.

In the past, specialization of modern research and the tendency to focus on the functional properties of individual senses, have impaired holistic approach to sense perception. In a remarkable turn, recent work on Multiple sense perception (3) has brought out the unique ability of human brain to connect and integrate information across the sense inputs.

MSP enables the possibility of generalizing across different sensory instances of the same *perceptual object*, thus paving the road to semantic categorization which has the potential to *tap the tacit knowledge of the 'perceiving subject'(I-factor) in all the sense perceptions.*

The multimodal coding of actions provided by *auditory mirror neurons* (4), for example, can be interpreted as the dawning of a distinctive feature of the human mind, the capacity to categorize objects and events in an abstract and context independent way.

In this context, CMIs provide a new window to look at Taste Perception.

3.1 Cross Modal Interaction(CMI)s with taste

Cross-modal interactions with taste involve the integration of taste perception with information from other sensory modalities, such as smell, sight, touch, and even sound.

- Some well-known cross-modal interactions with taste

3.1.1 Olfactory-Taste Interaction

The interaction between taste and smell is one of the most studied cross-modal interactions. Smell greatly influences our perception of taste, as many flavours are actually perceived through a combination of taste and smell. For example, when we eat food, aromas released from the food travel through the back of the mouth to the olfactory receptors, enhancing the overall flavour experience

- Aroma of 'Freshly baked bread' makes the taste more appetizing.
- Smell of Coffee enhances the richness and intensity of taste of coffee
- Coriander leaves in Rasam brings exclusive taste of the dish.

3.1.2 Visual-Taste Interaction

Visual cues, such as the colour and appearance of food, can significantly impact our perception of taste.

- Vegetable Biryani with carrots, peas, bell peppers and coriander leaves
- Gulab Jamoon with golden brown balls in a glossy syrup
- Plated Sushi roll with contrasting colours and garnishes

3.1.3 Tactile-Taste Interaction

The texture and mouthfeel of food can influence taste perception. For example, the creaminess of a dessert or the crispness of a chip can enhance the perceived richness or freshness of flavours.

Additionally, the temperature of food and beverages can affect taste perception, with warmer temperatures often enhancing sweetness and cooler temperatures enhancing freshness or acidity.

- Crispy Indian Tandoori chicken
- Creamy ice cream with chocolate chips on top in a crunchy cone
- French fries or Potato finger chips

3.1.4 Auditory-Taste Interaction

While less studied than other cross-modal interactions, emerging research suggests that sound can influence taste perception.

- Sizzlers with grilled and fried ingredients served on a hot plate with a sizzling sound indicating fresh, hot food.

3.2 Taste Illusions

Looking at 'Taste Illusions' has a potential to generate ideas similar to visual illusions of M.C. Escher based on 'Figure and Ground' principle in Gestalt theory.

3.2.1 Multi-modal illusions in taste

These are relatively rare compared to those in vision and hearing. However, there are some examples of CMIs involving taste perception.

- Visual-Taste Illusion

While not a traditional "illusion" per se, there is evidence that visual cues can influence taste perception. For example, the colour of food or beverages can affect our expectations and perceptions of taste. Studies have shown that people may perceive a drink as sweeter if it is coloured red, compared to the same drink coloured green or blue, even if the taste is identical.

3.2.2 Phantom Taste Perception

By definition, Illusion is a perception of non-existing thing or an entity not possible in reality. But interestingly such Illusions are possible. Researcher Linda Bartoshuk (5) coined the term **Phantom Taste Perception**, to explain such taste illusion which has gained importance in the context of medical conditions



Phantom Taste Perception

Phantom taste perception, also known as gustatory hallucination, is a sensory phenomenon where individuals perceive taste sensations in the absence of any external taste stimuli. In other words, they experience tastes even though there is no corresponding taste source present. These phantom taste perceptions can range from subtle to intense and may involve various tastes, such as sweet, salty, bitter, or sour. They can occur spontaneously or be triggered by factors such as psychological influences, medications, medical conditions, or sensory cross-modulation.

For example, someone might perceive a bitter taste in their mouth even though they haven't consumed anything bitter, or they may experience a metallic taste sensation without any metallic substances in their mouth.

Phantom taste perceptions are not fully understood, but they are believed to arise from complex interactions between the brain, sensory pathways, and psychological factors.

3.2.3 Butcher's Tongue Illusion

The "Butcher's Tongue Illusion" (6) is an experimental setup created by Michel et al., acting as a novel variant of the Rubber Hand Illusion, but applied to the tongue. In this illusion, participants' tongues are stimulated while they observe a mirrored dummy tongue being touched. This setup led participants to feel as if the touch they observed on the dummy tongue was happening to their own tongues. This experiment demonstrates the brain's ability to integrate multisensory information—visual, tactile, and proprioceptive—to create the illusion of touch on their own tongue, a part of the body rarely seen directly (Psyche Oxford).

4.0 Cooking and Culture: Art, Aesthetics and Design

Cooking and Culinary Arts offer an enfolding rooted in Culture and Social structure of Society.

Taste Perception is embedded in feudal social structures which have nurtured 'Aesthetics and Art practices' among elite. Cooking as Design can bring 'Taste Perception' to 'everyday experience of a common man' to which exclusive 'Culinary arts' can be connected.

4.1 Cooking and Taste

In Human Evolution, Cooking has brought a new dimension to 'taste'. Techniques of Cooking such as heating, seasoning, and combining ingredients, transformed the flavor, texture, and aroma of food. Cooking brought 'engagement with food', a centre stage in Human Culture.

4.1.1 Cooking as Art

In the past, 'Aesthetics of taste' led by culinary Arts, have shaped cultures in East and West.

- Culinary Art of chefs in West
When chefs focused on creativity, expression, presentation, and culinary techniques they created new 'boundaries' in taste. Cooking turned into an 'art form'. Treating the plate as a canvas and each dish as a unique creation became a hall mark of great Chefs. Some Chefs, took the Culinary art further by starting Institutes of study and research which became well known.

4.1.1.1 The Fat Duck Experimental Kitchen

is a research institute started by Heston Blumenthal a British chef who was known for his innovative and experimental approach to cooking. The Fat Duck-restaurant gained international acclaim for its avant-garde culinary techniques and creative dishes.

Blumenthal established The Fat Duck Experimental Kitchen as a research facility adjacent to his restaurant, to push the boundaries of culinary science, explore new cooking techniques, and develop innovative flavor combinations.

The Experimental Kitchen serves as a hub for experimentation, creativity, and culinary exploration, embodying Blumenthal's philosophy of combining traditional cooking methods with cutting-edge scientific principles to create unforgettable dining experiences.

- Bertazzoni Cooking Lab is one more notable research institute founded by Francesco Bertazzoni, an Italian chef, with similar objectives.

4.1.1.2 Recipes and Culinary Creativity: The Noma Legacy

In an article with above title (7) Patrik Engisch provides an analysis of culinary creativity, focusing on Noma, a renowned restaurant in Copenhagen led by chef René Redzepi. Engisch builds on Margaret Boden's theory of creativity, exploring how culinary creativity manifests in new, surprising, and valuable ways. The article categorizes culinary creativity into combinatorial, explorative, and transformative classifications (see ref 13) to understand the innovative culinary practices at Noma.

4.1.1.3 Chefs and Artists in dialogue

Culinary Arts have been rooted in the sensual experience, whereas Arts have been engaged in depicting reality, often translating 'Abstract Concepts', beyond sensual zone. In a paper, 'Chefs and artists in dialogue – about the use of food as a sensual and conceptual medium in contemporary art and cuisine(8), the author(Felix Bröker) points out, 'Artists that cook like the Futurists, Daniel Spoerri, Peter Kubelka or Rirkrit Tiravanija seem to work with cooking as an aesthetic practice in different ways than chefs do. Contemporary chefs on the other hand just started to incorporate conceptual thinking into a basically sensual craft. A closer look shows many parallels and intersections in both areas'

Several invigorating initiatives have taken place further in such dialogues between Chefs and Artists.

- A thought-provoking debate titled "Is Food Art?" featured on 'Surface', the blurring lines between culinary and visual arts are explored through the lens of notable figures from both fields. The discussion reveals diverse opinions on whether food can be considered art, reflecting on the sensory and ephemeral nature of culinary experiences. This dialogue

underscores the complexity of defining art and the intimate, multisensory experiences that food, much like traditional art forms, can offer (SURFACE).

- Esmé, is a Chicago-based restaurant and art project founded by former Next chef Jenner Tomaska and Katrina Bravo. Esmé illustrates the profound potential of combining culinary excellence with artistic expression to create meaningful community impact (Newcity Resto).
- "Make. Eat. Drink." Event, Created by Austin ceramic artists, Ryan Mckerley and Keith Kreeger, showcases how the tactile and aesthetic qualities of serving pieces can enhance the dining experience

4.1.2 Cooking Arts of East

Cooking Arts have flourished in East with rich tradition of culinary arts. Techniques fused with philosophies have distinct cultural heritage and identity.

Asian cuisines, including Indian, Chinese, Japanese, Korean, Thai and others, are known for their diverse flavors, vibrant colors, and emphasis on balance and harmony.

Five major traditions with distinct identity are well known

- Indian Cuisine
- Chinese Cuisine
- Japanese Cuisine
- Thai Cuisine
- Middle Eastern Cuisine

What may be more significant for 'design pedagogy' is to look at '*Cooking as an act of design*', which happens as a part of everyday life.

4.2 Cooking as design

Cooking is an 'act of design' because it involves creativity, planning, and the intentional arrangement of ingredients to achieve a desired outcome. Similar to designing a product or artwork, cooking requires making decisions about colour (food presentation), texture, flavour combinations, and overall composition.

Functionality, planning gets due consideration in the given context. Elements of design like proportion and timing are looked at, in a new frame work of achieving desired flavours. The embedded tacit knowledge which goes beyond the measurable features, inducts new sensibility to 'act of design'. For example, 'Aroma' as a feed back to judge time of frying becomes a 'feel', a tacit component of general design knowledge

Cooks, like designers, often experiment with different elements to create a harmonious and aesthetically pleasing result. They consider factors such as balance, contrast, and proportion to ensure that the dish not only tastes good but is visually appealing. The selection of ingredients, their preparation, and the cooking techniques used are all part of the design process in the culinary world.



5.0 Food Industry: Measures, technology and language used for Taste Perception

Food Industry engulfs Society with its high Financial stakes. Measuring of Taste has acquired a business importance with considerable resources made available for research and technology. Unfolding of 'Results and methodologies of studies done in the context of food industry' Would provide rich inputs for academic probes of Taste Perception as well as design engagements in the area like packaging and communication.

5.1 Growth projections

The global packaged food market is projected to experience steady growth in the coming years. According to a report by Grand View Research, Inc., (9) the global packaged food market size was valued at USD 3.2 trillion in 2020 and is expected to expand at a compound annual growth rate (CAGR) of 4.9% from 2021 to 2028. Innovations in packaging technologies, like sustainable and eco-friendly packaging solutions, are also expected to contribute to market growth. Considerable research is done related to taste measurement in the context of quality control, package communication, nutrition, health, etc.,

5.2 Measures, methods and technology

Objective measures become important in a system with large financial stakes. Technologies like Electronic tongue are developed.

Electronic Tongue: Technology has brought in electronic tongue which can be used for measurement of taste, without involving humans. Often such instrumental measures become means to reduce the 'risks involved in Individual decisions' in high stake Industry.

Measuring methods with bearing in Academic and Clinical research

- Psychophysical tests involve presenting subjects with taste stimuli under controlled conditions and asking them to rate the intensity, quality, or pleasantness of the taste. Different methods like, Threshold Testing, Preference Testing and Hedonic Scaling are used.
- Biochemical Analyses: Chemical analyses of saliva or other bodily fluids can provide information about taste receptor activity and the release of taste-related compounds, which can be used as measures.
- Brain Imaging Techniques: Functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) scans are used to study the neural processing of taste stimuli in the brain. These techniques allow researchers to observe which brain regions are activated in response to different tastes.

In the process of these studies, complexity of measurement of Perception of taste is recognized. Dr.Charles Zuker(10) says "Taste, the way you and I think of it, is ultimately in the brain. Dedicated taste receptors in the tongue detect sweet or bitter and so on, but it's the brain that affords meaning to these chemicals. Even in animals that had never experienced sweet or bitter taste, activation of these cortical fields still triggered the corresponding behaviours, showing that the sense of taste is hardwired in the brain. Experiments confirmed the essential roles of these cortical fields in sweet and bitter taste recognition

5.3 Language used for in Sensory Evaluations for Taste Perception. (11)
Naming becomes an initial means to express experiences in new fields. Names used for describing tastes and aromas, coined and used for the studies undertaken in Sensory evaluation become relevant for further study.

5.3.1 Various names of taste expressions

Sweet, cool, bitter, umami,
Zesty, warm, hot, tangy,
Sour, sharp, rich, salty,
Bland, rancid, tart, acidic,
Strong, citrus, mild, savory,
Spicy, metallic, weak.

5.3.2 Names used for Aroma

Aromatic, pungent, spicy, woody,
Floral, bland, green, citrus,
Earthy, rancid, savoury, leathery,
Rotten, tart, oily, creamy,
Acrid, strong, mild, buttery,
Musty, weak, scented, mossy,
Fragrant.

Here it is important to note that naming becomes an attempt to extract the experiential tacit knowledge into an articulated zone, even if it is partial.

However, terms from other cultures like Indian, Chinese, Arabic are missing in the current studies.

6.0 AI based Creativity, Silence (Inner Order and Individual and collective Creativity), Generative metaphors

One of the exclusive features of 'Arupa the implicate order'(12) is concern with the 'Inner Order' and 'Working Order' of the individual designer as well as community of designers across disciplines which affect 'Creativity'.

However, knowledge generated in practice dominates the new digital Industry, resulting in many gaps.

In this context, Creativity in taste perception can be examined in three modes

- AI based computational creativity
- Internal processes in thinking like 'Silence' and 'pleasure of eating'
- Generative metaphors in taste as a part of holistic thinking with Multi-Sensory Perception (MSP)

6.1 AI based computational creativity

Computational Creativity articulated by M Boden has been significant to field of design. Boden's framework, three types of creativity (13) as mentioned below are familiar to industrial designers as re-design and new conceptual design.

6.1.1 Combinatorial (recombining existing ideas or concepts)

Way back in seventies Prof. Arnald Votteler introduced to us at NID, concept of redesign in late sixties, which operates without disturbing the total set up in Industry, which is conceptually similar.

6.1.2 Exploratory (exploring the space of possible ideas)

We at IDC, framed one of the last degree project as 'redesign project' which in spirit was like this. Most of projects which we undertook for Industry like redesign of Boilers for Thermax Co. were of this type.

6.1.3 Transformational (creating radically new ideas or concepts)

The final projects of product design at IDC, were encouraged to be in this zone. Projects in Practice like 'Tool kit for Bamboo craft' and EVM had such scope.

However, new categorization offered by Boden becomes advantageous for problem setting in interaction and software design. The categories can help to set a boundary to operate by 'project staff or students', as leaders and faculty members would have little 'project experience' to fall back on. Projects in 'Taste experience' can be introduced in 'Practice and Pedagogy', to act as 'Models', to compare and connect metaphorically.

6.2 Internal processes which contribute to Creativity

Design in its pedagogy and practice has depended on doing with hands, manipulating and playing with materials, studio practices like building physical mock-ups and prototypes, which contributed to a great extent in developing tacit knowledge to operate. AI based digital industry poses a new challenge for acquiring 'inner orders' to operate. Perhaps existing knowledge base developed on Vision, Sound and Tactile/kinesthetic senses needs new inputs. Here is an opportunity to look at 'Taste Perception' with its potentials to tap unexplored cognitive processes. We will examine 'Silence of Taste' and 'pleasure of eating' in this context.

6.3 'Silence of Taste' and 'pleasure of eating'

6.3.1 Silence of Taste

Role of 'Silence' in relation to the senses, specifically sound and vision, was brought out in an earlier paper 'Arupa of Silence¹ Vision and Sound' in the context of design education. To recall salient points

- distinction between 'Silence without Intension' as a spiritual or cosmic order beyond human thought and 'Silence with Intension' as a meditative state significant for design and everyday life, which lays the groundwork for examining silence's role in enhancing sense perception and tacit knowledge acquisition, vital for the creative learning and practice of design.
- silence facilitates a deeper connection with the material, leading to the acquisition of somatic and collective tacit knowledge.
- silence is powerful in fostering a conducive learning environment that nurtures creativity, intuition, and a profound understanding of design principles.

With the above premise we may ask,

'Is there a silence of Taste?'

At the level of BLO (Biological Life Order), Taste is an indicator and protector, guarding wrong intake into stomach.

Animals, birds, etc, are less affected by man-made 'taste of food' compared to Humans.

For us, 'Taste sensation' is absent, when we are not eating or chewing. But it is not a 'state of 'Silence' of taste!

'Silence of Taste' is to be aware of taste while eating by paying full attention to the act of eating itself. Such 'Sensitization or meditative attention' can occur, akin to, 'listening or performing classical music'.

Can it be called, 'Active Silence of taste? Is it meditative?

Can there be 'intentional silence' of Taste which can act as a ground for creative acts?

Let us dwell on

- Pleasure of Eating and
- Reflective Process while eating for possible answers.

6.3.2 Pleasure of Eating

Pleasure of Eating is subject to 'cultural and individual conditioning with a social engagement as basis'. Traditionally it has been a ground to encourage and nourish aesthetics of taste as well.

But, Pursuit of pleasure, as an extension of I-psyc, can lead to habits of over eating, leading to unhealthy bodies when eating is not in tune with the stomach. Pleasure of 'Eating' can be a normal healthy process, if I-psyc does not cling to its 'past-memory' with a desire to repeat, which is rooted in psychological insecurity. We can often see a person getting into munching mode, even when one is not hungry. The act of eating becomes a kind of 'tension-releaser'. People who quit from habit of smoking, often end up over eating, putting on unwanted fat.

*Such Indulgence
in eating is
exploited by
consumer Industry
through
advertisements,
leading to
unhealthy
eating habits*

Studies in Neuro Science support the above contentions as seen in a paper, 'Neuroscience of affect: brain mechanisms of pleasure and displeasure' (14) by authors Kent C Berridge, Morten L Kringelbach, who point out that *'pleasure is never merely a sensation. Even a sensory pleasure such as a sweet taste requires the co-recruitment of additional specialized pleasure-generating neural circuitry to add the positive hedonic impact to the sweetness that elicits liking reactions. Without that pleasure gloss, even a sweet sensation can remain neutral or actually become unpleasant.'*

Other researchers like Dr. Cristina Gill Lopez, also have brought attention to dichotomy between

- Homeostatic(nutrient-driven) eating (which can be connected to I-fac) and
- Hedonic- (pleasure-driven) eating. (which can be connected to I-psyc)

with reference to eating and health in a paper on “Food Preferences: How the Brain Drives our Eating Behaviour” (15). She further points out, “*food preferences are not solely innate but are significantly shaped by a variety of factors including age, gender, health status, and socio economic conditions. This suggests that while certain preferences might be biologically driven, many are acquired or learned through exposure and experience. The paper also discusses cognitive determinants of food choice, contrasting conscious, effortful decisions with those driven by implicit, automatic processes*”.

6.3.3 Reflective Process while eating

Mindful eating, giving full attention to eating is advised for healthy eating.

I-psyc has significant say in what and how, one eats. Full attention to eating, akin to listening to music totally, can bring in *active silence of taste*. Whether it can create a ground for creating new ideas is less researched in the specific zone of taste Perception. However, it has been a part of Mindfulness and Meditative component in creativity sessions of some corporates.

- I used to give an ‘Almond (Badam)- chewing Task’ for ‘Mindful Taste experience’ to M.Des students as an introductory exercise! Many of them remember the task even after 20 years.

Almond Task

First, each of the students were given an almond(badam) to hold in their hands and imagine chewing it, as they recall their memory of its taste and aroma! Then they were asked to chew the almond slowly with full attention.

In the second step I used to ask them to imagine the taste of ‘Lays’ brand potato chips, which are highly advertised, showing the students, a video clip of the advertisement. This used to bring ‘saliva’ in their mouths without eating.

- Another Taste experiment was with children in a Fractal workshop. We gave a ‘Pop rock peppermints’, which pop and crackle in your mouth, to each kid to eat and experience fractals. It helped to connect ‘tacit fractal taste experience’ with abstract geometric, visual concept of Fractals, besides being great ‘Fun’.

6.4 Generative Metaphors in Taste

Metaphors are means to articulate new experiences in poetic, creative zone!

The term ‘Generative Metaphor’ was coined by Donald Schön, for ‘heart-as-a-pump’ metaphor, which helped Harvey, in conceptualizing the circulatory system in terms of mechanical principles. His discovery of ‘Heart as Pump’, made significant connections in, till then unconnected zones.

To explore 'Silence of taste perception' in the framework of 'Computational Creativity', 'Generative Metaphor' was used as a key word.

Chat GPT came out with metaphoric connections along with descriptions like

- **The Silence of Umami:** Metaphor: The depth of umami is like the unspoken poetry in a dish, a silent symphony that resonates on the taste buds without needing explicit description.
- **The Quiet Heat of Spices:** Metaphor: Spices, when used subtly, can create a silent dance on the palate, where the heat speaks in whispers, adding layers of complexity without shouting.
- **The Subtle Silence of Fresh Herbs:** Metaphor: Fresh herbs contribute to a silent garden of flavors, each leaf a nuanced note that collectively creates a melody on the taste palate.
- **The Unspoken Harmony of a Well-Balanced Dish:** Metaphor: A perfectly balanced dish is like a moment of silence in a beautiful piece of music, where every element plays its part without overpowering the others.

These metaphors attempt to convey the idea that certain taste experiences are profound and meaningful, often defying direct verbal expression and invoking a sense of silent appreciation.

Metaphors identified above, further take us into 'a poetic zone of thinking' in which 'individual metaphoric tracts' can operate.

What can be the further guide line from the frame work of 'Arupa the Implicate Order ?' Here 'Meaning' with its two rupas or manifestations as mentioned in earlier paper (16) comes into Picture.

- *Meaning as our internal representation based on our perception of entities outside.*
Meaning which refers to the objective of the individual designer or the group engaged with the task of design
- *Intention as the meaning seen from inside 'with respect to self'.*
Meaning which relates to the 'self' and 'Inner Order'!

This offers a new experiential format for design!

7.0 Conclusion:

The paper extends the boundaries of design thinking for AI based Interaction design in Pedagogy and Practice, by integrating the often-overlooked sense of taste. Its interdisciplinary approach and innovative theoretical framework offer fresh perspectives to provoke critical discussions on the role of sensory experiences in design. Paper creates a potential ground for relooking at all design elements like Symmetry, Balance, Proportion, Modularity to make design holistic in 'Practice and Pedagogy at Foundation level'. It points out the need for research in 'Culture and Creativity' rooted in 'Taste perception' related to design.

A sequel paper to explore the potential will be in order.

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